



LIBRARY
OF THE
UNIVERSITY
OF ILLINOIS

610.5

AM

v. 69¹

cop. 6

NATURAL
HISTORY

MAR 22 1948

CENTRAL CIRCULATION BOOKSTACKS

The person charging this material is responsible for its return to the library from which it was borrowed on or before the **Latest Date** stamped below.

Theft, mutilation, and underlining of books are reasons for disciplinary action and may result in dismissal from the University.

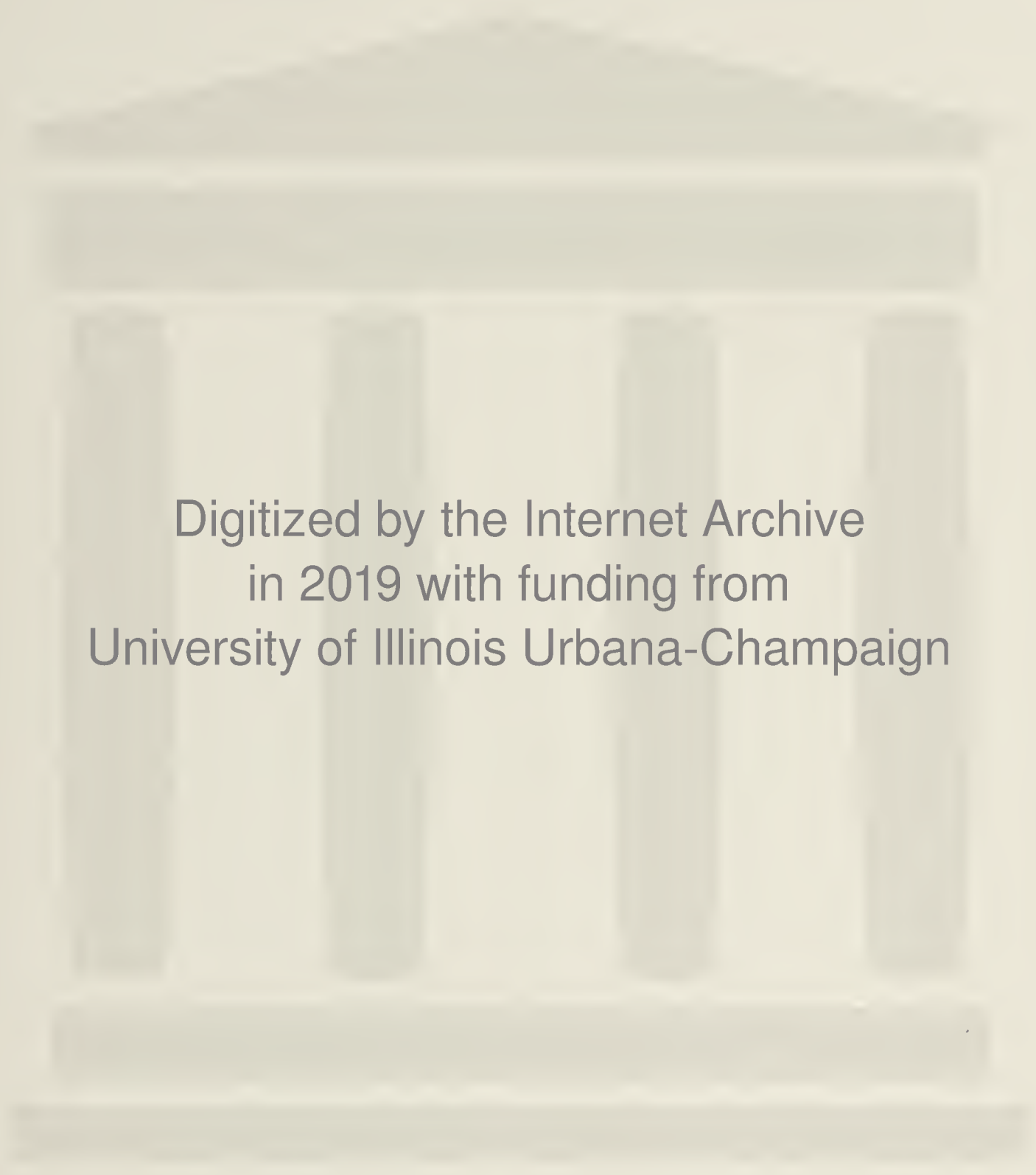
TO RENEW CALL TELEPHONE CENTER, 333-8400

UNIVERSITY OF ILLINOIS LIBRARY AT URBANA-CHAMPAIGN

BUILDING USE ONLY
NOV 13 1993
DEC 06 1996

When renewing by phone, write new due date below previous due date.

L162



Digitized by the Internet Archive
in 2019 with funding from
University of Illinois Urbana-Champaign

The Journal

OF THE

American Medical Association

EDITED FOR THE ASSOCIATION UNDER THE DIRECTION OF THE BOARD OF TRUSTEES BY

GEORGE H. SIMMONS, M.D., LL.D.

VOLUME LXIX : : : : JULY—DECEMBER, 1917

AMERICAN MEDICAL ASSOCIATION, CHICAGO, 1917

OFFICERS OF THE AMERICAN MEDICAL ASSOCIATION—1917-1918

GENERAL OFFICERS

PRESIDENT—CHARLES H. MAYO	- - - - -	Rochester, Minn.
PRESIDENT-ELECT—ARTHUR DEAN BEVAN	- - - - -	Chicago
FIRST VICE PRESIDENT—EDWARD H. BRADFORD	- - - - -	Boston
SECOND VICE PRESIDENT—JOHN McMULLEN	- - - - -	U. S. Public Health Service
THIRD VICE PRESIDENT—LAWRENCE LITCHFIELD	- - - - -	Pittsburgh
FOURTH VICE PRESIDENT—HOLMAN TAYLOR	- - - - -	Fort Worth, Texas
SECRETARY—ALEXANDER R. CRAIG	- - - - -	535 N. Dearborn St., Chicago
TREASURER—WILLIAM ALLEN PUSEY	- - - - -	Chicago
CHAIRMAN, HOUSE OF DELEGATES—HUBERT WORK	- - - - -	Pueblo, Colo.
VICE CHAIRMAN, HOUSE OF DELEGATES—DWIGHT H. MURRAY	- - - - -	Syracuse, N. Y.
EDITOR AND GENERAL MANAGER—GEORGE H. SIMMONS	- - - - -	535 N. Dearborn St., Chicago

BOARD OF TRUSTEES

M. L. Harris, Secretary	- - - - -	Chicago, 1918
Wendell C. Phillips	- - - - -	New York, 1918
Thomas McDavitt, Chairman	- - - - -	St. Paul, 1918
A. R. Mitchell	- - - - -	Lincoln, Neb., 1919
E. J. McKnight	- - - - -	Hartford, Conn., 1919
Oscar Dowling	- - - - -	Shreveport, La., 1919
Philip Marvel	- - - - -	Atlantic City, 1920
W. T. Sarles	- - - - -	Sparta, Wis., 1920
H. Bert Ellis	- - - - -	Los Angeles, 1920

JUDICIAL COUNCIL

A. B. Cooke	- - - - -	Los Angeles, 1918
Alexander Lambert, Chairman	- - - - -	New York, 1919
James E. Moore	- - - - -	Minneapolis, 1920
H. A. Black	- - - - -	Pueblo, Colo., 1921
Randolph Winslow	- - - - -	Baltimore, 1922
Alexander R. Craig, Secretary	- - - - -	535 N. Dearborn St., Chicago

COUNCIL ON HEALTH AND PUBLIC INSTRUCTION

W. S. Rankin	- - - - -	Raleigh, N. C., 1918
H. M. Brackett	- - - - -	Minneapolis, 1919
Milton Board	- - - - -	Louisville, Ky., 1920
Frank Billings, Chairman	- - - - -	Chicago, 1921
Walter B. Cannon	- - - - -	Boston, 1922
Frederick R. Green, Secretary	- - - - -	535 N. Dearborn St., Chicago

COUNCIL ON MEDICAL EDUCATION

H. D. Arnold, Chairman	- - - - -	Boston, 1918
H. Gideon Wells	- - - - -	Chicago, 1919

Robert C. Coffey	- - - - -	Portland, Ore., 1920
W. D. Haggard	- - - - -	Nashville, Tenn., 1921
William Pepper	- - - - -	Philadelphia, 1922
N. P. Colwell, Secretary	- - - - -	535 N. Dearborn St., Chicago

COUNCIL ON SCIENTIFIC ASSEMBLY

Roger S. Morris	- - - - -	Cincinnati, 1918
George H. Simmons	- - - - -	Chicago, 1919
J. Shelton Horsley	- - - - -	Richmond, Va., 1920
E. S. Judd, Chairman	- - - - -	Rochester, Minn., 1921
Alexander R. Craig, Secretary of the Association	- - - - -	ex officio.

COUNCIL ON PHARMACY AND CHEMISTRY

David L. Edsall	- - - - -	Boston, 1918
R. A. Hatcher	- - - - -	New York, 1918
A. W. Hewlett	- - - - -	San Francisco, 1918
John Howland	- - - - -	Baltimore, 1919
Henry Kraemer	- - - - -	Ann Arbor, Mich.
C. L. Alsberg	- - - - -	Washington, D. C., 1919
G. W. McCoy	- - - - -	Washington, D. C., 1920
F. G. Novy	- - - - -	Ann Arbor, Mich., 1920
George H. Simmons, Chairman	- - - - -	Chicago, 1920
L. G. Rowntree	- - - - -	Minneapolis, 1921
Torald Sollmann	- - - - -	Cleveland, 1921
Lafayette B. Mendell	- - - - -	New Haven, Conn., 1921
Reid Hunt	- - - - -	Boston, 1922
J. H. Long	- - - - -	Chicago, 1922
Julius Stieglitz	- - - - -	Chicago, 1922
W. A. Puckner, Secretary	- - - - -	535 N. Dearborn St., Chicago

SECTION OFFICERS

PRACTICE OF MEDICINE—Chairman, Lawrence Litchfield, Pittsburgh; Vice-Chairman, A. W. Hewlett, San Francisco; Secretary, James S. McLester, Empire Bldg., Birmingham, Ala.

SURGERY, GENERAL AND ABDOMINAL—Chairman, E. Starr Judd, Rochester, Minn.; Vice-Chairman, Robert C. Coffey, Portland, Ore.; Secretary, Eugene H. Pool, 107 E. 60th St., New York; Acting Secretary, George P. Müller, 1729 Pine St., Philadelphia.

OBSTETRICS, GYNECOLOGY AND ABDOMINAL SURGERY—Chairman, Brooke M. Anspach, Philadelphia; Vice-Chairman, R. E. Skeel, Cleveland; Secretary, Sidney A. Chalfant, Jenkins Arcade Bldg., Pittsburgh.

OPHTHALMOLOGY—Chairman, Alexander Duane, New York; Vice-Chairman, F. Phinzy Calhoun, Atlanta, Ga.; Secretary, George S. Derby, 7 Hereford St., Boston; Acting Secretary, Edgar S. Thomson, 405 Park Ave., New York.

LARYNGOLOGY, OTOLOGY AND RHINOLOGY — Chairman, Greenfield Sluder, St. Louis; Vice-Chairman, Philip D. Kerrison, New York; Secretary, L. W. Dean, 12½ S. Clinton St., Iowa City, Ia.

DISEASES OF CHILDREN—Chairman, Laurence R. DeBuys, New Orleans; Vice-Chairman, Richard M. Smith, Boston; Secretary, F. P. Gengenbach, Metropolitan Bldg., Denver, Colo.

PHARMACOLOGY AND THERAPEUTICS—Chairman, Arthur D. Hirschfelder, Minneapolis; Vice-Chairman, Walter A. Bastedo, New York; Secretary, Cary Eggleston, 412 West End Ave., New York.

PATHOLOGY AND PHYSIOLOGY—Chairman, Louis B. Wilson, Rochester, Minn.; Vice-Chairman, Francis Carter Wood, New York; Secretary, Isabella C. Herb, 110 S. Ashland Blvd., Chicago.

STOMATOLOGY—Chairman, Frederick B. Noyes, Chicago; Vice-Chairman, Henry S. Dunning, New York; Secretary, Eugene S. Talbot, 31 N. State St., Chicago.

NERVOUS AND MENTAL DISEASES—Chairman, Charles Eugene Riggs, St. Paul; Vice-Chairman, Charles W. Hitchcock, Detroit; Secretary, A. S. Hamilton, Physicians and Surgeons Bldg., Nicollet Ave. and 9th St., Minneapolis.

DERMATOLOGY—Chairman, Henry H. Hazen, Washington, D. C.; Vice-Chairman, Ernest Dwight Chipman, San Francisco; Secretary, Walter J. Heimann, 108 W. 87th St., New York.

PREVENTIVE MEDICINE AND PUBLIC HEALTH—Chairman, W. S. Rankin, Raleigh, N. C.; Vice-Chairman, Haven Emerson, New York; Secretary, Don B. Lowe, Akron, O.

GENITO-URINARY DISEASES—Chairman, Edward L. Keyes, Jr., New York; Vice-Chairman, Martin Krotoszyner, San Francisco; Secretary, W. F. Braasch, Rochester, Minn.

ORTHOPEDIC SURGERY—Chairman, Albert H. Freiberg, Cincinnati; Vice-Chairman, Fred J. Fassett, Seattle; Secretary, Henry B. Thomas, 30 N. Michigan Ave., Chicago.

GASTRO-ENTEROLOGY AND PROCTOLOGY—Chairman, Anthony Bassler, New York; Vice-Chairman, Alois B. Graham, Indianapolis; Secretary, Horace W. Soper, 316 Wall Bldg., St. Louis, Mo.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXIX, No. 1

CHICAGO, ILLINOIS

JULY 7, 1917

MAR 17 '18

THE EYE AND THE ENDOCRINE ORGANS*

WILLIAM ZENTMAYER, M.D.
PHILADELPHIA

Few subjects have claimed more of the attention of the research worker, the internist and the anatomist in the past decade than the function, anatomy, pathology and interrelation of the ductless glands. As a result, our knowledge of these matters has been greatly increased and the literature has now reached voluminous proportions.

The increasing interest in these organs by the ophthalmologist is well shown by the fact that since I began collating the literature for this address two other essayists have anticipated me. In January of this year there appeared an admirable summary of the established facts in the relation between the internal secretions and the eye by the late Dr. Schirmer, and a less comprehensive article by Lisser in September, 1916, from both of which I have freely drawn.

It is my purpose to bring to your attention not only facts but also what is still within the domain of speculation, hoping thereby to stimulate research to determine the value of such theories. I shall consider the subject from the aspects of experimental and indirect evidence, clinical evidence, toxic effects from the internal administration of the glands, indirect pathologic relation, suggestive etiology, and therapeutic uses of the glands in diseases of the eye.

EXPERIMENTAL AND INDIRECT EVIDENCE

The close topographic relation of the parathyroids to the thyroid and sympathetic nerves makes it difficult both in human surgery and in animal experimentation in operating on one structure to keep the other inviolate, and it is therefore difficult to decide in what relative degree the involvement of these structures is responsible for the resulting symptoms.

Thyroid Gland.—Gley and Rochon Duvigneaud found, from experiments on dogs, that in some instances after extirpation of the thyroid gland the cornea became porcelain white, leading at times to ectasia and superficial ulceration. Microscopically leukocytic infiltration was found. Leber, nevertheless, suggests that the appearances indicate, as the cause, a toxic endothelial necrosis. These investigators also saw produced an acute blepharitis with abundant lachrimation. Halstead noted conjunctivitis, and as a further complication partial blindness without ophthalmoscopic changes.

Following complete excision of the thyroid and parathyroids, in several instances Edmunds also encountered keratitis resembling syphilitic interstitial keratitis, in some cases unilateral and in others bilateral; but as its occurrence was usually associated with tetany leading to death, he believes it would in all cases have been bilateral had the animal lived. As a result of a similar operation, this author saw double cataract develop. Coats, who examined the lenses, was of the opinion that it was undoubtedly due to degenerative changes connected with the removal of the thyroids and the convulsions which followed.

While Edmunds believes that the altered secretion of the thyroid and parathyroids, produced by interference with the nerve supply, is more inimical to the nutrition of the cornea than the toxins produced by the complete removal of the glands, de Quervain is convinced that tetany thyropriva, as produced experimentally in animals, is the result of a toxemia of the entire nervous system, especially the brain, and is certainly due neither to injury to the neighboring tissues in the neck nor to the operation per se.

In tetany thyropriva, Falta and Kahn found spasm of the ciliary muscle and hypersecretion of tears.

Parathyroids.—There is some experimental evidence to indicate that disturbed function of the parathyroids alone can cause cataract. While the experiments of Erdheim showing that in parathyroidectomized animals there is a diminished calcification of the dentin and a hyperplasia of the enamel which frequently leads to fracture of the teeth, and those of MacCallum, Voegtlin, Leopold and von Reusz, which demonstrated a decrease in the lime secretion and a diminution of the bone salts, do not have a direct bearing on established relationship between the parathyroids and the eye, they do direct one's thoughts to the possible bearing of these findings on the syndrome of blue scleras and friability of the bones.

The view of Jeandelize that many convulsive disorders of man (convulsions of childhood, epilepsy and eclampsia) are due to parathyroid insufficiency, together with the experimental evidence adduced, strengthens the assumption that relative insufficiency of the secretion of these glands is an important factor in the etiology of zonular cataract.

Suprarenals.—In from five to ten seconds after the intravenous injection of epinephrin in rabbits and cats, the pupil begins to dilate, the nictitating membrane to retract, and slight ptosis to occur. These phenomena reach their height in from five to twenty seconds, and last about two and a half minutes longer. In dogs, after medium doses, there is miosis, enophthalmos and adduction of the eye, probably through oculomotor stimulation from increased intracranial tension. Toxic doses, however, produce dilatation of

* Chairman's address, read before the Section on Ophthalmology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

the pupil. In man, in the presence of paralysis of the sympathetic, the conjunctival instillation of epinephrin produces mydriasis. From observation of the constant use of epinephrin in daily practice for a number of years Santos-Fernandez finds that it only infrequently produces mydriasis. According to Nieden, the local use of epinephrin diminishes lacrimal secretion, and we are all familiar with the contraction of the vessels which results.

When a 1 per cent. solution of epinephrin is instilled into the conjunctival sac of animals deprived of the thymus gland, epithelial bodies or thyroid gland, the pupil becomes dilated in all, but with this difference: that where the thymus has been extirpated, it occurs only after the lapse of weeks, whereas after extirpation of the thyroid it occurs within a few hours. In the presence of pancreatic lesions, repeated instillations produce dilatation of the pupil. In exophthalmic goiter and during the administration of thyroid extract dilatation of the pupil may occur when epinephrin is instilled into the eye. This is due probably to the increased irritability of the sympathetic.

According to Bayer, the contradictory observations on the effects of epinephrin on intra-ocular tension have been brought to agreement by the studies of Ruberts which have shown that when epinephrin of the usually applied strength is instilled into the normal eye it causes no fluctuation of the tension, while in the glaucomatous eye this is very marked. First there is a diminution, then an increase, and finally a decrease. In glaucomatous eyes it must therefore be used with caution.

Pineal Gland—There is no evidence to show that perversion of the secretion of this body is capable of producing any disturbance of the functions of the eye, nor is it at all likely that the ocular symptoms associated with teratomas of this organ are due to other than the pressure exerted on neighboring structures.

It is of sufficient interest to note that the epiphysis cerebri is, in the words of Lord, "a rudimentary structure, developmentally the representation of the median eye present in some animals." This is also the view of Barratt, who says it is not correct to speak of the whole diverticulum, or even any part of it still existing, as the "remains of a median eye or as a vestigial eye."

Both Ogles and Campbell found, in cysts of the pineal gland, cells of varying shape filled with coarsely granular dark brown pigment, and think that they may represent the pigment cells of the retina.

Pituitary Body.—Without more definite experimental data we must consider the ocular phenomena associated with disease of the pituitary body as due to direct pressure and increased intracranial tension; but there are symptoms, notably the "antecedent amblyopia" of de Schweinitz, the frequent variability, and at times transient nature of the disturbed function, and the beneficial effects of glandular therapy on the amblyopia in some cases of undoubted hypophysial disease, that suggest the possibility that in some cases disturbed secretion is a factor. Furthermore, Uhthoff points out that cases have been recorded in which the ocular condition, particularly the disturbance of motility, more especially the oculomotor, was induced by changes in the basal nerves not the result of pressure.

Schirmer directs attention to the fact that the symptoms in the syndrome to which Oppenheim first called attention and to which he has given the name "tabes

pituitaria" are attributed to degenerative changes in the lumbar spinal cord due to the action of pituitary secretion, and comments that if this be admitted, a similar influence on the optic fibers is just as likely, and he prophesies that the time will come when certain cases of optic atrophy will be found to be of hypophysial etiology.

CLINICAL EVIDENCE

Time does not permit, nor would it be appropriate on this occasion, to give a careful analysis of the many eye symptoms and their variations dependent on the nature and extent of the disease of the pituitary body, yet we cannot be contented with their mere enumeration. According to de Schweinitz, one of the earliest ocular symptoms is "antecedent amblyopia" a form of blurred vision which antedates by a long period of time the objectively determinable amblyopia or any failure to read normally the ordinary test types, although the patient is conscious of a definite mist often in the central area. It may be unilateral and is probably by no means constant. Cushing and Parsons have also observed this symptom.

Visual Field Defects.—Coming now to the more definite phenomena, I shall first consider the visual field defects. As is well known, the typical field defect is a bitemporal hemianopsia, which is present in at least 40 per cent. of all cases; but we should give great weight to the assertion of Cushing that homonymous hemianopsia is by no means uncommon. According to Uhthoff, however, in the absence of acromegaly it is very rare. The development of the heteronymous defect from a superior temporal slant of the peripheral field, and the precedence of a hemichromatopsia are always to be borne in mind. As has been pointed out by several authors, notably by Weeks, Cushing and Evans, and emphasized by de Schweinitz, the boundary line between the seeing and the blind fields is not usually regular or vertical, and as Wilbrand and Sanger assert, there is probably always a preservation of the macula, but in some cases it is so limited as to be overlooked in the field taking.

While the frequency with which scotomas are present has been probably underestimated, yet, as will later be brought out, the very fact of their occurrence has doubtless led to mistakes in diagnosis. De Schweinitz and Holloway have classified these scotomas thus: 1. Small and paracentral with the possibility of their expanding into complete hemianopsia. 2. An absolute or relative defect up and out, forming a quadrant. 3. Scotomas varying in size and position with a possibility of their disappearing. 4. Large paracentral absolute scotomas in the outer halves of the visual fields. 5. Temporal field scotomas at some distance from fixation, manifested at some considerable time before the entire field is obliterated. 6. An antecedent amblyopia prior to the development of the central scotoma.

The amblyopia and the amaurosis usually develop slowly, though sudden blindness, just as sudden recovery of central vision or the sudden restoration of vision in the formerly blind field, is not unknown. Variations in visual acuity as well as in the extent of the visual field, from day to day, or even within shorter periods of time, are somewhat characteristic. According to Uhthoff, the dictum of Marie and others that the reduction of vision to blindness is a fundamental symptom of acromegaly is untenable.

Ophthalmoscopic Findings.—The preponderance of primary pressure atrophy over other disturbances of

the optic nerve is only what is to be expected from the nature and position of the intracranial lesion. The relative frequency of the occurrence of optic atrophy, papilledema and optic neuritis with and without acromegaly, according to Uhthoff's tables, is 20, 9 and 8.5 per cent., optic neuritis, including papilledema, occurring twice as frequently when acromegaly is present than when it is absent.

Disturbances of Musculature.—Oculomotor palsy is by far the most frequent type, and was present in Uhthoff's tabulation in 15 per cent., whereas all other forms of paralyses were seen in but 6.5 per cent. Only rarely is the superior oblique involved. The state of the pupils is dependent on the degree of intracranial pressure and the amblyopia. The occurrence of the hemianopic pupillary inaction sign is still in question. Nystagmus occurs in only a small percentage of cases.

Occasional Phenomena.—Visual hallucinations, which have been noted in a few instances, are not to be considered as of localizing importance, as they may occur with tumors situated almost anywhere within the cranium, as pointed out by Spiller. Evans alone speaks of cyanopsia. Exophthalmos has been observed as a phenomenon of congestion. Persistent photophobia has been occasionally seen, especially after operative interference (de Schweinitz and Holloway). The pigmentation of the skin of the lids is probably due to associated disturbance of the suprarenals. Difficulty of eversion of the lids and thickening of the palpebral glands are mentioned by de Schweinitz.

Tumors of the Pineal Gland.—According to Oppenheim, tumors of the pineal gland cause almost the same symptoms as tumors of the corpora quadrigemina; in the former, however, the oculomotor, trochlear, and abducent nerves are not so often affected, but nystagmus is more common. Frankl-Hochwart believes that when the foregoing symptoms are associated with an abnormal increase in stature, an unaccustomed growth of hair, obesity, drowsiness, and a premature genital and sexual development with evident precocity of adolescence, we must think of tumor of the pineal gland.

AFFECTIONS OF THE THYROID

Exophthalmic Goiter.—In view of the fact that some of the gravest symptoms of this affection may exist in the absence of either or even both of the phenomena from which it has received its most commonly given name, and that its pathogenesis is now known, it would seem more appropriate to speak always of this syndrome as "hyperthyroidism."

In the majority of the cases of hyperthyroidism, at some period, the eye symptoms dominate the clinical picture. The retraction of the upper lid, to which the striking and pathetic facies is due, is often the symptom which first calls attention to the existence of the disease. Associated with this we usually find loss of coordination between the downward movement of the globe and the upper lid, and occasionally the difficulty of eversion of the upper lid, and Kocher has observed that when an object fixed by the eye is moved rapidly up and down, it causes a convulsive momentary contraction of the upper lid, while Joffroy has noted a failure of the skin of the forehead to wrinkle when the patient looks up.

Under the term "deficient complementary fixation in lateral eye rotation," Suker has recently described an ocular symptom of hyperthyroidism. After extreme lateral rotation of the eyes either to the right or to

the left with the head fixed and with fixation of an object at this point maintained for a second or two, on attempting to follow this fixation point as it is rapidly swung into the median line, one of the eyes—it may be either—fails to follow the other in a complementary manner into proper convergence and for this point when it is brought into the median plane. Either the right or the left eye makes a sudden rotation into the fixation with its fellow, but before it does so, an apparent divergent strabismus is manifested. According to Suker, it is no doubt due to a dissociation in the functions of the sympathetic and the extraocular motor nerves of the eye, and perhaps also to exhaustion on extreme lateral rotation of the eyes.

Periodicity and incompleteness in the act of involuntary winking comprise a less constant lid sign. Exophthalmos may precede or appear coincidentally with the foregoing symptoms. Rarely it is unilateral and then may be accompanied by dilatation of the pupil. In some cases the proptosis indirectly leads to a destructive keratitis. A subjective accompanying symptom is a feeling of pressure behind the eyeball. Along with alopecia, which is not an uncommon symptom, there is falling out of the eyebrows and eyelashes. Less frequently observed symptoms are: epiphora, or, in some cases, deficient lacrimation; pigmentation of the upper lid, which is probably due to suprarenal insufficiency; tremor of the eyeball, and weak convergence and paresis of the ocular muscles, in the form of bilateral ophthalmoplegia externa, of the associated muscles and individual muscles. Nystagmus is a rare symptom. The occasional existence of an ocular bruit has been much discussed pro and con. Riesman has recently revived interest in the question, having heard it in two cases. He states that it was first described by Snellen and Schonfeld. Carrington and Drummond also give clear descriptions of it. Riesman speaks of it as a rhythmic murmur keeping time with the pulse and not to be confounded with a more or less continuous hum evidently due to the muscular movements of the eyeball. Roemer, in discussing the symptom, states that Hering has proved it to be due to activity of the orbicularis.

Becker has observed lateral displacement of the light streak and pulsation of the retinal arteries synchronously with the radial pulse. Rarely optic neuritis and optic atrophy are observed. In view of the observations of Coppez, Standish and others that these symptoms can result from the ingestion of thyroid extract, and the experimental demonstration by Birch-Hirschfeld and also by Nabuo-Inouye that ganglion degeneration of the retina, and optic atrophy may follow thyroid toxemia in dogs, it seems strange that affections of the optic nerve are not encountered more frequently.

ATHYROIDISM

Myxedema.—In this condition, in which the changes in the thyroid are chiefly atrophic, the edema of the eyelids with the consequent narrowing of the palpebral fissures is the most marked ocular phenomenon. The edges of the eyelids are hyperemic; the eyebrows are elevated and the hairs and cilia are sparse and brittle. Subconjunctival hemorrhages may occur. Other symptoms are lacrimation, asthenopia, neuroretinitis (Wagner) and superior-temporal contraction of the visual field (Ottolenghi).

Petzetakis studied the oculocardiac reflex in six persons with myxedema and found it enormously intensified over what is observed in normal persons.

He believes that the hypothyroidism leaves the sympathetic without the normal stimulation of the thyroid, and as a consequence vagotonus results. In one case the normal balance was restored by thyroid feeding.

Cretinism.—In this condition, which has been called infantile or juvenile myxedema, besides the conditions just enumerated, there is a wide spacing of the eyes. A conjunctivitis which is sometimes present has been attributed by Hitschmann to the interference with drainage, the result of the saddle bridge.

In both of the foregoing conditions it has been noted that the mydriatic effect of homatropin and similar drugs persists beyond the usual time.

Mongolian Idiocy.—Because of a slight outward resemblance with the foregoing two affections and because of the improvement resulting from the use of thyroid extract, some modern clinicians suspect a thyroid origin for the Mongolian type of idiocy, in which the eye symptoms of epicanthus and convergence of the palpebral fissures have originated the terminology of this affection.

Papilledema Due to Thyroidectomy.—Krauss has reported a case of papilledema in a man, aged 23, coming on after thyroidectomy and first observed eight weeks after the operation. Although the parathyroids had been carefully avoided, the operation was followed by a toxemia inducing tetany. Central vision was about normal and the fields showed partial color reversal with peripheral transient scotomas; but the distinctive feature was said to be the slight cutting of the form field with abnormally large color fields. There were prodromal attacks of absolute blindness immediately after the operation. The retinal edema extended from the peripapillary region along the course of the vessels.

Cataract Following Thyroidectomy.—After thyroidectomy in a woman, in which the operation was followed by tetany, Westphal saw double cataract going to maturity in five years; and Schiller observed bilateral cataract develop within six months after partial removal of a goiter in which the operation was followed by tetany.

The occurrence of tetany in all of these cases suggests an insult to the parathyroids as the probable essential factor in the postoperative symptoms.

The influence of the parathyroids in the causation of senile cataract has engaged the attention of Fischer and Triebenstein and also of Heschler; but the conflicting evidence prevents definite conclusions at this time. The former claim to have found signs of latent tetany in 82 per cent. of sixty-eight patients with senile cataract, whereas in control patients of the same age the percentage of tetany was less than 20. Heschler, however, found but 2 per cent. of tetany in fifty cases of presenile and senile cataract.

THYMUS GLAND

Garre found that in 95 per cent. of fatal cases of exophthalmic goiter there was a persistent hyperplastic thymus. An interesting case showing the influence of persistent thymus on the production of the symptoms of exophthalmic goiter is that of von Haberer. Notwithstanding that the patient had had part of the thyroid removed and the thyroid artery going to the remaining thyroid tissue ligated, his condition became desperate. Removal of a fragment of the thymus produced an amazing improvement with a return to the normal both subjectively and objectively, in three months' time.

Halstead records cases of exophthalmic goiter in which ligation of the thyroid arteries and thyroidectomy failed to check the disease, but thymus feeding, radium and Roentgen-ray applications caused remarkable improvement.

TOXIC EFFECTS OF THE INTERNAL ADMINISTRATION OF THE GLANDS

Hyperthyroidism from Use of Thyroid Extract.—Standish, writing in 1916, found recorded in literature eight cases of retrobulbar optic neuritis due to the ingestion of thyroid extract, and added three cases, one of acute development, of his own. The ophthalmoscopic appearances varied from the normal to a slight papilledema, turgid veins and retinal hemorrhages. Of the eleven patients, seven were females, three males, and in one the sex was not stated. The preponderance of the female sex is to be attributed to the fact that thyroid extract is one of the ingredients of many of the proprietary remedies for obesity.

SUGGESTIVE ETIOLOGY

There are many conditions of obscure etiology exhibiting changes which have been ascribed to altered metabolism, autotoxemia and abiotrophy. In view of this, as our knowledge of the function of the ductless glands enlarges, many are suspecting that a fault in one or more of these, reacting on the others, may be the cause of some of these conditions.

Hereditary Optic Nerve Atrophy.—In support of his contention that Leber's disease is primarily due to an inherited temporary disorder of the pituitary body, J. H. Fisher brings forward the following facts: that Leber noticed a great tendency for the visual defects to appear at or about the age of puberty and that evidence of a neuropathic type was afforded by such symptoms as headache, vertigo, tremors, numbness of all the limbs, or even epileptic fits; that in several reported cases there were similar symmetrical field defects; that patients with Leber's disease, as also those with rapidly developing pituitary body growths, often complain of subjective phenomena of light and colors often as "seen through a blue mist;" that variation in the degree of central amblyopia which occurred in Leber's disease is more consistent with an outside influence on the visual pathways than with primary changes in the nerve fibers; that in both conditions there is an epochal relation between the onset and the period of puberty and the climacteric and that in both, frequently in early stages of the disease, a very mild papillitis can be detected. In one of two affected children of a family, roentgenoscopy of the skull was negative, while the other showed a cellular or honeycombed shadow in the depression of the sella turcica. That similar changes were not found in the two cases he attributes to the fact that the negative finding was in a case of two years' standing. As the visual symptoms in Leber's disease are progressive up to a certain point and then come to rest, he argues that if the lesion which gives rise to these symptoms is due to some disorder of the pituitary body it also must needs be temporary and transient. He also makes the practical suggestion that cases of tobacco amblyopia with glycosuria be subjected to a more thorough critical investigation than we are accustomed to give them because of cases that are on record in which Leber's disease was complicated by glycosuria. Climenko, however, in two cases of Leber's disease failed to find symptoms pointing to disturbed internal secretion.

Hypothyroidism and Optic Atrophy.—The possibility of hypothyroidism producing optic neuritis terminating in atrophy is indicated by the occurrence of consecutive atrophy in two brothers and a sister who with other members of the family had general symptoms of hypothyroidism in a case reported by van Lint and Klesfeld. The visual fields showed peripheral contraction without scotoma. The roentgenograms revealed no lesions of the sella turcica.

Ocular Syndrome of Disturbance of the Internal Secretions.—Lamb describes a syndrome which he believes to be the initial group of ocular symptoms dependent on disturbance of the internal secretions. They are dilated and unequal pupils responding promptly to light and accommodation, eye ache, severe headache, chorioretinitis affecting more markedly the macula region and worse in the eye with the more dilated pupil. This is associated with a low grade ciliary congestion also in the eye with the larger pupil, usually the left one. Lacrimation and dryness of the conjunctiva may be present. There is a marked tendency to exophthalmos. The majority of these symptoms Lamb would explain by supposing an oversensitization of the tissues by the thyroid hypersecretion appearing in the blood, and in the presence of epinephrin producing a very definite excitation of the sympathetic nerve endings or "plates of Langley." The exophthalmos, insufficiency of convergence, asthenopia and ciliary congestion are due to fatigue following overstimulation. The chorioretinitis may be due to some direct effect of epinephrin on the pigment cells, or the result of exposure because of dilatation of the pupil over a long period of time, or to both.

Pigmentary Degeneration of the Retina.—Jones sees in many of the symptoms, general as well as ocular, of pigmentary degeneration of the retina, indication of disturbance of the ductless glands as an etiologic factor. Therapeutic measures based on this assumption have yielded him good results.

Osteitis Deformans.—The failure to find a causative factor for Paget's disease and because the pathology indicates a disturbance of metabolism which brings about the changes in the bones which resemble, clinically and experimentally, those encountered in disturbances of the ductless glands, have led to the belief on the part of some that the cause will be proved to be due to perverted action of these glands. The only records of ocular findings in this disease available are those of Copeze, who found in four cases pin point yellowish-white spots, presumably degenerative, in the retina; in two cases retinal hemorrhages, and in one, diplopia from displacement of the pulley of the superior oblique muscle.

Amaurotic Family Idiocy.—The myasthenia, the periodic convulsions, the fact that a toxemia which has usually been assumed to be the cause of Sach's disease can scarcely be a direct one because the disease is familial, and finally that lesions have been found in the suprarenals by Church, in the thymus by McKee, and that in one case Gordon found enlargement of the thyroid and in another atrophy, and that the symptoms of the disease are similar to those arising from epinephrin insufficiency have led Sajous to the belief that this disease is produced by a toxin which provokes organic lesions in the ductless glands, particularly in the most vulnerable of these, the suprarenals, when there is in these a congenital vulnerability which inhibits their power to sustain metabolism and nutri-

tion of the central nervous system, and the muscular and cardiovascular systems.

INDIRECT PATHOLOGIC RELATION

Secondary Hypernephroma of the Iris and Ciliary Body.—An association of one of the endocrine organs and the eye, of interest pathologically, is to be found in the case reported by Chance of secondary hypernephroma of the iris and ciliary body in which the primary tumor developed from a suprarenal rest in the left kidney. There were secondary growths elsewhere than in the eye.

Verhoeff calls attention to a case of epithelial tumor of the ciliary body, reported by Schlipp, and described by the latter as an unusual form of endothelioma, as probably one of secondary hypernephroma.

Keratoconus.—Based on the Abderhalden dialysis method, von Hippel found disturbance of metabolism of the internal secretory glands in two typical cases of keratoconus, and in a corneal condition closely allied to it. The thymus was found involved in all three, and in one solely. In two, the suprarenals gave a strong positive reaction. In one the thyroid gave a negative reaction, in one, a doubtful reaction and in one a weakly positive reaction.

GLANDULAR THERAPY

Glandular therapy has its justification in an attempt to meet two indications—a deficient or altered glandular secretion and a profound inanition due to disturbed metabolism in the absence of any direct evidence of disease of the ductless glands.

In combating the ocular manifestation of disorders of the hypophysis, pituitary extract of either or both portions of the gland and thyroid extract have been employed apparently with success.

The following brief summary is taken from de Schweinitz's report of cases of pituitary body disease and the results of treatment: 1. Tumor of the pituitary body; complete blindness lasting twelve days in the right eye and six weeks in the left; complete restoration of the vision of the left eye under the influence of large doses of thyroid extract associated with inunctions of mercury. 2. Moderate choked disk with complete blindness of the right eye lasting one week, and partial blindness of the left eye with loss of the nasal field; complete restoration of the visual functions under the influence of the administration of thyroid extract associated with inunctions of mercury.

The same author jointly with How reports an interesting case of atrophic pallor of the optic nerves with paracentral scotoma in the right eye and later bitemporal hemianopsia with marked impairment of central vision, marked enlargement of the pituitary fossa, with deepening of the pituitary pit and decided thinning of the posterior clinoids. After three weeks' administration of anterior lobe extract and thyroid extract, decided improvement in vision resulted. Later, vision of the right eye steadily improved, and that of the left steadily declined over a period of seven months. At the end of two and one half years, visual acuity equaled $\frac{6}{5}$ and the fields were normal in each eye. During that period the patient consumed 2,100 tablets of $2\frac{1}{2}$ grains each of thyroid extract and extract of the anterior lobe of the pituitary body.

Elsberg and King record a case of dyspituitarism with glandular insufficiency and cyst formation in which there were bitemporal hemianopsia, great impairment of central vision and pallid disks. One year later the field had changed to right homonymous

hemianopsia, but subsequent to a decompression operation again became heteronymous. Four months' treatment with pituitary extract resulted in marked enlargement of both fields in the nasal area.

Tumme's case was also one of dyspituitarism with limitation of the visual fields, failure of central vision and pallor of the optic disks. Under the use of thyroid extract alternating daily with whole gland pituitary extract, fields and visual acuity were normal two years later.

A convincing case of the value of organotherapy is that of Clothier and Devitt, quoted by Reber. A man, aged 39, had bitemporal hemianopsia and hyperpituitarism with enlargement of the pituitary body as determined by the Roentgen ray. Under the administration of thyroid and pituitary gland, in four months there was reestablishment of full form and color fields. After an interval of two years of nontreatment, incomplete vertical hemianopsia in the right eye, and marked contraction of form and color in the left eye were present. After twelve months of the glandular treatment, vision and fields returned to normal. In this case, the administration of either gland alone was without result.

The employment of organotherapy in the treatment of hyperthyroidism is of questionable justification, although there are those who assert that in the later stages of the disease the onset of symptoms of myxedema is an indication for the use of thyroid extract. Risley lends the weight of his authority to the use of thyroid extract in the treatment of interstitial keratitis in subjects whose insanitation and mental turpitude indicate a lowered metabolism. He argues that the drug does good by improving the action of the thyroid gland, whose secretion has been diminished by the general lowered vitality.

In the treatment of a condition to which he gives the name "malignant uveitis," Bordley has employed thyroid extract with brilliant results. In all, eight cases were treated, four with marked success, two doubtful and two failures. He does not wish to infer from this that this disease is necessarily a symptom of cretinism or myxedema.

Muncaster has found thyroid extract in combination with epinephrin and sodium cacodylate of benefit in cases of pigmentary degeneration of the retina and in old pigment deposits in the fundus.

More recently, Jones has suggested organotherapy in pigmentary degeneration of the retina.

Phillips reports favorable results from the transplantation of epithelial bodies in the treatment of cataract.

Along with the general symptoms of cretinism and myxedema the ocular lesions also undergo improvement with thyroid feeding.

The local use of epinephrin for congestion of the conjunctival and ciliary vessels is no longer promiscuous and its employment in glaucoma is of doubtful value. Its use for the prevention and control of corneal staphyloma is recommended by Pontius. It is of material assistance in the prevention and control of bleeding in ophthalmic surgery.

A Popular Diet Error.—The popular idea that "most people eat too much," which one hears expressed in common table talk, is not true. People who do not change in weight eat just enough to maintain the condition in which they have established themselves. They may, however, lose their surplus fatty tissue by restricting their diet.—Graham Lusk in *Science*.

TREATMENT OF INTESTINAL AMEBIASIS

WITH SPECIAL REFERENCE TO IPECAC AND ITS DERIVATIVES *

B. C. CROWELL, M.D.

Professor of Pathology and Bacteriology, and Director, Graduate School of Tropical Medicine and Public Health, University of the Philippines, College of Medicine and Surgery
MANILA, P. I.

Dysentery is a symptom of intestinal disease, and there are a large number of agents that may produce the intestinal disorders which lead to this symptom. Before the discovery of the various etiologic agents which may cause dysentery, its treatment was purely empiric and symptomatic. It was in this stage of our knowledge that ipecac was introduced as a form of treatment, and it was administered indiscriminately in all forms of dysentery.

The differentiation of etiologic types of dysentery has led to appropriate forms of treatment, and any discussion of the treatment of this disease must take into consideration the causative agents, and known facts concerning those agents. Therefore, I have prepared a brief summary of certain points in the history of our knowledge of amebas, as it is the treatment of the disease they produce that I wish to discuss.

In 1875, Lösch,¹ in a case of dysentery, described an organism which he called *Amoeba coli*. He reproduced the disease in dogs by injecting them with recently passed stools from this patient. His conclusion was that the *Amoeba coli* was not the primary cause of the disease, but that it was certainly capable of increasing a lesion of the large intestine already present, or at least of preventing its healing. Following this, numerous observers found the amebas in the stools and associated them with dysentery. In 1885, Kartulis,² from a study of over 500 cases, propounded the theory that typical dysentery was caused by amebas, as were also the liver abscesses that often accompany it. He found the amebas regularly in the stools of dysenteric patients, in ulcers of the large intestine, and in pus from liver abscesses, and he infected cats by rectal injection of dysenteric stools. Opposition to the theory of Kartulis was based on the rare finding of amebas in some places in which dysentery was endemic, and on finding them in various kinds of intestinal diseases and in healthy subjects.

The question now was to decide if there was a specific amebic colitis, and whether or not there are several species of intestinal amebas. In 1891, Councilman and Lafleur³ did much able work on dysentery, and as a result of their work the question of the existence of a specific amebic colitis was settled. These authors renamed *Amoeba coli* Lösch as *Amoeba dysenteriae*. In 1893, Kruse and Pasquale⁴ retained the old name *Amoeba coli* Lösch for the noninfectious species. In the same year Quincke and Roos⁵ set forth three species, and Celli and Fiocca⁶ (1894-1896) distinguished five.

The genus *Endamoeba* was created by Leidy⁷ in 1879, and the name applied to amebas not known to

* Read before the Manila Medical Society, April 2, 1917.

1. Lösch: Virchows Arch. f. path. Anat., 1875, **65**, 196.

2. Kartulis: Virchows Arch. f. path. Anat., 1886, **105**, 521.

3. Councilman and Lafleur: Johns Hopkins Hosp. Rep., 1891, **2**, 395.

4. Kruse and Pasquale: Deutsch. med. Wchnschr., 1893, **19**, 354, 378.

5. Quincke and Roos: Berl. klin. Wchnschr., 1893, **30**, 1089.

6. Celli and Fiocca: Centralbl. f. Bakteriöl., Part I, 1895 **17**, 302.

7. Leidy: Proc. Acad. Nat. Sc., Philadelphia, 1879, **31**, 204.

be found in the human host. This generic term was applied by Casagrandi and Barbagallo⁸ to those amebas found in the human intestine. In 1903, Schaudinn⁹ designated the species pathogenic for man as *E. histolytica* and the nonpathogenic species as *E. coli*.

From this time on, many species of endamebas have been described, many with small excuse, and now the pendulum appears to be again swinging in the direction of reduction in the number of species. More than twenty species of endamebas have been described by different authors as occurring in the human host. At the present time, at any rate, it is universally conceded that *E. histolytica* is pathogenic and causes dysentery. The position of *E. coli* is not quite so certain. Regarded by many as harmless commensal in the human intestine, by others its lack of pathogenicity is not conceded. The latter class of workers find it difficult to reconcile its alleged nonpathogenicity with the fact that they see cases of dysentery in which only *E. coli* can be found. Furthermore, they draw attention to the well known fact that protozoa are subject to very marked alterations as the result of changes in environment, and assert that it is at least conceivable that an ameba which under certain conditions is harmless may become pathogenic when those conditions are altered in certain ways.

The bearing of this protozoal study on the treatment of dysentery is apparent. It may be mentioned that meanwhile it has been shown that many other causes of dysentery may be differentiated, each type requiring appropriate treatment. In 1898, Shiga¹⁰ showed that one of the types of dysentery was due to a bacillus. Other types of dysentery bacilli have since been described, and probably more will be. The rôle of the tubercle bacillus, the spirochete, *Balantidium*, *Schistosoma*, *Opisthorchis*, *Clonorchis*, *Trichomonas*, *Lambli*a, and other parasites need only be mentioned to draw attention to the multiplicity of the causes of dysentery.

IMPORTANT QUESTIONS IN INTESTINAL AMEBIASIS

To confine our diagnosis, however, to intestinal amebiasis, aside from the question of pathogenicity and nonpathogenicity of species, other questions have assumed importance. Among these may be mentioned the occurrence of ameba carriers and the difficulty in distinguishing species.

Carriers.—As in diseases due to other causes, it has been found that endamebas may be present in stools of persons who have no dysenteric symptoms. Some of these persons have previously had attacks of dysentery, and others have never had acute attacks. This class of cases is subject to attacks or relapses, and to extension of the amebic process from the intestine to other parts of the body, especially to the liver. These persons also constitute a source of contamination for others.

Low,¹¹ in commenting on a case of amebic abscess of the liver occurring twenty years after the original attack of dysentery, says:

Much attention has recently been bestowed, and rightly so, upon the danger of chronic amebic carriers spreading infection to others. This case is a very striking example of the danger of the carrier to himself, and brings forward once

more the necessity of properly treating such cases . . . It is therefore of the utmost importance that all people who have had dysentery, even though it may have occurred years before, should have their stools thoroughly examined on several occasions to make certain that they are not amebic carriers; if they are found to be so, they should at once be treated in order to obviate the danger of a subsequent abscess in the liver.

Importance of Species Pathogenicity in Treatment.

—One may readily find endamebas and may be able to differentiate the species. All physicians will treat *E. histolytica* cases. The question is still an open one as to whether all *E. coli* cases should be treated. On this point it seems only rational that an attempt should first be made to find other causes for the dysentery, and failing this, if the patient is dysenteric, treatment should be instituted regardless of the protozoologist's opinion of *E. coli*. More difficult is that class of cases in which *E. coli* is detected only in routine examinations of a person not suffering from dysentery. In that case it seems that the development of the earliest signs of intestinal disorder should call for treatment.

It must be remembered that constipation and intestinal endamebiasis may occur together.

Periodicity of Appearance of Endamebas.—Still further, it should be borne in mind that even in cases of severe dysentery the endamebas may be present in the dejecta only at intervals, and thus several examinations at varying intervals may be necessary before the organisms are found. Incidentally, ignorance of this fact has led to much unjust criticism of the laboratory worker. In all protozoan infections, great care must be exercised in claiming good effects from the administration of drugs, in view of the fact of their well known periodicity and spontaneous disappearance. Every worker who follows his cases carefully with microscopic examinations becomes more and more chary of claiming good effects from the result of drugs. Recently Dobell and Low¹² have clearly shown the necessity of this by the daily examination of the feces of a patient with intestinal lamblasis for a period of 100 consecutive days. They found that on thirty-eight days out of the hundred, *Lambli*a was discovered in the stools. On the other sixty-two days none could be found, and the negative days were in sequence for as long as ten days at a time. This is only one concrete example of the principle that careful investigators frequently see exemplified.

TREATMENT WITH IPECAC AND ITS DERIVATIVES

Treatment of intestinal amebiasis should be undertaken with a knowledge of the facts just set forth.

As stated above, ipecac was formerly advocated for dysentery, irrespective of the cause. The Brazilian root was apparently first taken to Europe by Piso in 1658, where it was successfully used by Helvetius in the treatment of Louis XIV, and was sold as a secret remedy to the French government. Two centuries later, Docker introduced the use of large doses (60 grains two or three times a day) of powdered ipecacuanha in the treatment of severe dysentery in Mauritius. His excellent results were confirmed by others. In 1886, Maclean and Chevers advocated the use of ipecac in acute hepatitis. Later the drug fell into more or less disrepute, but its use has been revived as a result of Manson's advocacy of its employment in dysentery and Rogers' in hepatitis.

8. Casagrandi and Barbagallo: Ann. d' ig. sper., 1897, 7, 103.

9. Schaudinn: Arb. a. d. k. Gsndhtsamte, 1903, 29, 547.

10. Shiga: Centralbl. f. Bakteriöl., Part 1, 1898, 23, 599; 24, 817, 870, 913.

11. Low, George C.: Brit. Med. Jour., 1916, 2, 868.

12. Dobell and Low: Lancet, London, 1916, 191, 1053.

Meanwhile, many other substances have been used in the treatment of dysentery, among which may be mentioned quinin, bismuth, tannin, salines, opium, thymol, salts of silver, mercury and arsenic, including salvarsan. These drugs have been introduced by all routes, orally, by rectum, hypodermically, intramuscularly, intravenously, and through colostomy wounds. Each one of these drugs has accomplished good in some cases, but no one is good for all.

The chief interest in the treatment of amebiasis has centered around the use of ipecac and its derivatives, and it is with this phase of the subject that I wish to deal in this paper. This drug is commonly regarded as a specific for amebic dysentery. The drawbacks to its use in man have been, first, its emetic action and, second, the fact that dysentery does not always respond to the administration of the drug, in however large doses it may be given.

The drug contains five alkaloids, of which emetin and cephaelin are the chief. According to Ross,¹³ emetin was first separated from ipecacuanha by Pelletier and Magendie in 1817, and was first recommended for dysentery by Bardsley of Manchester in 1829, while Tull and Walsh gave it by mouth in 1891.

In 1912, Vedder¹⁴ reported in Hongkong before the Far Eastern Medical Association on the experimental action of ipecac on amebas, and there showed that emetin killed amebas in a dilution of 1:100,000. From this work he concluded that ipecac was a powerful amebicide, and he suggested that this action of the ipecac was due to emetin. This work of Vedder's was carried on in Manila.

Following up this experimental work, Sir Leonard Rogers¹⁵ in India tried the hypodermic administration of emetin in the treatment of amebic disease and reported what he referred to as "strikingly good results." Referring to his success in his earlier cases, he says:

Should further results fulfil the great hopes raised by the success above recorded, it will be difficult to exaggerate the boon which will be conferred on the numerous sufferers from the intractable and deadly amebic form of dysentery and its various hepatic complications.

A later article by Rogers¹⁵ in the same year says that he believed his hopes to have been justified. The drug has been used in the form of the hydrochlorid administered hypodermically and intramuscularly.

Since that time, the literature has teemed with reports of successes and failures in the treatment of intestinal amebiasis by this drug. The British became especially enthusiastic in the support of the drug. Locally in Manila there are many who have failed to obtain desirable results following the administration of emetin, although the patients were frequently benefited symptomatically, and the amebas have disappeared for a time. Recurrences and relapses, however, have unfortunately been common. Within the last two years especially, the number of people decrying the use of emetin as the result of unfortunate recurrences after its use has been constantly increasing.

A new method of treatment which promises more favorable results has been looked forward to. Apparently this has been partially realized. DuMez,¹⁶ in 1915, published formulas of two drugs which he sug-

gested might be of value in the treatment of amebiasis. These preparations were devised by DuMez especially for the purpose of treatment of this disease, hoping to obtain a drug which could be given by mouth, which would be efficacious, and which would not have the drawbacks ascribed to previous forms of treatment of the disease. These salts were emetin mercuric iodid and emetin bismuthous iodid.

As a result of his experiments on dogs, DuMez says that these two compounds may be given in doses representing 0.03 gm. of emetin hydrochlorid without causing vomiting and without any apparent nausea. The latter of these preparations alone has commanded attention.

It has the useful property of being practically insoluble in dilute acids but soluble with comparative ease in weak alkali. It might be expected, therefore, to pass the stomach unaltered, and then being dissolved in the alkaline juices of the duodenum, to undergo decomposition as it passed along the bowel with liberation of emetin and precipitation of bismuth sulphid. No serious attention was paid to this suggestion, as far as I can find out, until Dale,¹⁷ in July, 1916, reported on its use. He tried it in ten cases, with good results in eight. In one case relapse occurred after two full courses of the drug, and in one case treatment could not be continued, owing to the vomiting and diarrhea which it caused. He is enthusiastic over the use of the drug. He states that

TABLE 1.—DUMEZ FORMULAS

EMETIN MERCURIC IODID	
Iodin	43.08 per cent.
Mercury	12.50 per cent.
Hydrogen (as hydrogen iodid)	0.23 per cent.
Emetin	44.19 per cent.
EMETIN BISMUTHOUS IODID	
Iodin	58.26 per cent.
Bismuth	12.36 per cent.
Hydrogen (as hydrogen iodid)	0.30 per cent.
Emetin	29.08 per cent.

trouble occurred in some cases from vomiting, but this was easily overcome in most instances. The vomiting is delayed and the comfort of the patient is affected more than the efficiency of the treatment. From 32 to 36 grains, equivalent to about 10 or 12 grains of emetin hydrochlorid, he regarded as a full course, and the daily dose was varied from 2 to 4 grains given in capsules. He says the frequency of vomiting is in no way comparable with that seen with the ipecac treatment, and there is no need as a rule to restrict diet, to keep the patient recumbent, or to adopt the precautionary measures which the ipecac treatment entails. Dale considers the expense of the drug a serious drawback to its widespread use.

Later, Low and Dobell¹⁸ published a report of three cases of *Endamoeba histolytica* infection treated with emetin bismuth iodid in which they obtained good results, but the period of time during which the cases were observed after treatment and before the report was made was too brief to justify far reaching conclusions. One was a case of acute amebic dysentery, one a case of a convalescent carrier of long standing, and one a contact carrier case. These three cases remained negative during the time that they were kept under observation. These authors also refer to the unpleasant effects on the patient, but say that the result obtained from their cases has convinced them that emetin bismuth iodid is far more efficacious than

13. Ross: Lancet, London, 1916, **190**, 1.

14. Vedder: Tr. Far East Med. Assn., Hongkong, 1912.

15. Rogers, Leonard: Brit. Med. Jour., 1912, **1**, 1424; **2**, 405, 828.16. DuMez: Philippine Jour. Sc., Ser. B, 1915, **10**, 73.17. Dale: Lancet, London, 1916, **191**, 183.18. Low and Dobell: Lancet, London, 1916, **191**, 319.

emetin hydrochlorid given hypodermically in removing the cysts from the feces of chronic carriers. Conservatively they state that in their opinion "it should henceforward be generally employed in such cases, at all events until a more ideal treatment is forthcoming."

Still later, Dobell¹⁹ gave an exhaustive report on his study of the use of the drug in intestinal amebiasis. He treated seventeen cases of *E. histolytica* infection with emetin bismuth iodid, and his results are shown in Tables 2 and 3.

TABLE 2.—TREATMENT OF TWENTY-FIVE PATIENTS WITH EMETIN HYDROCHLORID AND WITH EMETIN BISMUTH IODID

Infected with <i>Endamoeba histolytica</i> : 25 men	
Treated with emetin hydrochlorid: 21 men	Treated with emetin bismuth iodid: 4 men; all discharged as cured
7 men: discharged as cured	14 men: not cured
Treated again with emetin hydrochlorid: 3 men; none cured	Treated with emetin bismuth iodid: 11 men; all discharged as cured
Not treated: 1 man; still infected	Treated with emetin bismuth iodid: 2 men; both cured

It must be mentioned in explanation of Table 3 that twenty-one days was adopted as an arbitrary limit, and cases which remained negative for this interval or longer after treatment were designated as "certain" cures. The effects of the administration of the double iodid on the protozoal contents of the stools are reported as truly remarkable. Within four days of the commencement of treatment, all traces of the *E. histolytica*, whether amebas or cysts, had completely disappeared from the feces, and in no single instance have they been subsequently found. Many of the men treated with the double iodid were infected with *E. coli*, *Lambia* and *Chilomastix*, and in no case did the treatment remove any of these protozoa. *E. coli* disappears from the feces during treatment, but almost invariably reappears afterward.

As regards ameba carriers, Low says, "Fortunately we now possess in emetin bismuth iodid a drug which sterilizes chronic cyst carriers with a certainty not

TABLE 3.—COMPARATIVE RESULTS WITH EMETIN HYDROCHLORID AND WITH EMETIN BISMUTH IODID

	Treated with Emetin Hydrochlorid	Treated with Emetin Bismuth Iodid
Total number of treatments	24	17
Number of "certain" cures	5	9
Number of uncertain cures	2	8
Number of relapses	17	0

attained by any previous methods." In a footnote he adds: "It is essential, however, that the drug be given as the powder in a gelatin capsule, and not in any compressed form. Since writing this paper I have had a case in which 'stearettles' of it were passed in the feces absolutely unchanged, and the same may take place with keratin-coated tabloids."

Imrie and Roche²⁰ treated six cases of *E. histolytica* infection, in four of which the patients had had dysentery. Four had previously received emetin hydrochlorid, but still passed endamebas. Forty-eight hours after institution of treatment with emetin bismuthous

iodid, endamebas disappeared, and in no case did they reappear while under observation, periods varying from fourteen to thirty-two days. The drug was administered in doses of 3 grains on twelve successive nights. Note that he says "Dale has introduced a compound of emetin and bismuth iodid for oral administration."

REPORTS ON EMETIN

The following are abstracts from articles which have appeared dealing with emetin from the standpoints of its mode of action, its toxicity, its pharmacology and its therapeutic action.

Jepps²¹ reports on the use of emetin hydrochlorid administered hypodermically in twenty-one cases of amebic infections (chronic cases and carriers). He found that after the injection of at least 10 grains of emetin hydrochlorid, 57 per cent. were not permanently free from *E. histolytica*. In these cases, relapses after the end of treatment occurred at intervals from the fifth to the twentieth day.

Levy and Rowntree²² investigated the toxicity of various commercial preparations of emetin hydrochlorid, and concluded that the administration of emetin hydrochlorid is not regarded as a harmless procedure. Individualization by close clinical observation is essential both for the success and safety of the treatment. The treatment should be given in courses, at intervals of several days or a week. The subcutaneous route is the one of choice. Individual dosage and the duration of each course must be determined by the exigencies of the case. One third grain three times a day for a week or ten days is usually a safe dosage in amebic infections. It is rarely necessary to give more than 1½ grains daily. Intravenous injections should be employed only in extreme cases. If this mode of administration seems imperative, small doses, well diluted (½ grain in 100 c.c. salt solution) should be slowly given, and blood pressure should be carefully observed during the injection.

Lyons²³ in 1915, investigated the mode of action and use of emetin in endamebiasis, and concluded that ipecac and emetin when taken by needle or by mouth act through absorption into the blood stream and exert their specific effect only on those endamebas within reach of the circulation, that is, in the tissues. Relapses are due to the survival of some of the endamebas probably through encystment. In the carrier state the endamebas are probably simply harbored in the lumen of the intestine in the same manner as the coli, thereby causing no symptoms. The intestinal mucosa is in some way protected against the penetration of the organism. In order to prevent relapses, an intermittent form of treatment should be instituted in every case, even though cysts are not found.

Ross¹³ says that he thinks the hypodermic use of emetin brings the drug more directly into contact with the amebas at the bottom of the ulcers, while the ipecacuanha by mouth does more to attack amebas on the surface of the mucous membrane and in the lumen of the intestine, so that he is inclined to favor the use of both at the proper stages in the treatment. He also favors the use of bismuth, the treatment elaborated by Deeks in Panama and consisting of a heaped teaspoonful of the subnitrate three or four times a day. The utility of this is supposed to depend not only on the

19. Dobell: Brit. Med. Jour., 1916, 2, 612.

20. Imrie and Roche: Lancet, London, 1917, 192, 17.

21. Jepps: Brit. Med. Jour., 1916, 2, 616.

22. Levy, R. L., and Rowntree, L. G.: The Toxicity of Various Commercial Preparations of Emetin Hydrochlorid, Arch. Int. Med., March, 1916, p. 420.

23. Lyons: Am. Jour. Med. Sc., 1915, 150, 97.

astringent value of bismuth but also on a chemical change and lastly on the mechanical action of the powder, which is likely to injure amebas by attrition. Ross believes in the use of a comparatively dry but varied diet in dysenteries.

Pellini and Wallace,²⁴ in 1916, investigated the pharmacology of emetin, and emphasize that emetin represses and may eventually paralyze the heart. It is a powerful gastro-intestinal irritant whether given by mouth or subcutaneous injection. It causes a definite derangement of metabolism, characterized by an increase in nitrogen loss and an acidosis. While in normal individuals given moderate doses, these actions may not be of importance, in pathologic states of circulation, intestinal tract or metabolism, they may be a very definite source of danger.

CONCLUSION

I wish to draw attention to the fact that Vedder in Manila suggested the possible curative action of emetin in amebiasis, while it remained for Rogers in India to demonstrate its practical use and to receive the credit therefor. DuMez in Manila suggested the advantageous use of his two compounds in the same disease, and thus far the British workers get the credit for having tried one of them.

I have purposely avoided prescribing any form of treatment for dysentery because of my position as a pathologist; but my aim has been to summarize and draw attention to the work of others concerning the use of ipecac and its derivatives.

THE RÔLE OF ALCOHOL IN THE WELFARE OF THE HUMAN RACE

FROM THE STANDPOINT OF PHARMACOLOGY AND
THERAPEUTICS *

BERNARD FANTUS, M.D.

Professor of Pharmacology and Therapeutics, University of Illinois,
College of Medicine
CHICAGO

There is no other substance the mere discussion of which so stirs the passion and prejudices of mankind as alcohol. There is no other pharmacologic agent that, to the same extent, has had its praises sung in verse and prose, and that has been cursed as violently and vehemently. A titanic political struggle is being waged for and against it. John Barleycorn is on trial for life. We of the medical profession must be just to the defendant, realizing that all that is has a reason for its existence. As our stand in this conflict must be no uncertain one, let us ask ourselves, What is the rôle of alcohol in the welfare of the human race? What would be the loss to mankind should those prevail who would abolish its use?

ALCOHOL AS A STIMULANT AND A DEPRESSANT

To judge from the opposing views held regarding it, alcohol must have great virtues as well as vast power for evil. Indeed, alcohol is a drug of curious antitheses in its actions on the body. It is, for instance, a stimulant and a depressant at the same time. Who would deny that alcohol is a stimulant, when

he notes the flushed face, the quickened pulse and respiration, and the increased vivacity of motion, action and speech, up to the appearance of brilliancy and inspiration, produced by a "moderate" dose of liquor? Who would question that he has taken a stimulant when he experiences these effects on himself, together with the feeling of warmth and well-being, strength and exhilaration that permeates his whole system when he takes such dose? And yet a critical study of the causes for these effects shows that they are not the result of a true stimulation of the nerve centers. It can be demonstrated that, in its effect on the central nervous system, alcohol is a depressant from the very beginning. It paralyzes the central nervous system according to the law of dissolution, which postulates that the last acquired functions are first to go. It shaves off the nervous system layer by layer, and causes stimulation by reason of the fact that removal of the higher functions produces an apparent stimulation of the lower ones. It upsets the normal balance of the brain, impairing and abolishing first the highest and last acquired functions, namely, those of self-restraint, attention, observation, reflection and judgment.

Alcohol, by removing the mental accretions of our later development, makes us feel young again. And who would not like to drink of the fountain of youth? A cup of liquor may convert the staid and steady banker into a reckless and boisterous boy, the calculating and critical professor into an irresponsible and loquacious youth. By abolishing the last acquired impressions first, liquor makes us forget our troubles. It enables us to drown our sorrows; but, as has well been said, alcohol is such a good preservative that it keeps our sorrow for the morrow. That even a small dose of liquor slows the speed and lessens the accuracy of thought has been proved over and over again by exact experimentation; and yet the person experimented on has the curious illusion that he has performed the act more quickly and better, for the finer grades of judgment have become lost. It is this over-estimation of oneself as well as the loss of ability to calculate on the consequences that makes liquor an accomplice in crime as well as an ally in heroism. For, after all, criminal as well as heroic deeds have this in common, that they are undertaken with a disregard of the consequences to oneself. The difference is that the criminal harms his fellow men, the hero helps them.

In the same way, deeds of bestial cruelty or of expansive benevolence are equally inspired by alcohol. There is "truth in wine" in that it exposes the character that would crop out when, for any reason, one's function of self-restraint is gone; but one must not rely on statements made by a person under the influence of alcohol, as though they were the truth, the whole truth, and nothing but the truth. Liquor may make the orator more eloquent. It is easy to be brilliant, when you do not care much what you say. Alcohol makes one feel strong, and yet it strengthens no one; it merely benumbs the sense of weariness.

When alcohol is used to the extent of producing intoxication, its mental anesthetic qualities are plainly evident. When one contemplates the degradation into which liquor drags us, one may well ask, Why do human beings put this stuff into their mouths that robs them of their brains? Brunton aptly answers that they do this for the same reason that human beings do anything, namely, to derive pleasure or to escape pain.

24. Pellini and Wallace: *Am. Jour. Med. Sc.*, 1916, **152**, 325.
* Delivered before the Chicago Medical Society, April 4, 1917.

Alcohol lends itself to either purpose. Is it a wonder that it is popular?

As an analgesic, alcohol deserves to be ranked alongside of opiates and cocain. It is particularly potent for the relief of gastric, intestinal and uterine colic. A narcotic dose of it will relieve any pain. On the other hand, no one will deny that it is a habit-producing drug, just like opium and cocain. This being the case, why should it not be included among the drugs covered by the Harrison law? In the number of victims, alcohol vastly outranks all other narcotics. The Harrison act, as it now stands, catches the petty thief and permits the robber chief uncontrolled devastation. Were the people adequately protected against its seductive qualities, alcohol might be a safer drug to use medicinally. While alcohol relieves pains, it cures none, excepting when used by injection into the nerve in trifacial neuralgia, for which purpose it now has a well established place. On the other hand, it must be ranked high as a cause of pain, for it is the single most common etiologic factor in neuritis.

The chief trouble with liquor is that it depresses and eventually paralyzes inhibition. A man may start out to take one drink, and wind up dead drunk. What is still worse, on long continued use of alcohol, the faculties, at first temporarily abolished, become lost forever, so that the chronic alcoholic becomes progressively less able to control himself. It is this loss of self-control that makes inebriety so hard to cure. For of what avail are promises, vows and pledges, when no power is left to execute them? The man who takes pride in the notion that he can drink or leave drink alone, just as he choses, should test himself by suddenly cutting out drink. He will probably be shocked at the hold the craving for liquor has on him. Fortunate is he who has will power enough left to resist the craving. Such a one merely had the alcohol habit, and he had better give it up while there is yet a chance, for he who does not will become progressively less and less able to resist, and may finally become an incurable drunkard, as a degenerative condition of the brain will have developed, recovery from which may be impossible. This is the way in which liquor strews the paths of life with wrecks of what were once men. It is possible for some to drink moderately during a long lifetime; but no one can tell whether or not he is one of these. As Forel says: "Moderate drinking is the nursery of inebriety."

How illusive the effects of alcohol are is well shown by its action on body temperature. It makes one feel warm, while at the same time it lowers body temperature, for it dilates the blood vessels of the skin, and we are accustomed to judge our body temperatures by the amount of blood in the skin. It at the same time benumbs the heat-regulating center. This is the reason why the highest as well as the lowest recorded temperatures in human beings have occurred under the influence of alcohol. Freezing to death most commonly takes place in intoxicated persons. Sunstroke is generally sustained from the combined effect of liquor, hard labor and strong sunshine. It is evident that alcohol should not be taken before one goes out into the cold. After exposure to cold, when one is in a warm room, it may help one to warm up more quickly. That is what its use in the breaking up of a "cold" amounts to. Of course, it is not a cure for "colds," as is popularly supposed by the laity.

Alcohol is not a true stimulant to the circulation. Its chief effect here is to change the distribution of the blood by producing dilatation of the blood vessels of the skin. As there is no essential change in blood pressure or acceleration of the pulse—which occurs only when alcohol produces mental excitement—there must be either constriction of deep blood vessels or stimulation of the heart. As the latter does not occur under ordinary circumstances, we must look to deep vasoconstriction and superficial vasodilatation as the chief change produced. This change occurs, at first, as the result of reflex stimulation of the vasomotor center from irritation of the stomach, and is later continued by a depression of the vasoconstrictor center, the more easily affected blood vessels of the skin showing the change first. The best use of alcohol for the improvement of the circulation is in shock. Here its narcotic action, which lessens the appreciation of the injury sustained, produces, no doubt, the chief benefit. Nevertheless, the reflex stimulation from the stomach is not to be despised. Hence for this purpose alcoholic liquor should be given in considerable concentration; for instance, brandy and water equal parts, preferably administered hot.

Alcohol is more truly a stimulant to gastric digestion than to any other function of the body. There can be no doubt that, given sufficiently diluted, it is a stomachic. In its power of stimulating the appetite, gastric secretion, peristalsis and absorption, it is probably unexcelled by any other chemical stimulant in our possession. The normal stomach, however, needs no such stimulant, and the diseased stomach is not cured by it. Indeed, alcohol is the single most important cause of gastritis in the adult. No doubt, were it not so efficient as a stomachic, it would not lead so often to the production of gastritis. As one can digest a poorly cooked meal better with the aid of alcohol than without it, poor cooking in the home is probably one of the causes that drive men to drink.

ALCOHOL AS A FOOD

That alcohol is a food cannot be doubted. Over 90 per cent. of it oxidizes in the tissues, each gram yielding over seven calories. Thus it has a higher caloric value than protein or carbohydrate. That it can replace fat and carbohydrate to a certain extent has been definitely proved. This effect might be useful during starvation. When, however, food is taken in abundance, alcohol is not only superfluous as a nutriment, but positively harmful. It is by burdening the system with excess of food that beer produces the bloated flabby-fat caricature of humanity; it is in this way probably that wine favors the development of gout. But the worst of it is that alcohol is a poison at the same time. To take enough calories in the form of liquor to represent a square meal, one would have to drink enough to make one dead drunk. Habitual consumption of it, no doubt, frequently contributes to the evolution of arteriosclerosis and of degeneration of the parenchyma and overgrowth of the connective tissue of the various important organs of the body, most especially of the liver and the kidney, though the extent of its cooperation in the development of hepatic cirrhosis, chronic interstitial nephritis and myocarditis is not yet fully established. It is certain that alcohol cannot be considered a useful food for healthy persons. With the drunkard, the food value of alcohol becomes greater in proportion to the degree to which he develops tolerance to its intoxicating qualities.

Owing to the deranged condition of his stomach, which makes it impossible for him to digest in comfort enough of other food, he becomes more and more dependent on the liquor, which not only helps him to digest his food, but also serves as a food itself.

In fever, alcohol is oxidized to a much greater extent than by the same person at normal temperature. Hence its food value might be of consideration in fever patients, especially in cases in which digestion is very much impaired. The mode of administration of alcohol to the fever patient depends on the other effects that might be desired at the same time. If we wish to obtain the stomachic effect, it is best given in the form of milk punch, a teaspoonful to a tablespoonful of brandy in each cup of milk. On the other hand, should we desire its stimulant effect on the circulation, a tablespoonful or two of brandy would be given diluted with one or two parts of water, the dose being repeated every hour or two. The effect should be watched, and the dosage continued only when it is decidedly favorable. When the stomach is nonretentive or the patient cannot swallow, the alcohol may be administered in starch water by rectum. Should hypnotic action be desired in a fever patient, beer or bottled stout might be given. Whether or not liquor thus used would lessen resistance to infection, cannot be answered in the light of our present knowledge. It is well known, of course, that drunkards give a much poorer resistance to infection than the abstainer. This, might, however, be due to the tissue damage produced by the previous use of the liquor. The rule that a narcotic drug habitué should not be deprived of the drug his system demands, when serious sickness overtakes him, should no doubt be applied here. When a drunkard has pneumonia, it is a poor time to attempt to break him of the liquor habit. It is just in such cases that liquor may be life saving.

I am very doubtful regarding the desirability of using liquor as a tonic in convalescence from acute disease. The patient is altogether too apt to think that what was good for him when he was weak ought to be good for him when he is strong. Likewise, because of danger of formation of the liquor habit, alcoholic beverages should not be prescribed in chronic ailments; as, for instance, beer in insomnia. After all, alcohol is merely a symptom remedy. It does not cure anything, excepting perhaps neuralgia of the fifth cranial nerve, when 1 or 2 c.c. of a 1 per cent. solution of cocain in 90 per cent. alcohol are injected into the various branches of this nerve to produce a more or less permanent degeneration of the nerve.

EXTERNAL USE

Perhaps the best use of alcohol is the external use. Thus it is useful as a skin disinfectant, when used in full strength. For chronic otorrhea, 30 per cent. alcohol saturated with boric acid may be used to fill the meatus, which is subsequently mopped dry. The strength of the alcohol may be gradually increased up to 95 per cent. Mucous membranes do not tolerate alcohol in disinfectant strength. In the mouth, alcohol can be borne in strengths up to 30 per cent., which may be useful as astringent if not as disinfectant.

As an antiseptic, compresses moistened with alcohol as strong as can be borne are useful in the treatment of skin infection, as in furunculosis. The initial concentration may be 25 per cent., the strength being gradually increased up to 60 per cent. or more, as tolerance is developed. The compresses are covered with oiled

silk to prevent evaporation, and changed two or three times daily. Their action may probably be enhanced by the addition of boric acid to saturation, by the application of a hot water bag outside the dressing, and by using hot boric acid dressings for one hour each time the compress is changed.

As a rubefacient, similar compresses moistened with 95 per cent. alcohol and covered with oiled silk are useful in the treatment of felons, boils and similar subcutaneous inflammations.

While alcohol produces rubefaction, when applied under occlusive dressing, it is a cooling lotion producing vasoconstriction when applied in such a way as to favor evaporation. Thus gauze kept moist with 50 per cent. alcohol and applied without covering forms a grateful cooling application in erysipelas. Dilute alcohol is also useful for sponging fever patients, though a somewhat more liberal use of cold water would be just as efficient.

CONCLUSION

It may be stated that alcohol has certain definite uses in the treatment of disease, though it is by no means indispensable. In the hands of the people, it is a dangerous habit-producing narcotic. The medical profession, well knowing its evil effects, cannot but ally itself with its enemies. Should humanity be deprived of liquor, it will have lost a consoler, but will have far less need for consolation. Alcohol may afford man a sense of well-being, but it certainly does not contribute to the welfare of the human race.

719 South Ashland Boulevard.

CRYSTALLINE DEPOSITS IN THE EYE*

F. PARK LEWIS, M.D.

BUFFALO

A study of life processes, even though we are not able to arrive at final conclusions, is always a subject of great interest. For the ophthalmologist a condition in which side by side with the normal functioning of an organ or a tissue may be seen a return to the elemental substances of which it is composed is peculiarly important, because in the eye alone, of all of the tissues of the body, he may follow Nature at work in her laboratory. He may see the blood vessels swelling in congested areas. He may observe the serous transudation, becoming in time a plastic exudate. If he cannot actually discover the blood vessel in the act of breaking, he can at least determine its location and disposition when a hemorrhage occurs. He is able to note the process of absorption or of disintegration of the transuded fluid, following it finally to the point at which, through retrogressive changes, it is reduced to its ultimate constituents, and glistens in the retina or scintillates in the vitreous as scattered masses of bright light reflecting crystals of cholesterol or atrophic patches of pigmentary degeneration.

It is of interest to the ophthalmologist, moreover, as he recognizes these end-results, degenerative changes which he may trace back to their origins, for the reason that having observed their termination he may the more readily perceive the earliest tendencies which, if continued, may lead to like disastrous results. It is a condition, furthermore, that appeals to him as a

* Read before the Section on Ophthalmology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

pathologist, as the same forces that impede the progress of normal physiologic processes in the eye during life may be producing similar changes in remote parts of the body where they cannot be seen, and where their existence may be only inferred from the presence of symptoms which are more or less misleading.

I have ventured, therefore, to choose a somewhat unusual subject, for though I may be unable to add any very new facts in relation to it, it may be worth while for us to consider in what tissues of the eye a reversion to the deposit of crystalline substances may occur, how these processes are brought about, and what they connote.

CRYSTALLINE CASTS IN THE CORNEA

It has been exceedingly rare in my experience to find in an eye, otherwise functioning normally, an extensive deposit of lime salts in the cornea. That they should occur is in itself an evidence that that particular part of the cornea has lost its vitality. One special case, coming under my observation some years ago, impressed me strongly:

The patient, a man then beyond middle life, and seemingly in perfectly normal health, had been under my care some twenty years before. At that time he suffered from an extensive corneal burn, involving both eyes and leaving deep opacities. Only the upper parts remained clear, and he was able to see through these by reason of iridectomies that I had made at the time, and had been thus enabled to carry on his work as a carpenter. After so many years he came again—with the ocular conjunctiva of the better eye on which he had chiefly depended highly injected and intensely painful. The sensation was as though it were filled with sand. The condition had been growing worse for weeks until it finally grew unbearable. The surface of the cornea presented the usual white nebulous appearance of a thick leukoma, with the vessels of the conjunctiva everywhere enlarged and extending to the limbus. On touching the surface with a probe I found that it gave a hard stony or glassy impression, and by running the point of the probe over the surface I found that a solid limy deposit had settled on the surface of the cornea, and while the surface seemed smooth, the epithelial covering had been wholly rubbed away by the lid and it was actually covered with fine elevations like pin points, in reality giving the effect of an extensive foreign body. With some little effort I succeeded in prying the mass from the eyeball, and it came away in the form of a perfect cast, the inner surface especially being honeycombed where it had adapted itself to the roughened surface of the substantia propria of the cornea. The outer superficies were also roughened, giving the appearance of having at one time been smooth, but the more prominent parts seemed to have been worn off, either from the attrition of the lid or from the chemical action of the secretions of the eye. On the edges of the cornea several smaller flakes were scaled off in the same way. In some places it was necessary to take a sharp knife to scrape off the mineral deposits, so intimately had they fixed themselves in the interstices of the corneal fibers. The removal of the deposit ended the discomfort from which the patient suffered, and he has never had any recurrence so far as I know.

Similar deposits not infrequently develop in scar tissue, resulting from old corneal ulcers in which the epithelium has been destroyed. They are always slow in forming, and the pathology seems to be the same in both instances.

Occasionally lime deposits may be found in the substantia propria of the cornea in which there have been no previous inflammatory changes. These seem to be of much the same character as the structural degeneration which occurs in the elastic tissue of the vessels in arteriosclerosis.

CALCAREOUS DEGENERATION IN THE SUBSTANTIA PROPRIA CORNEAE

A spare, feeble old man, whose arteries had for many years been hard, had had for a long time nebulae scattered through the cornea. More recently these had grown dense. In the right eye a mass occupied the pupillary area and was perhaps 2 mm. in diameter, gradually thinning toward the edges. The arcus semilis had taken on such a degree of density that it could with difficulty be distinguished from the white scleral tissue. A relatively clear area formed a circular zone of sufficient breadth to show almost the entire iris and a small and not very mobile pupil. In course of time the lens became opaque, and as there existed a good projection field and blindness was already present, with no hope of improvement, I yielded to his importunities and extracted the lens. As the knife engaged the cornea the sensation conveyed to the hand was that of cutting a tissue filled with ashes, and even the sound of scraping could be heard as the blade encountered the hard limy deposit with which the tissue was strewn. This was undoubtedly a very rare condition and was allied to the "nodular opacity" in which Treacher Collins says that calcareous deposits are sometimes found.

The operation proceeded without any other unusual incident. Healing was followed by no inflammatory reaction, but so advanced were the degenerative changes that the small amount of improved vision obtained by the operation gradually disappeared.¹

The concretions, which in the conjunctiva or on the tarsus have been considered of sufficient importance to have been carefully studied by Fuchs, are not of infrequent occurrence in the eyes of elderly people or when the eyes have been irritated or inflamed. Sometimes they are wholly encysted, occasionally they protrude through the epithelium, appearing as white or yellow bodies, and until they are removed cause much discomfort.

The concretions are the result of mucoid exudate in retention cysts. They are of the same character as the concretions found in degenerate chalazia.

Calcareous and osseous degeneration of the choroid have been so carefully studied, and so much has been written concerning these conditions, that I shall only briefly refer to them. The deposits, as were shown many years ago, are not in the choroid proper, but in the fibrous exudate between the choroid and the retina. Ossification is the last of the degenerative changes that occur in plastic choroiditis.

In eyes which have been subject to any long continued inflammatory process, calcareous concretions may be found in almost any of the tissues.

Bietti² found limy deposits in the optic nerve head. There was glaucomatous cupping in which new tissue was formed as a result of retinal inflammation, and in this the lime salts were deposited.

In nine cases reported by Rumschewitsch,³ ossification and calcification were found in different structures in the eye. In six there was a deposit of bone in the choroid which was not confined to the choriocapillaris. In two there was ossification of cyclitic membranes. In one there was a bony mass inside the vascular layer of the choroid with calcareous deposit in the retina.

Albertotti reports two cases of bony mass within the choroid.

Roy⁴ records a calcifying fibroma of the orbit.

Arboleda, a South American ophthalmologist, describes a condition characterized by the presence of

1. A condition closely allied to this rare form of corneal degeneration is described by Collins and Mayou as "transverse calcareous film of the cornea."

2. Bietti: *Ztschr. f. Augenh.*, January, 1908.

3. Rumschewitsch: *Arch. f. Ophth.*, 1908.

4. Roy: *Montreal Med. Jour.*, 1908.

minute calcareous bodies in the palpebral conjunctiva, frequently seen in Bogota, usually at the lid margins and at the culdesac.

All of these conditions must be distinguished from conjunctivitis petrificans, to which attention has within the last few years been directed. Sidler-Huguenin records a remarkable case of the latter condition occurring in a hysterical girl, aged 16. It was induced by her putting lime in the conjunctiva sac and grinding it into the lids, by scarifying the conjunctiva and by contusing the lids. Chemically and anatomicopathologically it differed scarcely at all from previously described cases of this remarkable form of conjunctival disease, and the author thinks that by a careful study of the patient, this disease as an entity may disappear from our literature.

The disease is so unusual that it may bear a brief description. The best description of it available is that found in the American Encyclopedia of Ophthalmology. It was first described by Leber in 1893, and is characterized by the presence in the conjunctiva of inflammatory swelling in which opaque white spots may be seen. The spots consist of lime in organic crystallizable combination. They increase in size as the disease spreads spasmodically, and finally coalesce, forming a hard, stony mass. New foci will appear while others are healing, and the process thus lasts for months or years. These smaller foci are said to vanish by absorption, while the larger ones coalesce into shriveled, thickened spots on the conjunctiva; but those who have seen cases of this kind do not explain how it is possible for a limy concretion to be absorbed. Blindness is through corneal involvement, and the treatment consists of removing such a focus when it is possible to do so.

Del Monte, the Italian ophthalmologist, gives a detailed history of a case of this kind which came under his observation, in which the *Bacillus xerosis* was found to be present. The *Bacillus xerosis*, we know, is commonly found both in health and in disease. Indeed, it was the only micro-organism present in a large proportion of the cases of infantile ophthalmias reported to our local board of health during the past winter. There seemed to be a xerosis epidemic.

In Del Monte's case, in an eye previously sound, hyperemia of the tarsal conjunctiva and the fornices suddenly came on and remained there for about four days, accompanied by very copious secretion, and then on the middle portion of the tarsal conjunctiva below and in the inner sectors of the conjunctivae of the globe, sometimes relatively large and single, at other times minute and multiple, these being accompanied by sharp pain and profuse lachrimation. The epithelium over these hemorrhages was shed as grayish white detritus, the aspect of the parts resembling that of a burn of the membrane, the margins clean cut, but the floor irregular, covered by whitish or yellowish foci, not easily removed even with scraping, the whole aspect of the exudate tough, membraneless, smooth, not elevated, and surrounded by considerable hyperemia, as well as the resulting scars, strongly suggesting the appearance of a diphtheritic ulcer. Other little foci appeared also without being preceded by hemorrhages, similar in appearance, always small in size, and whitish. The healing of these superficial ulcerations, and then the return of pain, hemorrhages and the formation of fresh lesions went on for a time as narrated. Apart from an injection of serum no treatment seemed to produce any effect whatever.

The pathologic examination was exceedingly interesting. The process, it seemed, divided itself into two periods, as shown from the microscopic examination of portions of the tissue excised at an early stage in the morbid process. At a very early stage there was loss of epithelium, although the

surface was smooth. In the substance the lymph spaces were very large, so much so that at parts the tissue was almost reduced to a large mesh network. In this tissue the vessels were dilated, with edema of the endothelium in all the coats. In the parts later removed there were signs of copious serous and cellular exudation which had parts in the interior of the fibrous tissue.

Del Monte's impressions from carefully made examinations are that the first step in the morbid process was an edema and cellular inflammation. Following this, by the absorption of the fluid, and in consequence of the pressure undergone which would, of course, be accentuated by the existence of highly resistant fibers, calcification might easily take place with partial necrosis of the tissues. Micro-organisms were obtained from the surface of the ulcers and from the broken down tissue, as well as from the surrounding zone of infiltration. Occasionally under the epithelium, at the edge of the ulcers, would be found large cells such as are seen in xerosis. Two forms of organisms were frequently present, one bacillary and the other coccal, but not, the author concludes, staphylococcal. He was unable to identify it with any measure of certainty. The xerosis bacillus was found deeply penetrating the tissues, sometimes even in leukocytes and in great numbers in the epithelial cells. Successful treatment followed the use of Behring's antitoxin serum.

Few cases of this rare disease have been reported. Among the most important is that of Laeber before the Heidelberg Congress in 1895. Cases have also been observed by Reif and Mayweg and by Posey in this country.

Perhaps the most typical form of degeneration which may go through the various phases to the deposit of the lime salts is found in the lens as it develops into cataract.

When the lens begins to sclerose the fibers are drawn more closely together. With this is a contraction of the intrafibrillar cement, a narrowing of the fibers, and a firmer interlocking of their crenated edges. Between these shrunken fibers the interfibrillar fluid collects in drops. Gradually the opacity extends until the lens is ripe. Following the period of maturity comes that of hypermaturity, in which the cortex liquefies, forming an opaque milky fluid. The surface of the capsule loses its radial markings and presents a homogeneous surface on which little white specks may sometimes be seen. These are due, according to Mayou and Collins, to calcareous deposits in secondary cataracts which form as a result of the diminished intracapsular tension. Ultimately degenerative changes progress in morgagnian cataract, the fibers undergo fatty degeneration, minute droplets form in them, giving rise to a granular appearance, these run together, and the fibers break down. In this way spaces are formed in the cortex of the lens containing a mixture of albuminous globules and drops of fat. As the cataract progresses, these spaces open up into one another, and more and more fibers undergo degeneration. Ultimately the whole cortex may become liquefied, and sometimes contains cholesterol crystals.

I have given this detailed description of the retrogressive changes which take place in the reduction of the lens from a vital organ into its primitive salts because it is exactly interpreted by our knowledge of cytology. In all life processes the structure proceeds from the simple to the more complex, from the elemental to the composite. When the vital bone ceases to be dominant the complex structures revert, going back again, step by step, through the same processes to their simple constituents.

The more important advances that have been made during the past decade have been along the line of

physiologic chemistry. With the upbuilding in its simplest form of the substances found in air and water into the protoplasm which becomes organized into living structures, capable of performing the functions for which it is designed, there must be corresponding retrogressive changes. In order that that perfect equipoise may be secured, the balance of the increment and the excrement of the cell must be maintained. This balance being once destroyed, the initiation of structural degeneration will have begun.

In considering this reversion in the living body to primitive forms we are looking on the last phase of organic life. It is the end-product of a long series of changes, of which the beginning was in the cell. There would be little of value, or even of interest, in recounting such conditions, even as curiosities in pathology, if they carried with them no intimation of the reason why the vital energy had departed, and why with its departure the structure, which it had held together, fell to pieces. This the study of dead tissues, no matter how carefully performed, fails to tell us.

The first altered pathologic condition which we see is macroscopic; the next is microscopic; the third—that which is most helpful—deals with physiologic chemistry.

BIOLOGY OF THE CELL

In every case of disease there must have been a wide range of gradations, from the initial disturbance of nutrition through the breaking down of structures, up to the final dissolution of the material into the elements of which it is composed. The end-results are visible to the naked eye. They are more fully detailed under the microscope, but they can be comprehended only through our study of physiologic chemistry. Permit me, therefore, in a word to recall a few of the important facts which have a bearing on the biology of the cell.

Every living cell, no matter what may be its function or ultimate destination, is a mass of protoplasm enclosed within a cell wall. It has in its substance proteins, lipoids and an enzyme. It is in fact a colloid in which crystalloid substances are readily soluble. Under the influence of chemical action, of heat, of electricity, of light or of radioactive forces, the cell is split up into the component carbohydrates, the molecules forming new groupings, through a long series, until the simpler forms are finally reached.

As Pauli has shown in his various lectures on "Physical Chemistry in Medicine," physiologic experience compels us to believe that chemical reactions of the most different kinds are simultaneously possible in the homogeneous ground substance of the cell; and in even the smallest particles of protoplasm, antagonistic chemical reactions, such as oxidation and reduction, hydration and loss of water, condensation, synthesis and their opposites, assimilation and dissimilation, are likely to occur through and beside each other.

Just as the chemist allows different chemical reactions to take place in different vessels, the cell is believed to utilize the different chambers of the honeycomb structure, and with the help of the colloidal ferments, the number and knowledge of which is daily growing, to allow the necessary reactions to go on independently of each other.

In order that we may visualize these cellular activities, which are constantly taking place, we must think in terms of cell structure continuously related. With such colloids as the cornea, the membrane of Descemet, the lens capsule, the lens cortex, the vitre-

ous, the hyaline membrane, the nerve cells of the retina and the membrane of Bruch in contact with such colloids as the lymph and the blood plasma, with the aqueous filled with crystalloids in solution, with each cell penetrable by the toxins given off from bacteria or from chemical changes, we may begin to realize the enormous possibilities that are opened up to us, not only concerning the physiology and the pathology of the eye, but as to the therapy as well. The same laws, it will be remembered, govern the cell contents and its membrane as to osmosis and surface pressure as apply to other animal membranes, and while it is not yet proved, it is not at all improbable that the edema within the eye, whether it takes the form of an acute or a chronic, a simple or a fulminating glaucoma, may ultimately be found to be due to the swelling within the vitreous cells of soluble toxins. Equally the atrophic changes in the lens fibers, like the fibrous and subsequently fatty changes in xanthelasma, or in the arcus senilis, are evidences of the presence of soluble toxins which have disturbed the normal functioning of local cells.

Therapeutically it is clear that every drug substance introduced into the animal body must be ionized before its constituent electrons can activate those within the living cell. This is, of course, aside from the subject under consideration. It has been most interestingly treated in a little volume by Leduc entitled "Electric Ions and Their Use in Medicine."

The acute or chronic inflammation of a tissue is only an intermediate stage, and is produced by a local irritation which may be due to a toxin introduced by some pathogenic bacterium.

Practically all forms of uveitis that are not traumatic, and many that are traumatic, are due to this cause. We no longer speak of rheumatic iritis. We look for the source of infection of both the rheumatism and the iritic inflammation. It may be found in an apical tooth abscess, it may arise from an infected sinus, or it may be as remote as the appendix. From such a locally infected point the toxin given off by the bacterium, the staphylolysin or the streptocolysin, is readily absorbed by the blood plasma and carried to the uveal tissues. Many illustrations come readily to mind, but one will suffice:

A lad of 18 had for five years been suffering from choroiditis. Large patches of exudation had been followed by atrophy, involving the macula of one eye, and coming dangerously near the visual center of the other. He had been under able, conscientious and expert care. When he was seen in midsummer in consultation it was evident that there must be somewhere a nidus, a focus of infection. He was seemingly perfectly well, free from both tuberculosis and syphilis. An investigation of his nose at first revealed nothing but a swollen middle turbinal. His rhinologist was urged to remove it for exploratory purposes. When this was done, immediately a mass of thick yellow pus appeared. The ethmoid was fully explored, opened and cleaned, and the active disease in the choroid became quiet. Two months later a new attack supervened, when a deeper hidden infected cavity was disclosed, and a roentgenogram revealed a blind abscess at the root of a molar tooth. Both were relieved when some weeks later a third attack developed. On this occasion the small, hard, sunken tonsils were removed, and both were found diseased. Since then there has been no recurrence of the active uveal disease; one cannot but feel, however, that had the source of the trouble been recognized much earlier the young man might have escaped the handicap of defective sight for the remainder of his life.

One hesitates to speculate, but the facts so rapidly accumulating all seem to point to the absorption of

different toxins as a possible, if not a probable, cause of both glaucoma and cataract.

In a recent case of glaucoma, in which excellent tridectomies had been made by an eminent Scotch surgeon, and in which only a remnant of sight remained, there were evidences of extensive choroiditis. The poor woman, finally in perfect health, had lost every tooth. She said that during the years in which she was steadily going blind she suffered constantly from toothache. It is well known that no sanitary precaution has been more neglected among the poorer classes, and even among the fairly well-to-do, than the care of the teeth.

One can readily understand from the cesspools that one finds in the mouths of those from whom more would be expected that these must be never ending sources of infection. I think that we will find, too, if we go outside of our special lines of work, that there is not a patient who comes to us, with commencing striae in the lens, who will not be found to have impaired metabolic functions. There will be a greater or lesser degree of intestinal indigestion, with the resultant absorption of toxic products. And if we would avoid the final degeneration changes, which so often are presented to us, we must seek for all possible sources of infection before the damage has been done.

454 Franklin Street.

ABSTRACT OF DISCUSSION

DR. BURTON CHANCE, Philadelphia: It is difficult to get at the chemical reactions going on in the ocular tissues, and the results of the observations of careful observers have often been disappointing. Certain general states of depravity justify us in assuming that deleterious compounds are manufactured which act on the ocular tissues, but it is difficult to link up well-marked signs of degeneration with any bodily ailment. The origins of degenerations in conjunctiva and cornea are obscure, in so far as their presence has been unaccompanied by the classical signs of inflammation. In a number of cases of nodular degeneration of the cornea, sometimes more than one in a family, colleagues skilled in laboratory examinations have failed to elucidate their origin in physico-chemical and other processes, as, for instance, diabetes. The ophthalmologist, therefore, views the whole subject as all but metaphysical, yet he is daily confronted by problems in which he finds in diseased eyes calcareous, crystalloid or colloidal products of inflammation which interfere with function or destroy the organs. Can it be that ordinary senile dissolution depends on the wearing out of the cell? Dr. Lewis' reference to cases of uveitis dependent on disease of the dental structures reminds me of similar cases. From teachings received I have insisted on examination of the teeth and gums in all cases of uveal and protracted tarsal and conjunctival diseases, as well as before operations on the eyeball. It has been my observation that delayed recovery after uncomplicated cataract operation has never occurred in subjects with good teeth.

Prostitution and the Army.—It is a matter of history that prostitution follows the army. In all the European armies at the present time vice and its consequences constitute one of the most serious, if not the most serious, of army problems. In some of these armies the wastage from venereal disease has been frightful. . . . From the standpoint of military strength and efficiency, such waste is serious. From the standpoint of social wholesomeness, it is more serious; for it means that not only will these men bring back into the social structure a vast volume of venereal disease to wreck the lives of innocent women and children, but they will bring back into it other influences, attitudes, and practices which will destroy homes, cause misery, and degenerate society.—M. J. Exner, M.D.

OBSERVATIONS ON TREATMENT OF FOOT CONDITIONS

C. L. LOWMAN, M.D.

LOS ANGELES

In the treatment of arch conditions by various men, and in the general literature on the subject, the relation of the transverse and longitudinal arches of the foot is not dwelt on much. I wish to call attention to a few facts regarding it.

Nearly all the anatomic and mechanical points regarding the bones of the foot and the parts they play, alone and together, in the function of weight bearing and locomotion have been ably dealt with in many special articles, and I can add but little to them. It is in regard to the clinical use of such knowledge that I wish to speak. Briefly, let us recall that anatomically we speak of two arches in the foot largely for convenience, and that actually the structure of the foot is dome shaped, doubly concave on the plantar aspect.

The weight is properly borne on the periphery, the short lateral curves having a definite relation to the long anteroposterior curves. In the more common static conditions, such as pronation, depression of the arches, "foot strain" and "weak foot," the weight is not thus borne. It is shifted inward so that the bones no longer resist the downward thrust, and the ligaments, which are required to assist in sustaining the body weight, gradually weaken and lengthen under the overload. This lengthening of the plantar structures, with the lowering and tilting of the dome, changes all its curves, and the foot becomes longer and broader than normal.

The lack of appreciation of these facts is evidenced in the plating and shoeing in many of the foot cases which I have had an opportunity to observe. I am sorry to say that some of these patients have been in the hands of orthopedic surgeons.

When the foot elongates, the distance from the os calcis to the head of the first metatarsal is lengthened in proportion to the relaxation and weight, while the phalanx remains unchanged in length. The anterior half of the foot becomes broadened in proportion to the depression, pronation and eversion, while the heel remains practically of the same breadth. Now, for a shoe to be fitted correctly, the "hinge" or breaking point of the sole should come directly under the first metatarsophalangeal joint. If a relaxed, pronated foot is so fitted, the shoe will then project beyond the great toe a distance equivalent to the amount of lengthening of the long arch due to the change in the metatarsal angle. If such a foot is so fitted and no lateral correction is made by raising the inner border of the heel, it will be encouraged to keep on lengthening, because there is not even the resistance of the laces and leather across the dorsum to prevent it.

As most patients will not be so fitted, women especially, the shoe will in consequence be too short; and when the forward thrust occurs in the metatarsal region, the toes will be crowded forward into the narrowest part of the shoe. As the shoe becomes softer and looser from age, the joint line of the foot will be pushed beyond the hinge of the sole, and faulty back pressure will occur against the heads of all the metatarsals and they will be depressed. The result will be worse in either case entirely in proportion to the amount of tapering in the toe of the shoe. If the shoe

is not straight lasted on the inner border, or the "swing" of the outer border is not very "full," as in the broad type of shoes, the toes will be increasingly cramped. Likewise the ball of the foot or cross arch in front will be depressed in accordance with the hollowness of the sole.

Patients have come to me unrelieved by treatments with plates and shoes recommended and given by orthopedic surgeons. Examination of the shoes, which often had been made to order at an expense of from \$18 to \$25 a pair, showed that the chief consideration had been to obtain a good grip of the heel and tilt it outward, and the toe of the shoe had been modified to placate Dame Fashion. They were made entirely too narrow to give relief from all symptoms, particularly those in the fore foot. There are many so called "anatomic," "orthopedic" and "foot form" shoes on the market which are designed without much consideration for the toes and fore foot except to be made a little wider, rounder, or of a more common sense type than the average shoes worn by women.

Many patients get relief at first because the change is radical; but if they have not been told to come back and have plates and shoes changed to meet the changes in the feet, they keep on wearing the same style and size of shoe because some prominent surgeon or orthopedist prescribed it. They do not realize that if a depressed arch is to be restored to normal and the arch plate and the shoe are to do any good except to relieve pain, the foot must become shorter and narrower. It cannot do this if the patient continues to wear a certain size plate in, say, a No. 5 shoe, when the normal foot measurement would call for a 3 or 4 shoe.

I have the same criticism to make in regard to stock or shoe store plates, which are indiscriminately prescribed and are even advocated and advertised in reputable medical journals. The average store plate is absolutely wrong mechanically. It is really a valgus shaped plate too long on the inner border and too short on the outer border. It usually has no lateral concavity and tips the foot inward into the opposite position from which it should be. To correct a valgus, the foot must be put in varus, a simple fact we all know. Yet I have seen surgeons prescribing and using plates that only increase the trouble. If the person with the flattened foot wears a No. 6 shoe, the clerk puts on a plate of corresponding size, which fits the patient and thus violates one of the commonest rules in orthopedic practice, namely, that patients should be made to fit the apparatus and not vice versa.

Certain conclusions must be drawn from such practices. The surgeon or practitioner is ignorant of the subject, or uses a stock plate because he can buy it cheaply in quantities and make a profit on it; or he is satisfied to have his patient obtain some relief from pain, to receive his fee and get rid of the patient; or he recommends certain plates and shoes because he sees them advertised in medical journals and demonstrated at medical conventions. Many seem willing to relieve pain and obtain fees rather than run the risk of losing a patient, especially a society patient, by insisting on what they know to be a correct shoe and what a normal foot should wear. They also neglect to follow up the foot needs until structurally it becomes as nearly normal as possible.

Now that the whole subject of body alinement is receiving attention, it seems to me that nothing should be more impressed on the general practitioner, the

surgeon, and the more inexperienced in orthopedic ranks, than the importance of foot posture and the correct surgical use of shoes. Furthermore, as much emphasis should be laid by them on the fact that they should expect and require their patients to use a correct shoe, when they prescribe it, just as they would expect them to take medicine prescribed for some functional derangement.

THE ENDONASAL OPERATION ON THE LACRIMAL SAC*

WILLIAM B. CHAMBERLIN, M.D.

CLEVELAND

To many it may seem a presumption for a rhinologist to enter the sacred domain of this section and discuss a subject so intimately the field of the ophthalmologist. The *Grenzgebiet* is still a cause for strife between surgeons as between nations. My own hope is that in the domain of medicine, at least, it may soon be transcended by that higher aim, "the ultimate good to the patient," just as in national life it may ultimately be a question of "the greatest good to the greatest number." Then will humanity and benevolence rather than selfishness be the guiding principle in men's lives.

The demands of modern medicine become each day more extensive and exacting, and the specialties each day more circumscribed in their limitations. Whereas, in this country at least, it is but a short cry back to the times when the same individual encompassed, or attempted to encompass, within his domain, the diseases of the eye, ear, nose and throat; such a condition exists as a rule today only in the relatively smaller communities. Ophthalmology has come into its own as a distinct specialty, just as otology bids fair to do in the not too remote future. This assumption of authority and finality in our own limited field makes us in a way more than ever dependent on help from our fellows, according to the extent to which that field affects or is affected by the field of our fellow worker. So the ophthalmologist, who calls in the rhinologist to perform an endonasal operation on the lacrimal sac, is no more of an anomaly than the internist who invites the technician of his field, the surgeon, to perform an operation for appendicitis; the surgeon who invites the otologist to perform an operation on the mastoid process; or the rhinologist who calls to his aid the dentist in his care of a diseased antrum, or to complete the result of his tonsil and adenoid operation by attending to the proper alinement of the child's teeth. Here is an instance in which team work and not selfishness, but mutual cooperation, spells success for both, and assures, or helps to assure, a successful outcome for the patient. My own cases are only those which have been referred to me by the ophthalmologists. In fact, I have no opportunity of seeing such cases in any other way.

Until a few years ago, according to West,¹ the treatment of dacryostenosis had made no real progress for a period of twenty-five years. In 1910 West published his paper entitled "The Window Resection of the Nasolacrimal Duct," and exhibited in all seven patients operated on by this method. This paper, as

* Read before the Section on Ophthalmology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. West: Berl. klin. Wehnschr., 1914, 51, 1633; Arch. f. Laryngol. u. Rhinol., 1913, 27, 224, 504; Berl. klin. Wehnschr., 1913, 50, 926.

the title indicates, referred only to the operation on the duct, but laid no claim to being an endonasal operation on the sac. In three of the cases, however, the sac itself was really opened. West soon became convinced that the opening of the nasal duct alone could not be sufficient, and that any operation, to be successful, must concern itself rather with the opening of the lacrimal sac as well. He immediately set himself about the new task, and, through the generosity of Professor Silex of Berlin, gained access to an exceedingly rich clinical material. The results of his later endeavors he reported in 1913. At that time, he reported the investigation of over 300 cases of various diseases of the lacrimal apparatus, and the operation on the lacrimal sac in 130 cases by the endonasal method. He claimed a favorable result in over 90 per cent. of the patients so operated on.

West asserts that Caldwell was the first to open the lacrimal canal, in 1893, when he reported one case. Still later, Killian and Passow reported similar cases. The idea of reestablishing the connection between eye and nose, as a passageway for the tears, was known to the ancients, who were for the most part unsuccessful in their attempts. In 1863, Berlin had revived the extirpation of the sac from without, and this had remained the operation of choice almost to the present. In 1904, Toti published the results of his attempts to reestablish the natural pathway from without by means of a skin incision at the inner angle of the eye. In 1910, von Eiken published a paper in which the approach to the sac by way of the antrum was advocated. West performed his first operation in 1908.

The various operations, previously described, were successful only in a relatively small proportion of cases. The external operations often gave rise to fistulas, and, if successful, as far as the curing of phlegmon was concerned, necessitated later the excision of the lacrimal gland to get rid of the epiphora. The resulting scar, too, was often unsightly. West's earlier operations on the nasal duct were also unsuccessful, because the stenosis occurred at the inferior border of the sac, where it joins the duct. The operation was, accordingly, inferior to and outside the field of the real difficulty in a large proportion of cases.

West's modified operation concerns itself with the lacrimal sac alone, the duct being disregarded. The free opening of the sac itself he regards as essential, if a cure is to be expected. That the sac is really opened in all cases is shown by the fact that a probe introduced into the lower punctum passes horizontally into the nose. A minute knowledge of the anatomy of the parts is absolutely essential. The technic is as follows: A quadrangular flap, covering the end of the lacrimal sac, and extending well forward over the ascending process of the superior maxilla, is resected submucously, its base of attachment being inferior. After its resection it is turned downward out of the field of operation, this inferior attachment acting as a hinge. The denuded area extends vertically through a space roughly limited by an anterior extension of two lines, the upper marking the attachment, and the lower the inferior border of the middle turbinal. Neither turbinal is encroached on, unless an obstructing hypertrophy is present. By means of appropriate chisels, a portion of the posterior border of the nasal process of the superior maxilla is chipped away, and the thin bone, covering the sac, resected. The sac itself is then grasped with forceps and a large portion of its nasal aspect resected with a thin scalpel. The

submucous flap is now replaced, the posterior part, over the area of the resected sac, being first removed. The flap is held in position for twenty-four hours by packing of iodoform gauze. The after-treatment is exceedingly simple, and consists in keeping the nose free of crusts and granulations, and irrigating the sac by way of the canaliculus with a 3 per cent. solution of boric acid. As stated before, West claims favorable results in 90 per cent. of his cases.

The advantages of West's, over the previous methods, for the treatment of the various diseases of the lacrimal apparatus, he enumerates thus:

"1. The physiologic function of the path for the tears is again restored, so that not only a suppuration of the sac, a lacrimal fistula or a phlegmon is healed, but also the tears flow normally through the nose. A later epiphora is accordingly avoided.

"2. A so-called cure by probing is rendered unnecessary.

"3. The lacrimal gland is spared.

"4. A skin incision or a curetting from without, with eventual scar formation, is avoided."

This operation he has performed in every possible sort of disease affecting the lacrimal apparatus.

After the operation, certain persons, by sharply blowing the nose, can force air out through the canaliculus. West does not consider this a disadvantage, as the patients do not complain of it. Halle's suggestion for forming a valve of the mucosa, in order to prevent this, he regards as impossible of accomplishment.

A more recent endonasal operation on the lacrimal sac is that of Yankauer.² The latter considers the West operation unsatisfactory because of the tendency of the opening of the middle meatus to close, such objection being avoided by his improved operation.

In the operation of Yankauer, the horizontal incision is begun at the attachment of the anterior end of the middle turbinal and carried forward for a distance of 5 mm. It is then carried downward to the anterior border of the inferior turbinal and backward along its inferior, free border, for about 2 cm., or from one-third to one-half the length of the turbinal. The incision is carried well down to the bone and the roughly rectangular flap, thus outlined, resected submucously, its posterior attachment acting as a hinge. On this hinge it is folded backward and held in place by tucking it under the anterior free end of the middle turbinal. A part of this submucous resection consists of the mucous membrane and periosteum on both sides of the anterior end of the inferior turbinal to a point well back of the opening of the nasal duct. The bony portion of the inferior turbinal, so uncovered, is then resected with punch forceps. The bony covering of the canal and sac is now removed with chisel and punch forceps, and the canal at its extreme posterior aspect slit from the opening in the inferior meatus to a point well above the junction of the inferior portion of the sac with the duct. When the sac is found to contain pus, a portion of its inner wall is resected to allow for free drainage into the middle meatus. This opening into the middle meatus closes subsequently. The internal wall of the duct and sac are now folded forward and held in position by folding the previous submucous flap down on it. The latter flap is held in position by a single stitch as well as by packing. The subsequent treatment consists in removing the pack-

2. Yankauer: *Laryngoscope*, 1912, p. 1331, Vol. XXII, Tr. Am. Laryngol., Rhinol. and Otol. Soc., 1913, 294.

ing after twenty-four hours, and irrigations through the lower punctum, the nose, of course, being kept free of crusts while healing is taking place.

Yankauer reports in all nine patients operated on by this method, during a period of three years: "Two were cases of mucocele of the sac; the other seven were suppurative. The suppuration ceased in all cases after the operation and has not recurred in any of them. The epiphora was relieved in all but one of the cases."

The most recent operation devised is that of Mosher.³ This method of opening the sac and duct was come on, as it were, by accident from an observation of the specimens on the cadaver in the development of Mosher's operation on the ethmoid labyrinth and frontal sinus. After removal of the anterior end of the middle turbinal and free exposure of the processus uncinatus, Mosher's stiff probe is introduced through the duct into the inferior meatus, the canaliculus having previously been slit. A roughly rectangular flap, limited anteriorly by the posterior lip of the ascending process of the superior maxilla and a portion of the superior border of the inferior turbinal, superiorly by the extreme limit of the middle meatus, and posteriorly by the extreme inner tip of the uncinate process, is now resected submucously and deflected downward and backward.

The inner wall of the lacrimal cell and bony covering of the duct are now broken through with an appropriate curet, the nasal process of the superior maxilla acting as a guide anteriorly. The fragments are removed with a conchotome. The inner wall of the duct and sac are now broken through by slowly withdrawing the probe, at the same time turning its tip sharply inward toward the septum. The probe is then reintroduced, and serves as a guide to the curetting away of the posterior tip of the ascending process of the maxilla, as well as the upper part of the processus uncinatus. The canal is subsequently widened by biting forceps after the probe is withdrawn, practically to double its previous width. A ligature is then passed through the nose upward and out through the dilated punctum, a piece of gauze being attached, kite-tail fashion, to its middle. This gauze is then drawn upward into the lacrimal sac, and the ends of the ligature fastened to the face with adhesive tape. The flap is now replaced.

After-treatment consists in removing the plug after two or three days, keeping the nose free from granulations and crusts, and keeping the passage free by passing the probe wherever it is indicated. Mosher asserts that the probe can be passed either from the nose or from the inner canthus. The operation "has been abundantly tried on the cadaver and three times on the living." Mosher admits that "it is too soon to say much about the results on the living, except that, so far, they are good."

From a review of the foregoing methods and operations it would seem that in the development and perfection of the endonasal method a possible solution of a difficulty, which has long been a perplexing one, may be reasonably expected. Certainly the external operation and its after-results have left much to be desired. The endonasal route obviates many of the disadvantages of the external operation. Whether or not the physiologic pathway for the tears into the nose can be maintained permanently in a sufficient percentage of cases at the hands of the average rhinologist is a question which time alone can answer.

The results in my own series of eight cases have been fairly good. The West operation was that of choice in all but one. In this the Yankauer operation was done. In only one case was there a complete failure. In this case the antrum was accidentally entered. Whether or not this had anything to do with the unsuccessful outcome it is impossible to say. In three cases a secondary operation was performed, that is, the stenosed opening at the beginning of the middle meatus was enlarged. All were cases of dacryostenosis and cystitis, except one. This was a case of stenosis and epiphora following a permanent opening into the antrum for empyema.

My own technic differs slightly from that of West. After the submucous flap has been outlined and elevated, a probe is inserted into the canaliculus, sac and duct. If this is difficult, the assistance of the ophthalmologist is summoned. This probe is held in place by an assistant. Its pressure renders the uncovering of the duct and sac easier. When the duct is freely uncovered, the point of the probe is directed inward toward the septum, thus bulging in its septal wall. A thin scalpel is now inserted between the probe and the lateral nasal wall, and the incision carried well up beyond the isthmus, so that the probe ultimately passes horizontally into the nose, as suggested by West. In this way a considerable portion of the duct and sac is completely removed. The infiltration of a few drops of 0.25 to 0.5 per cent. novocain solution, to the dram of which from 1 to 2 drops of epinephrin have been added, following the preliminary cocaineization renders the operation bloodless, as well as absolutely painless. The only pain complained of in any of my cases was that from the pressure of the lacrimal probe.

To many this operation from its description may seem difficult or impossible of accomplishment. It is difficult, and this difficulty I shall not attempt to minimize. The difficulty, however, is no greater than that attendant on the submucous resection of the nasal septum, and I can assert with firm conviction that any one who can perform a submucous resection can successfully perform the endonasal operation on the lacrimal sac.

In my hands the difficulties have been considerably lessened by the use of the modification of West's instruments, which I herewith present.⁴

ABSTRACT OF DISCUSSION

DR. HARRIS P. MOSHER, Boston: I have operated on nine patients. The results of four, after a year, are known. Three were operated on two years ago. When last seen the results were good. One recent case is still under treatment and the result is not yet apparent. One case was of mucocele of the sac. After nine months there was no return of swelling of the sac and the opening into the nose is patent. The second was of long standing, a suppurative sac, with a skin fistula. The eye is all right and the tears run over only when the patient gets cold. A third patient had a suppurative sac for seventeen years complicated by an infected mucocele of the ethmoid labyrinth. There is now a patent opening into the nose and the tears run over only on a cold day or in a strong wind. The fourth patient had a bony occlusion of the nasal duct which the ophthalmologists, after a number of trials, could not relieve. This man is wearing a style at the end of ten months, and with it there is no running over of tears except in a strong wind.

4. In addition to the references already given, the following will be found of interest:

Onodi: *Monatschr. f. Ohrenh. u. Laryngo-Rhinol.*, **46**, No. 4.

Mithoefer: *Ohio State Med. Jour.*, September, 1916.

Horgan, J. B.: *The Operation of Dacryocystorhinostomy: Its Indications and After-Treatment*, *Jour. Laryng., Rhinol. and Otol.*, London, June, 1916, 225.

3. Mosher: *Laryngoscope*, November, 1915, p. 739.

As to technic, if there is deviation of the septum to the side of the diseased sac, the lacrimal operation should be preceded by a submucous resection of the septum. The easiest approach to the sac is through the thin bone of the anterior ethmoid region. The steps of the operation are as follows: The anterior end of the middle turbinate is removed and the slitting probe is introduced through the cut canaliculus into the sac and on through the nasal duct to the floor of the inferior meatus. Next, the anterior ethmoid cells are exenterated. Then a cut is made in the mucous membrane of the nose along the posterior edge of the ascending process of the superior maxilla, and the probe withdrawn to the upper margin of the inferior turbinate, and when clear of the turbinate the point is pressed upward and inward and made to break through the nasal duct into the nose. The tip of the probe is then slowly forced upward, all the while slitting the inner wall of the nasal duct. The upward excursion of the probe is finally stopped by the increased resistance of the superior part of the lacrimal bone. Experiments on the cadaver have shown that this manipulation opens not only the nasal duct, but the lower two-thirds of the inner wall of the lacrimal sac. Unless it is the purpose of the operator to exenterate the lacrimal sac intranasally, the operation is finished by inserting the silver style. This may be removed at intervals and cleaned. On evidence of closure of the duct the style must be reinserted.

DR. WILLIAM B. CHAMBERLIN, Cleveland: One point I did not have time to bring out in the paper is the subsequent closure. This is a difficulty in any endonasal operation. Three of my patients were operated on the second time; but the secondary operation is comparatively a simple thing. The probe is introduced through the sac again and at the point of stenosis you can see a slight bulging. It is a comparatively easy thing to resect this with the punch forceps. In the after-treatment, if one is careful in keeping down granulations, as in any other part, epidermization will not be retarded. In many cases a preliminary submucous resection, especially a resection as high up as we dare go, is absolutely essential. It is a sine qua non of the operation.

Another point Dr. Mosher brings out in the discussion is the resection of the posterior part of the ascending process of the superior maxilla, which makes a groove for the duct. This is dense, firm bone. It is for the resection of this ascending process that West has devised his chisels, and it is for the resection of this process that I have modified his chisels, making them very much thinner, and also putting on the handle, thus enabling one to see every step of the operation. The view is less obstructed than with the West chisels, and you can insert it under the bone, and if it does not make a clean cut the bone may be fractured by a twisting motion. The forceps are a modification of the familiar Gruenwald forceps for the ethmoid, and are quite as effective as the instrument which West has especially devised for the purpose.

Managing Atypical Children.—Atypical or backward children should not be coddled, but encouraged, and, like plants of slow growth, in some instances they may be "forced." This may be done by supplying favorable conditions for growth and development, and by directing their physical activities in the right channels. Comparatively poor health is not always a contraindication, but often a decided indication for this forcing process. Many a nervous child immediately begins to improve physically as well as mentally when well directed pressure is brought to bear upon him in psychophysical education.—G. Hudson-Makuen, M.D.

THE REACTION AFTER INTRAVENOUS INJECTIONS OF FOREIGN PROTEIN *

FRANCIS J. SCULLY, M.D.
CHICAGO

During the last two years, intravenous injections of foreign proteins have been used as a therapeutic agent in various conditions. Satisfactory results have been reported in a variety of acute infections. In these reports the phenomena accompanying the injection are taken up as incidental to the presentation of the therapeutic results.

With the intravenous injection of a foreign protein, a certain reaction takes place which is fairly constant in all cases. For the purpose of observing the phenomena following the injections, careful records were made in the cases of acute articular rheumatism in which this treatment was employed. Observations were also made in a few cases of chronic arthritis and lobar pneumonia.

The foreign protein employed in these cases was typhoid vaccine. The vaccine was prepared from an active culture, grown twenty-four hours on agar slants, washed off with saline solution, killed by heating at

70 C. for two hours, and preserved by 0.5 per cent. phenol (carbolic acid). The vaccine was diluted so that each cubic centimeter contained 150,000,000; and injections of from 0.25 to 0.5 c.c. were used as the average dose.

Patients were taken as they entered the hospital with no selection except to exclude certain cases in which the vaccine was contraindicated, as will be shown later. Certain routine measures were taken

in the cases in which vaccine was given. The patient was allowed nothing to eat for at least one hour previous to the injection, so as to ward off nausea and vomiting. During the chill the patient was well covered with blankets. When the joints were acutely inflamed, from $\frac{1}{6}$ to $\frac{1}{4}$ grain of morphin was given to relieve the pain incident to the involuntary movements of the joints during the chill. The patient was kept in bed three days after all symptoms subsided. The vaccine was injected in the morning about three hours after breakfast, and the general symptoms, temperature, leukocytes and blood pressure were followed through the day and on the next morning.

THE GENERAL REACTION

Certain general symptoms were noted following the injection. For from half an hour to an hour there is no apparent change in the patient's condition. Then a chill occurs, which may become quite severe, and is accompanied with the usual symptoms of cyanosis and rapid pulse. With the onset of the chill the patient frequently complains of a dull temporal headache; nausea and even vomiting may be frequent at this time. The chill lasts from fifteen to thirty minutes and sub-

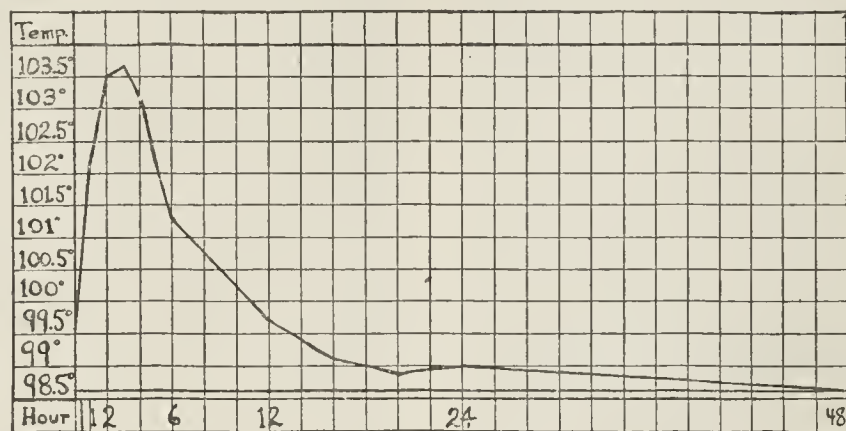


Chart 1.—Composite temperature curve following forty-seven intravenous injections of typhoid vaccine in twenty-five cases of acute articular rheumatism.

* From the medical clinic of Dr. Joseph L. Miller at Cook County Hospital.

sides gradually, the headache and nausea passing away with the chill. Following the chill there is a rise in temperature, and there are changes in the leukocyte count, in blood pressure and in the differential count, all of which will be more fully considered below. Following the chill there is profuse sweating. The sharp pains in the joints disappear shortly after the chill, though a feeling of soreness or stiffness may persist for a short time.

With large doses a more marked reaction was observed. In certain cases the average dose proved to be excessive, especially in those cases in which the patients were bedridden for some time. In these cases there was a severe rigor lasting one or two hours, and accompanied by marked cyanosis and a rapid, weak pulse. Following the chill the patient became very weak and showed signs of collapse. There seems to be a profound vasomotor disturbance, which may account for the sudden deaths that have been reported following intravenous vaccines.

Associated with severe reactions certain other symptoms were noted. Herpes occurred in three cases. The lesions were noted about the lips and inside the mouth. Prolonged headache occurred in several cases. Headache occurred in practically all cases during the chill; the headache was not constant in intensity, nor did the intensity seem to bear any relation to the severity of the reaction. Vomiting occurred in four cases with a severe reaction.

Temperature Curve.—Chart 1 shows a composite curve of forty-seven injections in twenty-five cases of acute articular rheumatism, and may be taken as a typical temperature curve. Little change is noted in the temperature until the chill occurred. Following the chill there is an abrupt rise until a maximum of 103.6 F. is reached four hours after the injection, after which there is a gradual fall to nearly normal in sixteen hours, and to normal at forty-eight hours. This curve corresponds closely to the curve obtained by Culver¹ in gonorrheal cases. Composite curves of primary and subsequent injections are similar, though the subsequent injections have a slightly lower curve. With the primary injections the maximum temperature of 103.8 was reached four hours after the injection. The highest individual maximum temperature observed was 106.6 three hours after the injection. The lowest individual maximum temperature was 102 three hours after the injection.

Leukocytes.—Chart 2 shows a composite curve of forty-three injections in twenty-four cases, and may be taken as a typical leukocytic curve. Following the injection and especially at the time of the chill there is a fall in the leukocyte count. The count may fall to normal or below, resulting in a leukopenia. This

will be noted in the chart, the count falling from 14,200 to 5,900. Toward the end of the first hour after the injection there is a gradual increase which continues until the highest count (39,900) is reached, about six hours after the injection. Following this there is a fairly rapid fall so that by the end of forty-eight hours the count is about the same as before the injection. This curve is similar to that obtained by Culver¹ in his cases.

Composite curves of primary and subsequent injections are similar, though the subsequent injections generally produce a slightly lower leukocytosis than the primary or preceding injection. The highest individual count was 77,200 six hours after the injection. The lowest maximal count was 13,600. Certain cases showed a persistent leukocytosis which did not seem to have any bearing on the severity of the infection or on the therapeutic result. The degree of leukocytosis did not seem to have any bearing on the results obtained, though cases with a marked reaction and a corresponding increase in leukocytes gave the best response to the treatment. With large doses the degree of leukocytosis was greater, counts of from 90,000 to 115,000 being noted.

Blood Pressure.—Chart 3 is a composite of thirty-eight injections in nineteen cases, and may be taken as a typical blood pressure curve. During the first hour after the injection, and especially at the time of the chill, there is a rise in blood pressure. This is not well shown on the chart, owing to fewer observations made, than at other points on the curve. This is due to the difficulty in taking the blood pressure while the patient is chilling, the twitching of the muscles making accurate readings difficult, and at times im-

possible. Probably during the height of the chill the rise is greater than shown by the readings which were made. After the chill there is a fall in blood pressure, reaching a maximal drop, 92 systolic and 60 diastolic, about six hours after the injection, and then coming up gradually to nearly normal in forty-eight hours. The systolic and diastolic pressures vary about equally at all times of the reaction. The composite curves of primary and subsequent injections are much alike, both diastolic and systolic, though in the subsequent injections the fall was not quite so great. The lowest single reading during the fall was 60 systolic and 40 diastolic six hours after the injection. With large doses a greater drop was noted. These patients show marked signs of shock.

Differential Blood Counts.—Considerable variation is noted in the differential count following the injection, as regards both the relative percentages and the absolute values.

Following the injection there is a steady rise in neutrophils from the first, reaching a maximum point two or three hours after the injection, and then falling gradually in forty-eight hours to a percentage

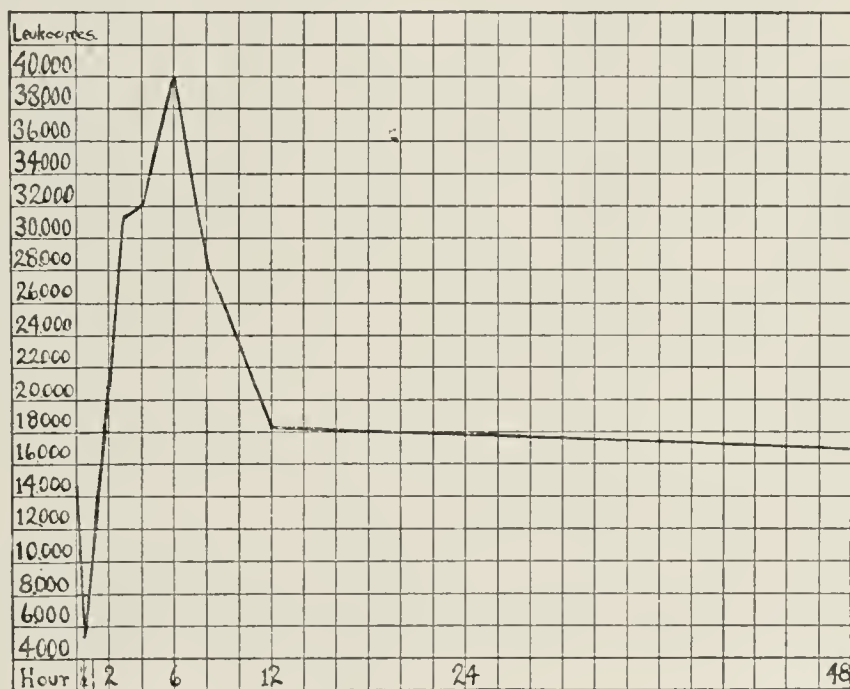


Chart 2.—Composite leukocyte curve following forty-three injections in twenty-four cases of acute articular rheumatism.

1. Culver, Harry: The Treatment of Gonorrheal Infections, THE JOURNAL A. M. A., Feb. 3, 1917, p. 362.

slightly lower than before the injection. The highest individual rise was to 94 per cent. from 60 per cent. In absolute values the neutrophils follow almost exactly the total leukocyte curve, showing that the increase in the leukocyte count is mainly due to an increase in neutrophils. During the chill there is a fall in the absolute value, followed by a sharp rise in six hours and then a fall to the same level as before the injection.

The large lymphocytes show a rapid fall following the injection, reaching the lowest point two or three hours after the injection and then rising to a percentage slightly higher than before. The most marked individual fall was from 23 to 3 per cent. In absolute values, there is also noted a fall during the chill, followed by a slight rise reaching its maximum in eight hours, and then falling to normal. While the percentage curve shows a steady rise after eight hours, the absolute value remains about the same, owing to the decreasing total leukocyte count.

The small lymphocytes show a slight rise during the chill followed by a fall two or three hours after the injection, then gradually rising to about the same percentage as before. The most marked individual fall was from 20 to 3 per cent. In absolute values there is a decrease during the chill, owing to the decreased total leukocyte count. With the increasing leukocyte count there is also an increase in small lymphocytes to about normal, where it remains constant.

The eosinophils show an absolute and relative decrease during the first six hours after the injection, followed by an absolute and relative increase. Simon² noted this variation in eosinophils following intraperitoneal injections of killed bacterial cultures. He found that subsequent injections were followed by a higher percentage of eosinophils than the preceding injection.

The basophils show a slight relative and absolute increase during the first eight hours, followed by a relative and absolute decrease.

The urine showed no marked change following the injection. At the end of twenty-four hours there was a slightly higher specific gravity due probably to the loss of fluids from the profuse sweating. No albumin appeared when none was found before the injection, nor was there any change when albumin was present before the injection.

Certain changes occur in the blood serum following the injection. Work by Jobling and Petersen,³ and later work by Petersen indicates a rise in ferments and a decrease in antiferments at the time of the reaction.

Four patients with chronic arthritis were also treated by intravenous vaccines with reactions similar to those in acute articular rheumatism. Three patients with lobar pneumonia also received the vaccine. Early

cases in the second or third day were chosen, and a similar reaction occurred, except that the temperature, instead of remaining low after the injection, gradually rose again in forty-eight hours to about the same level as before, where it continued until the natural crisis. No changes were noted in the physical findings following the injection.

Intravenous injections of vaccine are contraindicated in those cases in which the vasomotor system is weakened, and when the nervous system is unstable. In these cases collapse may occur, with a possibility of death resulting. Organic heart disease requires cautious treatment. In serious lesions the injection is absolutely contraindicated, as the heart becomes dilated and overworked, so that cardiac failure may result. In one case of this series with a mitral murmur, following the injection the heart dilated 2 cm. to the right, and 4.5 cm. to the left. Gradual recovery occurred, however, in twenty-four hours.

In acute infections, as lobar pneumonia, small doses are advisable because of the weakened cardiac musculature. Chronic alcoholism may be an absolute contraindication, as the shock of the vaccine reaction may precipitate an attack of delirium tremens, resulting in a prolonged or fatal course. In one case of acute

articular rheumatism in a heavy alcoholic, the patient received the usual dose of vaccine and had a typical reaction following. Thirty-six hours afterward he became delirious and remained so fifty-two hours, when death occurred.

THERAPEUTIC RESULTS

In twenty-five cases of acute articular rheumatism treated with vaccine, the following results were obtained: Ten cases cleared up after a single injection. All were recent and uncomplicated cases. No recurrences were noted while under observation, nor did any of these patients return to the hospital. Three cases cleared up slowly, requiring two or three injections. The shoulders were the last joints to clear up, the stiffness and soreness seeming to remain longer than in the other joints. Two cases recurred ten days after clearing up nicely after the first injection. These patients remained well after a second injection. Four cases were complicated, two with endocarditis, one with pericardial effusion, and one with empyema. In these cases there was a continued high temperature, and the patients received only temporary improvement after the vaccines until placed on salicylates. Four other cases were resistant to vaccines and cleared up under intravenous injections of sodium iodid. The remaining two patients are the one developing delirium tremens with a fatal result as cited above, and the other leaving the hospital refusing further treatment.

SUMMARY

Following intravenous injections of a foreign protein, certain definite phenomena occur. A general reaction is first noted with a chill accompanied by headache and nausea, and followed by sweating and relief of joint pain.

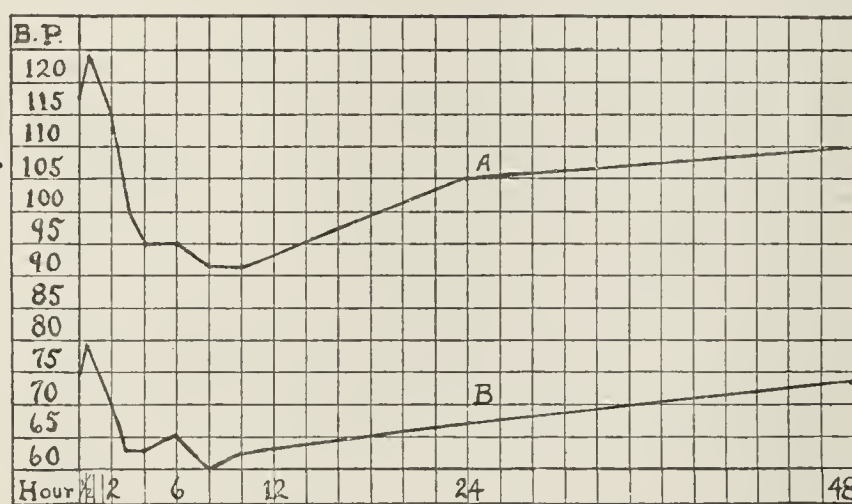


Chart 3.—Composite blood pressure curve following thirty-eight injections in nineteen cases of acute articular rheumatism: A, systolic; B, diastolic.

2. Simon: Internat. Clin., 1906, 1, 166.

3. Jobling, J. W., and Petersen, William: The Nonspecific Factors in the Treatment of Disease, THE JOURNAL A. M. A., June 3, 1916, p. 1753.

Following the chill there is a rise in temperature reaching a maximum about three or four hours after the injection and falling to normal in forty-eight hours.

There is a fall in leukocytes followed by a marked increase reaching a maximum six hours after, and gradually falling to the same level as before the injection.

The blood pressure rises during the chill, then falls, remaining low for three or four hours, and rising gradually to normal.

There is considerable variation in the differential counts, but the main change is an absolute and relative increase in the neutrophils.

The urine shows no definite change following the reaction. Intravenous vaccines are contraindicated in marked cardiac lesions and chronic alcoholism.

Successful results were obtained in 40 per cent. of the cases of acute articular rheumatism after a single injection and in 52 per cent. after two or more injections.

TREATMENT OF PARESIS BY INJECTIONS OF SALVARSAN INTO THE LATERAL VENTRICLE

SECOND REPORT

GRAEME M. HAMMOND, M.D.

Professor of Diseases of the Mind and Nervous System, New York Post-Graduate Medical School and Hospital

AND

NORMAN SHARPE, M.D.

Attending Neurologic Surgeon, St. Mark's Hospital

WITH LABORATORY DATA BY

J. WHEELER SMITH, JR., M.D.

Associate in Bacteriology, Department of the Laboratories, New York Post-Graduate Medical School and Hospital

NEW YORK

In our first report of this method of treatment of paresis,¹ only three patients had received any systematic treatment. Our first injection was given, Jan. 12, 1915. Since that time we have made injections in other cases, ten of which were treated at a sufficiently remote date to make a report now of value. Thus this article is based on the results obtained in the first thirteen consecutive cases, in all but two of which three injections were given, and in two, five injections each. A great deal of care has been taken in studying these cases both before and after treatment. We were particular to select for injection only those patients who undoubtedly had paresis, and in all cases the results of the examination of the spinal and ventricular fluids were carefully studied both before and after each injection. In none of these cases were there any symptoms of an alarming nature after the injections. Few patients showed even a slight rise in temperature, and none remained in bed longer than three days. Two of the thirteen, Patients 9 and 10, died, not from the effect of the operation but months after their final injection, dying in the terminal stage of paresis. Two other patients, one of whom received only one injection, were unimproved and have since been committed to asylums. The remaining nine have shown decided improvement, not simply in the serology, but from a clinical standpoint. They are much less emotional, their memories are better, they are

improved physically and mentally, and they are still improving.

In five of the nine (Cases 4, 5, 6, 7 and 8), there has been an exceptional improvement. These five patients have been able to return to their work and are now self supporting. They had been unable to work before coming to us for from three to eighteen months. Following injection and the period of several months' rest we advise after treatment, they have now been at their work for from five to eighteen months. Although two of these patients appear to be entirely normal and have been working steadily for more than a year, it is still too early to assert that any of them are cured. A period of three years, and possibly five years must elapse, without deterioration, before they can be considered free from danger of recurrence.

Our experiments on animals, as reported in the first paper, have shown that fluid introduced into the ventricle reaches all portions of the cortex of the brain and cord and has a much greater spread and diffusion than one introduced by any other method. It is only natural, therefore, that the improvement noted in these cases is such as has never before been obtained in any series of cases.

Not one of these thirteen could be termed an early case. The observed symptoms had existed for from six to twenty months. In several, however, the deterioration was but slight, and it is in these cases that we have obtained the maximum improvement.

In regard to the physical signs, naturally we have not been able to influence the Argyle Robertson pupil or to any extent the increased reflexes. However, we have seen the tremors of the face and tongue and dysarthria, if moderate, disappear after treatment.

Beginning with 0.6 mg. of salvarsan in the first case, we have gradually increased the strength of the serum until now we are giving double the initial dose. We do not know yet whether or not we have reached the maximum dose, or whether we are timing the injections so as to obtain the best results. It has been our custom to give the second injection a week or ten days after the first, and the third injection two weeks later. There is no positive reason for this, and it is purely tentative. Probably in the light of future experience, we may find it better to give it at different intervals. Probably we shall find it necessary to give more than three injections at first, and then, after several months, to give in some cases another series of injections. These are points that can be determined only by a wider experience and many more cases.

The harmlessness of the operation and the excellent results so far obtained lead us to urge that this form of treatment be universally adopted in the early stages of the disease. We have not found, and do not believe, that it has any effect in even retarding advanced cases. But it certainly seems to us that in the beginning of the disease, before serious changes have taken place in the cerebral structure, it holds out the best hope of improvement, and perhaps permanent stoppage of the disease, that we know of today.

SURGICAL ASPECTS

The operative technic which we are now using is the same as that described in the first paper. It is reasonably simple, has proved entirely safe, and we have seen no reasons for changing it. The time required for an intraventricular injection by this method varies from twenty to thirty-five minutes, the greater part of which is consumed in the gradual

1. Hammond, G. M., and Sharpe, Norman: The Treatment of Paresis by Injections of Neosalvarsan into the Lateral Ventricle, *THE JOURNAL A. M. A.*, Dec. 18, 1915, p. 2147.

escape of the cerebrospinal fluid, and the slow introduction of the serum, which enters entirely by gravity.

Others have used various modifications of this method, chiefly with the view of "saving time." One of these modifications has been the puncture of the ventricle by a sharp needle to which is attached a large syringe. The fluid is removed by suction, and the serum is then forcibly injected, the whole operation requiring only fifteen minutes. This procedure, which resulted disastrously in at least one instance, cannot be too strongly condemned. No surgeon of any experience in brain surgery would attempt the introduction of sharp instruments into the brain substance, and especially the forcible withdrawal and injection of fluids by means of a syringe into the lateral ventricle, where the consequences of a hemorrhage would be disastrous.

Another modification suggested requiring only from ten to fifteen minutes, is the perforating (under local anesthesia) of the scalp and bone (and occasionally the cerebral cortex) by means of a small drill, slightly larger than the ventricular cannula. Through this opening the cannula is blindly inserted into the ventricle; this procedure would be most dangerous. When one considers the number of large

the quantity of fluid found at injection of value as a prognostic factor.

In regard to the number of treatments necessary, the giving of only three injections has been purely arbitrary on our part, and was due to the marked clinical improvement following this number of treatments. As the laboratory data show, it will be necessary in some cases to give more than three injections, probably double this number. For example, in Case 12, in which the fluid Wassermann and colloidal gold reactions were strongly positive following the third injection, though the clinical improvement was marked, now, following the fifth injection (given since the tables were made up), the fluid Wassermann is negative and the colloidal gold reaction much reduced, and the clinical improvement continues. In two of the patients, in spite of the fact that they are apparently normal, and have been at work for over a year, the fluid Wassermann and colloidal gold reactions are now as strongly positive as before the first treatment. This has led us to place greater reliance on the clinical symptoms in determining improvement, and to suspect that in some cases the fluid syphilitic reactions, as has been found in blood reactions, may be unchangeable, even though the disease process has been eradicated.

TABLE 1.—RESULTS OF COMPLEMENT FIXATION REACTIONS *

Case	Blood Serums					Cerebral Fluids				Spinal Fluids				
	Before Treatment	After First Treatment	After Second Treatment	After Third Treatment		Before Treatment	After First Treatment	After Second Treatment	After Third Treatment	Before Treatment	After First Treatment	After Second Treatment	After Third Treatment	
3 A. M.	—	—	—	—	—	—	—	±	
4 B. P.	++++	++++	++++	++++	++	++++	+++	++++	++++	—	++++
5 J. B.	—	—	—	—	±	±	++++ (8 C.)	.....	+++	.....	.....	.....	++++ (8 C.)
6 J. M.	++++ (8 C.)	.....	.....	.....	.....	.....	—	.....	.....	++++ (8 C.)	
7 W. vH.	—	—	—	++++	—	(8 C.)	—	.....	.....	++++ (8 C.)	
8 J. MeQ.	—	—	—	—	++++	+++	
9 J. B.	++++	++++	++++	++++	++++	++++	++++	
10 E. MeC.	++++	++++	++++	++++	++++	++++	
11 S. B.	++++	++	++	++++	—	—	++++	++++	
12 A. C.	++++	++++	++++	++++	++++	++++	++++	
13 T. B.	++++	++++	++++	++++	++++	++++	++++

* The signs +++++, +++ and ++ mean that the reaction was positive; ±, doubtful; —, negative.

veins that are encountered in this area near the sinus, this method could be safely relied on to result disastrously in a certain percentage of cases. In our method, which consists of a 3/8 inch trephine opening under ether with incision of the dura, we obtain a clear view of the cortex and select a point free from vessels for the introduction of the cannula, thus avoiding the danger of cortical hemorrhage. By this method we have performed thirty-nine injections in this series of thirteen consecutive cases with no deaths and without any accidents. The patients are out of bed on the second day and ready to leave the hospital on the fourth day. All subsequent injections can be done under local anesthesia, the scalp being infiltrated over the original trephine opening; but we insist on incision of the scalp, and inspection of the cortex before introducing the ventricular cannula.

In some of our cases there has been a rise in temperature to 101 or 102 F. for from twelve to twenty-four hours following injection, with a corresponding increase in the pulse rate; but in no case have the reactions been such as to give rise to any anxiety.

Those cases in which, at the first injection, there has been found much fluid on the cortex or in the ventricle have shown the minimum of improvement following treatment, and we have come to look on

In our first cases we gave 0.6 mg. of salvarsan in blood serum. The dosage has gradually been raised so that now, as an initial dose, we give 1 mg. of salvarsan in salvarsanized serum, and have given 1.2 mg. This is three times the dose that can safely be given intraspinally. The reaction following 1.2 mg. has been no greater than that following 0.6 mg., that is to say, practically nothing. It is impossible to say now what the maximum dose is that can be given safely. We intend to increase gradually the dosage in each succeeding case, and in this way perhaps reduce the number of injections necessary.

LABORATORY DATA

The laboratory work done in the conduct of this series of cases may be considered under two heads: (1) the preparation of the medicated serums, and (2) the examination of the patients' blood serums, and cerebral and spinal fluids.

The medicated serums were prepared simply by the addition of salvarsan or neosalvarsan to 40 per cent. serum in 0.9 per cent. sodium chlorid solution. In brief, the method is as follows:

Blood, to the quantity of from 40 to 60 c.c., is drawn by means of suction from a vein at the bend of the elbow into a sterile needle and tube. The blood is drawn usually late

in the afternoon of the day before that set for the treatment. The blood is incubated at 37 C. over night. It coagulates and the clot contracts. On the following morning there is usually more than enough perfectly clear, cell-free serum available, which is easily removed from the tube by means of a bulb pipet. Twelve c.c. of the serum are transferred directly to a graduate, 18 c.c. of sodium chlorid solution are added (making a total volume of 30 c.c. of a 40 per cent. serum), and the graduate is immersed in a water bath at 56 C. for thirty minutes. Inactivation destroys complement, serum enzymes and vegetative micro-organisms. There should be none of the latter. Any one who prepares serums should be certain of his technic. After inactivation the serum is kept on ice until called for. Just before use it is medicated by the addition of salvarsan or neosalvarsan. The quantities used were usually fractions of a milligram, from 0.6 to 0.9. A few doses of 1.2 mg. were given with no untoward effects.

Swift² has determined that "the addition of salvarsan directly to serum produces a more potent mixture than results from the serum from blood, to which salvarsan has been added in equivalent amounts." But still better is the mixing of "small amounts of salvarsan with the serum of a salvarsan treated patient." He attributes the "increase in activity of salvarsanized serum produced by heating to 56 degrees C." as "due in part to the removal of inhibitory substances in the

0.1 c.c. of a 10 per cent. solution as the unit of complement, and the amboceptor is so adjusted that 0.1 c.c. is sufficient to effect complete hemolysis in fifteen minutes at 37 C. Two units of amboceptor are used in the tests.

At the expiration of the period of incubation for fixation, 0.4 c.c. of sensitized cells is added. The tubes are reincubated until the central tubes show complete hemolysis, when the readings are made.

We have found that the reaction with the cholesterinized antigen at 8 C. is the most sensitive, as it yields a larger percentage of positive results in known syphilitics than does any of the other reactions; but we have found also that the reaction with the simple alcoholic extract antigen at 8 C. is most reliable because it gives almost as many positive reactions in known syphilitics as does the former test and no positive results in doubtful cases, in which a diagnosis of syphilis is possible but not highly probable.

Cases 3, 5, 7 and 8 gave negative blood reactions before intraventricular treatment was begun. The reaction has remained negative in Cases 3, 5 and 8. Case 7 shows a ++++ reaction in the fourth column. This, I feel, is simply an instance illustrative of the greater delicacy of ice-box fixation. Cases 4,

TABLE 2.—CELL COUNTS AND GLOBULIN TESTS

Case	Cell Counts									Globulin Tests *								
	Cerebral Fluids				Spinal Fluids					Cerebral Fluids				Spinal Fluids				
	Before Treatment	After First Treatment	After Second Treatment	After Third Treatment	Before Treatment	After First Treatment	After Second Treatment	After Third Treatment		Before Treatment	After First Treatment	After Second Treatment	After Third Treatment	Before Treatment	After First Treatment	After Second Treatment	After Third Treatment	
3 A. M.	..	..	..	..	..	..	..	12	..	++	±	+	..	++	..	..	+	±
4 B. P.	25	..	40	..	25	..	4	1	1	±	++	+	..	+	..	+	±	±
5 J. B.	170	190	..	..	23	..	..	12	2	±	—	..	..	+	..	..	+	—
6 J. M.	..	..	..	..	..	..	5	..	..	..	..	..	..	..	..	±	+	..
7 W. vH.	..	7	25	..	10	19	38	..	..	..	..	±	..	±	±	±	..	..
8 J. MeQ.	..	..	5	..	..	..	5	..	..	..	—	..	..	++	+	..	..	..
9 J. B.	5	..	..	..	..	11	..	..	..	+	..	±	..	..	—	..	..	..
10 E. MeC.	67	18	..	..	..	..	140	..	..	..	—	..	..	..	±	±	..	..
11 S. B.	..	7	12	..	20	20	..	..	..	..	±	—	..	±	+	..	..	..
12 A. C.	40	10	11	..	23	..	..	..	..	..	±	±	..	..	..	..	..	..
13 T. B.	10	30	11	..	24	..	..	..	23	++	±	±	..	++	..	..	..	+

* Postive globulin tests were indicated by ++, +, ±; negative, by —.

serum and, in part, to a direct increase of spirochetidal power in the heated salvarsan."

We have heated our serums before the addition of the medication. It is quite possible that the fluid changes (cell count, globulin content, Wassermann and colloidal gold reactions) would have been more marked if the serums had been heated after medication, and probably still more marked if the patients had received intravenous doses of salvarsan from half an hour to an hour prior to the bleeding. The latter method we are now using.

THE EXAMINATION OF THE BLOOD SERUMS AND OF THE CEREBROSPINAL FLUIDS

1. A small portion of the serum from the blood drawn for the preparation of the medicated serum was put aside each time and was submitted to the complement fixation test for syphilis.

One set of tubes is incubated at 37 C. for one hour. The other set is placed in the ice-box, the temperature of which is about 8 C., for at least four hours, or, conveniently, overnight.

The hemolytic system is then titrated to determine the unit of amboceptor. Two tenths c.c. of a 5 per cent. suspension is taken as the unit of blood cells,

9, 10, 11, 12 and 13 gave positive blood reactions before treatment. In Cases 4, 9, 10, 12 and 13, the test is still just as strongly positive. In Case 11 there appears to be a diminution in the degree of positivity. Except in Case 11 there is no evidence of any effect by this treatment on the complement fixation reactions of the blood serums in this series of cases.

2. A specimen of the cerebral fluid was obtained just prior to each intraventricular injection. For various reasons, some or all of the examinations were not made of some of the specimens. Some of them were too bloody. Some were delayed in transit from the operating room to the laboratory, and occasionally a specimen has been mislaid or lost in transit.

There has been no regularity in the matter of lumbar punctures. Those spinal fluids of which we have records were drawn in sporadic efforts to compare the findings in them with those of the cerebral fluids. The results of such efforts have been so gratifying as to warrant our making spinal punctures a routine event at each admission. The fluids were collected in three samples, so that usually one sample was blood free. This specimen was employed in the tests. The cell count was done as soon as possible after the fluid was drawn, usually within fifteen minutes. An ordinary Thoma-Zeiss counting chamber with Zappert-

2. Swift, H. F.: Jour. Exper. Med., 1916, 24, 373.

Ewing ruling was used, and no diluent or staining fluid was employed. With a little practice it becomes an easy matter to differentiate the white cells from the occasional red blood cells, some of which are commonly found even in fluids which appear to the naked eye to be quite free of blood. A proper regulation of the lighting of the preparation is the most important consideration. A white light, preferably daylight, reflected by the plane surface of the mirror, is most satisfactory. The iris diaphragm should be about three quarters closed. Viewed with No. 2 or No. 4 ocular and No. 3 objective (Leitz) or the low, dry objective of any other system, the white cells appear as little bits of mother-of-pearl in contrast with the red cells, which seem faintly yellow gray. Some workers prefer to use a staining fluid, such as methylene blue or methyl violet.

The "globulin" tests used were the phenol test of Pandy, the ammonium sulphate tests of Nonne and of Ross-Jones and the butyric acid-sodium hydroxid test of Noguchi. The Pandy test is especially convenient. A drop of the spinal fluid is added to 1 c.c. of a saturated aqueous solution of phenol (carbolic acid). The presence of protein is indicated immediately by the recurrence of a reaction ranging from a mere opalescence to a milky turbidity. If the Pandy test is positive, the other tests are done; if negative, the others are omitted.

tion except in Cases 4, 8 and 11. In Case 8 the cerebral fluid gave a negative reaction and the spinal fluid a positive reaction, even before the institution of intraventricular treatment. This is a rather striking phenomenon. These findings are not isolated by any means. They were confirmed, as, Oct. 17, 1915, the spinal fluid gave a positive reaction, whereas, Dec. 29, 1915, the cerebral fluid again yielded a negative reaction. I have no record of a gold test in this case. Case 11 exhibits a similar phenomenon. Aug. 23, 1916, the spinal fluid gave a positive Wassermann reaction, and the gold curve was that of paresis. September 7, the cerebral fluid gave a positive reaction and a paretic curve. On that date the patient had his first treatment. October 7, his spinal fluid again gave a positive reaction and a paretic curve, but the fluid removed from the ventricle gave a negative complement fixation test and the indiscriminate syphilitic curve. On the other hand, in Case 4, although before treatment and after the first and second treatments both fluids gave positive complement fixation reactions, after the third treatment the spinal fluid gave a negative test. Jan. 27, 1917, the spinal fluid gave again complete fixation.

COMMENT

The alterations in the cell counts, subsequent to treatment, are not sufficiently striking or sufficiently

TABLE 3.—COLLOIDAL GOLD REACTIONS

Case	Cerebral Fluids				Spinal Fluids				
	Before Treatment	After First Treatment	After Second Treatment	After Third Treatment	Before Treatment	After First Treatment	After Second Treatment	After Third Treatment	
3 A. M.	5555554210	5542100000	5554210000	.....	.....	5555320000	.....	55544221110	.....
4 B. P.	5555444220	55555422210	55542211000	.....	.....	.....	54221000000	55555543220	55555555220
5 J. B.	00011100000	11100000000	00011100000	.....	11111000000	.....	.....	.....	22231111000
6 J. M.	.....	.....	55555552200	.....	.....	.....	.....	54222100000	55554322110
7 W. vH.	.....	.....	.....	55555442100	.....	.....	.....	28442211100	55555442100
8 J. McQ.	.....	.....	.....	.....	.....	.....	.....	.....	.....
9 J. B.	.....	.....	22210000000	.....	.....	.....	11112221100	.....	.....
10 E. McC.	12221000000	12221000000	.....	.....	.....	.....	.....	.....	.....
11 S. B.	55553222210	02211100000	55552100000	.....	55555432110	55555532110	.....	.....	.....
12 A. C.	55555432100	55432100000	55555432100	.....	55222222210	.....	.....	.....	.....
13 T. B.	.....	55555210000	5555555210	.....	55443211000	.....	.....	.....	55555443310

"Globulin" tests are recorded thus: strongly positive, ++; positive, +; weakly positive, ±; negative, —. There is a large personal factor in reading globulin reactions, more so, perhaps, than in any other spinal fluid test.

The technic of the complement fixation reaction done on the cerebrospinal fluid varied from that done on blood serum in only one respect. The quantities of serums used were 0.04, 0.04, 0.04 and 0.08 c.c. The cerebrospinal fluid was employed in larger amounts; 0.2 c.c. was used with each antigen, and 0.4 c.c. for the control. In other respects the tests were identical. The spinal fluids were heated before use to avoid possible anticomplementary action.

The records of the fluid findings are lamentably incomplete. It is apparent in Table 2 that the cell count in the cerebral fluid may range from 5 to 190, in the spinal fluid from 5 to 140; that the cell count in the cerebrospinal fluid removed from the ventricle differs from that removed from the lumbar region of the spinal subarachnoid space (except in Case 2, at the first examinations), and that the difference is sometimes great. It may be seen also that the globulin content ranges from — to ++ in each fluid, and exhibits equal concentration in both fluids or unequal concentration. These remarkable differences do not obtain with respect to the complement fixation reac-

tion except in Cases 4, 8 and 11. In Case 8 the cerebral fluid gave a negative reaction and the spinal fluid a positive reaction, even before the institution of intraventricular treatment. This is a rather striking phenomenon. These findings are not isolated by any means. They were confirmed, as, Oct. 17, 1915, the spinal fluid gave a positive reaction, whereas, Dec. 29, 1915, the cerebral fluid again yielded a negative reaction. I have no record of a gold test in this case. Case 11 exhibits a similar phenomenon. Aug. 23, 1916, the spinal fluid gave a positive Wassermann reaction, and the gold curve was that of paresis. September 7, the cerebral fluid gave a positive reaction and a paretic curve. On that date the patient had his first treatment. October 7, his spinal fluid again gave a positive reaction and a paretic curve, but the fluid removed from the ventricle gave a negative complement fixation test and the indiscriminate syphilitic curve. On the other hand, in Case 4, although before treatment and after the first and second treatments both fluids gave positive complement fixation reactions, after the third treatment the spinal fluid gave a negative test. Jan. 27, 1917, the spinal fluid gave again complete fixation.

The findings in the case of the globulin content are more susceptible to expression in a general statement. The globulin content, both in the cerebral and in the spinal fluids, was definitely diminished by this treatment.

The effect of treatment on the Wassermann reaction is not appreciable in Cases 2 and 11. In Case 4 the spinal fluid gave ++++ before treatment, ++++ after the second treatment, negative after the third treatment and ++++ again four months later. Case 11 exhibits no change in the Wassermann reaction in the spinal fluid, but after the first treatment shows a change in that of the cerebral fluid from ++++ to —, which was found to be — after the second treatment also.

There is an apparent increase in the strength of the Wassermann reaction in the cerebral fluid in Case 5 from ± to ++++. There is also an apparent change in reaction in the spinal fluids of Cases 3 and 6; in Cases 3, from — to ±, in Case 6, from — to ++++. These increases are probably only apparent, as the original determinations were made by the incubator method alone, the latter by the ice-box method as well. The ice-box method is much more

delicate in the detection of complement fixing bodies than is the incubator method.

Cases 3, 4, 6, 7, 11, 12 and 13 all gave typical paretic curves, both with cerebral fluids and with spinal fluids. In Cases 7 and 11, a transient effect was produced on the curves. In Cases 3, 4, 6, 12 and 13 no appreciable change has been wrought in the colloidal reactions.

The colloidal gold reaction appears to be a valuable aid in the diagnosis of syphilis of the central nervous system, in particular of paresis. The performance of the test is easy, requiring little apparatus, time or experience. Although a satisfactory theoretical basis for the reaction has not been advanced, the test seems to be of great practical value.

The preparation of the colloidal gold solution presents some difficulties to the beginner, but, in this as in everything else, persistent effort with careful attention to details is certain to be rewarded with success. The essentials are chemically clean water and glassware and reagent chemicals.

We have done the colloidal gold test on the fluids since November, 1915. There is a record of a colloidal gold reaction in all cases except Cases 1, 2 and 8. In Cases 5, 9 and 10 the gold reactions are not those of paresis. I desire to lay no emphasis on the absence of the paretic curve in Case 9, because in that case we have the record of only one examination. That test was made on the cerebral fluid after the patient had had two intraventricular treatments. I should like to have had one or two more specimens of the fluids. Patient 10 was a woman who died in advanced paresis; but she had had intensive intravenous medication and some intraspinal treatment. Such treatment, particularly the intraspinal, has a pronounced effect on the gold curve. Case 5, however, seems to me to be different. The patient, a man, had had no treatment except "pills," probably of red mercuric iodid. I strongly suspect that this is a case of cerebrospinal syphilis in contradistinction to paresis.

SUMMARY

The blood serums, the cerebral fluids and the spinal fluids of eleven patients with paresis undergoing intraventricular treatment with neosalvarsanized or salvarsanized serum were examined at irregular intervals, before treatment, after the first treatment, after the second treatment and after the third treatment. Some patients have been examined since, after a lapse of from four to eight months. The fluid changes were either nil or so slight as to be negligible in most instances.

Model House for Philippines.—The director of health of the Philippines and his associates have designed a model house for the islands to overcome the sanitary and other shortcomings of the nipa material used for house construction. The material used is fireproof and is composed of cement, sand and nipa, or husks of rice, reinforced by bamboo. This material is formed into shingles for the roof and slabs for the sides. They are formed in molds and cured in water after being removed from the molds. The cost of the model house made from this material is about \$250, practically the same as for nipa construction, including the yearly repairs. The life of the model house is about twenty-five years. The advantages of this house are its better sanitary qualities, affording no harbors for vermin and insects, and its fire-resisting qualities, better ventilation, etc. The health department has built several model houses, and will endeavor to have the new construction replace the old.

A REPORT OF THE USE OF DICHLORAMIN-T (TOLUENE-PARASULPHONDI-CHLORAMIN) IN THE TREATMENT OF INFECTED WOUNDS *

H. D. DAKIN, D.Sc.

The Herter Laboratory

NEW YORK

WALTER ESTELL LEE, M.D.

Pennsylvania Hospital, Philadelphia

JOSHUA E. SWEET, M.D.

Professor of Surgical Research, University of Pennsylvania,
School of Medicine

BYRON M. HENDRIX, Ph.D.

Instructor in Physiologic Chemistry, University of Pennsylvania,
School of Medicine

AND

ROBERT G. LE CONTE, M.D.

PHILADELPHIA

The search for the perfect germicide began when Lister first applied the principles of Pasteur to the practice of surgery. The perfect germicide should meet two simple requirements: It must kill all parasitic life, while causing no harm to any cell of the living body.

The problem has been partially solved for certain groups of infective agents, all of which, however, belong to the lower forms of animal life. The infective agents more closely related to the plant kingdom, the bacteria, have shown a greater resistance to lethal agents than is possessed by the cells of the animal body, and therefore the great problem of surgery, the prevention and control of bacterial infection, remains only partially solved.

The lethal effect of all the usual germicides on the animal cells, with the clinical result of retardation and inhibition of the natural processes of repair, have become so well recognized of late years that an attitude of antiseptic nihilism has existed. Surgeons have developed a technic which has depended somewhat on soap, water and alcohol, but chiefly on the natural bacterial resistance of the patient.

In civil surgery, in which by far the large majority of the wounds were primarily clean, this technic was usually sufficient to prevent the introduction of infective agents in numbers, or virulence, beyond the natural resistance of the patient; and in that small proportion of cases in which the primary wound was overwhelmingly infected, as acute suppurations and infected traumatic wounds, clinical experience had shown that the small germicidal effect of practically all of the classical agents was nearly always overbalanced by their destructive action on the human tissues, so that the routine treatment consisted in mechanically removing the cause whenever possible, instituting drainage when indicated, and the subsequent constant or interrupted use of physiologic sodium chlorid solutions, thus trying to avoid the destruction of the human tissue cells without interfering with the processes of natural immunity and bacterial resistance.

The demands made on surgery by the extensive suppurating wounds of modern warfare have reopened this question and made necessary a further search for an agent which would meet the requirements of a per-

* Read before the American Surgical Association, Boston, June 2, 1917, by Robert G. Le Conte, M.D., Philadelphia.

fect germicide. In military surgery the problem has not been one of the prevention of infection, asepsis, but up to the present, distinctly one of treatment of infection, antisepsis, for practically all military wounds, with the exception of a small proportion of bullet wounds, are virulently infected before coming into the hands of the surgeon.

The personal experiences of two of the writers working with both the English and French wounded, were the same as those reported by the majority of military surgeons, namely, with the exception of the chlorin preparations, all other antiseptic agents, in sufficient strength to be germicidal, hindered rather than helped in the control of suppuration and the process of repair.

The results reported from the use of Dakin's and later Daufresne's modifications of Labarague's solution are now known to every student of surgical progress and accepted by all those who have had the privilege of personally observing the work. Yet there are certain objections to these chlorin-containing solutions which constitute real obstacles to their general use: 1. The solutions currently used must be made with extreme care, and, being very unstable, it is almost necessary to have them freshly made daily. 2. All of these chlorin solutions irritate the skin if they remain in contact with it for any length of time.

The phenomenon of skin irritation is a definite obstacle to the use of these preparations, and in the experience of two of the writers there have been a number of cases in which the skin irritation, or burn as it is called, has persisted for months after the wound has healed. The burning, itching and pain of these skin reactions are of such a degree that it has been necessary to find some means to prevent or at least minimize the phenomena. At Compiègne and LePan, Dakin, Carrel, Dehelley and Depage have evolved a technic which will minimize this annoying irritation if carried out in its minutest detail; and from our personal experience, the success or failure of the method depends entirely on the degree of perfection with which the details of this technic are mastered and carried out.

THE DAKIN-CARREL-DEHELLEY-DEPAGE TECHNIC

The Dakin-Carrel-Dehelley-Depage technic consists essentially in: 1. The constant protection of all portions of the skin exposed to the chlorin solutions, or to the dressings containing the solutions, with vaseline. This is usually applied on strips of sterile gauze. 2. The use of very weak solutions of the hypochlorites. Below 0.4 per cent. of nascent chlorin the clinical effect of these solutions is nil, while above 0.5 per cent. the irritating effect on the skin becomes serious. Therefore a concentration of 0.48 per cent. is usually employed. By weakening the solutions in order to avoid skin irritation other problems are developed, the most difficult of which is that of making effective such minute quantities of a relatively weak germicide as is contained in a 0.48 per cent. solution of hypochlorite. Keeping the entire wound surface constantly moistened and in contact with the solution would seem to offer the maximum germicidal effect that could be expected, but the ease and rapidity with which these antiseptic substances unite with the protein and other substances in the wound exudate results in their rapid disappearance, in from thirty minutes to an hour, so that it is necessary not only to have the wound surfaces constantly in contact with the weak solutions, but also to provide for a frequent renewal of the solu-

tions. It is largely because of these reasons that in the technic of those who have obtained really satisfactory surgical results with weak hypochlorite solutions one sees such minute care exercised in complete and constant immersion of all the wound surfaces with frequent and regular renewal of the solution.

In the Dakin-Carrel-Dehelley-Depage technic a constant immersion of all the wound surfaces is maintained by a complicated hydraulic system. From a reservoir the solution is carried through a series of rubber tubes to every nook and cranny and fills the wound cavity just to the point of overflowing. By means of stopcocks the solution in the wound cavity is renewed at will, and without necessarily changing the whole dressing. The opening of a cock in the outlet tube from the reservoir flushes out the wound according to the principles of overflow, and leaves the cavity refilled with a fresh solution.

If all the conditions of the Dakin-Carrel-Dehelley-Depage technic are carried out in the minutest detail, our experience has shown that infected wounds in military, industrial and civil practice can be sterilized in a remarkably short time, and when it is mechanically possible, such sterilized wounds can be closed, and they will heal as one would expect a sterile one to do. While not minimizing the wonderful surgical opportunities such possibilities open up, for it would seem to us that it means the fulfilment of Lister's first vision of antisepsis, we do feel that this technic requires an unusual degree of painstaking care (not peculiar skill) on the part of the surgeon and the nurse, and it is not only time-consuming, but also demands unusual expense for both apparatus and dressings. The concrete expression of this is seen in the large personnel and generous budgets at Compiègne and LePan. When one realizes that this complicated technic has been devised primarily to avoid or minimize the skin irritation following the use of the hypochlorites, it certainly seems justifiable, and to us necessary, to search for another solution of the difficulty of skin irritation.

THE PROBLEM OF SKIN IRRITATION

From investigations made by one of us (Dakin) as to the mode of action of the various hypochlorite preparations used in the treatment of infected wounds, it appears that when hypochlorites react with proteins of any kind, one of the first reactions consists in the formation of substances containing the NCl-group. These products, which belong to the group of chloramins, possess marked bactericidal properties and are the active germicidal agents produced by the hypochlorites when they come in contact with the wound exudate.¹ These chloramins are nonirritating to animal cells, and this explains the absence of irritation in the wounds, where the irritating free chlorin of the hypochlorite has been changed into chloramins and other nonirritating protein derivatives.

It is quite simple to prepare these chloramins synthetically, and one of these substances in the form of a sodium salt of toluene-parasulphochloramin has been used quite extensively as a germicide and is now being sold under the trade name of chlorazene. This synthetic chloramin is nonirritating to the skin and wound surfaces, and can be used in aqueous solutions in a concentration of 2 per cent., which has approximately four times the germicidal value of the currently employed solutions of hypochlorites.

The desirability, however, of using strong concentrations of these germicides is clearly shown by the

1. Proc. Roy. Soc., 1916, B 89, 232.

work of C. J. Martin and Miss Chick, on the laws governing disinfection. They have definitely shown that a very complete analogy exists between ordinary chemical reactions and the process of disinfection, one reagent being represented by the disinfectant and the other by the protoplasm of the bacterium. If the act of disinfection is thus regarded as a chemical reaction proceeding with definite velocity, the successful use of germicides will depend on the establishment of conditions such that will permit the reaction to be pushed as far as possible toward completion in any given period of time. Maintenance of the active mass of germicide will obviously favor the course of disinfection. We have already referred to the difficulties encountered in maintaining an effective mass of germicide in the wound in the use of hypochlorites—and this is true to a lesser degree with the synthetic chloramins—because of the ease with which these substances unite with proteins and other compounds in the wound exudate and so lose their activity. By the use of an aqueous solution of synthetic chloramin of 2 per cent., we felt that a definite advance had been made in having a nonirritating germicide whose mass was four times that of the hypochlorites; but there was no improvement in the problem of maintenance, for in aqueous solutions these synthetic chloramins also disappeared rapidly in the wound exudate and had to be renewed at least every two hours.

One obvious method of overcoming this objection of rapid disappearance of the antiseptic was to dissolve an excess of the substance in some medium which would not only contain the desired large concentrations but would also hold it over a long period of time, as in oil, so that the germicide would slowly diffuse into the surrounding medium and thus permit the use of a large mass of germicide which at the same time would act (be maintained) for a longer period of time than would be possible with aqueous solutions.

At present we have made use of a dichloramin, first prepared by Kastle, Keiser and Bradey,² and later by Chattaway,³ the systematic name for which is toluene-parasulphondichloramin. We propose to give it the name dichloramin-T. As a solvent we have used eucalyptol chlorinated as described below with or without liquid paraffin, similarly chlorinated, to limit their decomposing action on the dichloramin-T.

The solutions are not permanent, especially in the presence of liquid petrolatum; but a 10 per cent. solution of dichloramin-T in eucalyptol may be kept in a colored bottle for at least one month with but 25 per cent. decomposition.

It may here be noted that these substances were first used by Dunham and one of us (Dakin) in experiments on nasal antisepsis which will be reported shortly.

We offer as a solution of the serious obstacle of skin irritation of the usual chlorin preparations a practically stable, nonirritating, synthetic double chloramin compound, toluene-parasulphondichloramin or dichloramin-T, this solution to be used in strengths varying from 5 to 10 per cent. (from twenty to forty times the mass of germicide ever present in the usable concentrations of hypochlorites) dissolved in a chlorinated oil in order that the germicide will be slowly liberated over a period of from eighteen to twenty-four hours instead of from thirty minutes to one hour, as with the hypochlorite solutions.

THE USE OF DICHLORAMIN-T

The technic of its application is simplicity itself, in contradistinction to that of Dakin, Carrel, Hehelley and Depage. After a careful surgical preparation of the wound at the primary dressing, and excision of all foci of infection and of devitalized tissues, the solution is applied on surface wounds with an atomizer in the form of a spray. In deep wounds the cavities are filled with the liquid. When dependent drainage exists because of the location of the wounds or when it has been purposely made, the lower opening is temporarily closed with gauze and then the cavity is filled with the oil, thus covering all the wound surfaces. The dependent drainage is then reestablished by removing the temporary gauze obstruction.

This privilege of dependent drainage cannot be practiced with the use of aqueous solutions and the Dakin-Carrel-Dehelley-Depage technic, in which the wound must act permanently as a basin to hold the weak solution. We feel that too much stress cannot be laid on this advantage.

We have found that it is necessary to apply the oil but once in twenty-four hours, and the wounds should be covered with only a few layers of gauze to avoid the absorption of the oil by the dressings.

The clinical phases of these problems have been developed at a special clinic organized at the Pennsylvania Hospital for the care of industrial accidents.

At first the Dakin-Carrel-Dehelley-Depage technic and the Dakin-Daufresne modified Labarraque's solution was used. The results in 160 completed cases treated during the first two months showed that the patients in this group, including wounds of the soft tissues, tendons, bones and joints, were discharged recovered in one third the time required by the average of the other hospitals of the city. The comparison was made by means of insurance statistics. For the last two months, the complicated and expensive Dakin-Carrel-Dehelley-Depage technic has been replaced by the routine use of daily dressings of first 5 per cent. and later 7.5 per cent of dichloramin-T in chlorinated eucalyptol and liquid petrolatum. In this last group of eighty-two completed cases the time required for healing was 16.3 per cent. less than in the former.

If we had only obtained as good results from this method as from the hypochlorites, the simplicity of the technic and the saving in dressing material, less than one third of the former amount being used, would have insured its replacing the former method.

PREPARATION OF DICHLORAMIN-T

The following details were worked out for Chattaway's method of preparation:

Chlorinated lime (from 350 to 400 gm.) of good quality is shaken with 2 liters of water on a shaker for half an hour, and then the mixture allowed to settle. The supernatant fluid is siphoned off and the remainder filtered.

Powdered toluene-parasulphonamid, 75 gm. (the crude product may be used), is then added to the whole of the hypochlorite solution and shaken till dissolved. The mixture is filtered, if necessary, placed in a large separating funnel, and acidified by the gradual addition of acetic acid (100 c.c.). Chloroform (about 100 c.c.) is then added to extract the dichloramin, and the whole is well shaken. The chloroform layer is tapped off, dried over calcium chlorid, filtered, and allowed to evaporate in the air. The residue is powdered, and dried in vacuo. It is sufficiently pure for most purposes without recrystallization.

2. Amer. Chem. Jour., **18**, 491, 1896.

3. Journal of the Chemical Society, London, 87 (1); 145, 1905.

The sodium toluene-parasulphochloramin which is sold under the trade name of chlorazene may be used instead of the toluene-parasulphonamid.

A SECOND METHOD OF PREPARING DICHLORAMIN-T

Fifty gm. of para-toluenesulphonamid are dissolved in 500 c.c. of water, and 100 gm. of sodium acetate and 100 c.c. of chloroform are added. The container is immersed in cold water, and a rapid stream of chlorin is passed in until the mixture is saturated. The mixture is allowed to stand a few hours and, if the odor of chlorin disappears, more of the gas is passed in. If necessary, more chloroform can be added to dissolve the dichloramin. From this point the procedure is the same as in the preceding method.

PREPARATION OF CHLORINATED EUCALYPTOL

Eucalyptol (U. S. P.), not eucalyptus oil, must be used. Five hundred c.c. are treated with 15 gm. of potassium chlorate and 50 c.c. of concentrated hydrochloric acid. After twelve hours the oil is well washed with water and sodium carbonate solution. Dry sodium carbonate is added to the oil, and the mixture is allowed to stand twenty-four hours. It is then filtered and dried with a little calcium chlorid.

PREPARATION OF CHLORINATED PARAFFIN OIL

Five hundred c. c. of commercial liquid petrolatum are treated with 15 gm. of potassium chlorate and 50 c.c. of concentrated hydrochloric acid. The mixture is exposed to the light and allowed to stand over night. It is then put into a separatory funnel, and washed successively with water, sodium chlorid solution, and water. The opalescent oil is tapped off, a lump or two of calcium chlorid and 5 gm. of charcoal are added, and the oil is filtered with suction.

In order to determine the amount of liquid petrolatum which can be added to the eucalyptol solution of dichloramin-T, the following mixtures were made:

Solution 1: 1 part liquid petrolatum to 2 parts 15 per cent. eucalyptol solution.

Solution 2: 1 part liquid petrolatum to 1 part 15 per cent. eucalyptol solution.

Solution 3: 3 parts liquid petrolatum to 5 parts 15 per cent. eucalyptol solution.

Solution 4: 2 parts liquid petrolatum to 1 part 15 per cent. eucalyptol solution.

These solutions were placed in test tubes, stoppered tightly, and preserved in the refrigerator at about 0 C. All solutions became somewhat turbid as soon as the liquid petrolatum had been added, but in forty-eight hours there was no appreciable settling out in any case. After a week, however, the dichloramin-T had partially crystallized from Solutions 3 and 4. Solutions 1 and 2 were no more turbid than just after the addition of the liquid petrolatum, and none of the dichloramin-T had crystallized out.

This experiment seems to justify the conclusion that no more than an equal part of liquid petrolatum should be added to a 15 per cent. solution of dichloramin-T in eucalyptol when the solution is to be kept for any length of time, but when the mixture is to be used immediately, as much as two parts of liquid petrolatum to one of the 15 per cent. eucalyptol solution may be used.

We have used a solution made up of one part of liquid petrolatum and two parts of 15 per cent. solution of the dichloramin-T in eucalyptol. A larger proportion of the liquid petrolatum would make the mixture somewhat cheaper, but would have no other apparent advantage.

One sample of chlorinated eucalyptol and two samples of chlorinated liquid petrolatum, one of which was chlorinated in the sunlight and the other on a cloudy day, were analyzed for chlorin by Carius' method with the following results:

Chlorinated eucalyptol:

0.1044 gm. oil gave 0.0044 gm. AgCl = 1.04 per cent. Cl.

Liquid petrolatum chlorinated on a cloudy day:

0.0936 gm. oil gave 0.0052 gm. AgCl = 1.37 per cent. Cl.

Liquid petrolatum chlorinated in sunlight:

0.1510 gm. oil gave 0.0231 gm. AgCl = 3.78 per cent. Cl.

The amount of chlorin which the oils take up is not large, but the amount absorbed is equivalent to a very considerable portion of chlorin which would be available from a 10 per cent. solution of the dichloramin-T.

CONCLUSIONS

In comparing the practical surgical value of dichloramin-T with aqueous hypochlorite solutions in the treatment of infected wounds, which in spite of many serious objections has given such promising results, we believe that our laboratory and clinical findings thus far warrant the following statements:

1. Dichloramin-T is a nonirritating⁴ synthetic germicide, and corresponds to the antiseptic chloramin substances found in minute quantities when nascent chlorin of the aqueous hypochlorite solutions is brought into contact with the exudate of suppurating wounds.

2. Dichloramin-T can be used in strengths of from twenty to forty times greater than is possible with the hypochlorites and in an oily solution which makes possible the slow elaboration of the germicide over a period of from eighteen to twenty-four hours instead of a rapid disappearance in from thirty minutes to one hour as with the hypochlorites.

3. Its use is as simple as the application of the tincture of iodine, and we can see no reason why it cannot be used to replace iodine as a primary dressing. In our experience it is just as effective as a germicide, and is without the destructive effect on the tissue cells. We have had the opportunity of using it in this way at the primary operation in seven wounds involving soft tissues, tendons, joints and bones and have not failed to have primary union. One case, a compound fracture of a metacarpal with severed extension tendons, did not receive treatment until three hours after the injury.

4. The chlorin in dichloramin-T, as in the hypochlorites, has the power of dissolving dead tissues. Hemorrhage, therefore, must be stopped by ligation, else the clot will dissolve and secondary hemorrhage may follow.

5. One should not depend on a chemical agent to perform, in the treatment of suppurating wounds, for that which can and should be done quickly and thoroughly by mechanical means. Neither chemistry nor bacteriology can or should be expected to replace the mechanics of surgery. At the best these chemical germicides can react only on the bacteria with which they actually come in contact, which means a very superficial process. Therefore, at the primary operation all infected tissue, foci and devitalized tissues must be removed when possible by surgical procedures. Finally, adequate drainage, dependent if indicated, must be provided.

4. We have seen two cases of skin irritation after several weeks of continuous use. It is similar to the eruption of ivy poison, and may be due to the eucalyptol.

The Needless Deaths of Peace.—Osler in speaking recently of the needless deaths of peace, stated that in 1915 "while nine of our soldiers abroad died every hour to save their country, twelve babies died at home in the same time." He said of syphilis that it is an easy first among the ten best killers; and of the gonococcus, that although it is not a great destroyer of life, it is the greatest known preventer of life. "With 30 to 40 per cent. of all cases of congenital blindness, with the chronic pelvic mischief in women, and with the unhappiness of sterile marriages, as a misery producer, the gonococcus is king among germs." He regards them as the most formidable enemies of the race, "entrenched behind the strongest of human passions and the deepest of social prejudices," but adds that the outlook is bright "as the public is being awakened, the state is intervening, and the changed heart of the people is allowing the sinner to get Christian treatment."

SODIUM SUCCINATE AND LEUKO-
CYTOSISEFFECT OF THE SUBCUTANEOUS ADMINISTRATION
OF THE DRUG ON THE LEUKOCYTE
CONTENT OF HUMAN BLOOD

FREDERICK S. HAMMETT, PH.D.

BOSTON

AND

ERNEST E. KESSLER, A.B.

WITH THE ASSISTANCE OF

C. C. BROWNING, M.D.

LOS ANGELES

The literature dealing with the physiologic functions and reactions of succinic acid or its salts is far from justifying the possible significance that may be attributed to its constant and fairly widespread occurrence in animal tissues.

The work that has been done seems to give rise to the idea that succinic acid takes an important part in the oxidations in the tissues. Batelli and Stern¹ report on the relative oxidizing powers of various tissues with respect to succinic acid. Thunberg² shows that the oxidative processes in muscle tissue are markedly influenced by the presence of this compound, and from this Mathews³ appropriately points out that the physiologic properties of succinic acid should be further investigated.

As an introduction to additional work on the subject, a study was made of the effect of the subcutaneous administration of sodium succinate on the leukocyte content of human blood from normal and pathologic persons.

The group of normal subjects was composed of four medical students apparently in good health. The other group was made up of nine persons suffering from phthisis. The majority of the latter patients had

TABLE 1.—EFFECT OF THE SUBCUTANEOUS ADMINISTRATION
OF SODIUM SUCCINATE ON THE LEUKOCYTE CON-
TENT OF THE BLOOD OF NORMAL
PERSONS

Subject	Normal Count		Count After First Dose		Count After Second Dose	
	Date	W. B. C.	Date	W. B. C.	Date	W. B. C.
A	2/ 2/17	6,550	2/ 6/17	9,000	2/28/17	9,350
	2/ 5/17	6,800	2/ 8/17	9,160	3/ 2/17	10,800
			2/ 9/17	9,200	3/ 9/17	7,750
			2/14/17	9,200	3/14/17	8,500
			2/21/17	7,200	3/16/17	7,200
B	11/27/16	8,000	12/12/16	11,800	1/ 3/17	13,150
	11/29/16	7,800	12/14/16	10,732	1/ 5/17	11,200
C	3/ 1/17	7,320	3/14/17	10,000	3/28/17	8,650
	3/ 6/17	7,300	3/16/17	9,200	3/30/17	8,600
	3/ 7/17	7,000	3/23/17	7,750		
D	9/12/16	8,520	9/19/16	10,860	9/26/16	11,400
	9/14/16	8,480	9/20/16	11,120	9/28/16	10,400
			9/22/16	9,850	10/ 4/16	8,700

as a result of secondary infections a high original leukocyte count, and hence lent themselves nicely to a determination of whether or not the increase in leukocyte content observed in the normal subjects as the result of the administration of sodium succinate could be superinduced on that already present as the result of the pathologic condition.

The time for making the tests was so arranged that the possibility of error arising from physiologic leukocytosis was minimized. The leukocyte count normal for the individual was determined in all cases preliminary to the administration of the sodium succinate. Within two or three days the first dose of the drug was given in the form of 0.1 c.c. of a 1 per cent. solution subcutaneously. From four to six hours later

TABLE 2.—EFFECT OF THE SUBCUTANEOUS ADMINISTRATION
OF SODIUM SUCCINATE ON THE LEUKOCYTE CON-
TENT OF THE BLOOD OF PATHOLOGIC
PERSONS

Subject	Normal Count		Count After First Dose		Count After Second Dose	
	Date	W. B. C.	Date	W. B. C.	Date	W. B. C.
A	7/19/16	15,400	7/24/16	13,942	7/31/16	14,960
			7/26/16	14,132	8/ 2/16	16,840
					8/ 8/16	15,750
					8/11/16	13,120
B	7/16/16	11,200	7/21/16	15,400	8/ 7/16	13,750
			7/26/16	11,950		
C	7/17/16	20,200	7/21/16	24,600	8/ 1/16	25,460
			7/26/16	25,480	8/ 3/16	18,760
			7/28/16	21,480	8/ 8/16	17,640
D	7/17/16	5,450	7/21/16	6,800		
			7/26/16	8,260		
E	7/19/16	10,190	7/21/16	14,080		
F	7/17/16	10,150	7/24/16	9,860	7/28/16	8,640
					7/31/16	9,300
					8/ 2/16	9,200
G	7/17/16	14,000	7/24/16	18,400	8/ 8/16	16,280
	7/19/16	14,800	7/26/16	16,860	8/11/16	13,760
			8/ 2/16	14,040		
H	7/17/16	11,680	7/24/16	12,800		
	7/19/16	12,460	7/26/16	13,560		
			7/31/16	12,880		
I	7/31/16	6,230	8/ 2/16	8,480		

the first test count was made, and in the majority of cases subsequent tests were made at intervals of two or three days until the leukocyte content of the blood had so far reverted toward the normal that the increase due to the drug was confirmed. Then a second administration of twice the quantity was made and the same procedure followed. No untoward reactions were observed as the result of this method of procedure.

In Table 1 will be found the figures representing the results of these experiments on the normal subjects. Table 2 contains the demonstration of the effect of this treatment on the leukocyte content of the blood in the pathologic cases.

From these tables it will be seen that in the normal subjects the subcutaneous administration of sodium succinate invariably produced an increase in the leukocyte content of the blood, ranging from 30 to 70 per cent., and that in the group of pathologic persons 66 per cent. showed an increase ranging from 20 to 40 per cent. There is apparently no relationship between the initial leukocyte count and the percentage of increase caused by the drug. It is evident that one of the physiologic reactions to sodium succinate is an increase in the cellular mechanism of defense for the organism. How much this is concerned with the body oxidation processes is a subject for further study.

CONCLUSIONS

The subcutaneous administration of sodium succinate in doses of 0.1 c.c. of a 1 per cent. solution causes an increase in the leukocyte content of the blood of both normal and pathologic persons.

1. Batelli, F., and Stern, L.: *Compt. rend. Soc. de biol.*, 1910, **69**, 370, 554; *Biochem. Ztschr.*, 1910, **30**, 172.

2. Thunberg: *Skand. Arch. f. Physiol.*, 1911, **25**, 37.

3. Mathews, A. P.: *Physiological Chemistry*, Ed. 2, New York, 1916, p. 611.

THE INCIDENCE OF PHOSPHATIC URINARY CALCULI IN RATS FED ON EXPERIMENTAL RATIONS*

THOMAS B. OSBORNE
AND
LAFAYETTE B. MENDEL

WITH THE COOPERATION OF

EDNA L. FERRY

NEW HAVEN, CONN.

During the early years of our investigations on the nutrition of rats a number of our experimental animals showed on necropsy the presence of calculi in the kidneys or bladder. These calculi ranged in number from one to a hundred or more, and in size from particles no larger than the head of a pin to large stones which filled the entire kidney, leaving only a thin wall of tissue surrounding the concretion. The number of such cases gradually diminished until during the last two years we have failed to find this condition among our rats. In view of these facts and the additional experience that none of our stock animals was ever found to be affected in this way, it became a matter of some interest to attempt to correlate, if possible, the appearance of these calculi with the diets on which the animals had been fed.

The foods which are furnished to the experimental rats here concerned have consisted of more or less isolated food materials mixed in proportions somewhat as in the accompanying tabulation:

PROPORTIONS OF FOOD MATERIAL

	Per Cent.
Protein	18
Starch	27
"Natural" or "artificial protein-free milk" ¹	28
Fats (either lard or butter fat, or both)	27

Such rations were calculated to supply the necessary energy in the form of suitable protein, carbohydrate and fat. The required inorganic nutrients were furnished by the "protein-free milk." When this was a "natural" product prepared directly from milk, it supplied the water-soluble vitamin now regarded as essential for adequate nutrition. In addition to this, a second dietary factor soluble in fats and furnished abundantly by butter fat, but not by lard, is at present believed to be required.

Inasmuch as nearly all of the proteins which have been employed in our experiments are represented among the rations of the affected animals, it is unlikely that the nature of the protein has been a determining factor in the production of calculi. The character of the carbohydrates and inorganic salts, the balance of acid-forming and base-forming foods, or a possible lack of water-soluble vitamins can also be eliminated as causes of the trouble; for the rats receiving the natural "protein-free milk" in their food were quite as subject to the disease as those receiving various artificial salt mixtures.

It is a striking fact that of the eighty-one cases of calculi which we have discovered in 857 necropsies, thirty-five (43 per cent.) of the rats had never received butter fat or any other source of the fat-soluble vitamin in their rations. Of the remaining forty-six cases, none of the animals had received food known to furnish such a vitamin during the entire course of the experiment; and only thirteen had this substance during more than one-half of the period in which they were on an experimental diet. When milk or butter fat was furnished at all in these instances, it was usually fed either for a short period at the beginning of the experiment, or as a means of realimenting a rat which had been depleted by feeding either a fat-free or a lard-containing diet. In four of the cases milk food was fed in alternation with a food deficient in one or more respects, for the purpose of keeping a stunted animal in good nutritive condition for a long time.² In all of these cases it is quite possible that the calculus formation started during the period when the animal had no milk or butter fat in the diet, and the subsequent addition of this factor was unable to prevent the development of the disease or lead to a solution of already formed calculi. In other words, *in every instance where calculi developed, the animals were without an adequate source of the fat-soluble vitamin for some time.* During the last few years our animals have, as a rule, been supplied with a liberal quantity of the fat-soluble vitamin throughout the entire period of their experimental feeding, which may account for the fact that none of them have developed calculi at any time.

According to a report of the Public Health Service on "The Rat and Its Relation to the Public Health,"³ "the bladder of rats very frequently contains very irregularly shaped, rough, somewhat branching concretions. These concretions are rather soft and tough and are dirty white in color." Well marked vesical calculi also have been reported. "In one case twenty-one smooth round stones which completely filled the bladder were found. The total weight of the stones was 3.8 grams. In another case six calculi were found, the total weight of which was 7.8 grams; the largest one weighing 5 grams. In a third case eight smooth, round stones weighing 1.7 grams were found, the largest of which weighed 0.6 gram. The last two cases were female rats; the sex of the first was not recorded. In each of these cases the bladder showed to the naked eye very marked evidence of inflammation. The mucous membrane was reddened, villous, and covered with tenacious mucus. In one case in which microscopical examination was made the mucous membrane was found to be covered with pus cells, the surface layers of which were undergoing degeneration."

The calculi observed in our experimental animals were, as already mentioned, of variable size, and distributed in various parts of the urinary tract. They were light in color and generally spherical in form. The total weight of concretions from a single rat sometimes exceeded 5 grams. The incidence of the calculi was about equal between the two sexes (39 females, 42 males).

Repeated chemical examination of specimens showed them to be characteristic phosphate calculi. An illustrative analysis of a kidney concretion weighing 1.5

* From the Laboratory of the Connecticut Agricultural Experiment Station and the Sheffield Laboratory of Physiological Chemistry in Yale University, New Haven. The expenses of this investigation were shared by the Connecticut Agricultural Experiment Station and the Carnegie Institution of Washington, D. C.

1. The descriptions of these products, which include all the essential inorganic ingredients of the diet, will be found in Carnegie Institution of Washington, Publication 156, Part II; Ztschr. f. physiol. Chem., 1912, 80, 307; and Jour. Biol. Chem., 1913, 15, 311. Sometimes these were replaced by a mixture of inorganic salts (Salt mixture I, Carnegie Institution of Washington, Publication 156, Part II, p. 80) to the amount of 2.5 per cent. together with lactose or sucrose.

2. Osborne, T. B., and Mendel, L. B.: Jour. Biol. Chem., 1914, 18, 95; Chart IV is a typical illustration of this method of stunting.

3. The Rat and Its Relation to the Public Health; U. S. P. H. and M.-H. S., 1910, p. 63.

grams, gave the following results: Loss on drying, =25.8 per cent. Composition of the dry residue: P=8.9; Ca=12.1; Mg=2.6 per cent.

Some carbonate was present. Oxalates and uric acid were absent, but the stone contained a small amount of a mucus-like substance. These data correspond with what might be expected for a concretion consisting essentially of insoluble phosphates of calcium and magnesium.

According to the most likely current conception of the genesis of such calculi,⁴ they may be assumed to arise because of changes in the composition of the urine brought about by infection and consequent ammoniacal decomposition. If it is asked what connection may be assumed to exist between the diet predisposing to the calculi and the possible infection of the urinary tract, we recall the inevitable nutritive failure, sooner or later, of all of our experimental animals which have not had an adequate supply of the fat-soluble vitamin. This outcome of a physiologically inappropriate diet may be associated with a general decrease in immunity to bacterial infection such as is exemplified by a form of infectious eye disease which is prevalent among animals inappropriately fed⁵ and which is speedily alleviated by the introduction of butter fat,⁶ cod liver oil,⁷ and certain other animal fats⁸ into the experimental rations.

We cannot offer any rigid proof of the etiologic relationship between the rations deficient in fat-soluble vitamin and the formation of phosphatic calculi. The impressive statistical fact that *in every case* where the calculi were observed the animal had existed for some time on a diet of the sort indicated, together with our failure to discover any other pathogenetic factor common to all the affected animals, makes the hypothesis suggested above worthy of serious consideration.

4. Compare Wells, H. G.: Chemical Pathology, 1914, p. 414.
5. Compare Knapp: Ztschr. f. exp. Path., 1908 **5**, 147.
6. Osborne and Mendel: Jour. Biol. Chem., 1914, **16**, 423.
7. Osborne and Mendel: Jour. Biol. Chem., 1914, **17**, 401.
8. Osborne and Mendel: Jour. Biol. Chem., 1915, **20**, 379.

The Bitter Tonics.—The bitter tonics are common "home remedies" and favorite "drug-counter prescriptions." They are given to convalescents who would continue to improve, tonic or no tonic, and the tonic not the recuperative power of the patient, gets the credit, or the physician prescribes a more hygienic living and a tonic. The health improves, and both physician and patient think the tonic did it. But even if the bitters have no direct action on gastric secretion and digestion, and no appreciable indirect action on the secretion of gastric juice, may they not be valuable aids in expelling worry and implanting hope and good cheer in the mind of the patient? May they not be an efficient handmaid to psychotherapy? There is no question that the bitter tonics connect up with the popular belief that the potency of a medicine is directly related to its strong (or bad) taste. And the readiness with which these tonics are dispensed nourishes the popular superstition that there is, or must be, a specific drug remedy for every ailment, a superstition that constitutes the chief aid of the medical quack and the "patent medicine" vender. The stimulation of certain nerve-endings in the mouth and in the normal gastric mucosa unquestionably contributes to the complex sensation of appetite, and these nerves are stimulated by condiments and flavors of food. Apart from this, *the physiologic way of augmenting hunger and appetite is moderation in the food intake or increasing the utilization of the food in the body by outdoor living, fresh air, cold baths, and physical work.* If these measures do not improve appetite and hunger, the chances are that the digestive tract is not in a condition to take care of the amount of food demanded by stronger hunger and appetite sensations.—The Control of Hunger in Health and Disease, A. J. Carlson.

A STUDY OF EXOPHTHALMIC GOITER FROM THE POINT OF VIEW OF THE BASAL METABOLISM

WITH REMARKS CONCERNING THE EFFECT OF
VARIOUS FORMS OF TREATMENT *

J. H. MEANS, M.D.

AND

J. C. AUB, M.D.

Associate in Medicine and House Physician, respectively, Massachusetts
General Hospital

BOSTON

During the last two years and a half an investigation of the basal metabolism in thyrotoxicosis has been carried out at the Massachusetts General Hospital. It was our original intention to report these data fully in a more technical paper first, and subsequently to discuss the clinical aspects of the work in a general paper. Since it now seems probable that we shall be unable to publish our work in detail until after the war, and since certain conclusions have been drawn which we believe will be of interest to clinicians, we are submitting at present an outline of our work, together with a discussion of the results obtained.

The manifestations of overactivity of the thyroid gland are numerous. Besides the well recognized features, such as tachycardia, nervousness, loss of weight, and tendency to increased sweating, a rise in the general heat production, or, as it is now commonly called, the basal metabolism, practically always occurs. Moreover, while a rise may be likewise found in a few other pathologic conditions, it is less marked, and is found in conditions easily differentiated from hyperthyroidism. So it seems fair to say that a rise in the basal metabolism is not only a constant feature, but is one of the most striking and characteristic manifestations of thyroid overactivity. Important work on the basal metabolism in exophthalmic goiter has been reported by Du Bois,¹ and the literature on the subject is reviewed in his paper.

To judge accurately the intensity of the intoxication, a quantitative measurement of some sort becomes necessary. The pulse and weight of course can be measured quantitatively, but as we shall show below, a very false impression of the toxicity may be obtained from these alone. It was for this reason that we undertook an extended study of the basal metabolism in various types of toxic goiter.

For a discussion of the methods used the reader is referred to various previously published papers.² It will suffice to say here that the patient's heat production is determined by calculation from his gas exchange. The latter is determined by means of Benedict's respiration apparatus.³ The method of calculation, called indirect calorimetry, is thoroughly discussed in the paper of Williams, Riche and Lusk.⁴ By indirect calorimetry the number of calories produced can be calculated, provided the oxygen absorption and the carbon dioxide output are known.

To compare fairly the heat production of one individual with that of another, their lowest level of

* From the Medical Service of the Massachusetts General Hospital, aided in part by a grant from the Proctor Gift, Harvard University.

1. Du Bois, E. F.: Metabolism in Exophthalmic Goiter, Arch. Int. Med., June, 1916, p. 915.

2. See, for example:

Palmer, Means and Gamble: Jour. Biol. Chem., 1914, **14**, 239.

Means: Jour. Med. Research, 1915, **27**, 121.

Means: Boston Med. and Surg. Jour., 1916, **174**, 864.

3. Benedict: Deutsch. Arch. f. klin. Med., 1912, **107**, 160.

4. Williams, Riche and Lusk: Jour. Biol. Chem., 1912, **12**, 349.

metabolism should be used. Hence the term "basal metabolism." The determination of this is made by having the patient in a postabsorptive condition (fourteen hours or more after food) and at complete muscular rest, for both muscular work and food increase the metabolism.

Our procedure, then, has been to obtain the gas exchange of the quiet, fasting patient with the respiration apparatus, and from that to calculate his heat production in calories per hour. We then divide this by his body surface, for the heat production of normal individuals has been shown to be proportional to their areas. We obtain the surface area by Du Bois' formula from the height and weight.⁵ This gives us the calories produced per square meter of body surface per hour. The basal heat production of normal individuals is very constant. It varies slightly with age and sex. A set of standards of the normal metabolism will be found in a paper by Aub and Du Bois.⁶ In all the present work we have handled our data as follows: The basal calories per square meter per hour are divided by the appropriate normal standard for individuals of the patient's age and sex, and the percentage variation from the normal thus found. So in the following pages if the metabolism is said to be +100 per cent. it would mean that it is twice the normal, and —50 per cent. would mean one-half the normal.

At the present time we have made 224 observations of the basal metabolism in fifty-seven cases of true toxic goiter, and twenty observations in eighteen cases of nontoxic goiter. We have also made thirty-seven observations in thirty-two borderline cases, as well as about thirty-five single observations in control cases, normal and pathologic.⁷ Each observation requires about three quarters of an hour's time for an observer and an assistant.

The first point which we wish to bring out is that the toxicity as judged clinically runs very nearly parallel with the rise in the metabolism. This is well shown in Chart 1, in which we have plotted the first observation in all our toxic and nontoxic goiter cases. The clinical impression as to the degree of toxicity is indicated by a series of plus signs, one sign meaning slightly toxic, two moderately toxic, and three very toxic. The average curve shows that in the clinically nontoxic cases there is essentially a normal metabolism; in the mildly toxic, an average rise of 43 per cent.; in the moderately toxic, an average rise of 53 per cent., and in the very toxic, an average rise of 76 per cent. The highest metabolism observed was +118 per cent. It will also be seen in this chart that of all the patients who clinically had hyperthyroidism,

all but one had a rise of more than 25 per cent., and of those cases that were clinically nontoxic goiter, only one, a questionable case, had a rise of more than 17 per cent. in the basal metabolism. The metabolism studies at the Russell Sage Institute seem to indicate that the normal metabolism varies within a range of plus or minus 10 per cent. from the average, and that any subject exhibiting a variation of more than 15 per cent. is distinctly abnormal. Our clinically toxic cases, then, with one exception, fall in the pathologic group from the metabolism point of view, and of the clinically nontoxic cases 80 per cent. fall within the normal zone.

We believe that the corollary of this relationship is that the rise in basal metabolism furnishes an accurate index of the degree of toxicity in hyperthyroidism, and that, in fact, it amounts to a functional test of the thyroid gland; and it is from this point of view that we have used it.

Our purpose, then, has been to observe as large a series of cases of thyrotoxicosis as possible, and over as long a period of time as possible, getting observations of the basal metabolism from time to time as a criterion for judging the severity and course of the disease and the effect of various methods of treatment.⁸

The chief therapeutic agents which have been studied are complete rest in bed, surgery, the Roentgen ray, and to a lesser extent, the effect of a few drugs. We have many observations on the first three, in cases of varying degrees of severity; and in a number of instances the observations extend over a period of a year or more. The effect of drugs has been studied in some cases in short periods, but nearly always in conjunction with rest, so that no very crucial test of the drug action has been carried out. It would be well to obtain extended observations on the effect of quinin hydrobromid, without other treatment, but we considered the effects of rest, surgery and the Roentgen ray more important and so studied them first.

EFFECT OF REST ALONE AND OF REST PLUS DRUGS

A large number of the patients whom we have followed have been, for a time at least, bed patients in the hospital. Some of these received no treatment except rest and forced feeding; others were given sedative drugs in addition. It was found that a large percentage of the cases, whether mild or severe, showed a very marked fall in the metabolism on rest alone, or on rest plus drugs, as also shown by Du Bois. This fall usually occurred over a period of from one to three weeks, when a level, or plateau, was

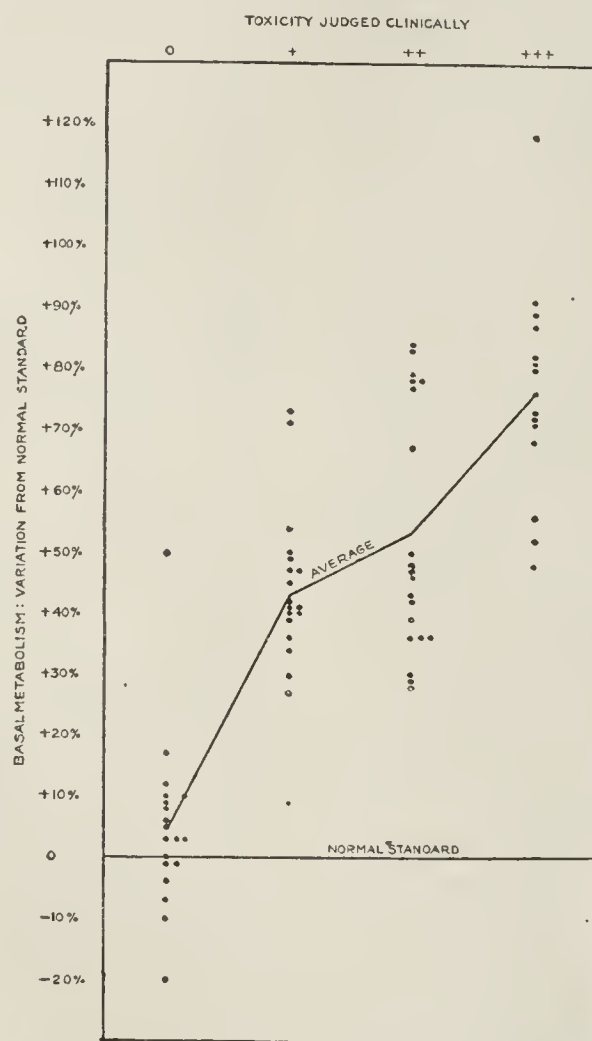


Chart 1.—First observations in all toxic and nontoxic goiter cases.

5. Du Bois, Delafield, and Du Bois, E. F.: A Formula to Estimate the Approximate Surface Area if Height and Weight Be Known, *Arch. Int. Med.*, June, 1916, p. 862.

6. Aub, J. C., and Du Bois, E. F.: The Basal Metabolism of Old Men, *Arch. Int. Med.*, May, 1917, p. 831.

7. This does not include observations already published.

8. We shall postpone the discussion of the results obtained in the borderline cases and the value of the metabolism determination for purposes of diagnosis until our complete work is reported. We might say here, however, that in cases in which it is uncertain whether any hyperthyroidism exists, a determination of the basal metabolism is undoubtedly of great importance.

reached. In Tables 1 and 2 we give data on two groups of cases, the first group being those in which we were able to observe the effect of complete rest alone, and the second group where, in addition to complete rest, the patients receive quinin hydrobromid in the usual dosage. The first observation in this table was secured after the patient had been in the ward for a few days, the second anywhere from one to three weeks later, the patient having had complete rest in bed in the interim.

Tables 1 and 2 show a drop of more than 20 per cent. in the basal metabolism in eleven out of sixteen cases treated by rest alone or by rest plus quinin hydrobromid, over a period varying between one and three weeks. The average drop in the cases treated by rest alone was 17 per cent., and of those who also received quinin hydrobromid was 19 per cent. In other words, the patients not receiving the drug showed practically as much reduction as those who did. Moreover, the series not receiving the quinin hydrobromid, as a group, were more toxic than those that did. Two cases, after the complete effect from rest had been obtained, showed no added effect from quinin hydrobromid. From these observations, then, we conclude that rest alone usually causes a decrease in thyrotoxi-

before. Patient 33, a young man, showed a remarkable improvement after six treatments. He had absolutely no treatment but the Roentgen ray, and when last seen was following his trade, that of a barber, and serving on the jury at the same time. Patient 66, a young schoolmistress, showed a marked improvement in spite

TABLE 2.—TOXIC GOITER: EFFECT OF REST PLUS QUININ HYDROBROMID

Case Number	Basal Metabolism: Percentage Variation from the Normal	
	First Observation	Second Observation (From 1 to 3 weeks later)
3.....	+80	+62
77.....	+48	+47
99.....	+72	+42
117.....	+45	+25
126.....	+47	+44
180.....	+46	+31
131.....	+42	+31
135.....	+39	+22
160.....	+78	+99
161.....	+84	+67
Average.....	+58	+47

of the fact that she continued at her work, which involved teaching a roomful of small children daily. Patients 25 and 120 showed some improvement, but were not cured when last seen.

Of those who had rest in addition to the Roentgen ray, Patients 10, 53, 93, 111, 121 and 123 showed either no improvement, or else no more improvement than might be explained on the basis of rest. Patient 21, a young woman with moderately severe exophthalmic goiter, showed no improvement with complete rest plus three Roentgen-ray treatments; but after the fourth, although she had resumed her normal life, she showed a marked improvement. Patient 48 probably was improved by the Roentgen ray, for although she had complete rest at the onset, on returning home and resuming her usual life (housewife) she continued to improve with prolonged irradiation. Patient 110, a

TABLE 1.—TOXIC GOITER: EFFECT OF COMPLETE REST ALONE

Case Number	Basal Metabolism: Percentage Variation from the Normal	
	First Observation	Second Observation (From 1 to 3 weeks later)
10.....	+68	+52
88.....	+73	+52
111.....	+87	+83
121.....	+109	+84
137.....	+71	+61
151.....	+79	+57
Average.....	+81	+67

cosis, as shown by the basal metabolism, and also that this decrease is not accelerated by giving quinin hydrobromid.

We have made scattered observations on other drugs, such as veronal, paraldehyd, triple bromids, etc., and in no instance have we found any fall in metabolism which could not be explained as the result of rest.

EFFECT OF THE ROENTGEN RAY ⁹

We have had an opportunity to study the effect of the Roentgen ray in exophthalmic goiter quite extensively. In Table 3 we have collected the data in all cases that we have been able to follow from the time before the patients had any treatment. Observations have been made on a number of others, chiefly to see whether they had had sufficient treatment. The irradiation was done at intervals of about three weeks, and each treatment was a maximal exposure; the thymus as well as the thyroid was exposed. Some of the patients had no treatment except the Roentgen ray, and continued at their normal occupations. This was true in Cases 12, 25, 33, 66, 107 and 120. Of these, Patient 12 after six, and Patient 107, after four treatments, showed no improvement; Patient 12 was a housewife with a long-standing toxic, nonexophthalmic goiter; Patient 107 a housewife with a return of toxicity following partial thyroidectomy several years

TABLE 3.—TOXIC GOITER: EFFECT OF ROENTGEN RAY

Case No.	Basal Metabolism: Percentage Variation From the Normal										
	Before Treatment	Number of Treatments									
		1	2	3	4	5	6	7	8	9	10
10	+68*	+52*	.....	.....	.....	.....	.....	.....	.....	.....	+88†
12	+49§	.....	.....	.....	.....	.....	+40§	.....	.....	.....	.....
21	+50*	.....	+53*	+50*	.....	+13§	.....	.....	.....	.....	.....
25	+83*	.....	.....	.....	+61§	.....	.....	.....	+63§	.....	.....
33	+78§	.....	.....	.....	+51†	.....	+14§	.....	.....	.....	.....
48	+82*	+61*	+61†	.....	.....	.....	+54§	.....	.....	.....	+20§
53	+48§	.....	.....	.....	.....	+57†	.....	+60†	.....	.....	.....
66	+42§	.....	.....	.....	+33§	.....	+13§	+28§	.....	.....	.....
93	+40†	.....	.....	+37*	+28*	+37*	.....	.....	.....	.....	.....
107	+41§	.....	.....	+21§	+54§	.....	.....	.....	.....	.....	.....
110	+42*	+25*	+34†	+17†	.....	-1§	.....	.....	.....	.....	.....
111	+83*	+57*	+87†	.....	+85†	.....	.....	.....	.....	.....	.....
113	+77§	.....	.....	+48§	.....	+39*	.....	.....	.....	.....	.....
120	+71†	.....	+56§	.....	+48§	.....	.....	.....	.....	.....	.....
121	+84*	+84*	+74*	+103†	+79†	+58*	.....	.....	.....	.....	.....
123	+74†	+34*	+58*	.....	.....	+73§	.....	.....	.....	.....	.....

* Complete rest in hospital ward.
† Complete rest outside hospital.
‡ Partial rest outside hospital.
§ Leading usual life.

social worker, with moderately severe exophthalmic goiter, showed a greater improvement than could be ascribed to rest alone, and after the fifth treatment had a normal metabolism with practically no symptoms, although she had resumed her work. Patient 113 also showed considerable improvement after her third treatment, although she had had no rest up to that time.

9. The Roentgen-ray treatments were given by Dr. A. F. Merrill, whom we wish to thank for his kind cooperation.

From these observations we conclude, first, that in certain cases, particularly the less severe ones, the Roentgen ray alone may cause a definite decrease in the metabolism, in fact, that it may be brought to normal; secondly, that in certain cases treated by rest plus the Roentgen ray there has been more improvement than can be accounted for by rest alone; and

more toxic, than they were before they were operated on.

ILLUSTRATIVE CASES

We give the histories briefly, and show charts, of three cases which illustrate certain points:

CASE 88.—A year ago the eyes of an unmarried woman, aged 22, with unimportant family and past history began to be prominent, her neck became full, and the usual symptoms of exophthalmic goiter came on gradually and have been getting progressively more marked. She had done no work for a year and had had four Roentgen-ray treatments between July and October, 1916, without improvement. She entered the medical wards of the Massachusetts General Hospital, Oct. 11, 1916. Physical examination at that time revealed well marked eye signs, considerable soft symmetrical enlargement of the thyroid with a loud systolic bruit, fine tremor of tongue and fingers, and warm, moist hands. The heart was somewhat enlarged to the left, very rapid, and there was a systolic murmur heard over the entire precordium.

The subsequent course of the case can best be followed in Chart 2. On complete rest in

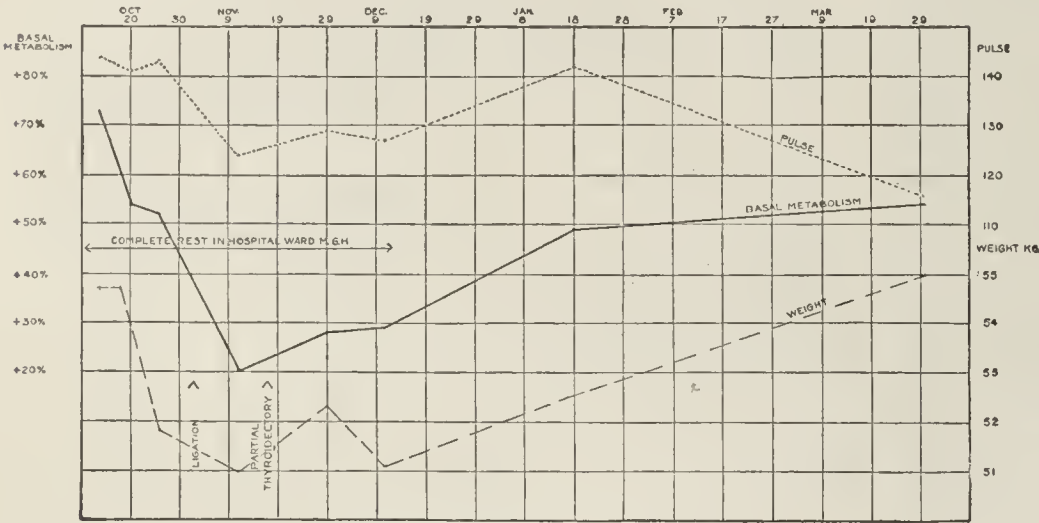


Chart 2.—Course in Case 88.

thirdly, that in other cases usually severe in type, there is not the slightest improvement, even though complete rest is combined with prolonged irradiation.

THE EFFECT OF SURGICAL PROCEDURES

Observations before and after partial thyroidectomy are shown in Table 4. In twelve cases observed just before and shortly after operation, a striking fall in the metabolism occurred in every one; also many of these patients had had prolonged rest in bed before operation, and had had the maximum drop from rest alone, had, in other words, reached a plateau before operation. In four of these, however, the metabolism subsequently rose again; in three cases the metabolism returned to normal and remained there. Some late results of operation are shown in Cases 3 and 16, both of which were still very toxic more than a year after operation. Cases 88 and 99 also showed a higher metabolism several months after operation than they did before. As to the effect of ligation of the thyroid arteries, we can say but little, having observations before and after this procedure in only two cases. In one of these the metabolism fell from + 52 to + 20 per cent., and in the other from + 50 to + 39 per cent., after ligation of the superior arteries. Du Bois, however, has made several observations on ligation, and found very little late effect.

Our series comprises observations on twenty patients treated surgically. Of these five died after operation. It is interesting to note that in three of these five, in whose cases more than one observation was secured previous to operation, the metabolism was rising, although the patient was having complete rest in bed at the time. The metabolism of all but two of the patients who recovered was either falling or level at the time the operation was done.

From these results we conclude, first, that the early effect of either ligation or partial thyroidectomy is usually a marked decrease in toxicity, as indicated by the fall in metabolism; second, that while this improvement sometimes is maintained, it also often is not, and some patients may become quite as toxic, or

TABLE 4.—TOXIC GOITER: EFFECT OF PARTIAL THYROIDECTOMY

Case No.	Basal Metabolism: Percentage Variation From the Normal				
	Few Days before Operation	1 to 2 Weeks after Operation	3 to 6 Weeks after Operation	2 to 7 Months after Operation	18 to 24 Months after Operation
3	+73	....	+62	....	+49
16	+30	....	....	....	+45
51	+40	....	+ 2	+19	
71	+40	+15	+36	+20	
83	+36	+30	+ 8		
88	+52	+28	+29	+54	
93	+37	+ 5	+ 4		
99	+42	....	+39	+46	
106	+50	+ 7	....	+ 5	
117	+41	+13	+27	+31	
121	+58	+15			
125	+50	+35	+34	+27	
126	+44	+14	+19	+20	
130	+22	....	....	+23	
137	+56	+34	+67		
143	+32	+19	+13		
151	+57	+35			

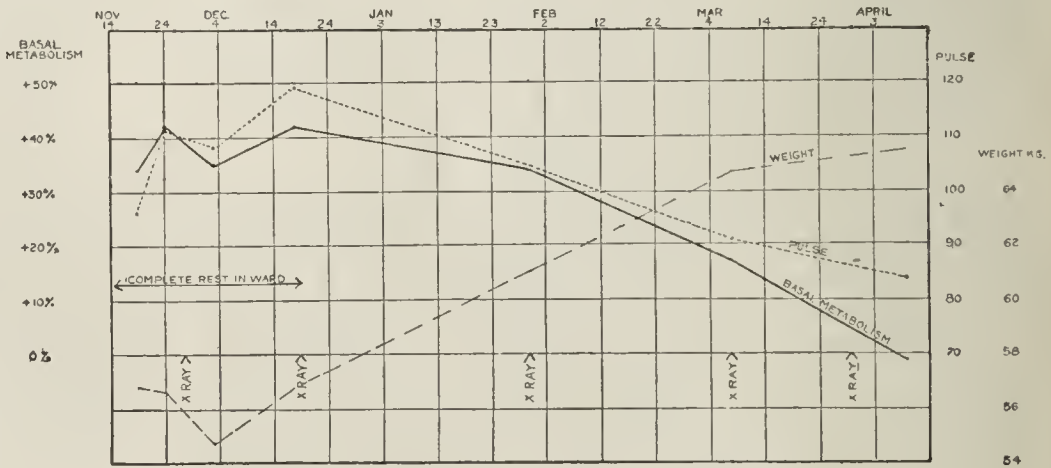


Chart 3.—Course in Case 110.

bed without other treatment, the metabolism fell from + 73 per cent. to + 52 per cent.

November 2, the left superior thyroid artery was ligated by Dr. C. A. Porter under local anesthesia. Ten days afterward the metabolism was only + 20 per cent.

November 17, Dr. Porter did a partial thyroidectomy (right lobe) under gas and oxygen. The patient stood the operation well. Pathologic examination of the thyroid revealed a typical follicular hyperplasia. Following the second operation, the metabolism remained about level up to the time when the patient went home, being just below + 30 per cent.

The important point that this case illustrates is the rise in the metabolism after the patient left the hospital. Although she felt well when seen in the middle of January and at the end of March, she still looked toxic, and it will be seen that her metabolism was rising. This, in our opinion, constitutes a definite indication for further treatment, either surgical or with the Roentgen ray.

We stated before that the weight and pulse were not the best indexes of toxicity, and this case indicates this point well. It will be seen, for example, that before operation, although the toxicity was decreasing, the patient was losing weight, while after the operation the reverse is true. Likewise, after the operation the pulse fell, though the toxicity as judged by the metabolism rose. In regard to the pulse, we think the discrepancies are due to the fact that tachycardia is not a pure sign of hyperthyroidism but is in part due to the actual condition of the myocardium. Hence, with myocardial damage, a tachycardia might continue without any thyrotoxicosis.

CASE 110.—An unmarried woman, aged 39, a graduate nurse, had had symptoms of hyperthyroidism for five months, but had kept at work during that time. Her chief symptoms were nervousness and intermittent pulse. She entered the hospital, Nov. 14, 1916. Physical examination showed slight eye signs, moderate soft, symmetrical enlargement of the thyroid with a systolic bruit, slight fine tremor of fingers and tongue, and warm, moist hands. The heart was normal.

This patient received no treatment but rest and the Roentgen ray. Her chart was an interesting one. A steady fall in basal metabolism and pulse and a gain in weight occurred during the course of treatment. At the time of the last observation she was back at work and yet had a normal metabolism. We doubt very much whether rest alone could accomplish any such result, and feel that it is just to credit the Roentgen ray with a considerable beneficial effect.

CASE 121.—An unmarried woman, aged 21, a domestic, had had symptoms for one year. All the typical symptoms of exophthalmic goiter had been present and had grown progressively worse, but she had not been obliged to give up her work.

She entered the hospital, Dec. 15, 1916. Physical examination at that time showed slight eye signs, moderate soft symmetrical enlargement of the thyroid with a loud systolic bruit, moderate tremor, and hot, moist hands. The heart was not enlarged, but showed a systolic murmur at the apex.

This case is interesting because there was a marked initial drop in metabolism on rest in bed; but after the plateau had been reached, prolonged rest and intensive Roentgen-ray treatment over a period of four months failed to accomplish any striking improvement.

April 16, however, Dr. Porter removed the right lobe and isthmus and a portion of the left lobe, under gas and oxygen, and although there was a marked reaction after the operation, in a few days the patient began to improve and at the last two observations the metabolism was only 15 per cent. above the normal. When last seen the patient presented only a very slight evidence of toxicity and wanted to return to work. We strongly advised her not to do so.

SUMMARY AND CONCLUSIONS

1. The general metabolism shows a characteristic increase in hyperthyroidism.

2. This rise may be used as a functional test of the thyroid activity or as an index of the intensity of the thyroid intoxication.

3. An extended study of the metabolism in various types of toxic goiter show that:

- (a) Rest alone usually causes a marked decrease in toxicity.
- (b) Drugs in addition to rest do not materially accelerate this decrease.
- (c) The Roentgen ray, in some cases, produces a definite improvement, while in others it seems to be quite without effect.
- (d) The usual immediate effect of surgery is a marked decrease in toxicity, but there is a very definite tendency toward a subsequent recurrence.

4. The lesson in therapeutics to be drawn from these results we believe to be about as follows:

- (a) Complete rest in bed plus irradiation should be continued until the metabolism reaches a level.

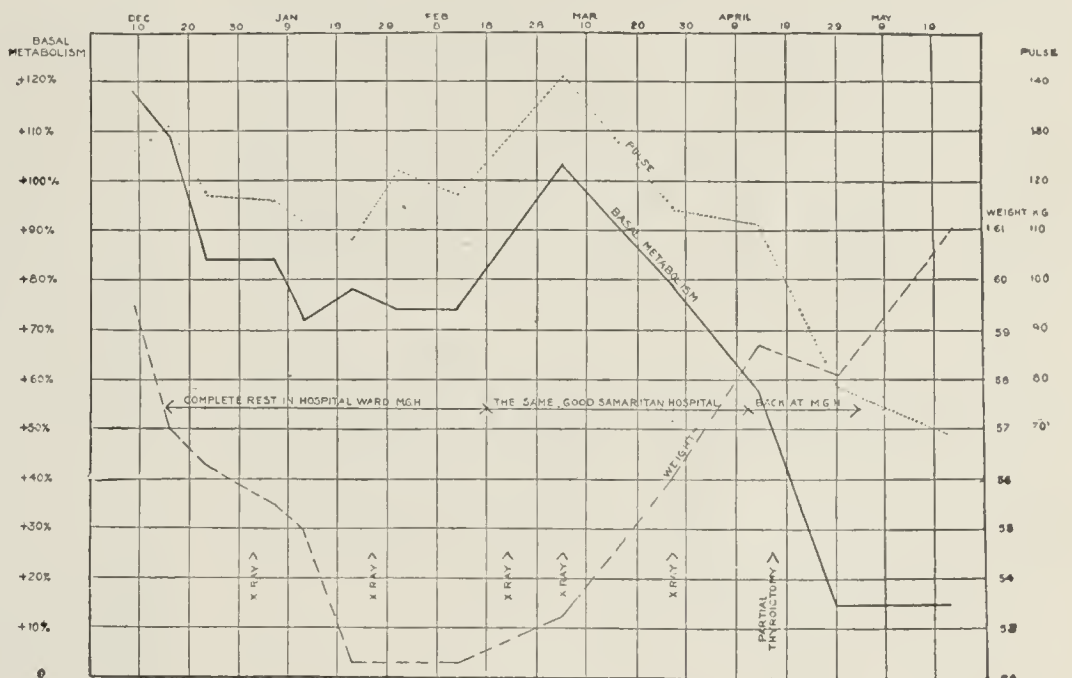


Chart 4.—Course in Case 121.

- (b) If rest and the Roentgen ray fail to restore the metabolism to within 20 per cent. of the normal, it is proper to resort to surgery, unless there is some definite contraindication. Among contraindications a rising metabolism, in spite of complete rest, seems to be very important.
- (c) Following operation, if the metabolism again increases, further active treatment should be carried out. The observations in the cases that we have followed for a long time emphasize the importance of keeping cases of exophthalmic goiter under observation for months rather than weeks, and preferably years rather than months.

15 Chestnut Street.

Founder of Medical Reserve Corps of the Army.—Robert Maitland O'Reilly, surgeon-general during 1902-1909, created the Medical Reserve Corps of the Army for the expansion of its medical service in time of war, in which many distinguished physicians and surgeons of the country are now enrolled.—Lieut.-Col. C. C. McCulloch, Jr., U. S. Army: The Scientific and Administrative Achievement of the Medical Corps of the United States Army, *The Scientific Monthly*.

Clinical Notes, Suggestions, and New Instruments

WOUND DIPHTHERIA COMPLICATED BY RHEUMATIC FEVER

J. F. BICAK, M.D., NEW YORK

March 19, 1917, E. B., boy, aged 5 years, of German descent, was brought to my office with the history of a fall three weeks before, resulting in a wound of the ulnar side of the palm just below the wrist. This was said to have "healed up" and "opened again" one week before he was seen. He was pale and looked ill, but there was no elevation of temperature. The nose and throat did not show any acute lesion. Inspection of the hand revealed a wound $1\frac{1}{2}$ inches long and from one-eighth to one-half inch wide, covered by a firm gray membrane. A culture revealed diphtheria bacilli. March 20, I called at his home and injected 5,000 units of antitoxin. The membrane disappeared from the wound in two days. March 27, the temperature rose to 103.6 F., and there were pains in both knees and the right ankle. The throat was reddened and next day the tonsils were covered with a loose exudate. A diagnosis of rheumatic fever was made. The temperature reached normal, March 31, when the patient was last seen. He still had a slight tenderness on pressure over the insertion of the left hamstrings.

On the day antitoxin was injected, a brother, C. B., aged 10 years, was found with a temperature of 103.5 F., evidence of inflammation of the mucous membrane of the nose, many punctate spots on the tonsils, and enlarged and very painful glands in the neck. Five thousand units of antitoxin were injected. A culture taken from the tonsils proved negative, but a diagnosis of diphtheria seemed safe. Recovery was prompt.

Another brother, G. B., aged 8 years, had excoriations at the edges of the nostrils, and evidence of inflammation of the mucous membrane of the nose. The mother stated his nose had been like that for a month. He received 1,000 units of antitoxin. The next day the temperature was 100.5 F. A culture was taken from the nose, and diphtheria bacilli found. Next day the temperature was normal and recovery good.

Two other boys were immunized.

631 East One Hundred and Sixty-Ninth Street.

AN UNCOMMON FRACTURE OF THE PELVIS

F. W. DUDLEY, M.D., MANILA, P. I.

A man, aged 42, while walking in his sleep, Nov. 27, 1913, fell from the upper story of his dwelling, a distance of about 12 feet. It would appear that the fall was partly broken by the hands and that the main force of the impact was received on the left side of the chest and over the left trochanter major. These deductions are made from the external marks of violence, the patient not knowing anything of the circumstances. He did not awaken as a result of the fall, being still asleep when found.

On examination, no fractures were discovered. Palpation of the left leg, thigh and hip was negative. There was no shortening, eversion, inversion or other deformity. The patient, however, was unable to extend the leg on the thigh, and when this was passively done, a slight vibration (not a crepitation) was transmitted to the hand held over the thigh. This gave the impression as if the head of the bone were sliding out of the socket and returning with a jump, such as is experienced in contortionists with lax ligamentum teres and joint capsule. The patient felt this also but experienced practically no pain.

Roentgenoscopy revealed a fracture beginning just beneath the anterior inferior spine of the ilium and extending downward and inward on about the line of union between the ilium and ischium, passing through the acetabulum and continuing on through the body of the ischium, completely separating the os innominatum into two parts. There was con-

siderable separation of the fragments at the beginning of the fracture line. Another fracture was noted in the ischium, a serrated fracture line extending transversely through the ramus of the bone.

The cause of the fracture was the blow transmitted from the great trochanter through the neck to the head of the femur. The rule is for the neck to give way.

The patient was treated in a Bradford frame with a lateral splint extending from under the arm to beyond the sole of the foot, with a cross piece, buckle straps and swathe being used to retain it in place. The frame was supported on an ordinary bed with mattress removed. Two cross pieces of heavy timber were placed across the bed, one at the head and the other at the foot, to receive the frame. Two planks, placed on this, outside the frame, served as a convenience for attending to the patient's wants.

Passive movement was begun on the tenth day, and the patient was allowed up on the forty-second day.

There was no shortening of the limb, no pain on movement, and the patient has complete use of the leg, the anatomic and functional results being perfect.

One year after the accident the patient was able to spend the entire day wading through rice paddies, shooting snipe, without pain or abnormal fatigue.

SIMPLIFIED TECHNIC FOR LOCAL ANESTHESIA OF TONSILS

W. T. PATTON, PH.C., M.D., NEW ORLEANS

Fellow of the American College of Surgeons

Some textbooks in describing injection of the tonsils for local anesthesia show six or seven points at which we are told to inject. Others use a curved needle and inject just under the mucous membrane. Both of these methods cause an edema of the tissue, causing so much distortion that often it is hard to find the tonsil, and after operation there is bound to be more or less reaction from the introduction of so much fluid into the tissues. Again, our anesthesia is often poor and unsatisfactory.

The middle and posterior palatine nerves (branches of Meckel's ganglion) join with the tonsillar branches of the glossopharyngeal nerve to form a plexus around the tonsils (circulus tonsillaris).

With the exception of the mesial free surface, the tonsil is surrounded by a distinct fibrous capsule, and external to this capsule is found the pharyngeal aponeurosis, which is rather loosely associated with the capsule. External to this is the superior constrictor muscle of the pharynx.

The circulus tonsillaris forms around the capsule in the loose pharyngeal aponeurosis, and then sends small branches into the tonsil proper, both anterior and posterior pillars.

First it is necessary to diminish the pharyngeal reflexes, by either spraying or swabbing the oropharynx with a 10 per cent. solution of cocaine, the swabbing being a much safer method. Applications are made at two minute intervals, until the reflexes are under control and the patient does not gag easily. Two or three applications are usually sufficient, though some patients may need six or more. In nervous persons it is wise to give a hypodermic injection of one-fourth grain of morphin ten minutes before the patient comes to the operating room.

After the reflexes have been brought under control, the anesthetic fluid is injected. Novocain solution, 1 per cent., with 15 minims of epinephrin solution, 1:1,000, to one-half ounce of the novocain solution, is the most satisfactory anesthetic. Schleich's solution No. 1, with 15 minims of epinephrin solution works well. Instead of a small sharp needle or one of the hooked tonsil needles, a medium size, fairly blunt, short pointed, ordinary spinal puncture needle should be used. The needle is inserted through the center of the tonsil outward and backward, with the idea of placing the point of the needle as near as possible between the capsule and aponeurosis at its exact center, which procedure is easy. The needle is shoved through the nonresisting tonsil tissue until a slight resistance is felt, which is the fibrous capsule,

and then just a fraction farther. Now from 15 to 20 minims of the novocain solution are injected. The solution infiltrates all around the capsule, and there is no edema or swelling. After several minutes, the tonsil can be removed by any method desired, with perfect anesthesia and little hemorrhage.

It is remarkable how easy one may anesthetize the tonsil in this way, with a small quantity of solution and only one puncture. If the tonsil is large or long, it is best to make two punctures, one through the upper pole and one through the lower pole.

I have removed over thirty tonsils by this method of anesthesia, and have had excellent anesthesia in all.

The advantages are:

1. Excellent anesthesia.
2. Small amount of fluid injected into the tissues.
3. Lack of edema and disturbance of the tissues.
4. Lack of postoperative reaction.

1109 Maison Blanche Building.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, SECRETARY.

HAY FEVER POLLENIN SPRING-MULFORD.—A liquid obtained by extracting the proteins of the pollen of rye (*Secale cereale*), timothy (*Phleum pratense*), orchard grass (*Dactylis glomerata*), sweet vernal grass (*Anthoxanthum odoratum*), and red top grass (*Agrostis alba*), and standardizing the solution by estimating the amount of protein contained in it. Preserved with three cresols.

Actions and Uses.—See New and Nonofficial Remedies, 1917, p. 242, under general article on Pollen Extract.

Dosage.—See New and Nonofficial Remedies, 1917, p. 242, under general article on Pollen Extract. Each package of Hay Fever Pollenin Spring-Mulford bears an expiration date (four months from date of removal from laboratory).

Manufactured by the H. K. Mulford Company, Philadelphia. No U. S. patent or trademark.

Hay Fever Pollenin Spring-Mulford, Four Syringe Package.—The syringes contain respectively 0.0025 mg., 0.005 mg., 0.01 mg. and 0.02 mg. of pollen protein.

Hay Fever Pollenin Spring-Mulford, One Syringe Package.—Each syringe contains 0.02 mg. of pollen protein.

Equal parts of the pollen of rye (*Secale cereale*), timothy (*Phleum pratense*), orchard grass (*Dactylis glomerata*), sweet vernal grass (*Anthoxanthum odoratum*), and red top grass (*Agrostis alba*) after being dried are ground in a ball-mill to destroy the cell membrane. This is then extracted with physiological sodium chloride solution. The extract is precipitated with acetone. The precipitate is dried and finally extracted again with physiological sodium chloride solution. The soluble proteins being brought into solution, a nitrogen determination is made on this extract, and it is then standardized according to the protein (nitrogen) content.

HAY FEVER POLLENIN FALL-MULFORD.—A liquid obtained by extracting the proteins of the pollen of ragweed (*Ambrosia artemisiifolia*), golden rod (*Solidago*) and maize (*Zea Mays*), and standardizing the solution by estimating the amount of protein contained in it. Preserved with three cresols.

Action and Uses.—See New and Nonofficial Remedies, 1917, p. 242, under general article on Pollen Extract.

Dosage.—See New and Nonofficial Remedies, 1917, p. 242, under general article on Pollen Extract. Each package of Hay Fever Pollenin Fall-Mulford bears an expiration date (four months from date of removal from laboratory).

Manufactured by the H. K. Mulford Company, Philadelphia. No U. S. patent or trademark.

Hay Fever Pollenin Fall-Mulford, Four Syringe Package.—The syringes contain respectively 0.0025 mg., 0.005 mg., 0.01 mg. and 0.02 mg. of pollen protein.

Hay Fever Pollenin Fall-Mulford, One Syringe Package.—Each syringe contains 0.02 mg. of pollen protein.

A mixture of 90 parts of the pollen of ragweed, 5 parts of the pollen of various species of golden rod and 5 parts of the pollen of maize after being dried is ground in a ball-mill to destroy the cell membrane. It is then extracted with physiological sodium chloride solution. This extract is precipitated with acetone. The precipitate is dried and finally extracted again with physiological sodium chloride solution. The soluble proteins being brought into solution, a nitrogen determination is made on this extract, and it is then standardized according to the protein (nitrogen) content.

BORCHERDT'S MALT OLIVE.—A liquid stated to be composed of olive oil 20 per cent., glycerin 10 per cent. and Borchardt's Malt Extract Plain 70 per cent.

(Accepted for inclusion with the appendix to New and Nonofficial Remedies.)

Prepared by the Borchardt Malt Extract Co., Chicago.

CITRESIA.—Magnesium Acid Citrate.— $\text{MgHC}_6\text{H}_5\text{O}_7 \cdot 5\text{H}_2\text{O}$.—The hydrated acid magnesium salt of citric acid containing not less than 98 per cent. of $\text{MgHC}_6\text{H}_5\text{O}_7 \cdot 5\text{H}_2\text{O}$.

Actions and Uses.—Citresia has the laxative and purgative action of magnesium citrate.

Dosage.—As a laxative 25 Gm. (6 drachms); as a purgative 50 Gm. (1½ ounce). It may be administered by dissolving citresia 25 Gm. in syrup of citric acid 25 Cc. and water enough to make 150 Cc.

Manufactured by Horace North, New York. No U. S. patent or trademark.

Citresia is a white or faintly yellowish-white, crystalline, odorless powder having an acid taste.

Citresia is very soluble in water; insoluble in alcohol, ether or chloroform.

Five Gm. of citresia should dissolve without residue in 25 Cc. of water.

If to 10 Cc. of an aqueous solution of citresia (1 in 20) 1 Cc. of hydrochloric acid and 1 Cc. of sodium phosphate solution be added and the solution be made slightly alkaline with ammonia water, a white, crystalline precipitate should be produced.

If 10 Cc. of the aqueous solution of citresia (1 in 20) be neutralized with potassium hydroxide solution and 1 Cc. of calcium chloride solution added, no precipitate should be produced. After boiling the mixture for one or two minutes, a white, crystalline precipitate should appear.

If 5 Gm. of citresia be shaken with 25 Cc. of alcohol, the mixture filtered, the filtrate evaporated, the residue, if any, dried for one hour at 100 C., and weighed, the weight found should not amount to more than 0.05 Gm. (limit of citric acid, and some other impurities).

If from 0.5 Gm. to 0.8 Gm. of citresia be weighed, and the salt dried to constant weight at 75 C., the loss should not amount to more than 30 per cent. (absence of an undue amount of water).

If from 0.5 Gm. to 0.8 Gm. of citresia be weighed, the salt ignited and the residue weighed, the ash should amount to not less than 13 per cent.

If from 2 Gm. to 3 Gm. of citresia be weighed, the salt dissolved in 25 Cc. of water and the cold solution titrated with normal potassium hydroxide, using phenolphthalein as indicator, the alkali required should correspond to at least 98 per cent. of hydrated magnesium acid citrate.

1 Cc. of normal potassium hydroxide volumetric solution = 0.30445 Gm. of $\text{MgHC}_6\text{H}_5\text{O}_7 \cdot 5\text{H}_2\text{O}$.

If from 0.5 Gm. to 0.8 Gm. of citresia be weighed, the salt dissolved in 50 Cc. of 1 per cent. hydrochloric acid, a slight excess each of sodium phosphate solution and ammonia water added, the mixture allowed to stand 15 hours, the precipitate collected in a weighed Gooch crucible, washed, dried, heated and weighed in the usual way, the weight of magnesium pyrophosphate should correspond to not less than 98 per cent. of hydrated magnesium acid citrate ($\text{MgHC}_6\text{H}_5\text{O}_7 \cdot 5\text{H}_2\text{O}$).

$\text{Mg}_2\text{P}_2\text{O}_7 \times 2.734 = \text{MgHC}_6\text{H}_5\text{O}_7 \cdot 5\text{H}_2\text{O}$.

ANTIRABIC VACCINE (See N. N. R., 1917, p. 291).

Eli Lilly and Company, Indianapolis, Ind.

Pasteur Antirabic Preventive Treatment (Harris Modification).—Brains and spinal cords of rabbits, dead of fixed virus rabies infection, are ground to a paste which is frozen by the addition of carbon dioxide snow. The mass is pulverized and rapidly dried in vacuo. The resulting dry powder is standardized by the method devised by Dr. Harris, and stored in vacuo in the cold. One dose is given daily over a period of 14 days, the early doses increasing in unitage up to a maximum. Supplied in emulsion in syringe ready for use. The first three doses are sent out from distributing stations, the remaining ones from the home office.

Test for Picric Acid in the Urine.—F. Arena acidifies the suspected urine with a few drops of concentrated sulphuric acid and then places in the urine some wool cleared of fat. Any picric acid present fastens on the wool in the course of a few hours. The wool is then treated with a few cubic centimeters of hot concentrated ammonia. To this are then added 1 or 2 c.c. of a 2 per cent. solution of ferric citrate, not allowing the two fluids to mix. With positive findings, at the zone of contact a bright red ring forms, due to formation of picraminic acid.—*Riforma Medica*, p. 441.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address "Medic, Chicago"

Subscription price Five dollars per annum in advance

*Contributors, subscribers and readers will find important information
on the second advertising page following the reading matter*

SATURDAY, JULY 7, 1917

IS EPINEPHRIN INDISPENSABLE FOR THE ORGANISM?

The physiologic potency of epinephrin has given it a widespread prominence alike in physiology, pharmacology, pathology and therapy. Any one who has witnessed the intense blood pressure raising effects of almost vanishingly small quantities of suprarenal extract or of the isolated epinephrin cannot fail to be impressed by such striking manifestations on the part of a biologic product. The diversity of the responses which can be produced serves to augment still more the interest in the active principle of the suprarenal structures. The local styptic power, so invaluable in diminishing inflammation and reducing hemorrhages; the relaxation of the muscles of the bronchioles, now familiar in the management of asthma; the profound effects on all structures innervated by the sympathetic nervous system; the production of hyperglycemia and glycosuria following administration of epinephrin, and its consequent relation to liver function—these are some of the familiar phenomena that have been demonstrated repeatedly or are already familiar in the routine of practice.

Lately this interest in epinephrin has been heightened by the widely discussed associations of the suprarenal bodies and certain mental states. These glands are asserted to participate in the emotions in a remarkable way. For example, during anger or fright, in some species, at any rate, something having the properties of epinephrin appears to be discharged into the blood in more than usual amounts. This is assumed to promote precisely those responses and prepare those conditions that favor a suitable performance on the part of the organism under the emergency that provokes the liberation of the hormone.

These observations are of the greatest interest as indications of a remarkable association of the glands with the emotions. But as Mathews¹ has significantly remarked, it must not be incorrectly inferred that the emotion of fright depends on the suprarenal glands, or that the manifestation of this emotion necessarily so depends. The fact is probably quite otherwise.

1. Mathews, A. P.: *Physiological Chemistry*, 1915, p. 672.

The central nervous system is responsible both for emotion and for the stimulation of the sympathetic system; only the sympathetic stimulates the suprarenals to secrete epinephrin, which in its turn makes the sympathetic innervation more efficacious. It is like a process of autocatalysis, the sympathetic system, as it is stimulated, automatically raising the efficacy of its own stimulation.

Despite these diverse interesting facts that are known about epinephrin, it must not be concluded that the liberation of this compound represents the sum total of the functions of the suprarenal bodies. Extirpation of these structures invariably results in death; but the symptoms which precede it are scarcely ameliorated, nor has the fatal outcome been prevented by the injection of epinephrin.

Stewart and Rogoff² have shown that after section of the nerve supply of the suprarenals in animals there was no demonstrable liberation of epinephrin into the circulation, for some weeks at least, after the operation. It is highly probable, therefore, that the entire secretion of this hormone from the glands is controlled by the nervous system. Furthermore, in a series of new experiments in which one suprarenal was excised and the nerves of the other severed, the animals recovered completely from the operation and behaved in every way like normal animals. It must be concluded, therefore, that the liberation of epinephrin from the suprarenals is not indispensable for life or health, unless, indeed, the necessary quantity, even in the suprarenal vein blood, is below the limits of detection by the methods used. The real cause of death after loss of the suprarenals remains to be elucidated, nor is there yet any adequate explanation of the pigmentation of the skin in Addison's disease.

THE ANTINEURITIC PROPERTIES OF MILK

"It is well to be on the right side of facts, for they are stubborn things and insist on being respected." This dictum deserves to be reiterated with strong emphasis at a time when shortage of food is confronting millions of people and when the possibilities of specific deficiencies in food products and the introduction of "devitalized" foods as a result of current methods of food manipulation are being widely discussed. In urging young men to "first get the facts," the secretary of commerce has said:

The relation men hold to truth, their respect for facts, their use of facts, largely determines their place and power in life. We make progress in the business world not necessarily by research for facts but at least by outreach for them and by respectful treatment of them when they are found. The amount of success will depend a good deal upon how far your vision goes in seeing the facts that surround you and on the

2. Stewart, G. N., and Rogoff, J. M.: Quantitative Experiments on the Liberation of Epinephrin from the Adrenals after Section of Their Nerves, with Special Reference to the Question Whether Epinephrin is Indispensable for the Organism, *Proc. Soc. Exper. Biol. and Med.*, 1917, **14**, 145; *Jour. Pharmacol. and Exper. Therap.*, 1916, **8**, 479.

extent to which your practice goes in using those facts. The man of broad mind sees more facts than he who has a narrower vision. Mental nearsight is usually not profitable. To be farsighted is at times physically inconvenient but commercially has much in its favor. It is more essential, however, that the sight, whether it be far or near, shall know a fact when it sees it and be ready to abandon a pseudo fact for a real one and to abide by the latter till further facts are found.¹

Despite the excellent nutritive properties which have been accredited to milk almost from time immemorial, science is tending to limit unbounded enthusiasm for this universal food. We have already referred to the apparently well founded assertion that the milk of mothers suffering from beriberi is not an adequate nutrient for their young.² The observation that deficiencies in the form of a lack of essential components as well as positively damaging substances can be thus transmitted is what deserves notice in this regard. If this is well substantiated,³ milk may become an actual menace at times when it is produced under physiologically unsatisfactory conditions or is subsequently deteriorated in commerce. Aside from possible inherent nutrient defects in milk as it is produced by the mammary glands, the problem of heating it, we still venture to assert, is far from solved. One needs only to read the conflicting claims as to the production of infantile scurvy by the use of pasteurized milk for infants, and the reports of the appearance of typical scorbutic symptoms in certain animals fed on raw as well as on heated milks, to wonder whether it is not timely to divorce fact and hypothesis completely in this matter in order to bring the subject out of its present chaos.

In addition to its reputed antiscorbutic virtues, in some species at least, fresh milk is reported to manifest antineuritic properties which give it a protective value against the encroachments of beriberi. An intimate relation between scurvy and beriberi has often been postulated of late. Symptoms intermediate between the two well characterized affections have also been described. For the purposes of the present discussion it will be advisable to avoid all conflicting claims by disregarding, for the moment, the possible antiscorbutic features of milk or its value as a possible stimulant to growth, and by concentrating attention on its relation to the prevention of neuritic manifestations which arise from the employment of diets which are somehow deficient.

The antineuritic properties of milk have not been thoroughly investigated. Accordingly, at the College of Medicine and Surgery in the University of the Philippines, Gibson and Concepción⁴ have attempted to

ascertain by feeding experiments whether or not antineuritic substances are present in milk and to what extent they may be affected by autoclaving the milk for two hours at 125 C. The outcome offers practical suggestions quite apart from the theory of etiology which may be held. The experiments at Manila indicate that the antineuritic property is present in milk in only slight amounts, and that the continued feeding of either fresh milk or autoclaved milk to animals (dogs and pigs) without suitable additions to the diet induces certain beriberi symptoms: degeneration of the peripheral nerves, persistent edema, and aphonia. There is no evidence, Gibson and Concepción state, that autoclaving the milk for two hours has in any way affected its nutritive value.⁵ Not even scorbutic symptoms have been observed. If we may tentatively accept the evidence of the Manila investigators, the antineuritic powers of milk are so slight that in infant feeding the diet should be extended as soon as possible. We may entertain, without accepting, their further suggestion that the young of healthy mothers probably come into the world with a reserve supply of vitamin substances sufficient to tide them over in a nutritive way until the time when, under natural conditions of life, they would begin to eat other foodstuffs.

ANTITOXIN FOR GAS GANGRENE

The gas-producing bacilli, now commonly spoken of as *B. welchii*, occur in a variety of lesions, but their chief hold on our interest lies in their connection with gas gangrene, that dreadful complication of wounds, especially those received in modern warfare. The effects of gas bacilli have been explained in various ways, most often as due to some form of intoxication, either from the products of the decomposition of infected tissues or through the generation of fatty acids as well as in other ways, but it has not been thought that the effects were dependent on true bacterial toxins. Bull and Pritchett,⁶ however, report highly interesting experiments, the results of which indicate that, under suitable conditions, cultures of gas bacilli produce true toxins to which their pathogenic effects, at least in certain animals, may be ascribed. There are produced at least two distinct toxins, one of which is hemolytic while the other causes local edema and necrosis and probably also a more general toxic action.

The destructive action on blood was shown most definitely by the intravenous injection of Berkefeld filtrates of cultures of gas bacilli in plain broth, to which sterile pigeon or rabbit muscle had been added; and the local destructive effects were produced best by subcutaneous and intramuscular injections of such

1. Redfield, W. C.: First Get the Facts, Science, 1915, 42, 39.

2. Infantile Beriberi, editorial, THE JOURNAL A. M. A., Nov. 30, 1912, p. 1977.

3. The Relation of the Mother to Some Dietary Factors in Milk, editorial, THE JOURNAL A. M. A., March 10, 1917, p. 782; A Restricted Diet, April 21, 1917, p. 1184.

4. Gibson, R. B., and Concepción, I.: The Influence of Fresh and Autoclaved Cow's Milk on the Development of Neuritis in Animals, Philippine Jour. Sc. (B) Trop. Med., 1916, 11, 119.

5. It may not be amiss to refer to some of the confusion on this subject, due to conflicting evidence. Lane-Clayton, Janet: Jour. Hyg., 1909, 9, 233. Daniels, Amy L., and Stuessy, Sylvia: The Nutritive Value of Boiled Milk, Am. Jour. Dis. Child., January, 1916, p. 45.

6. Bull and Pritchett: Jour. Exper. Med., 1917, 26, 119.

filtrates. Indeed, the lesions in the breast muscles of the pigeon, produced by injection of the filtrates, resembled closely the effects caused in animals and in human beings by actual infection with the bacilli. These actions of filtrates of gas bacilli cannot be neutralized with sodium hydroxid, and hence are not caused by butyric and other acids; they are materially reduced by heating filtrates to 62 C., and are completely removed at 70 C. for thirty minutes. Repeated injections of filtrates in pigeons and rabbits result in a true active immunity, and the blood of immunized rabbits neutralizes the toxic actions of the filtrate not only in the test tube, so far as the hemolytic action is concerned, but also in the living animal with respect to the locally injurious actions as well as the destruction of blood corpuscles, and it is still more significant that in pigeons such antitoxic serum proved to be protective and curative against actual infection with gas bacilli, both in the spore and in the vegetative stages. Bull and Pritchett also find that antitoxic rabbit blood and toxic filtrates of gas bacilli neutralize each other perfectly in multiples of single doses, thus fulfilling the law of multiple proportions as established with reference to the toxins and antitoxin of *B. diphtheriae* and *B. tetani*.

It appears, then, that gas bacilli may produce true toxins, which cause the principal pathogenic effects seen in gas infections and which can be neutralized by antitoxin, the latter being also protective and curative against gas bacillus infection in pigeons — a discovery that would seem to hold out great promise for the development of a specific treatment of human infection with gas bacilli.

THE CARE OF THE NEW-BORN

The first days of life are attended by a loss of body weight which is ordinarily regarded as a "natural consequence." The extent of decline, which ceases as a rule after the third day, averages from 150 to 200 gm., though the figures for the individual are highly variable. Whether or not an attempt should be made to combat this loss of weight has been debated. On the one hand, it is maintained that the intake of enough food to avert the loss should not be attempted until the newly born organism can grow up, so to speak, to the capacity of digesting and assimilating added nutriment; others find no occasion to delay prompt gains in weight so long.

An examination of the precise reasons for the usual early loss of weight may help to furnish enlightenment in the questions under dispute. The essential facts are assuredly not new; Talbot¹ has recently thus summarized them: The loss of weight is of two kinds: (1) "mechanical" and (2) "physiologic." The mechanical loss represents material which may be collected and weighed, and is due principally to the pas-

sage of urine and meconium, and at times to the vomiting of allantoic fluid, swallowed by the infant before birth. There is also a loss due to the evaporation of water from the skin. The physiologic loss of weight is that due to the actual oxidation of body substance as a result of metabolism, and to the fact that an infant is virtually starved during the colostrum period. The colostrum which an infant receives does not give enough food to supply the necessary energy to keep it warm.

Talbot has summarized the best quantitative data available with respect to human colostrum. The mother's breasts at birth contain only a small quantity of colostrum, which is increased under the stimulation of sucking, until the breast milk "comes in," on about the third or fourth day after birth. The amount of colostrum during the first twenty-four hours after birth is between 4 and 6 c.c., and gives approximately 3¼ calories. During the second day the baby receives from 78 to 129 c.c. of colostrum, or from 51 to 84 calories. On the third day the amount of colostrum varies between 199 and 238 c.c., which give from 129 to 154 calories. Colostrum, therefore, gives the newborn infant only a minimal amount of energy, insufficient to supply its energy requirements. It is quite natural that it should lose weight during the colostrum period.

From Talbot's standpoint, which seems to be the rational outcome of physiologic considerations, the question of early additional feeding centers in the nutritive condition of each child at birth. The fat, he remarks, which was deposited during the last month of intra-uterine life, is the storehouse of fuel, and must be present in large enough amounts to supply energy until the breast milk "comes in" to take its place. Clinical experience bears out the inference that infants without a good layer of fat at birth should receive food at the earliest possible moment. The practical directions are that "weak or premature infants should be fed shortly after birth, preferably with the milk of another woman; but when this is lacking, a 5 per cent. solution of some sugar, such as lactose, should be given as a temporary expedient." This addendum is not as likely to disturb an easily upset digestive apparatus as cow's milk is at such early ages.

There is another occasion for the depression of the physiologic functions in the new-born which may be averted. Heat may be lost through the water bath instituted too early. Temperature may actually become diminished and untoward consequences may arise in infants that are not vigorous at birth. Talbot believes that the bath, being a possible cause of chilling, as actual temperature records show, should be entirely discarded in the case of the new-born. Warm oil may be used to cleanse the body without evaporation and excessive loss of heat from the delicate organism.

1. Talbot, F. B.: Physiology of the New-Born Infant, Am. Jour. Dis. Child., June, 1917, p. 495.

FETAL ATHYREOSIS

Students of human thyroid disease will be interested in a series of observations with respect to the iodine requirement of pregnant animals reported from the field of animal husbandry. It is known that a large percentage of the sows in certain sections of the Northwest have given birth to hairless and otherwise defective young. Many of these pigs are born dead; others die in an hour or two, and few live more than twenty-four to thirty-six hours. The resulting loss in Montana amounts to about 1,000,000 young pigs annually. While the loss is heaviest among swine, there are numerous cases among sheep, and occasionally among cattle and horses.

The affected pigs are carried to the full term of gestation period, and though of full size are strikingly weak and low in vitality. Most noticeable in the appearance of a typical specimen is the absence of hair. Except for a few tactile hairs on the nose and a few around the eyes, the skin is smooth, shiny and bald. This scantness of hair varies from almost no hair through all gradations to the normal amount. The skin, particularly around the shoulders, feels pulpy, and is from half to three quarters of an inch in thickness. It is semitransparent and apparently edematous, but no fluid escapes on incision. The hoofs are thin walled, short, brittle, and evidently in an undeveloped condition. The heart, in every case examined, has a persistent foramen ovale. The thyroid is dark red, sometimes almost black, and presents a most constant enlargement. A histologic examination shows a uniform hyperplasia and a distention of the blood vessels.

It will be noted, as Smith¹ has pointed out, that the apparent symptoms of the affected pigs correspond in many details to those of myxedema in its classic type, and to the symptoms sometimes described by the earlier surgical workers as arising after extirpation of the thyroid. The hyperplasia of the thyroid varies proportionately with the acuteness of the malady.

The hypotheses that this affection of the pigs is due to the presence of some toxic substance taken with the food or to an infective agent of low virulence have not been found tenable. The evidence gathered by Smith at the Montana Experiment Station indicates that the malady is caused by the malfunction of the thyroid. An examination of the glands of affected animals showed that they are abnormally large, that the iodine content is extremely low in comparison with that of normal pigs, and that in general the iodine content varies inversely with the degree of hairlessness of the skin. An iodine deficiency during the gestation period causes a lack of function and hyperplasia of the fetal thyroid, resulting in an arrested development of the fetus.

It thus appears that, if certain as yet unknown conditions are favorable, the mother may obtain the amount of iodine required for the activities of both her own and the fetal glands; but if these conditions are not favorable, the maternal organism can still obtain the amount required for the activities of its own thyroid but not enough for the rapidly growing fetus. The iodine starvation of the fetus depresses the physiologic activity of the fetal thyroid, which causes the remarkably arrested development peculiar to this malady. The feeding of iodids is reported to have averted the appearance of fatal athyreosis in regions in which it would otherwise have been expected to occur.

If the facts reported may be taken as evidence, to quote Smith, that an abundant secretion of the fetal thyroid, during the later stages of intra-uterine life, is essential for the normal development of the fetus, certain important consequences suggest themselves to students of the human fetal development. The need of a suitable intake of iodine during pregnancy attains a new and perhaps unsuspected significance. Until something more definite is known, however, regarding the actual consumption of iodine in the food of man in different regions, it would be hasty to draw any far-reaching inferences. The problems of thyroid function need to be approached from many angles.

Current Comment

THEORIES AS TO THE ETIOLOGY OF
PERNICIOUS ANEMIA

Pernicious anemia remains, even at the present day, one of the perennial puzzles of the student of the etiology of disease. A few innovations, such as transfusion and splenectomy, have been introduced into the therapy of this insidious malady; but it would be rash to ascribe any lasting advantage to any of the proposed methods of treatment. Obviously, these will remain in the category of hit-and-miss procedures until the underlying cause or causes of pernicious anemia are better understood. Accordingly it is worth while, now and then, to take stock of the proposed explanations that are current and to learn what hypotheses have survived the criticism of competent observation or the test of investigation. Without some theories as guiding motives, little progress is made in the medical sciences. Squier¹ has recently summarized the more conspicuous conclusions regarding the genesis of pernicious anemia. We may temporarily dismiss consideration of one of the familiar hypotheses — hypersplenism — which is commonly discussed in this connection and forms the basis for the operative removal of the spleen as a therapeutic measure. The success of this can as yet scarcely be regarded as sufficiently striking to establish definitely a splenic etiology, at least in any preponderating rôle. The special part played by the spleen in the hemolytic proc-

1. Smith, G. E.: Fetal Athyreosis, a Study of the Iodine Requirement of the Pregnant Sow, *Jour. Biol. Chem.*, 1917, **29**, 215.

1. Squier, T. L.: Concerning the Chemistry of Pernicious Anemia, *Jour. Lab. and Clin. Med.*, 1917, **2**, 552.

esses of the disease that are now well known remains decidedly uncertain. Pernicious anemia has also been ascribed to a general disturbance of the lipoid mechanisms and functions of the body. As the result of such abnormality, hemolytically active substances like oleic acid or similar fatty acids might be liberated in undue amounts and exert a baneful influence on the integrity of the blood cells. Furthermore, the latter are known to abound in phosphatids and cholesterol compounds which are intimately concerned in hemolytic phenomena. The erythrocytes in pernicious anemia are notably susceptible to the influence of certain hemolytic agents. Somewhat more tangible, though equally indefinite, are the hypotheses that make pernicious anemia the result, as Squier expresses it, of a gastro-intestinal disturbance leading to destruction of mucosa sufficient either to allow undigested proteins to leak through into the blood stream where their parenteral digestion liberates protein poisons, or of the absorption of known hemolytic toxins produced in the course of intestinal putrefaction. In either case, Squier adds, the poison has a destructive influence on the intestinal mucosa, as well as the more evident hemolytic effect, and this results in the establishment of a vicious circle. We may confidently expect that before long the study of experimentally produced anemias will give much needed evidence as to the tenability of the hypotheses which are becoming more clearly defined from time to time.

THE NORMAL REACTION OF THE INTESTINAL TRACT

The sensitiveness of the digestive enzymes even to slight changes of reaction obviously renders it desirable to know what conditions they are likely to encounter in this respect in the different regions of the alimentary tract to which they may be carried. The behavior of each digestive secretion may be essentially changed by admixture with other fluids pouring into the gastro-intestinal canal for a variety of reasons. Shifts in the reaction of the mediums, the possible interaction of the enzymes themselves, and the even less well analyzed activating functions which one secretion may perform for another are features that illustrate how complicated the chemical processes represented by the combined action of all the fluids that are brought together within the intestine may become. The reaction of the intestinal contents is believed to be of moment not only for the enzymatic changes that may proceed within them but also in determining to a considerable degree what micro-organisms may gain a foothold in the alimentary tract. Thus distinctly acid conditions undoubtedly inhibit putrefactive processes; but the degree of acidity requisite and the possibility of establishing this within the lower bowel are by no means demonstrated. There are several series of observations on record relating to the reaction of the intestinal contents, but they are decidedly contradictory. One might readily conclude from these reports that the reaction is an exceedingly variable factor even in the same species. Nearly all of the published statements are based on tests made

with the familiar indicators, such as litmus. For the range of reaction bordering on neutrality, such as is characteristic of most physiologic fluids, the significance of the older indicator methods is anything but exact. The newest investigations in this field, by Long and Fenger¹ of Chicago, are more trustworthy because they are based on exact electrometric determinations of the hydrogen-ion concentration of the intestinal contents of man and animals. Intestinal fluids were collected from various levels in the alimentary tract by the aid of a narrow Rehfuess tube taken in to a considerable length. By this method it was found that in the human small intestine the reaction may vary from distinctly acid to slightly alkaline on the part which may be reached by the Rehfuess tube. When the tube is far enough down to secure a uniform mixture of contents, the acid reaction is apparently as common as the alkaline, but the degree of acidity is not sufficient to check the normal tryptic digestion, which in some instances seems to be favored by a reaction on the acid side of neutrality. The reaction found must vary with the state of digestive activity, and is simply an equilibrium condition between the chyme and the alkaline juices poured into the duodenum. Any reaction near neutrality may obtain. These new facts are valuable, not only from the standpoint of the possibilities afforded to digestive activity or bacterial inhibition, but also as indexes to the behavior which drugs that undergo chemical reactions in the presence of acids or bases may be expected to exhibit in the parts of the alimentary tract beyond the stomach.

THE BEHAVIOR OF MALIC ACID IN THE BODY

The organic acids which are found in many of the fruits which enter into the dietary of man were long the subject of misinterpretation with respect to their behavior in the body. Thus the "acid" fruits were at one time commonly charged with functioning in a way to augment the acidity of the organism, whereas we later learned to appreciate that many, if not most, of the dietary organic acids are oxidized in the body so as to give rise to carbonates. In this way the end-result of their metabolism is quite the reverse of what might be expected from a fixed acid substance. The consequent deduction that all organic acids are easily burned up in the organism, and therefore never exhibit any action more unusual than that shown by an ordinary oxidizable foodstuff, is almost as erroneous as the reverse conception of the unvaried acid manifestations of the substance under discussion. The truth seems to lie midway between these extremes of unwarranted generalization, so that we must at length recognize the necessity of learning specifically the behavior and the fate of each individual of the organic acid group in the living organism. When this is done there will be opportunity to discover, at the one extreme, compounds, like oxalic acid, which are extremely toxic and seem to traverse the body unchanged; others, like benzoic acid, which are not destroyed in the metabolism, but are conjugated with substances, like glycocholic,

1. Long, J. H., and Fenger, F.: On the Normal Reaction of the Intestinal Tract, *Jour. Am. Chem. Soc.*, 1917, **39**, 1278.

forming, in the instance cited, the innocuous hippuric acid of the urine; and still others, like tartaric and citric acids, which represent intermediate examples between the deportment just cited on the one hand and complete utilization in the body on the other. The behavior of some of the foregoing compounds was discussed recently.¹ To these may now be added the newest findings with respect to the salts of malic acid, which likewise is present in familiar fruits of the dietary.² Even this supposedly innocuous substance is not completely destroyed in the organism, according to Wise's observations on experimental animals; most of it, however, disappears in the metabolism, so that only small proportions are ordinarily excreted by the kidneys. In contrast with the acids previously considered,¹ malic acid must be administered in far larger doses than tartaric or citric acids, for example, in order to elicit signs of toxicity. Even very considerable amounts of sodium malate are not followed by such untoward symptoms as nephritis or glycosuria. Malic acid which escapes oxidation in the body is readily eliminated by the kidneys.

CASUALTIES IN THE MEDICAL CORPS OF THE BRITISH ARMY

There has been such an astonishing amount of misinformation, exaggerated and sensational statements, published in this country regarding the casualties among medical officers in the British Army that Col. T. H. Goodwin of the British Army Medical Service, now in this country, cabled to the British War Office for the actual facts. He received the following data: The total casualties among medical officers of the British forces, on the western front, from the beginning of the war to June 23, were: killed, 195; wounded, 707; died of disease, 62. Hence the total number of casualties from actual war injuries on the western front was 902, of which 195 were in killed. This is entirely different from some of the statements which have received wide publicity in this country—some even semiofficial in character—which have reacted to the detriment of the efforts to secure officers for the Medical Reserve Corps.

INFANT DEATH RATES AND SOCIAL CON- DITIONS AT MANCHESTER, N. H.

That the various conditions associated as causes and results with low earning capacity on the part of the father result in a high death rate in infancy among his offspring is shown in a report on infant mortality at Manchester, N. H., just issued by the Children's Bureau of the United States Department of Labor. A study was made of all babies whose births were registered during a single year and whose families could be found. In the entire group, 1,643, the death rate was 165; but the death rate among the poorest families was more than four times as high as among the families in the highest wage group. Among 119

babies whose mothers went out to work before the babies were 4 months old, the death rate was 277 per thousand. In families able to live in a one-family house, the death rate among babies in the first year of life was 86; when circumstances compelled residence in houses containing seven or more families, the death rate was 237. In families able to provide more rooms than there were persons in the family, the death rate was 124; when there were two or more persons per room, the death rate was 246. In each economic group the babies who were artificially fed had fewer chances of survival than did the babies whose mothers nursed them, but the difference in the death rates for breast fed babies and for those artificially fed is influenced by the economic status of the family, and is least among families of the highest income group.

Medical Mobilization and the War

Eligibility of Physicians of Foreign Birth for Service with Base Hospitals

To the Editor:—I note in the press that "the State Department has ruled that Americans of foreign birth or blood are ineligible for service in Red Cross units, recruited for service abroad."

My father, who was born in Germany, is a good American, and has been a faithful servant of the government for over twenty-five years. My mother was English-Irish and I have had ancestors in nearly every war the United States has had.

I have qualified for a commission in Medical Reserve Corps because I felt it to be my duty as a physician to serve my country. Now it seems I am not to have as much right, as a citizen, as my grandfather had when he was killed in the last charge in front of Atlanta, or of another ancestor, when he signed the Declaration of Independence.

I know United States Army officers of German blood and birth. Why are physicians discriminated against? If printed, please withhold name. * * *

COMMENT.—We publish one letter to represent a number that have been received. There evidently is some misunderstanding. The facts as we understand them, and as recorded in the *Official Bulletin*, are: The directors of Red Cross base hospitals received from the director-general of the Department of Military Relief of the American Red Cross, Colonel Kean, a copy of a letter from the state department to the effect that base hospital units intended for service in France should not include persons of German, Austro-Hungarian, Bulgarian or Turkish nationality or birth, "or American citizens whose fathers were born in Germany, Austro-Hungary or allied countries." It must be understood that this action does not refer to Medical Reserve Corps officers—that is, to those who may be sent to France with the troops; but to those composing the so-called base hospital units that have been in course of formation for over a year—long before war with any European country was considered probable (see *THE JOURNAL* for June 2, p. 1630), of which a number are already in France in connection with the base hospital work of the French and English armies. These base hospital units are, in a way, independent of our main army.

Commenting on this matter Mr. Henry P. Davison, chairman of the Red Cross war council of the American National Red Cross, says:

In view, however, of the earnest and whole-hearted way in which so many Americans have volunteered their services in manning these base hospital units, this ruling of the allied nations is peculiarly embarrassing to the work of our Red Cross. The Red Cross has, of course, never questioned the loyalty of any American citizen.

It is not difficult to appreciate the attitude of the allied governments, responsive as they are to the sentiment of their peoples. . . .

Obviously, no such ruling can be applied against our troops who will soon be fighting side by side with the allies in France, and I am confident that when the situation is fully understood exemption will be made in favor of those loyal American citizens who are sent to participate in the humanitarian work our Red Cross is undertaking.

1. The Behavior of Three Organic Acids in the Body, editorial, *THE JOURNAL A. M. A.*, March 31, 1917, p. 984.

2. Wise, L. E.: Elimination of Malates After Subcutaneous Injection of Sodium Malate, *Jour. Biol. Chem.*, 1916, 28, 185.

Misinformation as to Physicians in the War

To the Editor:—In reading the June 22 number of the *Boston News Bureau*, I noticed the following article taken from the *Wall Street Journal*:

Reports indicate that heaviest losses in the present war have been suffered by the medical corps. In former wars, physicians were kept in the rear, but not so now. Four doctors accompany each regiment, and three of these are sent to the firing line with the troops to give immediate aid to the wounded. Without arms and with no way of protecting themselves, these men are mowed down. Already 60,000 have been killed. In a recent engagement 257 were killed in an hour; in another engagement 400 were killed. An ambulance driver, temporarily called from his post, returned to find only twelve persons left out of the original 165 on duty when he went away.

I am wondering if something can not be done to avoid this awful butchery of our medical men, for I understand that our government has called on all persons to do their part in the way they can be most useful, so why not let the surgeons remain in the hospitals at the rear of the firing line, where they could relieve the suffering of perhaps thousands, while if they are sent to the front, they can only relieve a few at best. So I hereby appeal to you, as editor of the great A. M. A. JOURNAL, to use your influence, and protest to the higher powers to change the system, remembering that skilled physicians are not made to order, but that it takes many years of training and preparation to fit a man for the medical profession, while about three months of training will make a man ready for the firing line.

(Wife of a Country Doctor.)

[COMMENT.—We give space to the foregoing letter from a physician's wife principally because of the quotation from the *Wall Street Journal*. The tremendous amount of misinformation that has been circulated regarding doctors during the past two or three months would be amusing were it not for the fact that some of the misinformation causes worry and anxiety when it is not necessary. It applies not only to the number of deaths among physicians at the front in France, but also to the preparedness on the part of the medical profession to furnish its full quota of men for the Medical Reserve Corps and, on the other hand, to the impossibility of getting one tenth as many physicians for the Medical Reserve Corps as were needed. If our correspondent will notice page 1917 of THE JOURNAL for June 23 she will notice that Colonel Goodwin has stated that there have not been 2 per cent. of 60,000 deaths among physicians in the service. See also Current Comment this week as to the actual facts regarding the casualties on the Western front.—Ed.]

Promotions in the Reserve Corps

The following comment on promotions in the Medical Reserve Corps is taken from the *Army and Navy Register*:

Considerable interest has attached to the policy of the surgeon-general of the army in regard to the promotion of medical reservists who are on active duty at training camps and recruiting stations and other places. It has been generally determined that, after a reasonable period considered as equivalent to not less than ninety days, the claims of these officers to consideration for advancement might be entertained. No hard and fast rule has been adopted, however. Much will depend on circumstances, and pretty much everything will devolve on individual capacity and fitness. Least of all, will the employment of personal and political influence be of avail. That process of bringing officers to the attention of the authorities should not be used. It is certain to be more harmful than helpful in any individual case. Medical reservists at the training camps will probably be recommended for advancement by their commanding officers. Under such circumstances it will be a comparatively simple matter to pass on relative merits. Officers elsewhere stationed may, in some instances, find it advisable to make application for promotion; but it is expected that their senior officers will have the welfare of the corps in mind and will see to it that in due time the junior members, who are serving usefully, will be brought forward as qualified candidates for promotion. This statement is made from authoritative sources to supplement a shorter paragraph on the same subject published recently in these columns, which, as might be expected, attracted considerable attention and created a desire for further and more specific information on the subject of the promotion of the medical reservists.

A Medical Advisory Committee for the American Red Cross

In order to provide expert advice for the War Council of the American Red Cross in questions of sanitation and public health arising out of war conditions a medical advisory committee has been appointed as follows: Dr. Simon Flexner, director of the Rockefeller Institute, chairman; Dr. John W. Kerr, assistant surgeon-general, United States Public Health Service; Dr. Herman M. Biggs, director of the New York State Department of Health; Dr. William H. Welch, dean of the School of Hygiene, Johns Hopkins University; Dr. Frank Billings, professor of medicine, University of Chicago; Dr. M. J. Rosenau, professor of preventive medicine, Harvard University; Mr. Wickliffe Rose, director of the International Health Board; Dr. Victor C. Vaughan, professor of hygiene, University of Michigan; Dr. Charles V. Chapin, department of health, Providence, R. I.; Dr. Richard P. Strong, professor of tropical medicine, Harvard University; Dr. Richard M. Pearce, professor of research medicine, University of Pennsylvania.

Ex officio members: Col. Jefferson R. Kean, director-general, department of military relief, and Dr. T. W. Richards, assistant director-general.

A Tribute to the Doctor

The following editorial appeared in the *Peoria (Ill.) Journal*:

Twelve Chicago doctors enlisted recently for service which will probably take them to the European battlefields. According to the news reports, four of these doctors give up very large practices—and, as is generally known, a doctor's practice when once given up cannot be regained by the mere asking.

There is nothing especially unique in the announcement that twelve Chicago doctors enlisted for war service. Peoria doctors have done the same thing, and doctors in thousands of cities throughout the country have voluntarily given up more or less remunerative practices in order to offer their services to their country during war times. However, the enlistment of these thousands of doctors bears silent testimony of the rare traits which have characterized doctors since the very days of doctor pioneering.

In an address a few days ago, Henry P. Davison, chairman of the war council of the American Red Cross, paid the following tribute to the doctors: "The attitude of the doctors at this time is greatly gratifying. Unselfishness and patriotism distinguish them. The leaving of an established practice in order to do Red Cross work with practically no pay or in order to do field work at an insignificant salary surely puts the doctors down as men devoted to the best interests of the people and of their country."

Mr. Davison might just as well have gone further. Not only is the doctor who leaves for war duty an unselfish and useful man but he comes from a class which does as much service for humanity, perhaps, as any other class—in times of peace as well as war.

Here's to the doctor. If he makes big money he earns it. He never turns down a sick patient because that patient does not happen to have a bank book full of money. He works just as hard to relieve a poor man from suffering as he does to give relief to the millionaire. He knows the family woes and the family griefs—and he keeps them to himself. If he complains at being called from his bed at 3 o'clock in the morning, he doesn't carry his complaints to us.

Premedical and Medical Students in Officers' Training Camps

Representative Osborne has introduced a bill providing that medical and premedical students in attendance at national reserve officers' training camps shall be placed in medical schools to complete their medical studies, and thereafter serve in the rank for which they shall have qualified. The bill was referred to the Committee on Military Affairs.

Personal.—The following members of the Mercy Hospital staff, 1916-1917, have joined the Medical Reserve Corps of the U. S. Army: Drs. William R. McKenzie, Erwin E. Mayer, Bartus T. Baggott, Thomas K. Galvin, and Arthur F. Peterson.—Dr. Richard O'B. Shea of the staff has joined the Navy Medical Service.—Drs. Harry M. Stein, superintendent of the University Hospital, and Drs. Charles R. Edwards, William H. Toulson and John Evans have been commissioned first lieutenants in the Medical Reserve Corps. Drs. Toulson and Evans have already been assigned to duty.—Drs. Joseph L. McLaughlin and Charles W. Hoffman, of the staff of the Franklin Square Hospital, have received orders from Washington directing them to prepare to accompany the military forces to France. These two physicians volunteered their services to the government several weeks ago.

An Incident in the House of Commons

On June 7, Sir George Greenwood, in the House of Commons, asked the under secretary of war for England, the following questions: Whether a large number of American doctors had recently been sent, by arrangement with the British government, to treat British wounded soldiers in France; whether the American degrees of such doctors had been recognized for this purpose; whether he was aware that American osteopathic doctors held similar degrees and diplomas to those held by the doctors so sent to treat British wounded in France and were equally qualified to practice in the United States; and whether, in view of these facts, he would give permission to American osteopathic doctors, duly qualified in America, to attend to and treat British wounded in this country in cases where the patients might so desire. Mr. Macpherson wrote in reply: A large number of doctors commissioned in the army of the United States have been sent to Europe, and many of the most eminent practitioners in the United States are included. The American government has commissioned the officers sent, and it is not proposed to look for any other security that these officers are qualified for the duties assigned to them.

Courses for Assistant Naval Surgeons

Courses of instruction for medical graduates who have recently been appointed in the Medical Corps of the United States Navy are being given by prominent medical schools in Boston, New York, Philadelphia, Chicago and San Francisco. About twenty-four students are enrolled at each place. The course covers six weeks and will be repeated, if necessary, for another assignment of students. This course is an abridgment of that usually given at the United States Naval Medical School at Washington, D. C. The course in Chicago is given by instructors jointly of the Rush Medical College and the University of Illinois College of Medicine. Students are in attendance at classes six days of the week, from 8 a. m. to 1 p. m. In the afternoon they go to the Great Lakes Naval Training Station for drill. The subjects of the course are bacteriology, chemistry, clinical diagnosis, genito-urinary diseases, hygiene, ophthalmology, otology, parasitology, psychiatry, roentgenology, serology, surgery, tropical medicine, medical zoology and official duties in the medical department.

Medical Students and the Draft

Surgeon-General Gorgas authorizes the statement that medical students will not be exempted from the draft, but that they will be given conditional and limited furloughs to continue their medical studies.

Orders to the Officers of the Medical Corps

Capt. W. Cole Davis, M. C., to Wrightstown, N. Y., as camp sanitary officer.

Following officers, M. C., to places specified as camp sanitary officers: Major Charles C. Billingslea, Annapolis Junction, Md.; Capts. Ralph H. Goldwaite, Petersburg, Va.; William T. Cade, Little Rock, Ark.; Neal N. Wood, Battle Creek, Mich.; Edgar D. Craft, Des Moines, Iowa; Henry C. Michie, Jr., Rockford, Ill.; Luther R. Poust, Louisville, Ky.; Alvin W. Schoenleber, Yaphank, Long Island, and Kerwin W. Kinard, Chillicothe, Ohio.

Major Archibald G. Chittick, M. C., Indiana N. G., to Fort Benjamin Harrison for duty as instructor.

Major Frederick O. Waage, M. C., Pennsylvania N. G., to Fort Oglethorpe for duty as instructor.

Col. George E. Bushnell, M. C., to report in person to Surgeon General of the army for duty in his office.

Major Ralph S. Porter, M. C., from Texas to New York City; report to Brig. Gen. William L. Sibert prepared for extended field service.

Officers of the Medical Corps to report for examination: Majors Percy M. Ashburn, Henry S. Greenleaf, Chandler P. Robbins and Perry L. Boyer; Capts. William H. Thearle, Edward L. Napier and John R. McKnight; Majors Jay R. Shook, Ernest L. Ruffner and James F. Hall; Capts. Howard McC. Snyder, Condon C. McCornack, Joseph E. Bastion, Taylor E. Darby, Samuel S. Creighton, Sidney L. Chappell and Thomas H. Johnson; Majors William N. Bispham, Albert S. Bowen, Charles R. Reynolds, James L. Bevans and William W. Reno; Capts. William H. Richardson, Felix R. Hill, Thomas J. Flynn, John J. Reddy, Edward G. Huber, Clarence E. Fronk, Norman L. McDiarmid and William B. Borden.

So much of Par. 90, S. O. 133, June 9, 1917, War D., as relates to Major F. S. Marey, M. C., revoked.

Capt. Clarence E. Fonk, M. C., to duty at Fort Des Moines.

Lieut.-Col. Joseph T. Clarke, M. C., to Los Angeles for temporary duty.

Lieut.-Cols. Allen M. Smith and Joseph T. Clarke, M. C., to report to board at San Francisco for examination for promotion.

Lieut.-Col. Allen M. Smith, M. C., to Portland, Ore., for temporary duty.

Lieut.-Col. Thomas J. Kilpatrick, M. C., from Fort Oglethorpe.

The sick leave granted Major Robert B. Grubbs, M. C., is further extended two months.

Capt. William B. Meister, M. C., Los Angeles, to Letterman Hospital, Presidio, San Francisco, for treatment.

Capt. Charles W. Haverkamp, M. C., from West Point to Fort Oglethorpe to take charge of General Hospital.

Capt. Albert S. Bowen, M. C., now attached to Second Engineers, National Army, is assigned to permanent duty that regiment.

Medical Officers Ordered to Active Duty

ARIZONA

To report by telegraph to Commanding General, Southern Department, for duty, Lieut. A. A. McDaniel, Douglas.

ARKANSAS

So much of Par. 55, S. O. 121, May 25, 1917, War D., as relates to Lieut. William F. Ball, Batesville, revoked.

CALIFORNIA

To Fort McDowell, Lieut. Walter R. Scroggs, Richmond.

To report in person to Commanding General, Western Department, for duty, from Fort McDowell, Lieut. Henry Power, Palo Alto.

Par. 56, S. O. 141, June 19, 1917, War D., relating to Capt. John J. Kyle, Los Angeles, revoked.

Honorably discharged, Major Philip K. Gilman, San Francisco.

COLORADO

To Cornell Medical College, Capt. J. M. Steiner, Denver.

CONNECTICUT

To home, from active duty, Lieut. Charles E. Hyde, Southport.

DISTRICT OF COLUMBIA

To Fort Hamilton, Lieut. Arthur J. Hall, Washington.

To Walter Reed General Hospital, Ga., Lieut. Buckner N. Randolph, Washington.

GEORGIA

To Chicago, Capt. N. Pierce, Suwanee.

To Ft. McPherson, Ga., Lieut. William N. Adkins, Atlanta.

To Washington, D. C., Lieut. W. C. Brewer, Atlanta.

ILLINOIS

To Fort Benjamin Harrison, Lieut. Ralph H. Kuhns, Chicago.

To Washington, D. C., for instruction, Capt. H. H. Pillinger, Algenquin.

To Third Engineers, National Army, Lieut. Imas P. Rice, Oak Park.

INDIANA

To Chicago, Lieut. F. M. Whisler, Wabash.

To Fort Benjamin Harrison, Lieuts. Lee F. Hunt, Anderson; O. B. Norman, Bedford; Forrest L. Reese, Bicknell; Adrian E. Fauve, Ft. Wayne, and C. F. Bayer, Indianapolis.

To Rockefeller Institute for Medical Research, N. Y., for instruction in laboratory work, Lieut. U. G. Goodwin, Monticello.

Honorably discharged, Capt. William F. Clevenger, Indianapolis.

IOWA

To Fort Oglethorpe at Post Hospital, Capt. William H. Thomas, McGregor.

To Rockefeller Institute for Medical Research, N. Y., for instruction in laboratory work, Lieut. T. W. Kemmerer, Davenport.

KANSAS

To Fort Benjamin Harrison, Lieut. G. T. Johnson, Wamego.

LOUISIANA

To his home, Lieut. Charles L. Gauden, Elizabeth.

MARYLAND

To Baltimore, as instructor in roentgenology, Major Frederick H. Baetjer, Cantonville.

To Fort Oglethorpe, Lieut. Edward D. Ellis, Baltimore.

To Washington, D. C., Lieuts. Bartus Baggott, H. C. Bean, W. P. Dally, William Neill, Jr., S. D. Shannon and H. W. Sweeney, Baltimore.

To Sixth Engineers for duty, Lieut. Maynard J. Simmons, Indian Head.

Par. 17, S. O. 137, June 14, War D., relating to First Lieut. Maynard J. Simmons, Indiana Head, revoked.

MASSACHUSETTS

To Rockefeller Institute for Medical Research, N. Y., for instruction in laboratory work, Lieuts. D. J. MacPherson, Boston, and George L. Schadt, Springfield.

So much of Par. 27, S. O. 132, June 8, 1917, War D., as relates to Capt. A. W. Sellards, Boston, revoked.

MICHIGAN

To Washington, D. C., for instruction, Capt. Walter W. Manton, Lieuts. J. B. Seeley and H. A. Sullivan, Detroit.

So much of Par. 64, S. O. 141, June 19, 1917, War D., as relates to Capt. Walter W. Manton, Detroit, revoked.

So much of Par. 76, S. O. 132, June 8, War D., as relates to Lieut. C. E. Burt, Ithaca, revoked.

MINNESOTA

To Fort Oglethorpe for instruction, Lieut. H. L. Stickney, Rochester.
To Washington, Lieut. Stanley R. Maxeiner, Minneapolis.

MISSOURI

To Chicago, Lieut. C. K. Jones, Kingston.
To Fort Riley for instruction, Lieuts. Robert R. Glynn, Springfield, and Joseph C. Hynes, St. Louis.
To Washington for instruction, Lieuts. J. F. Hardesty, Edgar F. Schmitz, St. Louis, and James W. Rice, Kansas City.
To Second Engineers, National Army, Capt. Harry S. Crossen, St. Louis.

NEBRASKA

To Fort Riley, Lieut. Willis J. Redfield, Grand Island.

NEVADA

To Fort Riley, Lieut. Frank Tinges, Caliente.

NEW JERSEY

To Washington, D. C., for instruction, Lieut. H. M. Stein, Paterson.
To New York, to Rockefeller Institute for course medical research, Lieut. Frederic H. Thorne, Greystone Park.

NEW MEXICO

To Fort Bayard, to Army and Navy General Hospital, Capt. Ignatz D. Loewy, Silver City.

NEW HAMPSHIRE

To Fort Ethan Allen, Vt., Capt. Amos G. Straw, Manchester.
To Plattsburg, Capt. Lee C. Stillings, Surry.
Honorably discharged, Lieut. Ernest L. Huse, Meriden.

NEW YORK

To Fort Benjamin Harrison, Capt. Arthur M. Kane; Lieuts. Joseph Rosenfeld, Brooklyn; Harry P. Mencken, Long Island City; Winfield M. Hartshorn, Philip Van Ingen and John W. Warner, New York City.
To Fort Hamilton, Lieut. Ernest A. Campbell, New York City.
To Fort Niagara, Lieuts. H. L. St. John, Rochester; F. W. McSorley, Salem.
To Fort Oglethorpe, Major John T. Sprague, St. George, and Lieuts. Ernest L. Hicks, Thomas F. Lancer, New York City; R. M. Vose, Ithaca.
To New York City, Capt. Julius C. Bierwith, Long Beach, L. I., N. Y.
To Plattsburg, Lieut. H. A. Benson, Kings Park.
To Rockefeller Institute for Medical Research, N. Y., for instruction in laboratory work, Capt. Howard L. Van Winkle, Albany; Lieuts. W. L. Aycock, New York City, and S. H. Curtis, Troy.
To Fort Wadsworth, Lieut. Frederic H. Coerr, New York City.
To Washington for instruction, Capt. Alfred H. Thomas, Staten Island; Lieuts. R. B. Rhett, Brooklyn, and Morris K. Smith, New York City.
With Sixth Engineers, Lieuts. Robert E. Buckley and Russell La Fayette Cecil, New York City.
So much of Par. 83, S. O. 136, June 13, 1917, War D., as relates to Lieut. J. J. Steinfelder, New York City, revoked.
So much of Par. 83, S. O. 136, June 13, 1917, War D., as relates to Lieut. N. E. Titus, New York City, revoked.
So much of Par. 61, S. O. 124, May 29, War D., as relates to Lieut. William E. Youland, Jr., Albany, revoked.
To report by telegraph to the Adjutant General of Army for further orders, Lieut. Samuel A. Munford, Ithaca.

OHIO

To Fort Niagara, N. Y., Lieut. A. R. Warner, Cleveland.
To New York, to Rockefeller Institute for course in medical research, Lieut. Harry Wahl, Cleveland.
To Washington, D. C., Capt. Philip D. Wilson, Columbus.

OREGON

To Washington, D. C., to the Army Medical School, Lieut. Earl V. Morrow, Portland.
To report by telegraph to Commanding General, Western Department, Lieut. Fred A. Lieuallen, Portland.
Honorably discharged, Lieut. J. A. Pettit, Portland.

PENNSYLVANIA

To Allentown, Lieuts. John P. Bethel, Philadelphia, and Elmer R. Decker, Selinsgrove.
To Fort Oglethorpe, Capt. H. Fox; Lieuts. Thomas I. O'Drain, Samuel R. Skillern, Jr., and Charles M. Strotz, Philadelphia.
To Gettysburg, Lieuts. Clinton A. Kane and R. A. Schless, Philadelphia.
To New York, for instruction in medical research at Rockefeller Institute, Lieut. C. B. Reitz, Allentown.
To Washington, D. C., for instruction, Lieuts. John W. Fredette, Pittsburgh, and James E. McDowell, Philadelphia.
To Ninth Engineers, National Army, Lieut. Charles J. Cavanaugh, Philadelphia.
Honorably discharged, Lieut. John H. R. Hemminger, Somerset.
Resignation of Lieut. William M. Workman, Mt. Joy, accepted.

RHODE ISLAND

To Boston, with Fourth Engineers, National Army, Lieut. John S. Hodgson, Esmond.

TENNESSEE

To Fort Oglethorpe, Lieuts. George E. Horton, Wartrace, and Albert T. Ingalls, Chattanooga.

UTAH

To Fort Douglas, Capt. Harry N. Mayo, Salt Lake City.
So much of Par. 83, S. O. 136, June 13, 1917, War D., as relates to Lieut. H. T. Wickert, Huntsville, is revoked.

VERMONT

Par. 51, S. O. 136, June 13, 1917, War D., relating to Lieut. Henry R. Weston, Windsor, is revoked.

VIRGINIA

To Fort Oglethorpe for instruction, Lieut. R. B. Shackelford, The Plains.
To New York, to Rockefeller Institute for course in medical research, Lieut. B. L. Crawford, Richmond.

WISCONSIN

To Washington, D. C., for instruction, Lieut. T. D. Smith, Neenah.

WYOMING

To Yellowstone National Park, Lieut. Frederick H. Sparrenberger, Fort Yellowstone.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CONNECTICUT

University Receives Money.—Yale University has received pledges to the amount of \$250,000 for the endowment fund of the School of Medicine, and also \$260,000 for the equipment of the Yale Mobile Hospital Unit.

Completion of Memorial Laboratory.—The Brady Memorial Laboratory, which was presented to Yale University as a memorial to the late Anthony N. Brady, has been completed at a cost, with the equipment, of approximately \$175,000. It is situated on the grounds of the New Haven Hospital and will house the departments of pathology, bacteriology, pathological chemistry, obstetrics and gynecology and medicine.

ILLINOIS

Fund for Evanston Hospital.—The campaign to raise \$150,000 for the Evanston Hospital, contingent on which Mr. James A. Patten's gift of a similar amount to the hospital was made, will commence July 1.

Safeguarding Interests of Physicians During Military Service.—The Adams County Medical Society has taken steps to provide for the families of members who are called to the front and also to secure the practices of these physicians until their return to civil practice.

Personal.—Dr. William M. Hanna was elected medical director of the Illinois Encampment of the Grand Army of the Republic at its meeting in Bloomington, June 8.—Dr. Wilbur E. Post is a member of the commission which has left for Russia, under the chairmanship of Dr. Frank Billings.

Lecture on Poliomyelitis.—Dr. Ludvig Hektoen, head of the department of pathology and bacteriology in the University of Chicago, and director of the Memorial Institute for Infectious Diseases, delivered a lecture on poliomyelitis at the University of Illinois College of Medicine, Chicago, June 28.

A New Method of Working the Doctor.—A physician of Galesburg, who asks that his name be not mentioned, writes:

A man called at the office giving his age at 62 years, with sandy mustache, 6 feet tall, blue serge suit, soft shirt and collar, fibrous tumor on right side of lower jaw, rectal fistula, opening about 2 inches to left of anus. Gave his home as Urbana, Ill. He made all arrangements for operation, engaged his room at hospital and a special nurse to care for him, but did not want to go to the hospital until he heard from his brother, who was to send him a check to defray expenses and also was to be present at operation. The second day he reported to me that he had received a letter from his brother who would be unable to be present at the time of operation. He gave me his brother's address and told me to wire his brother after the operation. He also presented me a check for \$200 which his brother had sent him and asked to deposit it in the bank to my credit. I took him to the bank and he deposited \$150 to my credit, taking \$50 in cash, which he said he wanted to buy handkerchiefs, bath robe and night gowns for use at the hospital. He told me later that his niece would

probably be present. The result is, the nurse reported at the hospital but the old man never appeared at the hospital. He simply got the money and left town. Telephone communications with Urbana reveals no such person.

INDIANA

Safeguarding Interests of Physicians During Military Service.—The Indianapolis Medical Society has adopted measures for safeguarding the personal interests of members who are called into active military service.

Interns Win Strike.—The staff of interns at the Indianapolis Hospital which went on strike, June 15, because a colored physician had been named as intern at the hospital, returned to their duties at the hospital the next day on being notified that the intern had been dismissed.

Health Board Changes.—At the annual meeting of the Indianapolis City Board of Health, Dr. Gustavus B. Jackson was reelected president; Dr. Thomas B. Eastman, vice president, and Dr. Herman G. Morgan, secretary.—Dr. Edouard J. Dubois, city bacteriologist, was given an indefinite leave of absence to cover his term of service as camp bacteriologist at Fort Benjamin Harrison.

New District Officers.—Ninth District Medical Association at Noblesville, May 24: president, Dr. Fred A. Dennis, Crawfordsville; vice presidents, Drs. Omer D. Hutto, Kokomo, and Alvin R. Kerr, Melott; secretary-treasurer, Dr. Herman A. Beck, Lebanon.—Fourth District Medical Association at Greensburg, May 22: president, Dr. Elmer U. Wood, Columbus.

Physician Wins Verdict.—In the case of Dr. William A. Oyler, Ober, against the Eastman Hospital and Dr. J. Rilus Eastman, Indianapolis, in which \$10,000 damages was asked on account of alleged neglect in an operation for appendicitis on the 2-year old son of the plaintiff. Dr. Eastman introduced expert evidence that the operation had been scientifically, intelligently and skilfully performed and the jury returned a verdict in his favor.

Personal.—Dr. Alexander P. Gammack, South Bend, who has been serving with the Royal Army Medical Corps in France, has received the "Croix de Guerre."—Dr. Paul F. Martin has returned to Indianapolis after a year in the War Hospital, Pardubitz, Bohemia, and the American Red Cross Hospital, Vienna.—Dr. William Harrison, Kokomo, was operated on for appendicitis at the Good Samaritan Hospital, June 26, and is reported to be doing well.—Dr. Harry E. Sharrer, Hammond, has been appointed chief surgeon for the New York Central Lines for the Chicago district.—Dr. Jehu Z. Powell, Logansport, is under treatment for gallstone disease in St. Vincent's Hospital, Indianapolis.—Dr. Jonathan E. Canada, Fort Wayne, has been appointed assistant medical examiner for the Norfolk and Western system.—Dr. Eugene B. Mumford has been appointed director and Dr. Homer W. Cox, physician in charge of the Summer Mission for Sick Children at Fairview Settlement, Indianapolis, which opened to receive patients, July 2.

IOWA

Safeguarding Interests of Physicians During Military Service.—The physicians of Des Moines County have taken action to protect the interests of physicians who are called to the colors.

KANSAS

Society Provides for Military Members.—Kingman County Medical Society has taken action to provide for the interest of members commissioned in the Medical Officers Reserve Corps and called into active duty.

State Board Election.—At the annual meeting of the State Board of Medical Examiners in Topeka, June 19, Dr. George Morris Gray, Kansas City, was reelected president and Dr. Henry A. Dykes, Lebanon, was reelected secretary. Twenty graduates of the Kansas medical schools took the examination for license to practice.

Meeting of Health Officers.—At the annual meeting of the Kansas State Association of Public Health Officers, held in Kansas City, Mo., the following officers were elected: president, Dr. Burton K. Kilbourne, Minneapolis; vice president, Dr. Harry L. Aldrich, Caney; and secretary-treasurer, Dr. J. Carroll Montgomery, Manhattan.

Decatur-Norton Officers Show Patriotism.—At the meeting of the Decatur-Norton Medical Society, resolutions were adopted commending for their patriotism, physicians who have entered the military service and agreeing to assist in relieving

the financial burdens of those so called by attending to the practice of the absent physicians, and on their return giving back their practice, and deploring and discouraging the attempt of physicians to locate permanently in a community temporarily vacated by a physician who has gone to the front.

MARYLAND

New Base Hospital.—The University of Maryland base hospital unit is rapidly assuming shape. It will be a duplicate of the Johns Hopkins unit, with twenty-six doctors, sixty-five nurses and seventy-five enlisted men. Dr. Frank Martin has been commissioned major; Dr. Archibald C. Harrison, major; Dr. Arthur M. Shipley and Dr. Cary B. Gamble, captains, and Dr. G. Perry Ross, first lieutenant. The organization is in charge of Dean James M. H. Rowland of the University of Maryland.

Transfer of Quarantine Deferred.—The Baltimore city authorities are reconsidering the transfer of the Quarantine Station to the United States Public Health Service. Reports that New York has decided to retain control of its quarantine station for the purpose of maintaining an open port are said to have caused the postponement of the transfer indefinitely. The Public Health Service was scheduled to take charge this week, the federal government having agreed to pay the city \$177,000 for the buildings, grounds, boats and other equipment. Municipal officials now fear that federal control of the station would shut Baltimore out of what they call "an open port" and thereby seriously cripple its business. The agreement to turn the station over to the Public Health Service was contingent on federal control of the stations in New York, Philadelphia, Boston, Norfolk and elsewhere on the Atlantic seaboard.

MICHIGAN

Safeguarding Interests of Physicians During Military Service.—The Wayne County Medical Society will post in its club house a list of its members who go to war. It has also constituted a committee to care for the dependents of these physicians.

MINNESOTA

Safeguarding Interests of Physicians During Military Service.—The Hennepin County Medical Society has appointed a committee to look after the interests of the younger physicians who go to war. It also adopted a plan to provide medical relief for families of men in service. This plan will be carried into effect in cooperation with the American Red Cross. The Nicollet-LeSueur County Medical Society has adopted a similar measure.

MISSISSIPPI

Safeguarding Interests of Physicians During Military Service.—The Forrest County Medical Society has taken action to safeguard the interests of members who enter the army.

MISSOURI

Safeguarding Interests of Physicians During Military Service.—The Missouri State Medical Association has constituted a committee to formulate plans for caring for the practice of physicians called to service in the army and navy, and has asked the cooperation of all practitioners in the state. Component county societies will be asked to approve these plans.

NEVADA

Resolutions to Abrogate Patent on Salvarsan.—At a recent meeting of the Washoe County Medical Society in Reno, resolutions were adopted advocating the abrogation of the patents on salvarsan similar to those adopted by the Chicago and St. Louis medical societies.

Personal.—Dr. M. Rollin Walker is taking some special roentgenologic work in the Chicago clinics.—Dr. Henry Ostroff, Reno, has been appointed district surgeon for the Southern Pacific system, to succeed Dr. William H. Hood, Reno, resigned after more than twenty years' service.

NEW HAMPSHIRE

Safeguarding Interests of Physicians During Military Service.—The Belknap and Grafton County Medical societies have arranged to conserve the practices of members called into the medical service of the government.

NEW MEXICO

Safeguarding Interests of Physicians During Military Service.—The Santa Fe County Medical Society has taken action to protect the interests of members who volunteer for active service during the war.

NEW YORK

Sanatorium Plans Approved.—The state board of health has approved the plans and specifications for the new tuberculosis hospital for Rensselaer County. Bids were opened, July 2.

Convalescent Home Opened.—The Jewish Home for Convalescents at Grandview-on-Hudson was opened, June 17. The building cost \$100,000 and has accommodations for 300 patients. It is supported by the Federation of Roumanian Jews.

War Cross for Schenectady Physician.—Dr. Charles Briggs, Schenectady, attached to the Norton-Harjes Ambulance Unit of the American Red Cross has received the war cross for courage and devotion; the cross being bestowed at a special ceremony held at the front by General Dauvin.

State Law May Bar Liquor Advertisements.—Under the Hill-Wheeler local option law recently signed by Governor Whitman, newspapers containing liquor advertisements cannot be circulated through the mails in the 500 "bone dry" towns in this state, nor in cities that may go dry under this law. William H. Anderson, state superintendent of the Anti-Saloon League, has written to the postmaster-general that this is the construction which must be placed on Section 30 of the Raines Liquor Tax Law.

Safeguarding Interests of Physicians During Military Service.—The Medical Society of the State of New York has adopted a plan for aiding members who enter the medical services of the country.—The Kings County Medical Society, the physicians of Rochester and the Wyoming County Medical societies have approved this action of the state organization.—The Albany County Medical Society has taken a like action.—About 300 medical men of Buffalo adopted resolutions looking toward conserving the practices of physicians who are called to the colors.

Civil Service Examinations.—The state civil service commission announces that the examinations for the following positions in the state, county and village service will be held, July 28: assistant chemist, public service commission, first district, salary \$1,200 to \$1,500, men only, graduate chemists with two years' practical experience; sanitary engineer, state architect's office, salary \$1,800 to \$2,500, four years' satisfactory experience in sanitary engineering; physiologic chemist, state department of health, salary \$1,500, at least three years' practical experience in physiologic and biologic chemistry. Applications should be addressed to the State Civil Service Commission, Albany, and should be received at the office of the commission on or before July 18.

New York City

Ambulance Donated.—The National Association of Credit Men has voted to send two field ambulances to France, as memorials to two of its deceased presidents, James Graham Cannon of New York and John Field of Philadelphia. Funds have been appropriated to maintain the ambulances for six months.

Memorial to Dr. Bangs.—A bronze memorial tablet to the memory of Dr. L. Bolton Bangs which has been placed in the foyer of the New York Post-Graduate Medical School and Hospital was unveiled by the board of directors and faculty of that institution, May 29. Addresses were made by Drs. Frederic E. Sondern, Clarence C. Rice and James Pedersen and Bishop Courtney.

Columbia War Hospital.—Lieutenant-Colonel Schreiner of the Medical Corps has been sent from Washington, D. C., to inspect the building of the Columbia War Hospital, which is now nearing completion and which is designed for use as a receiving and forwarding hospital for the army medical service. Colonel Schreiner favors the taking over of the hospital by the government.

Personal.—Dr. Moses Kahn, who has been absent for six years, during which time he has been devoting himself to the study of tuberculosis, has resumed his practice in Brooklyn.—Dr. Marcus B. Heyman has been appointed medical superintendent of the Manhattan State Hospital, Ward's Island.—Dr. Jacob L. Maybaum has been appointed instructor in laryngology in the New York Post-Graduate Hospital.

New York's Red Cross Fund.—When the city officially closed the Red Cross campaign on June 26, it announced a total of \$37,847,893, a little more than \$2,000,000 short of the allotted \$40,000,000. The shortage is being gradually decreased and it is believed will in a short time be made up. The New York Chapter of the Red Cross has started a campaign among the city's employees, numbering 160,000, to raise one million dollars.

Award of the Seaman Gold Medal.—The Seaman gold medal, given by Dr. Louis Livingston Seaman, and annually awarded by the American Museum of Safety for progress and achievement in the promotion of hygiene and the mitigation of disease, has been conferred on the Julius King Optical Company for scientific research and progress achieved in overcoming the harmful effects of ultra-violet and infra-red rays of light in connection with arc-welding and other industrial processes at very high temperatures.

Health Department Abandons Diazo Test.—The diagnostic laboratory of the department of health announces that last year 1,700 specimens of urine were examined for the diazo reaction. Of this number less than 250 gave a positive reaction. As there is great doubt expressed as to whether this gave a real assistance to the physician in arriving at a diagnosis, the department feels that the time consumed in this work might have been better employed. It has therefore decided to discontinue the examination of specimens for the diazo reaction.

Again a Safe and Sane Fourth of July.—New York has this year followed the policy pursued for some years of endeavoring to eliminate Fourth of July accidents. The celebrations included patriotic meetings, addresses, music in the parks and a rally in the city college stadium. In 1903 there were 415 persons in the United States that developed tetanus following Fourth of July pistol and firecracker wounds. In 1908 there were seventy-six such cases with fifty-five deaths, while last year there was only one case recorded and this occurred in New York.

Newspaper Bans Patent Medicine Advertisements.—The *Harlem Local* of New York has written a letter to the health department stating in strong terms the stand it has taken against patent medicine advertisements. It writes "We shall continue to refuse to accept advertising not only of scurrilous patent medicine tradesmen, but also of liquor and tobacco manufacturers. We have our own convictions as to the uses and abuses of these wasteful and nerve eating drugs and do not propose to be a party to their exploitation, directly or indirectly."

Shortage of Nurses Confronts City.—It is reported that the shortage of professional nurses in New York has assumed such serious proportions as to alarm the committee on nursing of the mayor's committee on national defense. It is stated that the Red Cross alone has been draining the resources of the country at the rate of 200 nurses a month and this did not include the nurses attached to the base hospital units. In order to ascertain just how serious this shortage is, the committee is taking a census of all the nursing resources of the city with the view of establishing a bureau through which effective readjustments of trained and volunteer service can be made.

To Train a Reserve Corps in Child Welfare Work.—The Bureau of Child Hygiene of the department of health is prepared to give a series of short courses in practical methods of infant and child feeding and care. These courses are to be open to many women who desire to have a working knowledge of this type of preventive health work. The courses will be given in the fifty-nine baby health stations of the department of health. The courses will be of six weeks' duration and are open to women between the ages of 21 and 45. They are intended to offer a practical way to share in the duty of conservation of child life and in the prevention of the high infant mortality and morbidity which European nations at war have experienced. The department of health intimates that it may possibly need assistance of this nature in the future and wishes to have trained women available in emergency.

Patent Medicine Registration Proceedings.—The long delayed test case involving the validity from the constitutional standpoint of that section of the Sanitary Code which requires the registration of patent or proprietary medicines in the department of health, has been submitted to the appellate division of the supreme court of the first department for decision. This case arose out of injunction proceedings instituted by Messrs. H. Planten and Son, Charles W. Crit-

tenton and Fougere and Company. While these proceedings have been pending the department of health has not enforced the provisions of this section. If the court decides that the enactment of the section is within the powers and validity vested in the board of health, and is a reasonable exercise of such power, and therefore a constitutional and valid provision of law, the department will be in a position to start proceedings to enforce compliance with the terms. Although the department has complied with its agreement in not compelling registration pending this litigation, more than 3,763 preparations have been voluntarily registered with the department of health, on application made by 1,050 persons or firms.

OHIO

Safeguarding Interests of Physicians During Military Service.—The Ohio State Medical Association adopted a resolution at its Springfield meeting recommending that component county societies take action to care for the practices of physicians commissioned in the Medical Reserve Corps. —The Academy of Medicine of Toledo and Lucas County has established a patriotic fund to care for the families of physicians absent from their practices while in active military service. Each physician who does not enlist will be taxed 2 per cent. of his income, payable monthly, for this purpose.

OREGON

Safeguarding Interests of Physicians During Military Service.—The Portland City and County Medical Society has inaugurated a voluntary subscription to provide for the needs of the families of members who offer their services to the country. It is expected that the fund will amount to \$25,000 or \$30,000 within a year.

PENNSYLVANIA

Safeguarding Interests of Physicians During Military Service.—The Philadelphia County Medical Society has arranged to care for the practices of members called to the colors during the absence of these physicians, 35 per cent. of the fees being transmitted to the account of these absent members. —Allegheny County has taken similar action.

Philadelphia

Older Physicians Urged to Serve in Hospitals.—Physicians too old to serve in the military medical and surgical corps should organize and fill the vacancies in the hospitals made by the departure of young physicians for the front, according to Dr. Hobart A. Hare, surgeon of the Coast Defense Reserves, who spoke before the emergency session of senior medical men for service in war time, in the College of Physicians.

City Gives More than a Million for Medico-Chirurgical Buildings.—The city will pay \$1,036,000 for the Medico-Chirurgical College and Hospital, Cherry and Eighteenth streets, the buildings to be torn down and the land used for the parkway. This sum was agreed on by the city, the members of the Medico-Chi and University of Pennsylvania faculties. The buildings used for hospital purposes will remain standing during the war according to arrangements made by the mayor and the navy department, which will assume direction of the hospital.

Personals.—Dr. George Woodward has been elected president of the Philadelphia Art Alliance. —Dr. Robert Goodman has been made assistant medical instructor of the bureau of health. —Dr. Edward E. Montgomery was elected president of the Philadelphia branch of the national wartime prohibition committee at its recent meeting. The other officers are: executive secretary, Horace Geiger; treasurer, William R. Nicholson; vice presidents, Bishop Rhineland, Edwin Madison Taylor, Dr. Ernest LaPlace, Prof. William E. Lingelbach, Dr. Judson Daland, Louis J. Kolb, Dr. Leo S. Rowe; executive committee, Dr. Edwin H. Parkin, Dr. Edward E. Montgomery, Dr. Rufus W. Miller, Albert Cross, Homer W. Tope.

Medical Institutions.—The Methodist Episcopal Hospital having been chosen by the United States government as a navy base hospital, the board of managers of the institution has decided to increase its facilities. Plans have been prepared by the architect for a large addition and the remodeling of the fourth floor of the present administration building. The addition will be four stories high with a basement 120 by 76 feet of fire proof construction with exterior walls of brick trimmed with terra cotta. The basement will be devoted to storage and locker rooms for the clothing and effects of the incoming patients. The entire first floor will

contain a complete Roentgen-ray laboratory department. The second floor will be public and semiprivate wards and maternity cases will occupy the third floor. —At a recent meeting of the trustees of the German Hospital it was decided to change the name of the institution to the "Lankenau Hospital," in order to perpetuate the memory of John D. Lankenau who left his entire fortune to the German Hospital and the Mary Drexel Home. His estate was valued at \$1,500,000. The present year is the one hundredth anniversary of Mr. Lankenau's birth and the board deemed it a fitting time to apply his name to the institution.

RHODE ISLAND

State Board of Health Changes.—Dr. Byron U. Richards, Pawtucket, became secretary of the state board of health, July 1, succeeding Dr. Gardner T. Swarts, Providence. Dr. Swarts has resumed practice in Providence.

TENNESSEE

Safeguarding Interests of Physicians During Military Service.—Nashville physicians have agreed to cooperate in caring for the interests of physicians who go with the Medical Corps of the Army.

VIRGINIA

Tuberculosis Clinics.—Dr. B. Lawrence Taliaferro of the Catawba Sanatorium, conducted a series of clinics in Norfolk, June 25 to 27, under the auspices of the Virginia Anti-Tuberculosis Association.

Personal.—Dr. Lazarus Karp, Richmond, has been elected state representative to the American Jewish Congress. —Dr. Charles J. Andrews has been elected president of the Norfolk branch of the Medical Hygiene Society. —Dr. Lucien Lofton has been elected medical inspector of the Richmond Health Board.

New Hospital Buildings.—Citizens of Richmond have subscribed \$225,000 for the erection of a hospital for colored patients, and Major James H. Dooley has given \$40,000 for the erection of a hospital for contagious diseases. The buildings, now under construction, are to be a part of the present Memorial Hospital, which is the teaching hospital of the Medical College of Virginia.

WASHINGTON

Safeguarding Interests of Physicians During Military Service.—The Washington State Medical Association has recommended to its component societies for their adoption a plan for assisting families of physicians who go to war.

Medical Contracts Filed.—Up to June 14 more than 1,000 contracts had been received by the first aid board of the state in accordance with the provisions of the new law, which became effective, June 7, under which a new medical aid board was created, this board being allowed to make business arrangements either with contract doctors or with individual physicians. Employees in hazardous industries are assured payment for the first aid treatment following an injury, as well as compensation under the industrial insurance act.

New State Officers.—The twenty-eighth annual meeting of the Washington State Medical Association was held in Spokane, June 20 to 22, and the following officers were elected: president, Dr. C. Stewart Wilson, Tacoma; vice presidents, Drs. Wilmot D. Reed, Tacoma, and Russell T. Congdon, Wenatchee; delegate to the American Medical Association, Dr. Henry H. McCarthy, Spokane; alternate, Dr. Frederick Epplen, Spokane, and trustees, first district, Drs. Hiram E. Cleveland, Burlington, and John W. Hunt, Seattle, and second district, Drs. Herman P. Marshall, Spokane, and Cornelius J. Lynch, North Yakima. Tacoma was selected as the next place of meeting.

CANADA

Canadian Soldiers Invalided.—Returns just received in Canada from the Director of Medical Services in London, England, show that on June 1 the number of Canadian soldiers invalided in the United Kingdom fell from 22,562 to 22,482, while the number of Canadians in non-Canadian institutions fell by 635.

Hospital News.—The new military hospital at Queen's University, Kingston, Ont., is now ready to receive two hundred returned convalescents. —At a meeting of the governors of Hamilton General Hospital, June 27, the offer of Colonel MacInnes to furnish a ward in the new hospital in honor of the memory of his father, the late Senator MacInnes,

and of Dr. Albert Pain and Mrs. Pain, who went down with the *Titanic*, was accepted.

Personal.—Capt. Archibald Naismith, M.D., son of Dr. Archibald D. Naismith, Staffordville, Ont., who has been two years in France with the 101st Field Ambulance, has been awarded the military cross.—The Hon. Dr. Robert S. Thornton, Deloraine, minister of education, Manitoba, was in Toronto the past week and addressed the Ontario Medical Council on one uniform medical examination for all Canada for license to practice.

Ontario Medical Commission.—The counsel for the Christian Scientists argued before the Ontario Medical Commission on June 28 that a person under the British law has the right to any treatment he desires when sick, or none at all. As far as the Ontario Medical Act was concerned, a man had the right to die if he wanted to, although the criminal code would bear on that phase. He further argued that the law allows a man the liberty of saying whether he will be attended by a regular practitioner or not. The only question under the act is that of fraud. Under the laws of Ontario, he said, Christian Scientists are not recognized any more than any other religion or sect. "It is doubtful whether in a strict legal sense, Ontario is a Christian province at all." Counsel for the different schools of healing gave information as to court decisions bearing on chiropractors, osteopaths, Christian Scientists and other practitioners in the province. It was contended that there have practically been no legal decisions which throw any light on their legal status in Ontario. Mr. H. S. Osler, K. C., counsel for the College of Physicians and Surgeons, said that if the argument was reduced to a question of fraud, then the public should be protected against fakirs and humbugs.

Ontario Medical Council.—The Ontario Medical Council met in Toronto during the week ending June 30 under the presidency of Dr. Edmund E. King, Toronto. The following officers were elected for the ensuing year: president, Dr. William E. Crain, Crupler, Ont.; vice president, Dr. Robert Ferguson, London, Ont.; registrar-treasurer, Dr. H. Wilberforce Aikins, Toronto (reelected).—Among questions discussed by the council was that of disciplining the practitioner in Ottawa, Ont., in a child substitution case of interest to Chicago and Ontario physicians. The doctor in question was found guilty of disgraceful conduct in a professional respect and his name ordered struck off the register of the college.—The federal government will be memorialized to take steps to prevent the sale of all patent or proprietary medicines containing alcohol content in excess of 2.5 per cent. It was alleged that one widely advertised patent medicine was a wine which contains 17 per cent. of alcohol and that it is of little medical value.—Newspapers were criticized and a resolution was passed calling the attention to certain patent medicine advertisements, as they were a violation of the Ontario Temperance Act.—A committee reported recommending that graduates of a number of American colleges be allowed to practice in Ontario without attending school for one year, provided they pass the examinations. A similar arrangement, of course, must be agreed to by the American states affected.—Before the next meeting a committee will gather information on the alarming menace of venereal diseases.—It was decided that a special committee should take a military census of the medical profession in Ontario. It is felt that although a large number of Ontario physicians are already on active service, a great deal more can still be done, as in some places a medical man might be able to do the work of his confrère and thereby relieve one man to go to the front. It is understood that a similar census will be taken in all the provinces of Canada, and the report when completed be placed in the hands of the Dominion government.—A resolution was passed urging that there should be only one qualifying examination in medicine for the whole Dominion of Canada, instead of one for each province as at present.

GENERAL

Meningitis in Naval Camp.—Spinal meningitis is reported to have broken out in Camp Dewey, Kitemaug, where nearly 200 junior naval reserves are encamped. Two cases have been reported and the camp is under quarantine.

Ophthalmic Examinations.—The American Board for Ophthalmic Examinations announces that the next examination will be held at Pittsburgh, October 30. Those who desire to take the examination and be certified by the board should secure application blanks and further information from the secretary, Dr. Frank C. Todd, 506 Donaldson Building, Minneapolis. Application should be made before August 1.

Sanatoriums Hold Meeting.—The fifth annual meeting of the Southeastern Sanitarium Association was held in Greenville, S. C., May 9 and 10 and the following officers were elected: president, M. M. McCord of North Carolina; vice presidents, Dr. Richard C. Smith, Newport, Tenn.; C. B. Reynolds of North Carolina; Francis A. Coward, Columbia, S. C., and A. B. Wood of Georgia, and secretary-treasurer, Clarence F. Smith, Greenville, S. C.

Change of Meeting Place.—The annual meeting of the National Medical Association of Colored Physicians, Dentists, Pharmacists and Nurses, which was scheduled for Memphis, Tenn., in August, has been changed, and will now be held in Philadelphia, August 28 to 30. The change has been made in response to an invitation extended jointly by the Philadelphia Academy of Medicine and Allied Sciences and the Northeastern Medical Association.

Personal.—Surgeon Thurlow W. Reed, Norfolk, Va., on duty at the Naval Station, Cavite, P. I., who was operated on for appendicitis at the United States Naval Hospital, Canacao, P. I., May 4, has recovered and returned to duty.—Dr. Harrison J. Hunt, surgeon of the Crocker Land Expedition, which went to the Arctics in 1913, has arrived in New York and reports that he left the expedition at North-Star Bay on December 18. Dr. Hunt made a sledge journey over the ice to Melville Bay.

Bequests and Donations.—The following bequests and donations have recently been announced:

Maimonides Hospital, Chicago, \$20,000, partial proceeds of a bazaar held June 18-25.

Montreal General Hospital, \$500,000; Faculty of Medicine of McGill University, \$500,000, and Montreal Maternity Hospital, \$100,000, by the will of Sir Samuel McDonald, Montreal.

Southampton, L. I., N. Y., Hospital, \$90,000, by the will of Mrs. May Rock, Bayport, L. I.

German Hospital, Brooklyn, \$5,000; Jewish Hospital, Brooklyn, \$2,000, by the will of Marie Dade.

Albany Alumni Elect.—The forty-fourth annual meeting of the Alumni Association of Albany Medical College was held in Albany, June 8, and the following officers were elected: president, Dr. Robert B. Lamb, Beacon, N. Y.; vice presidents, Drs. Daniel C. Case, Slingerlands, N. Y.; C. S. Pratt, Watertown, N. Y.; Frederick C. Leonard, Carbondale, Pa.; Tiffany Lawyer, Albany, N. Y., and Norman Baldwin, Oneonta, N. Y.; recording secretary, Dr. Jesse M. Mosher, Albany, N. Y.; corresponding secretary, Dr. Clinton B. Hawn, Albany, N. Y.; financial secretary, Dr. Robert Babcock, Albany, N. Y., and historian, Dr. Arthur J. Bedell, Albany, N. Y.

New England Alumni of Maryland Dine.—The New England Alumni Association of Maryland University School of Medicine, Baltimore, held its eighth annual reunion and banquet in Boston, June 12, and elected the following officers: president, Dr. George C. Parcher, Saugus, Mass.; vice presidents, Maine, Dr. Lawrence E. Willard, Saco; New Hampshire, Dr. Fred von Tobel, Lebanon; Vermont, Dr. Frank C. Angell, Randolph; Massachusetts, Dr. Richard H. Morris, Everett; Rhode Island, Dr. Frederick R. Devine, Riverside, and Connecticut, Dr. Timothy M. Ryan, Torrington, and secretary-treasurer, Dr. Abraham K. Yoosuf, Worcester, Mass.

Civil Service Examination.—The United States Civil Service Commission announces an open competitive examination for physicians, for men only, to fill present and future vacancies in the position of physicians in the Indian Service, with salaries ranging from \$1,000 to \$12,000 a year; in the Panama Canal Service, with salaries of \$1,800 a year; as acting assistant surgeon in the Public Health Service, with salaries from \$480 to \$1,800 a year; and as surgeon and assistant surgeon in the Coast and Geodetic Survey, with salaries of \$1,200 a year with 20 per cent. additional while serving in the Philippine Islands. Applicants must have graduated from a medical school of recognized standing or must furnish proof of actual graduation within six months from date of graduation. They must have reached their twenty-first birthday on the date of examination, but eligibles more than 40 years of age on the date of examination will not be considered except for filling vacancies in the positions of acting assistant surgeons in the Public Health Service and eligibles who are less than 22 or more than 30 years of age on the date of examination will not be considered for positions in the Panama Canal Service. Application should be made for Form No. 1312, stating the title of examination desired, to the Civil Service Commission, Washington, D. C.; or to local civil service boards.

PARIS LETTER

PARIS, June 7, 1917.

The War

TREATMENT OF COMPLICATED FRACTURES OF THE THIGH IN THE
SURGICAL FORMATIONS AT THE FRONT DURING
PERIODS OF GREAT ACTIVITY

G. Lardennois, at the meeting of the medical corps of the Third Army, called attention to this subject and to the impossibility of transporting directly by carriage to the specialized formations a man with a fractured thigh. On the other hand, in the surgical ambulances of the advance or the evacuation hospitals of the first line, the material and the time available may prevent the utilization of complicated methods. The surgeon in these formations should (1) disinfect the wound; (2) reduce the fracture, and (3) secure apposition of the fragments. His duty is to render the wounded evacuable to the fracture center of the region. The prognosis depends on this first intervention. The disinfection comprehends (1) the excision of dead tissues; (2) the removal of the projectile; (3) removal of splinters and fragments, and (4) the establishment of drainage. Lardennois insists on the necessity of free drainage. One or two drains are of no use. They quickly become occluded. One must make an open trench or canal which will permit the outflow of the serum and a survey of the broken bones. Whenever wounds are made by one or more projectiles, Lardennois always has recourse to posterior drainage, which will drain in the dorsal decubitus. For fractures of the middle third and the inferior third, he utilizes the space between the biceps cruralis on the outside and the semimembranosus and semitendinosus on the inside. For subtrochanteric fractures he incises vertically, exterior to the long portion of the biceps, below the gluteus maximus, which must be displaced sometimes 1 or 2 cm. to give an opening. Free access to the bone must be maintained for eight days at least, with large drains placed at angles to the wound, with separators or with careful maneuvers in the course of the dressings. The wound disinfected, the fracture must be reduced at once and the limb placed in a trough (*gouttière*). If the wounds are too extensive to permit of the application of a plaster dressing, a simple Thomas splint will assure a good reduction, maintained by extension, the limb being placed in flexion and abduction. This apparatus permits of moving the patient without pain and without danger. Whenever it is possible, Lardennois applies a plaster dressing. The plaster dressing holds the wounded limb in good position; flexion, abduction, and external rotation are more marked the higher the seat of the fracture. The thigh is flexed on the pelvis, and the leg on the thigh. This position is maintained despite the fact that the limb can move in the cast under the effort of muscular contraction. Overlapping of the fragments is impossible. The points of bearing of the plaster are the wing of the ilium and the calf of the leg. These regions must be well padded with cotton. The whole posterior surface of the thigh is free of the plaster, permitting posterior drainage. The windows permit observation of the wounds. On account of the position, the patient is able to maintain a semisitting position in the bed, or he may be placed in an armchair. He can be moved easily and carried to the dressing room, or to the roentgenography room. He can be evacuated if the roentgenogram shows good reduction and if the local and general symptoms permit. Usually at the end of eight or ten days he is able to be transported by sanitary train to the fracture center of the army, where he may be left in a cast, the Alquier apparatus may be applied, suspension used, or, better yet, he may be placed in a Delbet apparatus.

Decherf said that the ultimate results of the treatment of complicated fractures had not always been very brilliant. In the interior a great number of angular femurs were observed, with shortening varying from 6 to 18 cm. This angular deformity is due to the action of the psoas muscle and the glutei, which draw the lower end of the upper fragment upward and outward. This deformity is observed most frequently in fractures of the superior and middle thirds of the femur. On the contrary, in fractures of the inferior third, supracondyloid fractures, the deviation of the inferior fragment is conditioned on the action of the calf muscles. These muscles draw the upper extremity of the inferior fragment backward, so that the lower end of the upper fragment points forward under the skin. In the treatment of complicated fractures of the thigh, suspension is popularized in the effort to avoid all vicious unions. By this procedure, combined with extension and abduction, a maximum of

straight reductions of the thigh with a minimum of shortening is obtained. In addition, the ease with which dressings are made avoids pain to the patient. The suspension apparatus comprises a hammock trough supporting the limb, supported above the plane of the bed by a system of cords running through pulleys. The traction apparatus is composed of strips of bandage terminating at the foot in two loops and held in place by adhesive bands about the leg. The loops hold a bar of wood to which is attached a cord and a weight.

The advantages of suspension are: 1. Facility in dressing. The thigh being maintained above the plane of the bed, the wound is easily inspected by merely raising the hammock without moving the patient, hence the dressings do not cause the patient any pain. 2. Facility of moving the patient, even for his hygienic care, the patient easily raising himself without the least pain. 3. Inspection of the wounded member. At each dressing the thigh is uncovered and the course of healing may be observed. If one of the fragments becomes displaced, the deviation may be corrected immediately; a flaring up of any purulent condition or a lymphangitis will be detected. 4. There is no sloughing of the heel or malleoli. 5. Early massage—the first day—is given the knee and the muscles of the thigh. 6. Union appears to be more rapid, because of greater circulatory activity; the edema of the leg disappears rapidly, in two or three days.

Emile Girou emphasized the advantages of the Thomas apparatus employed by the English. Before it was brought to his attention, he had employed an apparatus constructed by a village mechanic. This apparatus was a sort of Thomas splint, made of hollow tubes, light and inexpensive, which immobilized the fracture very well. Extension was secured by a leather boot having a wood sole with a hole in it.

TREATMENT OF INFECTED WOUNDS BY MEANS
OF HELIOTHERAPY

Leriche, associate professor of the Faculty of Medicine at Lyons, has addressed to the Société de chirurgie de Paris an interesting communication on this subject. In collaboration with Mlle. Mendeleef he has been able to study the mechanism of heliotherapy by means of bacteriologic examinations of about twenty patients. The fluid which oozes copiously from the wounds exposed to the sun furnishes a veritable hunting ground for microbes—a flooding of the tissues within and without. A drop of this fluid examined under the microscope shows, according to the duration of the insolation and according to the age of the wound, either a fluid full of microbes in suspension or a fluid full of vivacious leukocytes all filled with microbes. In comparing the smears made before, during and after the insolation the phagocytosis comes out still more clearly. These observations seem to establish the fact that the phagocytosis completes the action of the mechanical disinfection accomplished by the copious exudation referred to above. The action of the sun on certain microbes appears, moreover, more rapid than on others. Leriche has seen the *Bacillus pyocyaneus* disappear definitely after one or two fifteen-minute sun-baths. He has seen the septic vibrio disappear almost completely after half an hour of exposure to the sun. After six hours of insolation the *Vibrio proteus* disappeared from a wound resulting from a tardy secondary resection of the knee which presented an abundant fetid suppuration.

In the most favorable cases (a fresh wound, excision properly performed, the surface flat) sterilization was accomplished in forty-eight hours. After two sun treatments, one of thirty minutes, the other lasting two hours and a half, the wound became sterile and remained so, under regular insolation, for the following six days. At this time the secondary suture was made and was successful. In the least favorable case (a regular, anfractuous fresh wound, accompanied by fracture of the scapula and tibia) the sterilization was brought about in from four to six days, and remained in that condition. When the wound is older, more gravely infected, or of such a nature as to prevent the sun's rays from penetrating it readily, the sterilization is less rapid still. From the standpoint of technic and indications for the procedure, Leriche emphasizes the two following points:

1. If the sun is not too strong one may, without harm, expose the wounds to the sun a long time, but if the sun is strong and hot, one should not risk the long exposure. Heliotherapy must accordingly be applied in the form of short, progressive treatments. One should not exceed a quarter of an hour the first few days, otherwise one may induce very annoying local erythemas and even troublesome general reactions (increased temperature, headaches and prostration).

2. Heliotherapy is not a panacea which dispenses with proper surgical treatment. On wounds not treated surgically it serves as a sure check. The same is true if the operation performed has proved inadequate. The wound must be fully exposed, and the sun's rays must fall as nearly directly as possible. Just as regards the mode of dressing, the conditions which surround a surgical operation are the deciding factor and the most important criterion with regard to the mode of treatment; for instance, in all places in which this exposure of the focus of the wound is not possible (the upper part of the thigh, a wound of the pelvis, etc.) it is preferable to resort to continuous irrigation, such as is accomplished by the Carrel method.

Sencert has called attention to the fact that for a long time he has applied, without exception, pure asepsis, completed by heliotherapy, not only to the fresh wounds, but also to old suppurating wounds. In regard to the latter, it is important at the start to establish the cause for the persistence of the suppuration (collection of pus, poor drainage, foreign body, bone splinters, necrosed osseous focus). When the cause of the suppuration has been established, it must be immediately removed, without loss of time in instituting a preliminary treatment of the wound by means of chemical disinfectants. Only in case the operation is completed in the first onset can untoward conditions be avoided. All loose remnants of tissue should be removed, the ramifications of the projectile should be followed up, and all anfractuositities should be suppressed, so as to display the wound completely. One should search for and remove not only all foreign bodies and the free bone splinters, but also the adherent bone splinters. The wound when cleansed, opened up and dried should be recovered with a purely aseptic dressing and daily exposed to the sun's rays. If the wound in question was operated on prematurely while still inflamed, for two or three days any necrosed tissue which was not removed at the time of the operation is rapidly eliminated, and soon there appears a red and vivacious granulating tissue. The swelling and the pain disappear. The surrounding teguments become normal again. At the end of a week the wound is completely sterile. The secretions have stopped entirely. If it is a question of a wound operated on while suppurating freely, and particularly (for that is often the case) if it is a wound complicated by a comminuted fracture, accompanied by copious suppuration, after a few days the traumatic focus is pervaded by red granulations which rapidly fill all its deeper parts. The temperature becomes normal, the patients no longer suffer, they recover their appetite, and their general condition improves rapidly. This favorable outcome, as the result of this simple treatment, is absolutely constant. If it should happen that the local and the general condition do not rapidly improve, or if a drainage of pus should persist, it may be concluded that the operation was not thorough, and that there is still in the wound a deep diverticulum, a foreign body, or a bone splinter, which is causing the infection. Up to May 1, 1917, Sencert treated by this exclusively aseptic method 492 wounds of the head, 36 wounds of the thorax, 18 wounds of the abdomen or of the pelvis, 47 wounds of the large joints, 139 diaphysial fractures, and 207 wounds (mostly multiple) of the soft parts. It is by virtue of this experience that Sencert thinks that he is justified in affirming the clinical excellence of the aseptic treatment for infected war wounds. He has been able, moreover, to confirm these clinical observations by means of a bacteriologic test, which afforded him the opportunity of verifying the development of phagocytosis and the destruction of the microbes by merely bringing into play an organic defense. One may therefore affirm that a thorough surgical operation followed by postoperative aseptic treatment through exposure of the open wounds to the air and light effects their progressive and rapid disinfection without its being necessary to resort to any chemical agent.

Also Quénu has been able to confirm good results from heliotherapy. For more than a year he has been exposing to the sun for two or three hours such wounds after they have been opened up and all loose remnants of tissue removed, and he has been astonished by the oozing of the lymph, the vascularization of the wounds and their rapid evolution toward a sterile condition and a normal coloration. Comparing these results with those produced by hot air jets at 60 or 70 C. (140 or 158 F.), he concludes that the caloric action in the two given cases is identical.

Delbet insists that the main therapeutic action of the sun consists in a reinforcement of the means of defense of an organism, and that the rays of the sun do not act as do bactericides and antiseptics, in the ordinary sense of the

word. They act on the cells and on the humors. He asserts that the microbes, which, before the treatment, are for the most part extracellular, are almost all phagocytes. The formation of pus becomes much less abundant or ceases entirely.

Likewise, Chaput asserts that he has obtained good results from heliotherapy in the treatment of war wounds, torpid wounds, and tuberculous and nontuberculous fistulas; but he thinks that in our part of the country, where cloudy days are frequent, it is preferable to expose the wounds to electric light, which permits of regular and prolonged treatments. From his point of view, artificial light is much superior to heliotherapy for the treatment of local wounds. On the other hand, heliotherapy is much more active in improving the general condition of the patients.

LONDON LETTER

LONDON, June 12, 1917.

The War

THE ANTISEPTIC FLAVINE

The prevalence of sepsis in war wounds and the difficulty of coping with it by the methods in vogue in peace times has reopened the whole question of wound treatment and led to considerable research. On the one hand, the advocates of antiseptics have endeavored to find new and more powerful agents; and on the other, Sir Almroth Wright and his school have proclaimed the uselessness of antiseptics and advocated "lymph lavage" promoted by the use of hypertonic saline solution. The controversy is not yet settled. The Medical Research Committee (whose work has frequently been referred to in previous letters) has had researches made for unrecognized antiseptics of high value since the first month of the war. The committee has now issued a report on the results obtained. Work at Haslar Naval Hospital and at the London Hospital showed early the value of malachite green, which is giving good results. When it was desired to investigate flavine, which was a little known but patented German dye, none was available in this country, and its manufacture requires highly skilled work. But the committee had a supply made at its biochemical department, and investigated at the Bland-Sutton Institute of the Middlesex Hospital by Dr. Browning. In a paper published in the *British Medical Journal*, January 20 (abstracted in *THE JOURNAL*, Feb. 17, 1917, p. 581), he announced that it had the remarkable property of destroying bacteria without destroying tissue, and in the presence of that serum its potency was increased. Samples were sent to leading surgeons for the purpose of receiving reports for the guidance of the naval and military authorities. The uses of flavine for particular purposes have still to be carefully defined in relation to other antiseptics and to operations. Three firms are preparing to supply the public, but under our patent law it will be necessary for them to procure a license to manufacture. It is proposed that all firms shall use only one name for the substance, a condition which will restrain any firm from securing monopoly privileges by wide advertisement of a fancy name. The committee proposes that the substance shall be officially called "Acriflavine." This will avoid the German name "Trypflavin," which is registered as a trademark, and will prevent confusion with an existing vegetable dye already called "flavine." In an address to the court of governors of the Middlesex Hospital, Sir John Bland-Sutton states that he has obtained excellent results in septic cases from flavine. It is diamino-methylacridium chlorid, which was originally prepared by Benda at the desire of Ehrlich from coal tar.

THE SHORTAGE OF DENTISTS

The shortage of physicians is a new phenomenon created by the war almost entirely. Some slight shortage, due to the increased demand for physicians caused by the insurance act, previously existed. Prior to the passage of that act there were too many physicians, at least too many to make a comfortable living. But the shortage of qualified dentists has always existed, and has only been aggravated by the war. In an address to the Liverpool Odontological Society, the president, Mr. John W. Tomlinson, gave some remarkable figures: In 1879 the number of names on the Dentists' Register was 5,289; in 1916 the number was 5,453. Thus in a period of thirty-seven years the increase was only 164. In the same period the population of the country increased from 34 to 46 millions, and the number of names on the Medical Register from 22 to 43 thousand. No other profession in the

country shows such stagnation. At a recent meeting of the General Medical Council, the Dental Committee made a report on the shortage of dentists, which was attributed mainly to the inadequacy of the dentists' act. This act prohibits unqualified practitioners from using the designation of dentists, but does not in the least prevent them from practicing dentistry. The result is that they far outnumber the qualified dentists. They treat the working classes, who are either unable or unwilling to pay the fees demanded by qualified dentists.

THE SHORTAGE OF PHYSICIANS

The effect which the constant demand of physicians for the army is having on the supply of physicians is illustrated by the report of Dr. Niven, health officer of Manchester. He has been unable to find a suitable applicant for the post of assistant medical officer at the Baguley Sanatorium, though a salary of \$2,000 a year is offered.

A MOTOR LABORATORY FOR THE FRENCH RED CROSS

A motor bacteriologic laboratory for the French army has been provided by the London committee of the French Red Cross. It is extremely compact, but by means of extensions can be enlarged so as to form a room about 18 by 12 feet. Electric light and all the latest bacteriologic appliances are provided. Everything is so arranged that the whole can be packed up in a short time when required to go to another station. The total cost is \$7,500. A somewhat smaller laboratory has been constructed for presentation to the French Red Cross.

Panel Practice

In spite of the greatest of all wars, domestic questions, such as the panel system, continue to be discussed. In Birmingham a joint committee appointed by the Panel Committee and the British Medical Association has just issued a report. General satisfaction on the part of the insured is shown by the diminishing numbers seeking advice as private patients. When dissatisfaction exists, its causes are stated principally to be lack of sufficient examination. The following extensions are considered necessary to make the insurance medical service adequate: 1. A consulting or special opinion in necessary cases by a panel of consultants who would see the insured in their own homes or at the consultant's offices as required. 2. Institutional treatment by panel physicians in consultation with a physician or surgeon, and operations by the latter when necessary. 3. Complete service of necessary laboratory work for diagnosis, vaccines and serums, and roentgenoscopy. 4. Nursing of patients in their own homes by a system of district nurses. 5. Dentistry, including the provision of dentures. 6. Convalescent homes. 7. Instruction by lectures. It is also suggested that 2,500 should be the largest number of names permitted on one physician's panel. At present, popular physicians often have panels exceeding 3,000, with a large private practice in addition. In cases of chronic incapacity it is suggested that certificates by the physician every four weeks should be sufficient. At present they are required every week, and a fair proportion of the physician's office time is occupied in writing certificates.

The Insurance Act

The insurance act is still on its trial, and while no one doubts that it has come to stay, no one doubts that it will be profoundly modified in the future. Even the great pre-occupation of the war has not prevented discussion of its merits and demerits. The York medical panel committee has recently adopted an interim report of a subcommittee appointed to consider the working of the act as regards medical benefit which well summarizes the present position as to the advantages to the community and the panel physicians. The gains to the latter are: (1) an income known approximately in advance, which probably but for the war would have enhanced the market value of practices; (2) ease in introducing substitutes in absence from illness or other cause; (3) freedom from dispensing and sending out accounts, and (4) fixed rules for patients. On the other hand, the subcommittee is not sure that the defects of the act do not counterbalance its advantages. Among the minor defects named are limitation of the free choice of physician, owing to the number of physicians who refuse to work the act, and the difficulty patients have in changing their physicians. There are also the disadvantages inherent in any form of contract practice, which tend to make it less efficient than private practice. The physician is irritated by the fact that any complaints against him are dealt with by

a lay committee, and also by limitation of the drugs to be prescribed on the grounds of expense. Another defect arises from the multiplication of authorities dealing with health matters. The gain to the community that would arise if the work of public health was brought into relation with the work of the physician is also emphasized. One of the greatest defects is the gap that exists between the treatment of the insured under different circumstances, for instance, when a patient in order to get certain forms of treatment has to be removed from the care of his panel physician to a hospital. The act also breaks down in important directions through failure to provide treatment for much grave disease, facilities for consultation, nursing in serious cases, specialist treatment, anesthetics, and pathologic service. The establishment of a ministry of health to coordinate all the activities of the health authorities, and hospitals staffed by or mainly by panel physicians are advocated.

Marriages

SURG. JOHN SAMUEL BOGGESE, U. S. P. H. S., San Diego, Calif., to Miss Henrietta Wadsworth of Minneapolis, at San Diego, June 19.

LIEUT. EDWARD JOHN DAVIN, M. O. R. C., U. S. Army, New York, to Miss Grace Ayleward of Goshen, N. Y., in New York, June 13.

HARRY JAMES SMITH, M.D., Vacaville, Calif., to Miss Frances Huffman of Petaluma, Calif., at Oakland, Calif., June 17.

STEPHEN WILLIAM HAYES, M.D., to Miss Margaret Agnes Nolan, both of New Bedford, Mass., at New York, June 5.

ISIDORE CHARLES RESHOWER, M.D., New York, to Miss Minna Nannette Strouser of Atlantic City, N. J., June 24.

ROBERT LESTER CRUM, M.D., Hollywood, Los Angeles, to Miss Louise Elizabeth Blondeau of Los Angeles, May 19.

WILLIAM HERBERT MASON, JR., M.D., Murray, Ky., to ORA HANNAH KRESS, M.D., of Takoma Park, Md., June 18.

LIEUT. CHARLES CLIFFORD HAWKE, M. C., Kan. N. G., to Miss Rachel N. Bowling of Winfield, Kan., June 12.

DANIEL DAVIS, M.D., Baltimore, to WILLA MAE FRICKE, M.D., of Rochester, Minn., at Wausau, Wis., May 17.

CHARLES WILLIAM VATES, M.D., Mount Oliver, Pa., to ROSE ELIZABETH STANLEY, M.D., of Oil City, Pa., June 9.

EDWARD L. ROBBINS, M.D., Syracuse, N. Y., to Miss Margaret Theresa Coughlin of Albany, N. Y., June 16.

DANIEL CLEVELAND PATTERSON, M.D., Bridgeport, Conn., to Miss Marian P. Gibney of New York, April 28.

CLARENCE PROCTOR THOMAS, M.D., New York, to Miss Irene Doolittle of Toronto, Ont., in New York, June 9.

STEPHEN W. HAYES, M.D., to Miss Margaret Nolan, both of New Bedford, Mass., in New York, June 7.

FRANK RAYMOND MENNE, M.D., to Miss Aletha Eleanor Messinger, both of Portland, Ore., May 30.

JAMES NORVAL STOOPS, M.D., Scottsbluff, Neb., to Miss Mary Edith Kriess of Kearney, Neb., June 12.

ERL ARMITAGE BABER, M.D., Dayton, Ohio, to Mrs. Irene Angela Miersch of New York, June 8.

JOHN W. CLARK, M.D., Cartersville, Mo., to Miss Jessie I. Rowden, at Lakeside, Mo., June 12.

LYMAN FOSTER HUFFMAN, M.D., Cleveland, to Miss Beatrice Swayze of Overland, Ohio, June 16.

LUTHER COURTER SAMPSON, M.D., to Miss Helen Marguerite MacMahon, both of Buffalo, June 2.

WILLIAM HILIARY GUY, M.D., to Miss Ethel Hansbury, both of Philadelphia, June 15.

JOHN B. FRISBEE, M.D., to Miss Marie Gatzmeyer, both of Anaconda, Mont., May 19.

FRED. W. BUCKLEY, M.D., to Miss Louise Sabin, both of Beatrice, Neb., May 23.

THOMAS HENRY LEWIS, M.D., to Mrs. Charles Mair, both of Chicago, June 16.

JAMES HUBERT WEST, M.D., to Miss Rena Richey, both of Cleveland, June 9.

ALLEN JOSEPH HRUBY, M.D., to Miss Sylvia Petrtyl, both of Chicago, May 16.

Deaths

Capt. Paul Fitzsimmons, Medical Director, U. S. Navy (retired), Washington, D. C.; University of Georgia, Augusta, 1869; aged 78; a Fellow of the American Medical Association; a member of the Association of Military Surgeons of the United States; who entered the navy as assistant surgeon, Dec. 19, 1871, and was retired, Feb. 27, 1911, on attaining the age of 62 years, after fifteen years and four months of sea service and twenty years and four months of shore or other duty; surgeon of the *U. S. S. Brooklyn*, during the Spanish-American War, and later fleet surgeon; in charge of the Naval Hospital, Newport; medical officer of the Washington Navy Yard; in command of the Medical Supply Depot, New York, and a member of the Naval Examining and Naval Medical Examining boards, Washington; died in the Washington Naval Hospital, June 11.

Capt. Walter Audubon McClurg, Medical Director, U. S. Navy (retired), Washington, D. C.; Jefferson College, 1872; aged 65; a Fellow of the American Medical Association, and Association of Military Surgeons of the United States; who entered the navy, Feb. 8, 1874, and was retired, Sept. 1, 1908, on his own application after more than thirty years' service, including fourteen years and eleven months of sea service, and eighteen years and three months of shore or other duty; on duty on the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., from 1889 to 1893, and fleet surgeon of the North Atlantic Fleet in 1902 and 1903; died in his apartment in Washington, June 16.

Charles Henry Whitman, M.D., Los Angeles; Bennett Medical College, Chicago, 1886; College of Physicians and Surgeons, Chicago, 1890; aged 62; a Fellow of the American Medical Association, and formerly president of the Los Angeles County Medical Society and Los Angeles County Surgical Society; professor of clinical surgery in the Medical Department of the University of Southern California; formerly a pharmacist; since 1909 superintendent of the Los Angeles County Hospital; died in that institution, June 14, from lobar pneumonia.

Robert Goodloe Harper Hayes, M.D., Bellefonte, Pa.; Jefferson Medical College, 1884; aged 57; a Fellow of the American Medical Association, and a member of the Association of Military Surgeons of the U. S., and for many years secretary of the Center County Medical Society; major and surgeon during the war with Spain; a member of the Bellefonte Board of Health, and founder of the Bellefonte Hospital; one of the most widely known practitioners of central Pennsylvania; died at his home, June 20, from intestinal disease.

Augustus Alphonso Hussey, M.D., Brooklyn; College of Physicians and Surgeons in the City of New York, 1896; aged 45; a Fellow of the American Medical Association; associate visiting obstetrician to the Brooklyn Hospital, and visiting obstetrician and gynecologist to the Brooklyn Hospital Dispensary; consulting obstetrician to the Norwegian Hospital, and visiting physician to the Bushwick Hospital; died suddenly while taking nitrous oxid gas and oxygen for the extraction of a tooth in Brooklyn, June 20.

Herbert Maxon King, M.D., Loomis, N. Y.; New York University, New York, 1887; aged 52; a member of the medical Society of the State of New York; a member of the American Association of Pathologists and Bacteriologists; American Climatologic Association; American Sanatorium Association and National Association for the Study and Prevention of Tuberculosis; a specialist in respiratory diseases; physician to the Loomis Sanatorium; died at Loomis, June 24.

James C. Rutledge, M.D., Detroit; Detroit College of Medicine and Surgery, 1898; aged 46; formerly a Fellow of the American Medical Association; a member of the Michigan State Medical Society and Association of Military Surgeons of the United States; for three years an acting assistant surgeon in the United States Army, with service in the Philippine Islands; died in the Receiving Hospital, Detroit, June 1, from cerebral hemorrhage.

William Halliday Fraser, M.D., Los Angeles; McGill University, Montreal, 1867; aged 78; formerly a member of the Illinois State Medical Society; a practitioner of La Salle, Ill., from 1871 to 1913; supreme medical examiner and emeritus supreme medical examiner of the Order of Scottish Clans of the United States and Canada since 1897; surgeon to St. Mary's Hospital, La Salle; died in the Clara Barton Hospital, Los Angeles, June 11.

Hugh Walter Blair, M.D., Sheffield, Ala.; Vanderbilt University, Nashville, Tenn., 1885; aged 55; formerly a Fellow of the American Medical Association; a member and once president of the Colbert County Medical Society, 1913; formerly mayor of Sheffield; died, June 12, from a gunshot wound of the head, self-inflicted, it is believed, with suicidal intent, while despondent on account of family troubles.

Peter Harry Steltz, M.D., Washington, D. C.; University of Pennsylvania, Philadelphia, 1888; aged 48; a Fellow of the American Medical Association; chief surgeon of the Pennsylvania system and medical advisor of the Baltimore and Ohio system at Washington; for twenty years in charge of the hospital at the Washington Union Station; died at his home, June 5, from heart disease.

Franklin Timothy Burke, M.D., New York; Long Island College Hospital, Brooklyn, 1898; aged 47; a member of the Medical Society of the State of New York; a specialist in diseases of the nose and throat, and chief of the staff of the laryngologic clinic of Cornell University Medical College, and assistant instructor in the department of laryngology; died at his home, June 8.

Joseph A. H. Miller, M.D., Princeton, Ky.; University of Louisville, Ky., 1889; aged 57; a Fellow of the American Medical Association and a member of the American Association of Railway Surgeons, and Mississippi Valley Medical Association; health officer of Caldwell County, Ky., and district surgeon of the Illinois Central Railroad; died in Louisville, June 7.

Barton Dwight Skinner, M.D., Greenport, N. Y.; Bellevue Hospital Medical College, 1869; aged 63; a Fellow of the American Medical Association; for thirty-two years treasurer and once president of the Suffolk County Medical Society; visiting physician to the Eastern Long Island Hospital, Greenport; died in that institution, June 23, from disease of the intestines.

David Joseph Cummings, Medora, Ind. (license, Indiana, 1897); aged 71; formerly a Fellow of the American Medical Association; a member of the Indiana State Medical Association; for nearly half a century health officer of Jackson County; a veteran of the Civil War and a practitioner since 1869; died at his home, May 21, from cerebral hemorrhage.

Richard S. Hill, M.D., Upper Marlboro, Md.; University of Georgetown, Washington, D. C., 1886; aged 53; special agent for the investigation of foreign and domestic markets for the sale of Maryland tobacco; director of the Maryland State Farmer's Institute; formerly a member of the legislature; died at his winter home in Washington, D. C., June 12.

Samuel R. Robinson, M.D., Sturgis, Mich.; Columbus (Ohio) Medical College, 1878; aged 65; a member of the Michigan State Medical Society, and once vice president of the St. Joseph County Medical Society; a specialist in diseases of the eye, ear, nose and throat; died in a hospital in Fort Wayne, June 13, after a surgical operation.

Addison Cornelius Posey, M.D., Hanford, Calif.; Kentucky School of Medicine, Louisville, 1875; aged 68; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of California; a specialist in diseases of the eye, ear, nose and throat; was found dead in his home, May 31, from heart disease.

Charles Edwin Lones, M.D., Knoxville, Tenn.; Lincoln Memorial University, Knoxville, 1896; aged 41; a member of the Tennessee State Medical Association, and once professor of anatomy in his alma mater; who was injured in an automobile accident near Maryville, Tenn., June 3; died in the Knoxville General Hospital, June 12.

Adrien J. Kirghis, M.D., St. Cloud, Minn.; University of Vermont, Burlington, 1899; aged 41; a Fellow of the American Medical Association, who served in the military division of the armies of France for a year after the outbreak of the war and retired only on account of serious impairment of health; died at his home, May 31.

Stewart Anderson Milliken, M.D., Silver City, N. M.; New York University, New York, 1888; aged 56; formerly a Fellow of the American Medical College and a member of the Association of Military Surgeons of the United States; lieutenant-colonel, M. C., New Mexico National Guard; died in Las Vegas, N. M., April 21.

David W. Horning, M.D., Minneapolis; Chicago Homeopathic Medical College, 1883; aged 65; a member of the Minnesota State Medical Association; lecturer on practice in the Homeopathic Medical College of the University of Minnesota; died at his home, about June 19, from heart disease.

Holmes Mayhew Jernegan, M.D., Boston; New York Homeopathic Medical College, 1869; aged 70; lecturer on surgical anatomy and clinical surgery in the Massachusetts Homeopathic Hospital from 1870 to 1873; for five years professor of surgery in the Boston University School of Medicine; died at his home, May 30.

Edward Stephen Howard, M.D., San Francisco; Jefferson Medical College, 1898; aged 58; formerly chief surgeon of the Municipal Emergency Hospital Service of San Francisco; professor of anatomy in the College of Physicians and Surgeons of San Francisco; died suddenly in his office, June 12, from heart disease.

Leo E. Bennett, M.D., Muskogee, Okla.; University of Tennessee, Nashville, 1883; aged 59; founder of the *Indian Journal* and the *Muskogee Phoenix*; Indian agent from 1899-1893; formerly United States marshal for eastern Oklahoma, and for one term mayor of Muskogee; died in Mineral Wells, Texas, May 28.

Charles Edward Scholl, M.D., Logansport, Ind.; University of Maryland, Baltimore, 1873; aged 74; formerly a member of the Indiana State Medical Association; a Confederate veteran; who was knocked down, June 3, in an altercation regarding a tile drain; died, June 17, from concussion of the brain.

George A. Robertson, M.D., Battle Creek, Mich.; Cleveland University of Medicine and Surgery, 1867; aged 76; formerly president of the state homeopathic medical society; once a member of the board of aldermen and coroner of Calhoun County; died at his home, May 22.

James Williamson Owen, M.D., New Bedford, Mass. (license, Massachusetts, 1894); aged 65; a practitioner since 1873; secretary of the British Medical Reform Association for twelve years, and for three years an editor of its official journal; died at his home, June 4.

Alexander McKee, M.D., Glens Falls, N. Y.; Maryland Medical College, Baltimore, 1899; aged 43; a member of the Medical Society of the State of New York; milk and food inspector for Glens Falls; died at the home of his sister in Hudson Falls, N. Y., June 11.

Nathaniel Clark Bacon Haviland, M.D., Worcester, Mass.; University of Vermont, Burlington, 1878; aged 62; formerly a Fellow of the American Medical Association; a member of the Massachusetts Medical Society; died at his home, April 22, from cardiorenal disease.

Harry Eldridge Williams, M.D., Coatesville, Pa.; Homeopathic Medical College of Pennsylvania, Philadelphia, 1866; aged 77; for twenty-nine years secretary of the school board and school director; a veteran of the Civil War; died suddenly at his home, June 9.

Thomas J. Nolan, M.D., Snyder, Neb.; John A. Creighton Medical College, Omaha, 1903; aged 43; a member of the Nebraska State Medical Association; died in St. Joseph's Hospital, Omaha, May 23, from peritonitis following an operation for cholecystitis.

Albert R. Ayres, M.D., Hannibal, Mo.; St. Louis College of Physicians and Surgeons, 1870; aged 75; hospital steward and later captain and assistant surgeon of volunteers during the Civil War; for many years a druggist of Hannibal; died at his home, May 29.

Adolph Matthew Evetz, M.D., Carroll, Iowa; St. Louis University, 1910; aged 33; a member of the Iowa State Medical Society; formerly intern in St. Anthony's Hospital, Carroll; was crushed and instantly killed in an elevator in that institution, June 15.

Louis Sanford Sweitzer, M.D., Akron, Ohio; Western Reserve University, Cleveland, 1875; aged 67; formerly a Fellow of the American Medical Association; a member of the Ohio State Medical Association; died in Los Angeles, June 21.

Joshua M. Eisenbise, M.D., Quinter, Kan.; University Medical College, Kansas City, Mo., 1900; aged 50; a member of the Kansas Medical Society; died suddenly in the Bethany Hospital, Kansas City, Kan., recently, after a surgical operation.

William Bell Hunn, M.D., Junction City, Ky.; Kentucky School of Medicine, Louisville, 1893; aged 46; was instantly killed, May 19, when a revolver fell from the pocket of his coat and was discharged, the bullet striking him in the chest.

Edward James Cook, M.D., Buffalo; Niagara University, Buffalo, 1895; aged 75; a member of the Medical Society of the State of New York; for twenty-six years a clergyman of the Methodist Episcopal Church; died at his home, June 7.

Theodore H. Wells, M.D., Albuquerque, N. M.; Hospital College of Medicine, Louisville, Ky., 1878; aged 65; for many years physician of Bernalillo County and a druggist and postmaster of Old Albuquerque; died at his home, June 15.

Nelson Horatio Lowry, M.D., Woodhull, Ill.; Hahnemann Medical College, Chicago, 1872; aged 70; for half a century a practitioner of Woodhull; a veteran of the Civil War; died at his home, May 22, from cerebral hemorrhage.

George Andrew Matthews, M.D., Anniston, Ala.; University of Michigan, Ann Arbor, 1869; aged 67; formerly a member of the Medical Association of the State of Alabama; died at his home, May 12, from carcinoma of the liver.

Elmer Orren Miller, M.D., Aberdeen, S. D.; Starling Medical College, Ohio, 1895; aged 54; a Fellow of the American Medical Association; died in St. Luke's Hospital, Aberdeen, June 16, from cerebral hemorrhage.

Thomas E. Sawyer, M.D., Uba, Tenn.; University of Tennessee, Nashville, 1906; aged 44; a member of the Tennessee State Medical Association; died suddenly on a passenger train at Greenfield, Tenn., June 7.

Volney E. Tygret, M.D., Bowling Green, Ky.; Vanderbilt University, Nashville, Tenn., 1882; aged 59; formerly a member of the Kentucky State Medical Association; died at his home, June 1, from heart disease.

John Byron Robinson, M.D., Brooklyn, Md.; University of Maryland, Baltimore, 1862; aged 81; for nearly half a century a practitioner of Anne Arundel County; died, June 2, in Johns Hopkins Hospital, Baltimore.

Moses Alfred McDonald, M.D., Whitesville, Ky.; Louisville (Ky.) Medical College, 1883; aged 61; a Fellow of the American Medical Association; died at his home, May 18, from pulmonary tuberculosis.

William Fink Marks, M.D., Reading, Pa.; Hahnemann Medical College, Philadelphia, 1869; aged 71; for many years president of the board of health of Reading; died at his home, June 4, from cardiac asthma.

Charles Francis Haugh, M.D., Delphi, Ind.; Medical College of Indiana, Indianapolis, 1905; aged 35; who retired from practice after two years to go into business; died at his home, May 30, from heart disease.

Patrick F. Griffin, M.D., Honesdale, Pa.; Jefferson Medical College, 1886; aged 53; a Fellow of the American Medical Association; died suddenly from heart disease, May 27, while making a professional call.

Lawrence Wilbur Campbell, M.D., Ada, Ohio; Rush Medical College, 1881; aged 60; a Fellow of the American Medical Association; formerly mayor of Ada; died at his home, June 11, from nephritis.

Henry A. Record, M.D., Forestville, N. Y.; Hahnemann Medical College, Philadelphia, 1865; for forty years a practitioner of Chautauqua County; died at his home, April 22, from heart disease.

James H. Rainwater, M.D., New Canton, Ill.; Missouri Medical College, St. Louis, 1889; aged 58; a Fellow of the American Medical Association; died at his home, May 13, from pneumonia.

Charles A. Dunn, M.D., Cannelville, Ohio (license, Ohio, 1896); aged 62; for thirty-eight years a practitioner of Muskingum County; died in the Good Samaritan Hospital, Zanesville, Ohio, April 21.

Adelbert E. Moody, M.D., St. Regis Falls, N. Y.; Albany (N. Y.) Medical College, 1885; a Fellow of the American Medical Association; died in Cornwall, Ont., April 22, from typhoid fever.

Mentor V. Richard, M.D., Pearl River, La.; Tulane University, New Orleans, 1882; aged 56; for many years coroner of New Orleans; died at his home, May 31, from acute gastritis.

Jervis H. Wattles, M.D., Battle Creek, Mich.; Western Reserve University, Cleveland, 1886; aged 76; for nearly half a century a practitioner of Battle Creek; died at his home, May 18.

Andrew J. McLaughlin, M.D., Aldrich, Mo.; Marion-Sims Medical College, St. Louis, 1892; aged 63; formerly a member of Missouri State Medical Association; died at his home, May 17.

Charles Benjamin Knowlton, M.D., Buffalo; University of Buffalo, 1872; aged 82; for many years instructor in penmanship in the public schools of Buffalo; died at his home, May 11.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

CREOSOTE-DELSON AND CREOFOS

Report of the Council on Pharmacy and Chemistry

Creosote-Delson and Creofos, or Creosote with Hypophosphites, were submitted by the Delson Chemical Co., Inc., New York City. Creosote-Delson is said to be "beechwood creosote from which the irritating and caustic properties are removed by fractional distillation." It is claimed that Creofos contains "2 grains of Creosote-Delson and $3\frac{3}{5}$ grains of the combined Hypophosphites in each fluidrachm of the mixture or emulsion, the lime salt predominating." It is also claimed that "the primary object of the hypophosphites in this preparation is that of maintaining the refined creosote in a pure, unoxidized state, and that no particular claim for therapeutic action on their part is advanced." It is explained further, however, "the addition of the lime was prompted by the belief . . . that the fundamental cause of pulmonary tuberculosis is lime starvation . . ."

The assertions are made that Creosote-Delson is superior to the official creosote because it can be taken "abundantly and persistently without harm to or interference with stomach and kidneys" and can be "taken uninterruptedly and indefinitely," while the dosage is "unlimited by any former knowledge of Creosote Therapy." Creosote-Delson is not on the market except in the combination Creofos, although it is supplied on request.

Creofos is advised in the treatment of tuberculosis, whooping cough, measles, "Grippe and Colds," bronchitis, asthma, "Intestinal Affections (Colitis, Summer Diarrhoea, etc.)," while its use is suggested for the "prevention of the spread of contagious diseases," and for "preventing contagion, in minor contagious diseases at any rate, in schools and families."

The following advertisement has recently appeared in the *New York Medical Journal* and in the *Therapeutic Gazette*:

CREOFOS MEDICATION

is the successful development of the most advanced practice in the treatment of infectious diseases. It destroys completely the causative organisms by a bactericide many times more powerful than phenol, yet absolutely harmless to animal life.

Unlike serums, its activity is not confined to any specific disease, and its use insures against sequelae (as pneumonia following grippe).

Especially valuable in the treatment of infants and patients of delicate constitution and in cases where time is of importance.

The Delson Chemical Co. was requested to supply information regarding the identity of Creosote-Delson and to support the claim that although it is "the whole drug" its dosage is "unlimited by any former knowledge of Creosote Therapy." The reply was virtually an admission that the toxic, caustic, phenolic components of creosote were present in Creosote-Delson just as in the official creosote.

The referee of the Committee on Therapeutics in submitting his report to the Council pointed out that it is difficult to discuss the pharmacologic merits of a semi-secret preparation, like Creosote-Delson, claimed to be more acceptable to the human organism than the official product it is intended to supplant, when the action of the parent drug is still questioned or disputed by eminent clinicians.

Absorption experiments have been carried out with creosote and creosote compounds such as creosote with hypophosphites or calcium or creosote carbonate chiefly by a study of the elimination products in the urine. But any evidence so far offered that these combinations increase absorption and lessen the irritating, caustic or toxic properties has been wholly inconclusive. The evidence offered by the Delson Chemical Co. presented no control experiments with the

official creosote and did not prove that either Creosote-Delson or Creofos was less toxic than a corresponding amount of ordinary beechwood creosote.

The referee concluded that no proof had been offered that these preparations are materially superior to ordinary creosote preparations from the pharmacologic or therapeutic standpoint, and that the claims made for Creosote-Delson and Creofos are unwarranted in the light of our knowledge of the properties of creosote. The advertisement quoted above is an example of unproved and unwarranted claims.

On the recommendation of the referee the Council declared Creosote-Delson and Creofos inadmissible to New and Non-official Remedies for conflict with the rules as follows:

Creosote-Delson: The information so far available is not sufficient to define the nature, or composition, of Creosote-Delson, or to indicate in how far this product differs, if at all, from the official creosote (conflict with Rule 1). No methods are furnished for determining the identity or composition of Creosote-Delson (conflict with Rule 2). The available information does not show that Creosote-Delson has advantages over creosote (conflict with Rule 6).

Creofos: The composition of Creosote-Delson not having been furnished, the statement concerning the composition of Creofos is also unsatisfactory (conflict with Rule 1). The therapeutic claims are unsubstantiated and grossly exaggerated (conflict with Rule 6). The name is not descriptive of its composition as is required for pharmaceutical mixtures (conflict with Rule 8). There is no evidence that hypophosphites prevent decomposition of creosote (if this occurs). Hence the inclusion of hypophosphites must be considered irrational (conflict with Rule 10).

The Council's report was sent to the Delson Chemical Co. for consideration. The firm's reply contained nothing to warrant a revision of the report and the Council voted that Creosote-Delson and Creofos were inadmissible to New and Nonofficial Remedies and authorized the publication of this report.

SOME MISBRANDED NOSTRUMS*

"Quaker Herb Extract," "Payne's New Discovery," "Payne Quick Relief" and "Quaker Oil of Balm."—These four products were sold by the Quaker Herb Co., Cincinnati, Ohio.

ELIZABETH DAILY JOURNAL, FRIDAY EVENING

ANOTHER MONSTER PARASITE OVER SIXTY FEET LONG

Martin Krekeler's Life Was Saved by Quaker Herb Extract—He Had Suffered Nearly Four Years, Taken Medicine of All Kinds; He Kept Growing Worse and Had Begun to Lose Hopes of Living--To-day He is in Perfect Health, Due Entirely to "Quaker."

"I was saved by Quaker Herb Extract. For nearly four years I suffered tortures from a stomach complaint which medicine did not cure. Every day I awoke to be getting worse. I became utterly discouraged and began to think there was no cure for me. My appetite was gone, one day it seemed I could not get enough to eat, and the next day the very sight of food would nauseate me, my breathing at times was so difficult as though I was in the last stages of asthma, sometimes my heart would beat like a steam engine, my stomach was terribly swollen and hard, which I was told was caused by gas. Bowels were decidedly irregular. I began to have no ambition, and felt tired and worn out all the time. I never knew I lived nearly every day and everything to get better, but it seemed there was no help for me. Another peculiar feature about my complaint was that I did not really know what ailed me. I was told it was catarrh or intestinal indigestion or ulcerated stomach, and last week the Quaker man told me it might be worse. Who was right? We shall see. I began to take Quaker Herb Extract last Saturday night. I continued taking it faithfully according to directions. As each succeeding day showed no improvement, I began to think the Quaker man was wrong. But yesterday morning early I got a rather sudden dizzy spell, which surprised me that I walked for my daughter. She came, and I had to ask her assistance to help me to a sudden attack of dizziness. I felt something pass from me and became frightened. Rather alarmed, I rested for a few moments and then concluded to see what I had expelled. I noticed a yellow object, and immediately placed it in an old fruit jar, and my daughter took it to the Quaker man at Gorsuch's drug store. He pronounced it a large worm and found it to be over 60 feet long, complete with head, and unbroken. Now I realize what had caused my years of suffering and misery. Quaker Herb Extract removed the cause. I cannot describe how different I feel to-day and yesterday. I would be ungrateful indeed if I did not express my thanks to the Quaker man for recommending Quaker Extract to me. This is surely the greatest and most wonderful remedy on earth."

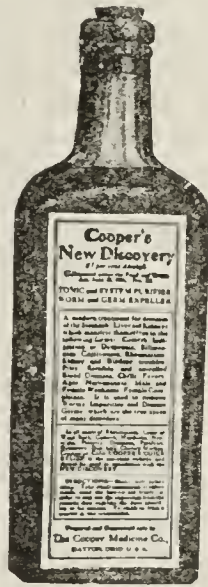
The foregoing was related by Mr. Krekeler in presence of Mary at Gorsuch's store, who will verify it. He is 54 years old, a salesman, and lives on Burton road. This experience goes to prove why all persons should call on the Quaker man at once. Remember, he can be seen at Gorsuch's, No. 175 Broad street, daily from 8 A. M. to 8 P. M. On Saturday night until 10 o'clock. Call in the morning if you possibly can. Quaker Herb Extract, three bottles for \$2.00. Oil of Balm, 50c.—Advertisement

The "Quaker Herb Extract," according to the federal chemists, was essentially a water-alcohol extract of an emodin-bearing cathartic drug. The alcohol strength was 18 per cent. It was sold as a cure for catarrh and grip, a preventive of rheumatism, kidney and bladder troubles and scrofula, malaria and various other conditions. These claims were declared false and fraudulent. "Payne's New Discovery" contained over 18 per cent. alcohol and, according to the federal chemists was a water-alcohol solution containing small amounts

* This material, with much additional, appears in the new edition of the pamphlet "Convictions," price fifteen cents.

of baking soda, licorice and extractive matter from a laxative plant drug. While the label declared the stuff was not a cure-all it was said to be a germ eradicator and a cure for catarrh and rheumatism, a remedy for all nervous disorders, a cure for gout and sciatica, a specific for malaria, a remedy for grip and falling of the womb, and a number of other conditions. These claims were naturally declared false and fraudulent. "Payne Quick Relief" was chiefly turpentine with cayenne pepper, resin, camphor and chloroform present. It was claimed to be a cure for cholera infantum and an effective relief for pleurisy, dysentery, cholera morbus and deafness. The claims were declared false and fraudulent. "Quaker Oil of Balm" seems to have been from the federal chemists' report virtually the same as the "Quick Relief," viz., turpentine, cayenne pepper, chloroform, etc. The claims made for it, which were very similar to those made for the "Quick Relief," were declared false and fraudulent. The company would neither affirm nor deny its guilt but entered a plea of *nolo contendere* and was fined \$100 and costs.—[*Notice of Judgment No. 4474.*]

"Cooper's New Discovery" and "Cooper's Quick Relief."—The Cooper Medicine Company, Dayton, Ohio, sold these two products both of which were declared misbranded under the Food and Drugs Act. The "New Discovery" was a nostrum of the alcoholic- tonic type. Federal chemists reported that it contained 20 per cent. alcohol, some emodin, aloes and a small quantity of oil of sassafras together with reducing sugars. The claim that it was an effective treatment for diseases of the kidneys, scrofula, so-called blood diseases, gout, diabetes, and many other conditions was declared recklessly and wantonly false and fraudulent. The "Quick Relief" was a liniment consisting of cayenne pepper in alcohol (31 per cent.) flavored with oil of sassafras. The claim that it would afford instant relief to sprains and pain and was a remedy for croup, and effective for preventing injuries due to burns and scalds from becoming inflamed was declared false and fraudulent. The company pleaded guilty and was fined \$50 and costs.—[*Notice of Judgment No. 4460.*]



Wilson's Preparation.—Herman L. Davis traded under the name "General Agent for Wilson's Remedy, New York," and sold a product called "Wilson's Preparation."¹ It was sold as an effective remedy for consumption, asthma and all lung and throat maladies. Government chemists reported that Wilson's Preparation was a powder consisting largely of starch, acacia and sugar with potassium acetate, calcium hypophosphite and quinin. The therapeutic claims were, naturally, declared false and fraudulent and applied knowingly and in reckless and wanton disregard of their truth or falsity. Davis pleaded guilty and was fined \$25.—[*Notice of Judgment No. 4480.*]

1. This same fraud used to be sold as "The Wilson Consumption Cure" and purported to be a wonderful prescription of the Rev. Edward A. Wilson. Post office authorities put the Wilson Consumption Cure out of business by denying it the use of the mails. The matter is dealt with in the pamphlet "Consumption Cures" (price 20 cents) published by the American Medical Association.

Visualization.—A catfish depends 95 per cent. on its taste barbels, or feelers, for knowledge; an eagle on its eyes; a hound on its nose; a blind man chiefly on touch. A soundly sense-organized man gathers knowledge through all his five senses, but he gets a greater impress through his eyes—through visualization—than through all the other four senses. Although the teaching of disease prevention and accident injury is the most important in life's curriculum, yet they are the most difficult to visualize because their demonstration is in the form of a negative.—E. A. Ayers, M.D., *Public Health News*, New Jersey

Correspondence

TUBERCULOSIS AND WAR

To the Editor:—An article on this subject by Dr. Maurice Fishberg (*THE JOURNAL*, June 16, 1917, p. 1791) deserves serious consideration, first, on account of the tremendous importance of the subject and, secondly, because careful analysis of the article gives the reader a different impression from that gained at first glance. I am inclined to believe that Dr. Fishberg had no intention of conveying the ideas that have been gained by at least a considerable percentage of those who have read this article.

My attention was first called to Dr. Fishberg's paper through a letter from a prominent physician engaged in military medical work, saying that Dr. Fishberg's article had given him the impression that tuberculosis among soldiers need not be seriously considered.

I searched the article for such a statement, but radical as Dr. Fishberg is in his opinions, I could find no such utterance. In his recapitulation, however, I found the unfortunate expression, "The problem of tuberculous infection of soldiers need not be considered seriously." I am quite certain that Dr. Fishberg did not anticipate the broad interpretation which might be given to this sentence. It is quite clear from the context that he intended to convey the idea that tuberculosis acquired through infection of healthy persons engaged in military service need not occasion any great amount of apprehension or concern. He did not mean, as I take it, that tuberculosis among soldiers is not a matter for most serious consideration. In fact, he supports his contention with the assertion that "in the vast majority of tuberculous cases discovered among the soldiers, it was ascertained that they had been affected with the disease before enlistment." It is this lighting up of preexisting tuberculosis among the thousands who have been previously infected and not the new infection of healthy soldiers which is now occasioning concern.

The impression that one gains from Dr. Fishberg's entire article, however, is that he is attempting to negate the generally accepted belief that tuberculosis constitutes one of the most serious problems of the present war.

As I see it, Dr. Fishberg's contentions, which he supports with extensive citations of current literature, are these:

1. Certain tuberculous individuals do not break down under the strain of military service.
2. Certain exceptional tuberculous individuals actually improve in physical condition during military service.
3. Reactivation of former tuberculosis is no greater in military service than in civil life with similar physical demands.
4. On account of the foregoing facts, recruits should not be rejected on account of previous tuberculosis or previous sanatorium treatment unless showing evidences of acute tuberculous disease.
5. New tuberculous infection of healthy individuals in the army is not sufficiently frequent to occasion serious concern.
6. The incidence of tuberculosis in the civil population of France, Germany, Russia, England, Italy and other warring nations is no greater than in times of peace.

His first and second contentions are not questioned by any one familiar with tuberculosis. In private practice, we occasionally meet tuberculous persons, even those with bacilli in the sputum and showing other evidences of active disease, who are able to meet heavy physical demands; and occasionally we come on a patient who appears to improve on account of or in spite of great physical activity. The vast majority of tuberculous persons, however, break down under strain and, so far as I know, we cannot differentiate exceptional individuals from their fellows. Dr. Fishberg quotes Banks to the effect that of sixty-four tuberculous persons enlisted in the army and navy, nineteen engaged in active service for an unstated period of time without breaking down, although one of the nineteen had "broken down temporarily."

While it is interesting and surprising that as many as 30 per cent. of these men could stand active military service, it is more important that over 70 per cent. of those who were

apparently well enough to be accepted in the army broke down on account of their tuberculous condition.

His third contention, while open to some question as to fact, is not sufficient to sustain his fourth contention: That is, because reactivation of dormant tuberculosis is no more frequent in military service than in civil life, previous tuberculosis should not serve as a bar to enlistment.

The reactivation of tuberculosis in civil life among those who have ever been sick with the disease is so great that no one would consider accepting a group of men formerly tuberculous for any important duty involving physical strain. The policy of all nations has been to select, for military service, men who are physically most fit. At the present time, in recruiting an army of 1,000,000 or a subsequent army of 2,000,000, there is not the slightest occasion for the United States to accept cripples of any kind. We have at hand 10,000,000 men between the ages of 21 and 31 and 17,000,000 more over 18 and under 45, the ages which some of the warring nations now accept as the limits of liability to military service. However the experience of civil life may compare with that of military service, every tuberculous person or previously tuberculous person enlisted is a weak link in the army, regardless of the apparent condition of the individual, and is a probable added financial burden to the nation.

Dr. Fishberg lays stress on certain quotations from Dr. William Osler and on the fact that discharged sanatorium patients have been accepted in the German army. England, with half our population, is maintaining an army of 5,000,000 men. Our army, to be relatively as large as that of England, would have to contain 10,000,000 men. If we should be compelled to draft an army of such proportions, and if fighting men became difficult to obtain, we can imagine even the most conservative of American physicians advocating the enlistment of those who give only moderate promise of being able to render any sort of military service. We have not reached that place as yet, and I am under the impression that Dr. Osler at the present time would not advocate the acceptance in the American army of a single individual who was formerly tuberculous.

As to the acceptance of tuberculous persons in the German army, this is not convincing to many of us. Germany seems determined to win the war at all costs. Humane considerations have been ruthlessly swept away to attain this end. The nature of the war is such that it has become necessary at times to deliberately sacrifice thousands of lives in a battle for the purpose of carrying out some strategic point. Men who are able to serve in critical positions for a few days or hours may answer the purpose for such sacrifice, and thereby could save that many able bodied men to the empire.

The voluminous quotations employed by Dr. Fishberg do not controvert the fact that persons as physically unreliable as former tuberculous patients, as a class, are wholly unsuited for military service, and should not be accepted so long as able-bodied men may be obtained, and this in spite of the fact that certain rare tuberculous individuals survive the ordeals of war or that reactivation is no more likely in military service than in civil life.

The fifth contention, that tuberculous infection of healthy recruits in military service is not sufficiently frequent to cause grave apprehension, will create no particular discussion. The doctrines that primary infection usually occurs in childhood and that tuberculosis is less infectious among adults than previously believed are now quite generally accepted. This contention does not materially affect the seriousness of the tuberculosis war problem.

The sixth contention of Dr. Fishberg is purely a question of fact. The statement that the incidence of tuberculosis in the civil population is no greater in France during the war than it was previous to the war seems to be supported to Dr. Fishberg's satisfaction. On the other hand, Dr. Hermann Biggs, who has studied the situation at first hand, gives very convincing testimony exactly to the contrary. As to this point, it is perhaps fairest to say that for the time being we can merely accept a Scotch verdict.

My chief object in discussing this paper of Dr. Fishberg's is to impress the hasty or careless reader that only to a very

limited extent does the author successfully take issue with the fact that tuberculosis is one of the most important problems in the present war.

GEORGE THOMAS PALMER, M.D., Springfield, Ill.

THE BACTERIOLOGY OF FOODS

To the Editor:—Referring to Prof. Edwin O. Jordan's article on this subject (*THE JOURNAL*, April 14, 1917, p. 1080), we wish to take issue with him in relation to the bacteriological examination of milk. Health departments and milk inspectors in their endeavor to ensure a pure milk supply to the public have received great aid from bacterial counts. The more efficient and intelligent dairymen also appreciate the value of such tests, and milk supplies of many cities have been improved and infant mortality lessened through the active cooperation of civic officials and producers in the employment of bacteriological methods and their practical application.

The arguments advanced by Professor Jordan are the arguments of the inefficient dairymen and their apologists, refined, it is true, marshaled by a keen mind, but still the same old plea against enforcement of fair and reasonable bacterial regulations for the production and handling of this important food product. This is so much a fact that, whenever in courts of law, action is brought against careless producers or handlers of milk, the defense quotes articles similar to this one by Professor Jordan, and the tendency of such articles is to nullify the good work which has been done.

We do Professor Jordan the justice to believe that in his pursuit of an idea he overlooked this practical and unhappy application. We believe the following statement made by him to be entirely unwarranted by any proof adduced in his article:

Large numbers of milk bacteria, irrespective of kind, in themselves and without reference to their sanitary implications, have never been shown to be definitely injurious.

This flat and unsupported dictum is so at variance with the opinions of many others that we, as officials engaged in enforcing bacterial limit regulations, feel that attention should be called to its tendency to create a false impression, and we desire also to present briefly what we believe to represent the actual conditions, which are admirably set forth in the following abstract from the "Third Report of the Commission on Milk Standards" (*Public Health Reports*, Feb. 16, 1917):

Relation of Large Numbers of Bacteria to Infant Mortality.—The Commission believes that the numbers of bacteria in milk have a relation to the infant mortality, for the following reasons:

(a) Evidence furnished by clinical observations of groups of children fed on milk containing small numbers of bacteria and large numbers of bacteria shows a higher death rate in the latter than in the former.

(b) In general, a reduction in infant mortality in cities results from a substitution of milk containing small numbers of bacteria for milk containing large numbers of bacteria.

(c) Bacteria causing no specific intestinal infections in adults may cause infant diarrhea, and milk containing large numbers of bacteria more often contains species capable of setting up intestinal inflammation in infants than milk containing small numbers of bacteria.

In the membership list of the New York Milk Committee appear the names of eight public health officers, seven bacteriologists, three chemists, and two agricultural experts. Thirteen of the number have been educated as physicians; two of the members have had long practical experience in the milk industry; six have been connected with the production and control of certified milk.

So far as we are aware, the only practical research of this kind was that of Drs. William H. Park and L. Emmett Holt, of which account was given in their article, "Report upon the Results with Different Kinds of Pure and Impure Milk in Infant Feeding in Tenement Houses and Institutions of New York City: A Clinical and Bacteriological Study" (*Archives of Pediatrics*, December, 1903).

Quotations from this article appear in the fourth edition of Professor Jordan's "Text-Book of General Bacteriology," page 540, as follows:

Park and Holt, as the result of a comprehensive study of the relation between milk-supply and infantile diarrhea in New York City,

reached the conclusion that "no special varieties of bacteria were found in unheated milk which seemed to have any special importance in relation to the summer diarrhea of children." While it is therefore perhaps premature to assign a uniform bacterial cause for every case of infantile diarrhea or to attempt to differentiate between different causes, there can be no doubt as to the influence of the numbers of bacteria in milk. The most conclusive investigations on this point are those of Park and Holt. These observers found that during hot weather the effect of bacterial contamination on the health of infants was very marked when milk was fed without previous heating. "When milk is taken raw, the fewer the bacteria present the better the results. Of the usual varieties, over 1,000,000 bacteria per cubic centimeter are certainly deleterious to the average infant."

Writing to one of us ten years after the publication of this article, Dr. Holt says:

I still believe, even more strongly than when the article to which you referred was published, that "of the usual varieties of bacteria found in milk, over one million per c.c. are deleterious to the average infant."

Again, after a table showing the difference in bacterial content of milk carefully collected and cared for as compared with ordinary milk, Jordan ("Text-Book of General Bacteriology," p. 535) says:

Many such figures might be cited, but they all lead to the same conclusion: namely, that the number of bacteria in milk depends chiefly—(1) upon the degree of original contamination of the milk, (2) upon the age of the milk, and (3) upon the temperature at which it has been kept. In other words, the bacterial count gives valuable information both as to the cleanliness and staleness of this indispensable food.

With this statement of Professor Jordan's we are in complete accord, and on such a basis bacteriologists of various cities have worked and have brought about marked improvement in milk supplies.

FRANCIS H. SLACK, M.D., Boston.

Deputy Health Commissioner; Former Chairman, Committee on Bacterial Milk Analysis, American Public Health Association.

GEORGE E. BOLLING, Brockton, Mass.

City Bacteriologist; Chairman of Committee on Methods of Bacterial Analyses of Milk and Milk Products and the Interpretation of Results, International Association of Dairy and Milk Inspectors.

This letter was referred to Professor Jordan, who replies:

To the Editor:—It is difficult even with careful phrasing to avoid expressions that, when taken from their context, may be liable to misinterpretation. I had supposed that the statement to which exception is taken was sufficiently guarded to prevent all misunderstanding. Certainly the general tenor of my address is in no wise antagonistic to the proper use of bacterial counts in controlling public milk supplies. My own position in this matter is generally known, as is shown indeed by the quotation from my book cited in the foregoing letter. Let me state once more specifically and emphatically that I believe that bacterial milk counts are a valuable aid in controlling the quality of milk supplies and that their application by municipal authorities has helped to bring about a great improvement in the public milk supplies of American cities.

A certain discrimination on the part of readers as well as writers seems desirable. If attention is drawn to the fact that sometimes some observers have placed undue weight on colony counts in judging the sanitary quality of a milk, this ought not to be taken as the personal opinion of the writer that colony counts should have no weight.

With regard to the particular sentence to which objection is made, it is not quite clear why I should be asked to give proof of what seems to me a lack of evidence or what the nature of such "proof" would be. Keeping in mind the qualifications as I have stated them, the sentence even isolated from the text has ample warrant in the present state of our knowledge. I do not know of any evidence that shows that milk containing 1,000,000 *B. subtilis* is any more or any less injurious than milk containing 1,000,000 *B. coli* or 1,000,000 lactic acid bacilli or 1,000,000 streptococci or a mixture of all four. For this reason I was careful to use the phrase "irrespective of kind." Let me not be misunderstood. In thus pointing out the lack of evidence for distinction I am not expressing an opinion that there is no distinction. Many investigators have commented on this lack of evidence. One opinion by a

competent authority which is at hand may be cited: "The hypothesis that the ordinary saprophytic germs of milk produce disease and death in infants is singularly lacking in experimental confirmation" (Schereschewsky, J. W.: "Heat and Infant Mortality," Transactions of the Fourth Annual Meeting, American Association for Study and Prevention of Infant Mortality, 1913, p. 113).

In the body of my article on the "Bacteriology of Foods" I have shown that in practice bacterial milk counts are today interpreted differently according to conditions, in large and small cities, in raw and pasteurized milk, etc. In other words, the validity of the very statement objected to by my critics is recognized in some places in official regulations. The important work of Park and Holt cited above constitutes in no sense a contradiction of my position. Their observations on the connection of high numbers of bacteria with the health of infants relate to the bacteria of ordinary raw market milk. For obvious reasons no distinction was made in this study between the bacteria themselves and the bacterial products that had accumulated in the milk. It was plainly quite impossible to differentiate between the kinds of bacteria present in each feeding. The fact that a correlation between numbers and effect existed in their series of observations is no proof at all that the effect was due solely to the numbers.

One further question may be asked: Are we justified in concluding that large numbers of bacteria in ordinary unheated market milk and in pasteurized or certified milk that has been kept for some days at a low temperature possess exactly the same sanitary significance? What I have called the "sanitary implications" are certainly different in these three cases. A sanitarian might be pardoned for preferring a properly pasteurized milk that had been kept in his own clean ice-box for several days to ordinary raw market milk even if the latter had fewer bacteria. Have we as a matter of fact any evidence that numbers, irrespective of kind, in themselves and without reference to their sanitary implications are definitely injurious? If so what and where is it?

I may say, finally, that the argument that we should refrain from discussing vexed questions before scientific societies and in scientific journals because of the possible effect such discussions may have on public opinion has never appealed to me. Educated opinion in the long run is more likely to be influenced in an undesirable way by the attempt to conceal the deficiencies and shortcomings of our scientific knowledge. It is certainly unfortunate that the lack of convincing evidence can be used as an argument to bolster up a bad cause; it would be much more unfortunate if scientific men generally asserted that there was evidence when there was none and maintained that a working hypothesis was the same as a demonstrated fact.

EDWIN O. JORDAN, PH.D., Professor of Bacteriology,
University of Chicago, Chicago.

FOOD REQUIREMENTS OF CHILDREN

To the Editor:—In THE JOURNAL, June 9, 1917, the first editorial is relative to "Food Requirements of Healthy Children." You seem to agree with Dr. Lucy Gillett in her figures as to their needs. You make no reference to your editorial of Sept. 9, 1916, p. 814. In this Dr. Du Bois, of Russell Sage Foundation, seems to find a far larger amount needed for healthy athletic boys from 13 to 16 years of age than Dr. Gillett mentions for the same ages. It occurred to me that some of your readers would more likely have a more correct view if you would endeavor to correlate the two articles.

JOSEPH J. MACGOWAN, M.D., Heth, Ark.

[COMMENT.—In our earlier editorial we quoted the finding of Du Bois that the basal requirement of boys in metabolism is 25 per cent. above that of the adult. We also cited the statistics of Gephart indicating that the total fuel intake of a group of 300 boys from 13 to 16 years of age in a large boarding school was three times that of the basal level of from 1,700 to 1,800 calories. These figures were based on statistics computed on the basis of the meals served. The upshot of the evidence was that growing athletic boys are

apparently not content with the conventional 3,000 calories per day. Gillett's estimates were based on a larger variety of statistics obtained in different ways. The sources of reliable information for the food needs of children at the ages considered are admittedly scanty. Being considered from the standpoint of the needs of the average child among the less well-to-do classes, Gillett's compilations doubtless represent lower limits rather than maximum or even optimum data. Even so, a diet yielding up to 3,300 calories per day for 16 year old boys is suggested. Our correspondent does well to call attention to these discrepancies because they illustrate how much more ought to be known about the food requirements of children at all ages so that blunders will not be made in the requisitioning of supplies for them when emergencies arise.—Ed.]

VENARSEN

To the Editor:—The following is a copy of a letter sent to the Intravenous Products Company, which needs no explanation:

June 8, 1917.

The Intravenous Products Co., Denver, Colo.

Gentlemen:—In reply to your circular letter under date of June 3, may I say that after using a great quantity of Venarsen both in clinical and private cases, I can see no more effect upon these cases than if so much water had been administered.

This is also the report of Don R. Black, pathologist for Bell Memorial Hospital, University of Kansas. In our experiments all bloods were tested before and after each administration of this product.

WILLIAM A. WILSON, M.D., Kansas City, Mo.

AMBULANCE DRIVING NOT "AN OLD MAN'S JOB"

To the Editor:—The Chicago Tribune editor who says that driving an ambulance on European battlefields is "an old man's job" presumably intends to leave his job in the hands of an older and wiser man while he goes to the front to demonstrate his heroism behind earth works, forgetting that ambulance drivers have to work in the open.

He says:

"Driving an ambulance is an old man's job. It requires little strength, no great endurance, and the danger is small. No young man, fit for military duty, can afford at this time to join the ambulance corps. He owes it to his country to get into the fighting ranks, but he also owes it to himself to avoid the appearance of being a slacker. The ignominy of staying behind with nurses while his companions are fighting in the trenches will be great, and it ought to be great. We realize that many young men have previously joined the service in good faith, but the time has come when such enlistments will be regarded as an alibi to escape military duty. There are plenty of men past military age who are capable of driving the ambulances."

He forgets that the men he insultingly calls "slackers" have been risking and losing their lives in one of the most important branches of the country's service while he has been getting ready to do something.

Having the facts, can't you enlighten him in regard to the records of the service which he so tactlessly and unjustly disparages?

S. W. WILLIAMS, Chicago.

PRESERVING RUBBER GOODS

To the Editor:—Some years ago, English surgeons in India found that if rubber goods were kept in a closed receptacle containing a small quantity of oil they were kept soft and pliable. A suitable receptacle can be made by taking a tin bread box with a close fitting lid. A tinsmith can fit into it one or two perforated trays, the lower one sufficiently high to prevent oil from touching it. In India a 5 gallon oil tin answers for the bread box. In the bottom of the box a few spoonfuls of kerosene oil, just enough to cover the bottom, are placed, and then the trays for the rubber are put in. The box should be marked, "Do not shake." I have used the oil method, and know that rubber apparatus so cared for has a period of usefulness much longer than usual.

ANNIE YOUNG, M.D., Philadelphia.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALABAMA: Montgomery, July 9. Chairman, Dr. S. W. Welch, Montgomery.

CONNECTICUT: Regular: New Haven, July 10-11. Sec., Dr. Charles A. Tuttle, 196 York St., New Haven.

CONNECTICUT: Eclectic: New Haven, July 10. Chairman, Dr. John W. Fyfe, Saugatuck.

CONNECTICUT: Homeopathic: New Haven, July 10. Sec., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

DISTRICT OF COLUMBIA: Washington, July 10. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington.

INDIANA: Indianapolis, July 10-12. Sec., Dr. W. T. Gott, 84 State House, Indianapolis.

MASSACHUSETTS: Boston, July 10-12. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.

NEW MEXICO: Santa Fe, July 9. Sec., Dr. R. K. McClanahan, U. S. Naval Hospital, Las Animas, Colorado.

OKLAHOMA: Oklahoma City, July 10-11. Sec., Dr. R. V. Smith, Tulsa.

PENNSYLVANIA: Philadelphia and Pittsburgh, July 10-12. Sec., Mr. Nathan C. Schaeffer, State Capitol, Harrisburg.

SOUTH DAKOTA: Deadwood, July 10. Sec., Dr. Park B. Jenkins, Waubay.

VERMONT: Burlington, July 10-12. Sec., Dr. W. Scott Nay, Underhill.

WEST VIRGINIA: Charleston, July 10. Sec., Dr. S. L. Jepson, Capitol Bldg., Charleston.

Higher Requirements in New York

An official report states that the New York Board of Regents, after Jan. 1, 1918, will require for admission to medical schools, in addition to a four-year high school education, two years of collegiate work (sixty semester hours), which shall include courses in physics, chemistry, biology, English, and a modern foreign language (French, German, Italian or Spanish). This is the twenty-third state to adopt this higher requirement. The complete list of states and the dates when the requirement became or becomes effective is as follows:

State Examining Board of	Number of Years Required	Affects Students Matriculating	Affects All Graduates
Alabama	2	1915-16	1919
Alaska	2	1918-19	1922
Arizona	2	1918-19	1922
Colorado	2	1910-11	1914
Indiana	2	1911-12	1915
Iowa	2	1911-12	1915
Kansas	2	1918-19	1922
Louisiana	2	1918-19	1922
Maryland	2	1918-19	1922
Minnesota	2	1908-09	1912
Montana	2	1918-19	1922
New Hampshire	2	1915-16	1919
New Jersey	2	1917-18	1921
New Mexico	2	1918-19	1922
New York	2	1918-19	1922
North Dakota	2	1908-09	1912
Oklahoma	2	1917-18	1921
Rhode Island	2	1918-19	1922
South Carolina	2	1918-19	1922
South Dakota	2	1911-12	1915
Virginia	2	1917-18	1921
Washington	2	1918-19	1922
Wisconsin	2	1915-16	1919

Missouri March Examination

Dr. George H. Jones, secretary of the Missouri State Board of Health, reports the oral and written examination held at St. Louis, March 26-28, 1917. The examination covered 14 subjects and included 100 questions. The percentage required to pass was 75. Fifteen candidates were examined, of whom 14 passed and 1 failed. Three candidates were licensed through reciprocity and 2 were granted reregistration licenses by examination. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Columbian University	(1900)		89.1
Loyola University	(1916)	75.5	87.6
Rush Medical College	(1884)		82.7
College of Physicians and Surgeons, Iowa.....	(1898)		75
Kentucky School of Medicine	(1869)		75
American Medical College	(1908)		75
St. Louis College of Physicians and Surgeons.....	(1910)		75.1

St. Louis University	(1917)	83.8
Syracuse University	(1916)	75
Medico-Chirurgical College of Philadelphia.....	(1915)	86.8
Meharry Medical College	(1911)	80.4
University of West Tennessee	(1915)	79.1
Baylor University	(1916)	79.6

FAILED		
University of West Tennessee	(1915)	58.1

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
University of Louisville		(1912)	Kentucky
University Medical College of Kansas City.....		(1913)	Kansas
Miami Medical College		(1905)	Kentucky

Book Notices

THE ORGANISM AS A WHOLE FROM A PHYSICO-CHEMICAL VIEWPOINT. By Jacques Loeb, M.D., Ph.D., Sc.D., Member of the Rockefeller Institute for Medical Research. Cloth. Price, \$2.50. Pp. 379, with 51 illustrations. New York: G. P. Putnam's Sons, 1916.

One of the things which has characterized the development of modern biologic science has been the adoption by the workers in this field of the methods of physics, chemistry and physical chemistry used in the so-called exact sciences. A more recent and perfectly logical step has been the adoption of the physicist's mechanistic attitude of mind with regard to the interpretation of the results obtained from such studies, not alone for a single physiologic process or the action of an individual organ, but also for the behavior of the organism as a whole and, indeed, for the behavior of the species or of the whole animal kingdom, including what is understood by the term "adaptation." Loeb sees the organism as primarily and fundamentally a physicochemical system which, subjected to various external stimuli, natural or experimental, gives rise to modes of individual or racial behavior, not essentially adaptive in their nature but definite and capable of calculation, so far as the factors involved are known. It is particularly fitting that Loeb, who has always stood in the fore in the use of exact methods in his many and various biologic researches, should be the one to give expression to this point of view. His method of treatment is experimental throughout. Mendelian heredity, artificial parthenogenesis, the tropisms, etc., each "does its bit" in a logical and fascinating presentation. The general scientific reader will find no better place in which to review or become acquainted with the present day problems and tendencies of general biology.

THE BREAST: ITS ANOMALIES, ITS DISEASES, AND THEIR TREATMENT. By John B. Deaver, M.D., LL.D., Sc.D., Professor of the Practice of Surgery, University of Pennsylvania, and Joseph McFarland, M.D., Sc.D., Professor of Pathology and Bacteriology in the Medical Department of the University of Pennsylvania, Assisted by J. Leon Herman, B.S., M.D., Assistant Surgeon to the Methodist Hospital of Philadelphia. Cloth. Price, \$9 net. Pp. 724, with 285 illustrations. Philadelphia: P. Blakiston's Son & Co., 1917.

This covers the field of breast diseases in great detail. The evolution, involution and surgical anatomy of the normal breast are first given. A feature of the chapters on congenital and acquired anomalies is that practically every condition enumerated is supplemented by photographs of one or more patients. The article on infections deals especially with conditions which arise in the lactating breast. More than half of the book is devoted to tumors. Cysts are considered separately, and an attempt is made to simplify the pathologic classification which has become so complex in recent years. Certain forms of true tumors are considered here. Under nonindigenous tumors are grouped all of the different varieties arising from connective tissue and consequently not peculiar to the mammary gland. The chapter on carcinoma is especially valuable because of the statistical study of a large series of cases and the consideration of the operative technic. An interesting chapter on the nonoperative treatment of cancer of the breast is contributed by Dr. George E. Pfahler, in which his extensive experience with the Roentgen ray is given. The foreign literature has been especially well reviewed, and a literature index is inserted at the end of the article on each disease.

Social Medicine, Medical Economics and Miscellany

REEDUCATION AND REHABILITATION OF CRIPPLES MAIMED AND OTHERWISE DISABLED BY WAR

[The following is the statement of Dr. S. I. Franz to the conference on the reeducation and rehabilitation of maimed, crippled and otherwise disabled soldiers held under the auspices of the General Medical Board of the Advisory Commission of the Council of National Defense.]

The importance of the work looking toward the rehabilitation of the maimed and crippled, using these two terms to cover the great number of different kinds of defects which have been produced, is being appreciated more and more by the Belgian, English, and French governments, and by the special physicians and others who have been compelled to deal with certain of the problems. This is shown both by the number of institutions which have been established, and which are being planned, and by the amount of space in the medical journals which is given to the consideration of the various factors involved. More recently there have been numerous expressions of criticism that these matters were neglected at the beginning of the war, and many hopes that more energetic measures would now be taken to deal with this class which had been neglected.

As the result of previous wars and of accidents in industrial pursuits numerous crippled and maimed have been produced. Except in relatively few cases these individuals have been permitted to bear their infirmities as well as they could, and the burden of their support has fallen on their families, or on the state if they became social parasites, beggars, and the like.

In many cases these individuals have gravitated to the poorhouses or to special homes for the crippled, where they have been supported mostly in idleness. Now, however, it is being appreciated that great effort, and as concerted as is possible, must be made to limit the parasitic conditions, and to make these relatively incompetents as competent as possible. For the general welfare of the nation as a whole, for the comfort and the well-being of the individuals, a *laissez-faire* method of dealing with them cannot, and should not, be tolerated. No matter whether or not pensions will be provided for partial or for complete support, humanitarian and social interests demand that something more shall be done. Efforts must be made to bring about a functional betterment, for the performance of those operations which will make the individual a useful and a productive member of society. On the side of the individual efforts must be made to prevent the mental attitude of dependence and of woefulness, and this attitude or tendency to this attitude must be replaced by one of effort, of pride in accomplishment, and of self-help.

Statistics are not available regarding the number of those who require special treatment of the nature of reeducation. That the number is not a small one, and that in case the war continues for any length of time for our troops the number will not be small in these United States, are evidenced by the efforts which are being made in the countries which have been at war for nearly three years to bring about a medical and public appreciation of the conditions. The several conferences of the allied nations at which the different aspects of the general problems (medical, educational, scientific, social, etc.) have been discussed have also shown the need of preparation for many more than are now taken care of.

Borne has divided these individuals (and has grouped with them certain others) into three general classes:

1. Those who, with immediate care, can be made almost perfect. (This group includes those who have been operated on, but who have been compelled to remain quiet and almost motionless, and who consequently have also suffered from muscular atrophies and ankyloses. Here also come the tendon retractions, the defects which are due to adherent bind-

ing cicatrices, etc. In some cases it may take as long as six months to get an individual of this class normal, or approaching his normal condition. Many of these individuals have been incapacitated in the manners mentioned because of lack of appreciation of the possibilities of the production of such defects.)

2. Those who are definitely educable, or who are adaptable to work of some kind, but who cannot return to their former occupations on account of the defects which have been produced. (The class includes all those who have lost a part of the body, such as a hand, or foot, or arm, or leg, or even one or more fingers. In these cases after surgical interventions, amputations and the like, it may take only three or four months to make the individual as nearly normal as he can be made. This includes, of course, necessary orthopedic appliances.)

3. Those who are so severely and extensively mutilated and infirm that nothing can be done for them. (Relatively few of this class will exist. Some of those now thought to be incapable of training will be found to be amenable to some kind of treatment, and this is one of the problems which will need to be considered. Those who cannot be benefited by treatment of any kind, educational or otherwise, will probably have to be kept as permanent wards in special institutions or in homes for disabled soldiers.)

It has been estimated by Amar that if proper and prompt treatment is available 80 per cent. of the whole number are reeducable. Some of those who are not counted in this classification will probably be dealt with in special institutions where they may also be educated. This is true of the blind and the deaf. Of the total which he considers educable, Amar also counts that at least three quarters may be unconditionally returned to some kind of gainful occupation and to useful social life, after they have been given the training which their conditions warrant. The remaining quarter can be instructed in certain occupations, and can carry them out for such a period of time, that will enable them to be useful although their physical conditions may make them very slow in performance and may prevent their active competition with more normal individuals. For this last class, therefore, special workshops may be required, special positions may need to be sought, and some may need special permanent care.

Already in France and in England much work has been done with the maimed and crippled, as has been said, and the kinds of occupations which have been undertaken by these defectives are numerous. Besides farming and horticulture, for which many have special aptitudes and previous special training and for which their infirmities are not prohibitive, the following occupations have been taught, or retaught, to certain individuals: clerical work, stenography and typewriting (with the necessary instruction in writing, drawing, geography, arithmetic, commercial law, important languages besides the native language), carpentry, wood turning and carving, tailoring, brushmaking, basketmaking, shoemaking, book binding, trussmaking, making orthopedic appliances, locksmithing, making chains, making mats and rugs, making playthings, working in wood and in iron in making articles for ornaments, plastic arts.

It will readily be seen, therefore, that a considerable number of occupations are open to those who have been maimed or crippled, and that many more will be found in our industrial establishments there is no doubt. In the selection of an occupation there should be considered carefully the tastes and the previous aptitudes of the individuals, their past occupations, the degree of education, and great care must be exercised that caprice is not given away, so that an individual select such an occupation that it is inconsistent with his infirmity and that, if not entirely consistent, it is so time-consuming that the cost of reeducation is out of proportion to any expected gains that the individual may make subsequently. In many cases also it is necessary to limit the kinds of occupations from which selection may be made, for certain occupations may tend to increase an existing infirmity such as a contracture or a laxity of an articulation which cannot be corrected.

Roehard has criticized the conduct of the reeducation work in France, because of the lackadaisical methods which were used at the beginning. The corrective apparatus was badly conceived, awkward and not effective for its purpose in many cases, and due regard was not paid to the individual. It is important that each individual be considered as an individual, and that he be treated with that kind of mechanotherapeutic measure that will be best fitted to his particular needs, and at the same time that if any corrective apparatus is needed this should be considered in relation to the occupation that the individual is to undertake as a matter of rehabilitation and also in relation to the defect which is present.

Perhaps no better general outline of what is needed can be cited than that of a commission of the Royal Society of Medicine which has recommended as follows:

1. A service of physical treatment, consisting of hydrotherapy, electrotherapy (including roentgenotherapy), mechanical treatment, medical gymnastics, and massage should be made available at the earliest possible date for all soldiers needing it who are disabled by war. 2. Centers of physical treatment, comprising all the foregoing methods, should be established throughout the country on an adequate scale, and wherever possible in association with general hospitals, so that other forms of special treatment and diagnosis may be readily available. 3. At such centers there should be a uniform system of measurements and records. 4. Centers of reeducation and centers of physical treatment should be closely associated.

In any consideration of the general matter of reeducation and rehabilitation one matter must be given due attention, viz., the placing of the men after the reeducation has been completed. It would be a waste of time and effort if such individuals were reeducated and they were refused by the public to take advantage of their possibilities. The organization of the work must deal with these matters, and perhaps with such other things as are being considered in France, like mutual societies, organizations, and cooperative endeavors for the general benefit of the members. And propaganda for the popularization of the work of these men, for their utilization in a variety of ways, should not be too lightly considered.

Dr. Amar, one of the most noted of the French leaders in the movement for rehabilitation, has protested against the lack of preparation and the failure to provide suitable facilities for the proper prosecution of the work when the maimed first came in. He has insisted on the necessity for full preparation and on the necessity for careful, scientific and thorough work. In this regard he has said: "The time has come for organizing the work of the wounded in such a manner that each one may take his true place in the social machine, and contribute according to his ability." And, in like vein, Regnier, after pointing out some of the difficulties of the work at the beginning has emphasized the need of a careful "scientific organization" if the work is to be conducted for the greatest benefit of the country, and of the individuals who have helped their country and who desire to be returned to that condition in which they may be of the greatest help to themselves and to their fellows.

Soldier's Heart

The British Medical Research Committee publishes a report by Dr. Thomas Lewis of investigations made by him and his colleagues at Hampstead of the condition called soldier's heart, a term which the committee believes is not a good one, and for which Lewis has proposed the term "effort syndrome." It is said (*Lancet*, London, April 14, 1917) that there is no proof that the condition is primarily cardiac. Lewis gives the leading symptoms in the order of their importance as breathlessness, precordial pain on exertion, exhaustion, giddiness and fainting. Of less importance are palpitation, headache, lassitude, irritability of temper, insomnia, shakiness and flushing. A disinclination to take alcohol, commonly for reasons of distaste, is regarded as a rather remarkable association. Further classifying the characteristic signs, Lewis gives the following as ascertained on examina-

tion: increased heart rate, with exaggerated response to emotion, exercise and posture; exaggerated systolic blood pressure; diffuse apex beat and irregularity; high pressure in patients up and about; fleeting disturbances of temperature, and quickened respirations after exertion, and often also in the resting state; coldness, blueness or wetness of the palms and soles; tremor of the hands; exaggeration of the deep reflexes; hyperacid urine with increased calcium output chiefly in the form of calcium oxalate crystals; and an increase in white corpuscles to 12,000 on the average, chiefly in the lymphocytes. The alteration in the blood is said to lie in the deficiency of those salts, which, acting as buffers, ease the shock to the reaction caused by the addition of acids or alkalis. In their absence the acids evolved by muscular exercise tend to irritate the respiratory centers. There is a high incidence of the condition among men who were formerly in sedentary occupation. This indicates that the initial stages of the training of conscripts of this type should be more moderate. Keep them out of bed; use no drugs in treatment.

Climate and the Consumptive

The open-air treatment of tuberculosis provides a powerful weapon against a dreaded disease. The enthusiasm which it awakened not unnaturally centered attention prominently for a long time on the outdoor life and made climate the pivotal point of consideration. Gradually other important helps in the fight for recovery are being emphasized so that the need for rest, suitable food, and even appropriate medication is not overlooked at present. But the quest of climate remains the feature that is most debated with the expectation of a helpful solution. In *Public Health Reports*, 1917, 32, 318, Asst. Surg.-Gen. J. W. Trask of the United States Public Health Service comments on this common idea that somewhere there must be a region with a climate specially suited to the tuberculous. He says:

"Climate relates to the condition of the air of a locality as regards temperature, humidity and prevailing winds, and for the purpose of the present discussion may be considered to be the same thing as atmosphere. It is really a suitable and favorable atmosphere the consumptive needs and seeks. The conditions to be sought in an atmosphere or climate are those which are most suitable to maintaining the natural well-being of the body, conditions adapted to the well, but of special importance to those who have a chronic affection, such as tuberculosis, to overcome. The things which make a climate good or bad are the temperature and humidity of the air, the frequency and velocity of winds, and the presence or absence of dust and smoke."

The best climate for one affected with pulmonary tuberculosis has been described as that which furnishes a favorable atmosphere for the greatest number of hours of the day and the greatest number of days of the year. To live in an ideal climate one would have to divide the year between different localities. Even this would fall short of the highest ideal if it meant failure to take into account the items of expense, the problems of food, exercise and work, the possibility of medical supervision, and the question of family and friends. In the midst of such conflicting interests there is a refreshing helpfulness in the epitome prepared by Dr. Trask:

"A favorable climate for a consumptive is one that is not too warm. A moderately cool atmosphere is invigorating, while a too warm one is depressing. Very cold weather, on the other hand, makes the living of an outdoor life more difficult and less attractive. Moderately cool atmospheric conditions are those to be sought. No locality has a climate that is favorable all the year, and most localities in the United States have favorable climates for a considerable portion of the year if one will only take advantage of them. In one's quest for a favorable climate one must not forfeit suitable food, rest and peace of mind, or gain a more favorable atmosphere in which to live at the price of homesickness and worry. The consumptive can usually obtain the most favorable conditions for recovery, including an outdoor life, suitable food, rest, medical attention and nursing, at or near his home. A suitable atmosphere or climate can be obtained during many hours

of the day by avoiding overheated or crowded rooms and by sleeping on a porch in all ordinary weather and in a room with open windows when it is very cold or stormy. Leaving home, except to go to a sanatorium, is fraught with much danger, unless one is financially able to meet all possible demands, and it should be most carefully considered even then."

Medicolegal

Validity of Contract to Attend Smallpox Patient

(*Mayor and Council of City of Sugar Valley vs. Mills (Ga.)*,
91 S. E. R. 17)

The Supreme Court of Georgia, in reversing a judgment obtained by plaintiff Mills, a physician, for services rendered to a smallpox patient, says that the town of Sugar Valley was incorporated by an act of 1887 which provided that the corporate powers of the town should be vested in a mayor and five councilmen, and by the name of the mayor and council of the town of Sugar Valley they might sue and be sued and exercise all other corporate powers that might be necessary in performing their duties; that said mayor and councilmen should have power and authority to pass all laws and ordinances that they might deem necessary for the government of said town. There was no other general welfare clause, or clause in regard to the right to make contracts, in the charter. But these provisions of the charter of the town were supplemented by the general law, as contained in Section 1646 of the civil code, which is as follows: "The ordinary of each county, or the corporate authorities of any town or city in this state within the limits of which the smallpox has appeared, or may appear, are authorized and empowered to provide a suitable hospital for those so afflicted, and to furnish them with medical or any other attention that in their judgment those so afflicted may require." When considered together, the foregoing provisions of the law confer authority on the mayor and councilmen of the town of Sugar Valley to employ a physician for the purpose of treating smallpox patients within the incorporate limits. However, construing the plaintiff's petition most strongly against the pleader, it was not to be accepted as alleging that the mayor and council, acting in their corporate capacity, entered into a contract with him. The language should be construed as alleging that the mayor at one time informally employed the plaintiff, and that at another time the council informally employed him, to treat the smallpox patient. It was erroneous to overrule the ground of demurrer to the petition that it was not alleged that the plaintiff made any contract with the mayor and council of the town of Sugar Valley in its corporate capacity. The charter of the town of Sugar Valley, supplemented by the general law (civil code, Section 1646), provides that the municipality may enter into contracts for medical services to smallpox patients, through the instrumentality of the mayor and councilmen of the town. This contemplates formal action by the mayor and councilmen when duly assembled. An agreement, entered into privately with the mayor and at another time with the councilmen, will not suffice.

Practicing of Medicine by Bishop or Preacher in Violation of City Ordinance—Church Receiving Pay

(*Fealy vs. City of Birmingham (Ala.)*, 73 So. R. 296)

The Court of Appeals of Alabama, denying a rehearing, affirms a conviction of defendant Fealy whom the complaint charged with having treated or offered to treat one Keeling, a human being, of and for gallstones, organic heart trouble, or other diseases of human beings without having first obtained a certificate of qualification from the state board of medical examiners, against the laws and ordinances of the city of Birmingham. The court says that it is of opinion that the complaint set forth an offense sufficiently pleaded. By a blanket, or omnibus, provision of Ordinance 181 of the city of Birmingham, all misdemeanors against the laws of the state are also made offenses against the city. The statute against practicing medicine without having obtained a cer-

tificate from the state board of medical examiners is to be found in Section 7564 of the code, which makes it a misdemeanor for any person, without such certificate, "to treat or offer to treat diseases of human beings by any system of treatment whatsoever." It has been frequently held that in charging a statutory offense, the offense is sufficiently pleaded if set forth in the language of its creation. And the court is not impressed with the demurrers challenging the constitutionality of the ordinance; the regulation of the practice of medicine is a valid exercise of the police power. Nor does the court think it was error to sustain demurrers to the defendant's pleas that in the treatment of said Keeling as alleged in the complaint he was practicing and putting in effect his religious faith and doctrine as set forth and promulgated by the Altrurian Church of which the defendant was a bishop, and a preacher, etc. The question to be determined was not whether the defendant practiced his religion in treating Keeling, but whether the defendant practiced medicine, within the meaning of the statute. Assuming that one brings himself within the statute and practices medicine without a certificate of qualification, he is none the less guilty because in so doing he also practiced his religion. The regulation of the practice of medicine is a police regulation for the protection of the public; it does not interfere with the exercise of religious liberty; it merely safeguards the lives and health of the public against the use and employment of dangerous agencies in the hands of the unlearned and unpracticed in the science and art of medicine. Whether an act is or is not embraced within the statute as practicing medicine depends on the latitude of interpretation of the act. The Alabama statute is extremely broad; its language is: "Any person who treats or offers to treat disease of human beings . . . by any system of treatment whatsoever." Under this statute, this court apprehends, any agency of supposed therapeutic value set in motion with the design to cure, prevent or alleviate human disease or suffering of body or mind by one who receives a quid pro quo (consideration) for such service would be comprehended within its terms; not necessarily that there should be an employment of drugs or surgical or mechanical appliances. Physicians in some cases ascribe a therapeutic value or efficiency to the power of mental suggestion; would the physician, in employing such agency, be any the less practicing his profession? The court thinks not. In those cases, however, in which no charge is made for the service, and recourse is had merely to prayer, without the employment of material or human agencies, it cannot be said that the person invoking divine interposition in behalf of another is treating or offering to treat diseases of human beings by any system within the meaning of the statute, and cannot be said to be practicing medicine. In the instant case, the defendant not only employed prayer and the laying on of hands, but, if Keeling's version be accepted, the defendant put his ear over Keeling's heart and examined him somewhat in the region of the kidneys and liver, and rubbed him about the affected parts. It was immaterial that the sums paid to the defendant went to the church or society of which he was president and bishop, since, if the offense was committed by the defendant, the law would countenance or tolerate no evasion by his receiving compensation by indirection through the medium and device of a corporation.

Against Compulsory Roentgenographic Examination

(*Gregory vs. Acme Road Machinery Co. (N. Y.)*, 162 N. Y. Supp. 574)

The Supreme Court of New York, Appellate Division, Fourth Department, affirms an order denying a motion made by the defendant for an order directing the plaintiff to submit to having a roentgenogram taken. The court says that the question was whether the plaintiff might be compelled, under the provisions of Section 873 of the code of civil procedure, to submit to a roentgenographic examination in connection with the usual physical examination before trial, in an action for personal injuries. The special term of the supreme court held that the court has no power to order the plaintiff to submit to the taking of a Roentgen-ray picture, and this court thinks that holding is correct. If it were absolutely

certain that the plaintiff would not be injured by the taking of the roentgenogram, the court thinks he might be compelled to submit to it in aid of the physical examination. It was true that the expert, who it was proposed should take the roentgenogram, stated in his affidavit that with his apparatus there was no danger of burning, or of subjecting the plaintiff to any bodily injury. But it is well known that persons have been burned and seriously injured in the taking of such roentgenograms, and the expert conceded that, when an operator is not experienced and has not extensive knowledge of roentgenography, a person may be burned by the ignorance of the operator and by too long exposure. This court is clearly of the opinion that the plaintiff cannot be required to take the hazard of such an examination. This is not the taking of an ordinary photograph, which should do no harm to the subject. A want of attention, care and skill on the part of the operator might result in serious injury to the plaintiff, and that hazard the plaintiff should not be required to take, even if the provisions of the section were adequate to compel him to do so. A further discussion of the question seems unnecessary.

Liability in Personal Injury Case for Mistake of Surgeon

(*Galveston, H. & S. A. Ry. Co. vs. Miller (Texas)*, 191 S. W. R. 374)

The Court of Civil Appeals of Texas, in affirming a judgment for \$17,750 damages in favor of plaintiff Miller, for personal injuries, holds that there was no error in the trial court's refusing to instruct the jury that if it found the plaintiff's condition was impaired, rather than benefited, by any operation performed on him, then the jury was instructed that he could not recover on account of such impaired condition as a result of such operation, if any, unless the jury found from a preponderance of the evidence that such operation appeared to the surgeon performing it to be necessary, and that it was more probable that such operation, when performed, would benefit the plaintiff rather than injure him. Inverting the instruction, it would seem that it could be construed by the jury to have required it to find that the operation appeared necessary to the operating surgeon, and to have required the jury also to find as a fact that the operation would more probably benefit than injure the plaintiff, before he could recover any damages for the impaired condition resulting from the operation, if the jury found that the condition was impaired by the operation. The instruction was not a correct statement of the law. All that could defeat the plaintiff's claim for damages for increased injury caused by the operation was his own negligence in the selection of a surgeon. If not negligent in the selection of the surgeon, the defendant was liable for the mistake, if any, of the surgeon; and it was immaterial whether the operation appeared to the surgeon as necessary, or whether in fact the operation was more beneficial than hurtful.

Sufficient Information and Proper County for Trial

(*People vs. Maczulski (Mich.)*, 160 N. W. R. 576)

The Supreme Court of Michigan, in affirming a conviction of the defendant of having unlawfully procured himself to be registered as a physician under the provisions of Act 237 of the Public Acts of 1899, as amended by Act 368 of the Public Acts of 1913, says that the information charged the offense in the language of the statute and was sufficient. The supreme court also thinks that the court in the county in which the record showed that the defendant's application for a license was filled out and filed and the license was issued had jurisdiction to try the case, notwithstanding that he passed an examination in another county.

Society Proceedings

COMING MEETINGS

Montana Medical Association, Kalispell, July 11-12.
Western Roentgen Society, Kansas City, Mo., July 20-21.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

June, CLIII, No. 6

- 1 *Some Neurologic Observations in One Hundred and Fifty Laminectomies for Spinal Disease and Injury. C. A. Elsberg, New York.—p. 781.
- 2 *Obsolete Miliary Tubercles of Spleen. O. Klotz, Pittsburgh.—p. 786.
- 3 *Association of Gastric Symptoms in Nephritis with Retention of Nitrogenous Waste Products in Blood. A. F. Chace, New York.—p. 801.
- 4 Studies in Physiology and Pathology of Stomach After Gastro-Enterostomy. A. O. Wilensky and B. B. Crohn, New York.—p. 808.
- 5 Two Cases of Probable Syphilis of Intestines. D. A. Haller and I. C. Walker, Boston.—p. 824.
- 6 Diverticulum of Duodenum; Report of Case. S. Basch, New York.—p. 833.
- 7 *Use of Raw Eggs in Practical Dietetics. W. G. Bateman, Missoula, Mont.—p. 841.
- 8 *Treatment of Bronchial Asthma by Vaccination; Report of Cases. M. H. Sicard, New York.—p. 856.
- 9 *Effect of Anesthesia and Operation on Kidney Function. R. Colp, New York.—p. 868.
- 10 *Unusual Disorder of Cardiac Mechanism Relieved by Surgical Operation. E. B. Krumbhaar, Philadelphia.—p. 872.
- 11 Lead Poisoning in Children, with Especial Reference to Lead as Cause of Convulsions. K. D. Blackfan, Baltimore.—p. 877.
- 12 *Case of Primary Endothelioma of Pleura. R. A. Keilty, Philadelphia.—p. 888.

1. See THE JOURNAL, June 10, 1916, p. 1852; also July 15, 1916, p. 168.

2. **Obsolete Miliary Tubercles of Spleen.**—In a series of 404 necropsies, tuberculosis was encountered in 172 cases. The spleen was involved sixty-nine times, and in forty of these miliary lesions were completely or almost completely healed by fibrosis. The average age was 42 years and the youngest was 18 years. Six of the cases showed a persistent tuberculosis in other organs. In fifteen cases the liver also contained healed miliary tubercles. In none of the cases had there been recognizable clinical manifestations of splenic involvement. The spleen was not enlarged. In twelve cases with healed miliary tubercles of the spleen no other tuberculous process was found. The splenic infection was a hematogenous one arising most commonly from antecedent foci in the lungs or peribronchial glands. Those cases in which no primary tuberculous focus was found probably had a similar mode of origin in which, however, the initial focus was of minor extent unrecognizable at the time of necropsy. Klotz points out that the fibroses which are observed in anthracotic peribronchial glands are difficult of analysis as indicating a preceding infectious origin of the fibrosis. The healed splenic tubercles are recognized only by careful search and complete gross sectioning of the tissues of the organ. The presence of the healed miliary tubercles of the spleen indicates the frequency of a tuberculous bacteremia from which the tissues may entirely recover. The different organs demonstrate a variable resistance to the tuberculous infection. Reinfection may take place in the spleen.

3. **Gastric Symptoms in Nephritis.**—Gastric symptoms, Chace says, are among the most common early symptoms of nephritis. In cases with obscure gastric disturbances the chemical examination of the blood has been found very valuable. Several cases are reported in which the estimation of the blood creatinin not only showed that the patients were suffering from severe nephritis, but gave a fatal prognosis. In some of the earlier cases the blood uric acid was of value as an early diagnostic sign.

7. **Use of Raw Eggs in Practical Dietetics.**—Further experiments made by Bateman on man show that raw egg-white is a decidedly indigestible substance. It may cause diarrhea and vomiting when ingested in any large quantity. Its utilization by the body is poor, since it is used only to the extent of from 50 to 70 per cent.

8. **Treatment of Asthma by Vaccination.**—Whatever the variety of germ causing asthma, whether *Streptococcus viridans* or *Streptococcus hemolyticus*, Sicard is convinced

that an autogenous vaccine made from the sputum will cure the attacks. It is best given twice a week, in constantly increasing strength, for twelve to twenty injections. It is much better to give such dosage that local reaction occurs, although Sicard has had cures in patients who showed no local reaction. On the other hand he has had cases which showed no improvement until doses were given in sufficient quantity to cause local reaction. Sicard has adopted the practice of beginning with 100,000,000 in adults and feeling his way cautiously until finding the dose that caused local reaction, and then provoking a local reaction on every injection. If at any time the local reaction be too severe, or if general symptoms occur in the form of fever, chilliness, general malaise or aches, or increase in the asthma, he allows a rest for a period before beginning again, using his judgment as to continuing the same dosage or dropping back to a smaller one; it is better to avoid going backward if possible. One thousand million is often far enough to carry them, although more obstinate cases may require 2,000 million, and Sicard has carried them to 3,000 million and higher. It is very striking to see the asthma clear up after the first injection, as has happened in a number of cases. The longest period cure Sicard reports is two years.

9. **Effect of Anesthesia and Operation on Kidney.**—On the whole, says Colp, the average case after thirty-six hours postoperative shows very little change in kidney function as demonstrated by the phenolsulphonephthalein test, although 25 per cent. showed urinary changes, which in ten days time were again negative. The functional activity of the kidney is depressed as the length of anesthesia is increased, while in short anesthetics the kidney might even appear to be stimulated to a slight degree. As age increases the threshold activity of the kidney is lessened. Nervous patients, anemic, obese and arteriosclerotic patients as a rule, show some effect of their physical or psychic state on kidney function. Preexisting conditions of albuminuria have a tendency to decreased phthalein excretion, and those cases which have a decreased phthalein excretion, in the majority of instances, show effects of kidney depression as evidenced by careful urinary analysis, although these effects are only temporary. For long anesthetics and apparently for nervous patients, gas and oxygen as an anesthetic seems to have the least irritating effect on kidney function, as demonstrated especially by urine examination.

10. **Disorder of Cardiac Mechanism.**—A case of cardiac arrhythmia by Krumbhaar is described in which a condition of ectopic beats arising in different parts of Tawara's node was simulated by a shortened conduction time (P-R interval) with recurring auricular extrasystoles (pulsus bigeminus). Both of these disorders of the cardiac mechanism were relieved by a pelvic operation (anterior and posterior colporrhaphy), at least to the extent that they disappeared during the period of observation.

12. **Primary Endothelioma of Pleura.**—Keilty's patient presented loss of weight, weakness, cough, expectoration, headache, vomiting, gastro-intestinal symptoms, chest signs of consolidation, Roentgen-ray shadow over the primary growth, metastases, palpable lymph nodes, palpable liver with nodules, fixation of the vocal cords, negative sputum and Wassermann, and secondary anemia. The case terminated in a nephritis, cardiac failure, jacksonian convulsions and hemiplegia. Pathologically there was one large primary mass arising from the pleura, composed of endothelial cells in various types and arrangements, with extension to the lung, bronchial lymph nodes, trachea and bronchi and compression of the aorta. Metastases followed to the liver, kidney, lymph nodes, abdominal skin, right radius and brain, with erosion of the spinal bony column and fracture of a rib.

American Journal of Orthopedic Surgery, Boston

June, XV, No. 6

- 13 Plea for More Frequent Use of Rational Functional Methods in Treatment of Fractures. C. H. Bucholz, Boston.—p. 447.
- 14 Orthopedic Findings in Group Study of Miscellaneous Affections. G. J. McChesney, San Francisco.—p. 459.
- 15 Hereditary Deforming Chondrodysplasia; Report of Cases. A. Ehrenfried, Boston.—p. 463.

- 16 Delayed Development in Tarsus; Report of Two Cases. C. L. Lowman, Los Angeles, Calif.—p. 479.
- 17 Apparatus for Application of Jackets in Scoliosis. F. H. Ewerhardt, St. Louis.—p. 483.

American Journal of Roentgenology, New York*June, IV, No. 6*

- 18 Some Essential Points in Anatomy of Lung. W. S. Miller, Madison, Wis.—p. 269.
- 19 Relation of Pathology of Pulmonary Tuberculosis to Roentgen Findings. K. Dunham, Cincinnati.—p. 280.
- 20 Pneumoconiosis. W. W. Boardman, San Francisco.—p. 292.
- 21 Roentgen Treatment of Hyperthyroidism. G. W. Grier, Pittsburgh.—p. 300.
- 22 Action of Roentgen Rays on Plate, Pastille and Skin. J. Reiner and W. D. Witherbee, New York.—p. 303.
- 23 Unusual Position of Ureteral Calculi. G. C. Johnston and G. W. Grier, Pittsburgh.—p. 308.
- 24 Method for Dental Stereoroentgenography. H. Lctord and C. G. Lunan, El Paso, Texas.—p. 309.

American Review of Tuberculosis, Baltimore*April, I, No. 2*

- 25 Nature of Resistance to Tuberculosis. A. K. Krause, Baltimore.—p. 65.
- 26 Group Studies in Tuberculosis Under Different Climatic Conditions. W. C. Klotz, Los Angeles, Calif.—p. 83.
- 27 *Prognosis of Pulmonary Tuberculosis in Infancy. T. C. Hempelmann, St. Louis.—p. 99.
- 28 Case of Recurrent Pneumothorax. M. I. Marshak and J. W. Craighead, Edgewater, Colo.—p. 109.

May, No. 3

- 29 *Case of Intrathoracic Cyst with Calcification. G. J. Heuer, Baltimore.—p. 129.
- 30 Renal Function in Pulmonary Tuberculosis. E. H. Funk, Philadelphia.—p. 145.
- 31 What Massachusetts Is Doing to Prevent and Control Tuberculosis. J. B. Hawes, II, Boston.—p. 157.
- 32 Experimental Investigations of Tuberculous Peritonitis and Effect of Pneumoperitoneum. R. G. Peschman and H. J. Corper, Chicago.—p. 165.

27. **Pulmonary Tuberculosis in Infancy.**—A study was made by Hempelmann of the fate of 130 infants under 2 years of age with pulmonary tuberculosis. Sixty-four of these died and sixty-six were living at the time of the last note on the history. Of these sixty-six, only thirty are known to have lived for a period of more than one year after the diagnosis was made. Some of these, however, were observed for periods of four and five years. In computing the mortality, only those babies were classed as "living" who were known to have lived at least one year after the diagnosis was made. This eliminated thirty-six babies and the mortality among the remaining ninety-four was as follows: Under 1 year of age, the mortality was 78.7 per cent.; from 1 to 2 years of age, the mortality was 57.4 per cent., and for the 2 years, the mortality was 68 per cent.

29. **Case of Intrathoracic Cyst.**—The patient whose case is cited by Heuer was a man 53 years of age, who up to the day of onset of his illness had performed the heaviest labor and was unaware of the condition in his chest until a physical strain gave rise to pain, cough and shortness of breath. He presented the physical signs of pleurisy with effusion. In an attempt to confirm the diagnosis by thoracentesis, the exploratory needle met with resistance such as might be offered by a bony structure. The roentgenograms made possible a diagnosis which could not have been reached by physical examination alone. From these it was evident that there was present a cystic condition with complete calcification of the cyst wall, and that the cyst contents consisted of fluid and air. That was a communication between the cyst and the lung was clinically evident because of the periodic expectoration of large amounts of sputum. The roentgenogram apparently showed this point of communication. Following the roentgenologic studies diagnostic efforts were directed toward establishing the nature of the cystic condition. There was no evidence of tuberculosis, no eosinophilia and no characteristic findings in the sputum, such as hooklets or hairs. Etiologically, there was no history of pulmonary affections, of trauma of the chest or of intimate association with dogs. A positive diagnosis could not be made before operation. The diagnoses suggested were encapsulated empyema, hematoma of the thorax, echinococcus cyst and dermoid cyst.

Annals of Ophthalmology, St. Louis*April, XXVI, No. 2*

- 33 Some Phases of Diagnostic and Therapeutic Uses of Tuberculin in Uveitis. H. Woods, Baltimore.—p. 223.
- 34 Internal Secretory System and Eye. R. S. Lamb, Washington, D. C.—p. 239.
- 35 Cataract Operation as it is Done by Spanish and Latin American Surgeons. J. S. Fernandez, Havana, Cuba.—p. 243.
- 36 Lupus Vulgaris, Particularly in Its Involvement of Ocular Structures. B. Chance, Philadelphia.—p. 246.
- 37 Case of Lupus of Conjunctiva and Cornea. C. E. G. Shannon and L. W. Hughes, Philadelphia.—p. 255.
- 38 Pressure Changes in Curvature of Cornea, Due to Chalazion and Other Lid Tumors. T. W. Moore, Huntington, W. Va.—p. 257.
- 39 Case of Orbital Abscess within Muscle Cone. C. M. Miller, Richmond, Va.—p. 260.
- 40 Unusually Long Open Wound After Cataract Extraction. E. J. Bernstein, Detroit.—p. 265.
- 41 Suggestion for Improved Prothesis. T. J. Dimitry, New Orleans.—p. 268.
- 42 Tuberculosis of Retinal Vessels with Recurring Hemorrhages and Proliferating Retinitis. F. R. Spencer, Boulder, Colo.—p. 272.

Archives of Diagnosis, New York*April, X, No. 2*

- 43 Dyspituitarism. G. A. Moleen, Denver.—p. 103.
- 44 Endothelial Cells — Normal Blood Constituent — New Staining Method for Mitochondria. F. Proescher and H. A. Seil, Pittsburgh.—p. 122.
- 45 Diagnosis of Arterial Group. S. R. Roberts, Atlanta, Ga.—p. 129.
- 46 Diagnosis of Pellagra. E. J. Wood, Wilmington, N. C.—p. 139.
- 47 Symptoms vs. Physical Signs in Early Diagnosis of Pulmonary Tuberculosis. P. H. Ringer, Asheville, N. C.—p. 145.
- 48 Clinical Consideration of Temperature of So-Called Obscure Origin in Infants and Children. H. Lowenburg, Philadelphia.—p. 150.
- 49 Gastric Disturbance in Gallbladder Disease. W. F. Cheney, San Francisco.—p. 164.
- 50 Syphilis of Stomach; Diagnosis and Treatment. B. B. V. Lyon, Philadelphia.—p. 169.
- 51 *Diagnostic Sign of Gastro-Enteroptosis. C. D. Aaron, Detroit.—p. 178.
- 52 Early Symptoms and Diagnosis of Acute Infantile Paralysis. L. C. Ager, Brooklyn.—p. 180.
- 53 Diagnostic, Prognostic and Therapeutic Value of Lumbar Puncture in Spinal Injuries. H. Neuhof, New York.—p. 193.
- 54 *Diagnosis and Prognosis in Fractures of Base of Skull. F. E. Bunts, Cleveland.—p. 196.
- 55 Pain in the Back. W. S. Reynolds, New York.—p. 202.
- 56 Factors in Prognosis of Syphilis of Nervous System. E. L. Hunt, New York.—p. 207.
- 57 Diagnosis and Prognosis of Cerebrocerebellar Diplegia. L. P. Clark, New York.—p. 211.
- 58 Degenerate; Born Delinquency and Criminologic Heredity. J. V. Haberman, New York.—p. 218.

51. **Diagnostic Sign of Gastro-Enteroptosis.**—Aaron states that in cases of gastro-enteroptosis, deep, continuous pressure with the ends of the fingers, over the celiac plexus, in the epigastrium will induce pain. The point of sensibility varies in different individuals. To locate it, the cooperation of an assistant is necessary. With the patient standing, the physician applies his fingers in a series of deep pressures until the point of greatest tenderness is found. The fingers are held at this point. The nurse then takes a position behind the patient, passes both arms about him so that the hands, meeting in front, rest on the hypogastrium and lifts the abdomen in its entirety. This relieves the epigastric pain at once, despite the great pressure exerted by the physician at the point of tenderness. When, however, the nurse allows the patient's abdomen to drop to its former position, the deep pressure continuing, the pain reappears. Aaron has found this sign to be constant in gastro-enteroptosis. In organic disturbances, such as gastric ulcer, carcinoma, etc., the pain under pressure continues even when the abdomen is lifted.

54. **Fractures of Base of Skull.**—As the result of his clinical experience, Bunts has formulated the following rules for his guidance: First, simple cases of fracture of the base of the skull without severe laceration of the brain practically all get well without operative interference. Second, the greatest cause of danger in these cases is from septic meningitis and operation cannot prevent this complication, but rather adds to its probability. Third, the bad cases, complicated by a bursting fracture of the skull with an extensive laceration of the brain, practically all die. Fourth, it is in this class of cases that operations such as removing spicula of bones, crushed brain, etc., are most frequently resorted to, but

usually without avail. Fifth, distinct compression symptoms coming on immediately after the injury without obvious evidence of extensive brain laceration would probably be deserving of decompression operation, for they might be due to hemorrhage and be susceptible for relief or arrest. Sixth, late symptoms of compression with beginning choked disk might be due either to hemorrhage or edema, and should be subjected to immediate operation, though in the one case in which Bunts had an opportunity to follow this plan, operation and subsequent necropsy showed no clot, very slight hemorrhage, but extensive laceration of the brain, not only in the lowest frontal convolution near the site of fracture, but in the occipital region far from the fracture the laceration of the brain was even greater than in the frontal. Seventh, there are insufficient available statistics as yet to show that decompression operations hasten the recovery after fracture of the base, or lessen subsequent liability to cerebral disturbances.

Archives of Internal Medicine, Chicago

June, XIX, No. 6

- 59 Hay-Fever and Hay-Fever Pollens. W. Scheppegeggrell, New Orleans.—p. 959.
- 60 *Systolic Blood Pressure Following Exercise; Remarks on Cardiac Capacity. D. L. Rapport, Boston.—p. 981.
- 61 *New Interpretation of Pathologic Histology of Hodgkin's Disease. D. Symmers, New York.—p. 990.
- 62 *Treatment of Syphilis of Central Nervous System. D. A. Haller, Boston.—p. 997.
- 63 *Salicylates. Renal, Functional and Morphologic Changes in Animals Following Administration of Salicylate. P. J. Hanzlik and H. T. Karsner, Cleveland.—p. 1016.
- 64 *Id. Further Observations on Albuminuria and Renal Functional Changes Following Administration of Full Therapeutic Doses of Salicylate. P. J. Hanzlik, R. W. Scott and T. W. Thoburn, Cleveland.—p. 1029.
- 65 Influence of Nonspecific Substances on Infections. J. W. Jobling, Nashville, Tenn.—p. 1042.
- 66 *Effect of Pituitary Injections on Blood Pressure of Febrile Patients. H. B. Schmidt, Ann Arbor, Mich.—p. 1059.
- 67 Diminished Blood Platelets and Marrow Insufficiency. G. R. Minot, Boston.—p. 1062.
- 68 Reaction of Cerebrospinal Fluid. L. D. Felton, R. G. Hussey, and S. Bayne-Jones, Baltimore.—p. 1085.
60. **Systolic Blood Pressure.**—The work reported on by Rapport was done at the Hampstead Military Hospital, London, which institution has been set aside by the British War Office for the investigation and treatment of soldiers suffering from cardiac disabilities. The conclusion drawn is that as an immediate sequence of accomplished exercise, whether that exercise is moderate in degree, or whether it calls forth a full effort on the part of the person who performs it, there is a rise of systolic blood pressure. The curve rises from a little above the original normal level to a point far above it; the rise is abrupt and has largely escaped detection on this account. This rise, in cases in which it is discovered, is spoken of by Barringer as the "delayed rise," and by him is considered to show that the exercise which produces it has overlooked the heart. With this conclusion Rapport disagreed. He says that to speak of the rise ("delayed rise") itself as an index of a change in the circulatory reaction is unsound; to speak of a delay in the full development of the rise with severe effort, is usually to speak correctly. Rapport regards Barringer's method of ascertaining the shape of the blood pressure curve to be without value, on account of the large variations in pressure which occur in the fraction of a minute following accomplished exercise.
61. **Hodgkin's Disease.**—According to Symmers, Hodgkin's disease is primarily neither an infective nor a neoplastic lesion of the lymph nodes, but a systemic disease which expresses a predilection for lymphoid tissues, giving rise to multiple foci of growth at approximately the same time and in response to the same provocative agent. The provocative agent, whatever its nature and origin may be, causes preliminary hyperplastic changes in the lymphoid tissues and initiates disturbances in the bone marrow, characterized, among other things, by proliferation of the nongranular mononuclear cells of the lymphocytic type, eosinophils and eosinophilic myelocytes. These cells, together with the myeloplaxes, are thrown into the circulation and filtered out by the lymph nodes or deposited in them in response to

chemotactic attractions, the fibrotic changes in the recipient tissue representing a purely local reactive process. The histologic changes beyond the lymphoid system proper, namely, in the liver, kidneys, etc., represent a reaction on the part of normally existing lymphomatous foci to the same toxic substance which is responsible for the disturbances in the bone marrow and for the myeloid transformation of the lymph nodes.

62. **Treatment of Syphilis.**—Haller's paper consists of a description of the preparation of mercurialized serum and of a tabulation of the results obtained from its use in forty-five patients to whom 150 doses were given, with a comparison of these results and those obtained in previous cases with salvarsanized serum. Eleven patients previously treated with salvarsanized serum were each given three or more intraspinal treatments with mercurialized serum, a total of thirty-eight doses. The effect on the Wassermann reaction, cell count and clinical symptoms was in every case equally as good as, if not better than, from the same amount of salvarsanized serum. The reactions in every case were more severe than with the salvarsanized serum.

63. **Salicylates.**—The administration of salicylate in doses corresponding to full therapeutic doses for human beings per kilogram of body weight, Hanzlik and Karsner say, causes the appearance of albumin, leukocytes, casts or castlike bodies, and sometimes red blood corpuscles, in the urine of animals (cats, dogs and one rabbit). A preexisting albuminuria is aggravated by the administration of salicylate. The albuminuria is of direct renal origin. So far as the nonprotein and urea nitrogen of the blood are concerned, there is a diminution in renal functional efficiency. Morphologically, a lesion of the kidney appears, varying in severity from simple cloudy swelling of the epithelium of the proximal convoluted tubule to extensive cloudy swelling of all the cortical parts of the tubules, associated with an acute intracapillary glomerulitis, the latter process being denominated as an acute tubular nephritis.

64. **Renal Functional Changes Following Administration of Full Doses of Salicylate.**—The administration of salicylate in full therapeutic doses invariably causes the appearance of albumin, white blood corpuscles and granular casts or castlike bodies in the urines of normal, rheumatic, nonrheumatic, febrile and afebrile persons. The albuminuria is not of febrile origin, but due directly to the drug. A preexisting albuminuria is aggravated by the administration of salicylate. So far as renal functional efficiency is concerned, there is a diminution. This is indicated by: (1) lessened water excretion [taken in connection with (2) and (3)]; (2) diminished phenolsulphonephthalein excretion, and (3) accumulation of urea nitrogen of the blood. The administration of bicarbonate together with salicylate has practically no demonstrable influence on the albuminuria and renal functional changes produced by the salicyl.

66. **Effect of Pituitary Injections on Blood Pressure of Febrile Patients.**—Twenty-seven observations were made by Schmidt on fifteen patients. Of these, six had pulmonary tuberculosis, three infectious sore throat, one exophthalmic goiter, three lobar pneumonia, one surgical shock, and one was convalescing from typhoid. From 1 to 1.5 c.c. of extract of pituitary gland was injected deep into the muscle of the arm. The blood pressures were taken several times before the injection, and thereafter at intervals of about fifteen minutes for a period of one hour or more. The pulse rate, temperature and rate of respiration were also noted. Aside from an occasional slowing of the pulse rate, which never exceeded ten beats per minute, no definite change in these occurred. Before the injection the pulse was usually of a bounding character (pointed or collapsing pulse). Following the injection it could often be felt to become smaller and more sustained. This change was usually noted in the observation made fifteen minutes after the injection, and it continued for an hour or more. The systolic blood pressure after pituitary injections was not altered in any constant or striking manner. The rise in the diastolic pressure amounted in some instances to 15 mm. Hg, or more, and this, together with its time and relative constancy, made it certain that it

was due to the action of the drug. The impression was gained, furthermore, that the rise in diastolic pressure was most striking and constant when the pulse was of a definitely pointed form. No effect on the pulse or blood pressure was observed when the pituitary extract in doses of 2 c.c., or when pituitary substance in doses of 15 grains of the desiccated gland, was administered by mouth.

Annals of Surgery, Philadelphia

June, LXV, No. 6

- 69 Surgical Experience and Surgical Knowledge. J. E. Sweet, Philadelphia.—p. 673.
- 70 *Results of Treatment of Lymphosarcoma by Means of Roentgen-Rays and Other Methods. A. F. Holding, New York.—p. 686.
- 71 Histologic Study of Circular Suture of Blood Vessels. C. Goodman, New York.—p. 693.
- 72 *Studies in Regeneration and Growth of Bone. B. Brooks, St. Louis.—p. 704.
- 73 Congenital Lipomata of Cheek; Report of Two Cases. J. Ransohoff, Cincinnati.—p. 711.
- 74 Case of Secondary Hemorrhage Treated by Ligation of Common Carotid Artery. W. Bartlett and O. F. McKittrick, St. Louis.—p. 715.
- 75 Study of Motor Disturbances Accompanying Ulcer of Stomach or Duodenum and Changes Produced by Operation. A. O. Wilensky, New York.—p. 730.
- 76 *Anatomic Point which Facilitates Location and Delivery of Appendix. D. Guthrie, Sayre, Pa.—p. 742.
- 77 Cystic Dilatation of Vermiform Appendix. P. J. Reel, Columbus.—p. 743.
- 78 Typhoid Spine; Report of Case. A. H. Levings, Milwaukee, Wis.—p. 747.

70. **Results of Treatment of Lymphosarcoma.**—A series of thirty-five cases of lymphosarcoma observed by Holding offers an unusual opportunity for comparing the results of different methods of treatment in this disease. The series includes several anatomic types, as lymphocytomas, large round reticulum cell sarcomas, tumors approaching atypical Hodgkin's disease in histology, and lesions approximating the chronic granulomas. It does not include any of the embryonal epithelial tumors (endotheliomas nor infectious granulomas) which frequently resemble lymphosarcoma so closely that they are diagnosed as such. The duration of the disease varied from two months to seven years. In fifteen of the cases the disease first manifested itself in the tonsil; in fourteen of the cases the disease first affected the cervical glands, and in six cases other glands in the body were first affected. Cases with primary manifestations occurring in the tonsil were most malignant. Thirty of these patients are dead or dying. Five are symptomatically well. In twenty-two patients from one to five operations had been performed, and the patients presented with postoperative recurrences. In none of the cases was excision used alone. In most of the cases several methods of treatment were used. Three patients were treated with autogenous vaccine derived from tumors excised from the patient; one patient was treated with serum from a goat which had been given immunizing doses of a diphtheroid organism isolated from the patient's tumor; one patient was treated with colloidal copper; two with other experimental methods, all of which yielded no conclusive therapeutic results. Eight patients were treated by surgical operations followed by mixed toxin treatment; of these, one has been symptom-free for four years; five are known to be dead and two disappeared from observation.

Nine patients were given mixed toxin treatment at first and grew worse; other agents resorted to were radioactive methods, and the patients made rapid improvements as soon as this change was made; one of these patients became symptom-free. The other four toxin patients who were not put on radioactive treatment did not improve. One patient was treated by mixed toxin alone; he was unimproved and is now dead. Fourteen patients were treated with mixed toxin in conjunction with other methods; six were improved; six were unimproved; two disappeared from observation. Five patients were treated with Roentgen rays alone; of these, one has been symptomatically well for three years; in two the masses disappeared but later presented in other parts of the body, and both patients are now dead; the other two patients were unimproved. Twenty-three patients in all were treated with massive doses of Roentgen rays; of these fifteen were improved. Two patients were treated with radium alone; one

has been symptom-free for one year; the other was improved for a time but is now dead. Seven patients were treated with radium in conjunction with other methods; one has been symptom-free for one year; six were improved. Five patients have been symptomatically well, respectively, three years, four years, three and one-half years, one year and one year. Thirteen patients were improved. Of the thirty-five patients, nineteen are known to be dead; one is dying; five have disappeared from observation. Thirteen patients of the thirty-four were improved for periods varying from one month to one year. Twelve patients of the series were unimproved.

72. **Regeneration and Growth of Bone.**—The experiments reported on by Brooks show that sodium alizarin sulphonate when given by mouth, subcutaneously or intravenously has selective intravital staining properties, and that it stains only bone which has been but recently formed or is formed during the period the dye is in the circulation. The use of sodium alizarin sulphonate experimentally furnishes a valuable method in the study of the problems of regeneration and growth of bone.

76. **Anatomic Point which Facilitates Location and Delivery of Appendix.**—The attachment of the lower root of the mesentery opposite the sacro-iliac joint marks the point of juncture between the ileum and the cecum. By its location, Guthrie says, the appendix can be found readily and delivered without drawing any of the colon or the small intestine out of the wound. The advantages are obvious. With so little trauma to the intestine, the postoperative convalescence is made comfortable, the danger of infection is lessened, and the time of operation shortened within reasonable limits. The method can only be employed in cases in which the appendix lies free in the abdomen.

Boston Medical and Surgical Journal

June 14, CLXXVI, No. 24

- 79 Military Medicine; Means to Perpetuate Its Teaching in Massachusetts. P. E. Truesdale, Fall River.—p. 825.
- 80 Gastric and Duodenal Ulcers. J. S. Rodman, Philadelphia.—p. 834.
- 81 Practicing Physician and Public Health. M. E. Champion, Wollaston.—p. 840.
- 82 Case of Congenital Anomaly of Larynx. G. H. Powers, Boston.—p. 843.

June 21, No. 25

- 83 Physiologic Factors Concerned in Surgical Shock. W. B. Cannon, Boston.—p. 859.
- 84 *Recognition of Pancreatic Insufficiency, with Special Reference to Loewi Test. H. R. Decker, Pittsburgh.—p. 867.
- 85 Some Unusual Conditions Observed in Two Hundred and Forty-Five Postmortem Examinations at Danvers State Hospital. L. G. Lowrey, Boston.—p. 872.
- 86 Some Conditions Leading to Incorrect Diagnosis of Adenoids in Children. V. Dabney, Washington, D. C.—p. 875.
- 87 *Bárány's Sign in Epileptics and in Schoolchildren. E. A. Tracy, Boston.—p. 877.

84. **Pancreatic Insufficiency, Reference to Loewi Test.**—In 500 cases in which the Loewi test was applied there were eighteen positive reactions, only two of which were known to have pancreatic lesions, one, a case of carcinoma of the pancreas, the other, chronic pancreatitis associated with gallstones. In fifteen gallbladder cases there were three positive reactions. In only one of these was the pancreas involved. From this record it is apparent: (1) that the reaction is not pathognomonic of pancreatic disease, (2) that it is absent in cases which by other methods are proved to have pancreatic lesions.

87. **Bárány's Sign in Epileptics and in Children.**—Tracy examined fifty patients at the Monson State Hospital for epileptics. Bárány's sign, conjugate deviation of the eyes, was found present in twenty-three cases, the conjugation pointing to the left in thirteen of them and to the right in ten. Tracy concludes that Bárány's sign is not constant in epilepsy, when found. It is not rare in apparently normal children.

California State Journal of Medicine, San Francisco

June, XI, No. 6

- 88 Organized Medicine; Consideration of Some of Its California Problems. G. H. Kress, Los Angeles.—p. 186.

- 89 Otitic Meningitis. E. C. Sewall, San Francisco.—p. 206.
- 90 Present and Proposed Legislation for Prevention of Blindness. E. F. Glaser, San Francisco.—p. 213.
- 91 Meningitis of Nasal Origin. H. McNaught, San Francisco.—p. 217.
- 92 Ectopic Pregnancy; Report of Case. W. F. Jordan, Floriston.—p. 218.

Illinois Medical Journal, Chicago

June, XXXI, No. 6

- 93 Conquest of Cancer. A. McGlannan, Baltimore.—p. 368.
- 94 Boric Acid in Treatment of Pneumonia and Other Affections Caused by Diplococcus of Weichselbaum. This is the Meningococcus Not Pneumococcus. E. H. Ochsner, Chicago.—p. 371.
- 95 Role of Syphilis in Internal Medicine. A. S. Warthin, Ann Arbor, Mich.—p. 373.
- 96 Medical Legislation in Illinois. C. St. C. Drake, Springfield.—p. 379.
- 97 Tic Douloureux; Report of Case. G. W. Robinson, Kansas City, Mo.—p. 384.
- 98 Alcoholism as Observed at Sceleth Hospital of House of Correction with Necropsy Findings. C. E. Sceleth, Chicago.—p. 387.
- 99 Some Experiences with Radium. C. W. Hanford, Chicago.—p. 389.
- 100 Arteriosclerosis and Its Relation to Mental Diseases. E. F. Leonard, Chicago.—p. 393.
- 101 Cases of Folie a Deux. S. N. Clark, Kankakee.—p. 395.
- 102 Present Status of Epidemic Poliomyelitis. A. L. Hoyne, Chicago.—p. 401.
- 103 Chronic Appendicitis. G. D. J. Griffin, Chicago.—p. 403.
- 104 Antiseptics and Germicides; Uses and Abuses. S. J. Russell, Chicago.—p. 405.
- 105 Safety First in Anesthesia. T. L. Dagg, Chicago.—p. 407.

Journal of Laboratory and Clinical Medicine, St. Louis

June, II, No. 9

- 106 Smallpox Vaccination at University of California. J. N. Force, Berkeley, Calif.—p. 599.
- 107 Report on Prophylactic Vaccination with B. Typhosus, B. Paratyphosus A, and B. Paratyphosus B. W. C. Davison, Brooklyn.—p. 607.
- 108 Significance of Lambliia Intestinalis in Stool Examinations. A. H. Logan and A. H. Sanford, Rochester, Minn.—p. 618.
- 109 Chloroma; Report of Case. R. H. Boots, Pittsburgh.—p. 622.
- 110 Thymus. P. G. Woolley, Cincinnati.—p. 632.
- 111 Orthostatic Albuminuria. A. F. Beifeld, Chicago.—p. 638.
- 112 Diastolic Pressure in Aged. L. M. Bowes, Chicago.—p. 641.
- 113 Chemistry of Cerebrospinal Fluid. C. E. Kiely, Cincinnati.—p. 645.
- 114 Splenomegalia. J. W. Shuman, Sioux City, Iowa.—p. 647.
- 115 Quantitative Separation of Heroin from Organs. W. D. McNally, Chicago.—p. 649.
- 116 Preparation of Protein Extracts for Diagnostic Cutaneous Tests. N. S. Ferry, Detroit.—p. 655.
- 117 Studies of Complement; Relation to Certain Tests. N. E. Williamson, Stockton, Calif.—p. 658.

Kentucky Medical Journal, Bowling Green

June, XV, No. 6

- 118 Improvements in Treatment of Wounds During Present War. I. Abell, Louisville.—p. 264.
- 119 *Rheumatism from Modern Viewpoint. S. J. Meyers, Louisville.—p. 273.
- 120 Tuberculous Meningitis. J. R. Morrison, Louisville.—p. 277.
- 121 Then and Now. B. P. Earle, Dawson.—p. 280.
- 122 Radium Treatment of Cervical Cancer; Report of Case. L. W. Frank, Louisville.—p. 282.
- 123 Complications in Operative Treatment of Uterine Tumors. J. G. Sherrill, Louisville.—p. 284.
- 124 Infections of Hand; Their Diagnosis and Treatment. H. McKenna, Louisville.—p. 290.
- 125 Endocarditis. W. R. Burr, Auburn.—p. 293.

119. Abstracted in THE JOURNAL, Dec. 2, 1916, p. 1693.

Medical Record, New York

June 16, XCI, No. 24

- 126 Importance of Duodenal Alimentation in Severe Dyspepsia Occurring After Gastro-Enterostomy. M. Einhorn, New York.—p. 1023.
- 127 Venous Stasis and Colloidal Diffusion as Etiologic Factors of Gastroduodenal Ulcer. F. B. Turck, New York.—p. 1026.
- 128 Explanation and Meaning of Bahinski Sign. M. Solomon, Chicago.—p. 1029.
- 129 Intraspinal Medication in Treatment of Syphilitic Disease of Nervous System. L. M. Gaines, Atlanta, Ga.—p. 1034.
- 130 Splenic Anemia, with Cirrhosis of Liver and Ascites. H. M. Moses, Brooklyn.—p. 1037.
- 131 Carcinoma from Standpoint of General Surgeon. C. G. Heyd, New York.—p. 1039.
- 132 Poisonous Principle of Poison Oak, Nonbacterial. J. B. McNair, Pasadena, Calif.—p. 1042.

June 23, No. 25

- 133 Constitutional Aspect of Ordinary Chronic Dyspepsia. C. S. Fischer, New York.—p. 1081.

- 134 Liquid Paraffin Dressings. D. H. Stewart, New York.—p. 1087.
- 135 Megacolon in Childhood, Its Medico-surgical Treatment. A. Peskind, Cleveland.—p. 1089.
- 136 Prognosis in Pulmonary Tuberculosis. P. C. Bartlett, Boston.—p. 1091.
- 137 Practical Value of Chemistry to Medicine. F. S. Hammett, Los Angeles.—p. 1093.

Military Surgeon, Washington, D. C.

June, XL, No. 6

- 138 Collection and Evacuation of Sick and Wounded from Front to Base. T. H. Goodwin.—p. 609.
- 139 Diagnosis of Tuberculosis in Military Service. G. E. Bushnell.—p. 620.
- 140 Sanitary Service of Austro-Hungarian Army in Campaign. J. H. Ford.—p. 645.
- 141 Epidemiologic Study of Outbreak of Measles, Camp Wilson, San Antonio, Texas. E. L. Munson.—p. 666.
- 142 Illinois Camp of Mobilization, Springfield, June 19 to August 7, 1916. J. Frank.—p. 680.
- 143 Effects of Submarine Duty on Personnel. W. W. Cress.—p. 699.
- 144 Administrative Technic of Antityphoid Inoculations. J. H. Allen.—p. 710.

Missouri State Medical Association Journal, St. Louis

June, XIV, No. 6

- 145 Significance of Nonspecific Protein Reaction in Specific Therapy. A. Sophian, Kansas City.—p. 231.
- 146 Blood Chemical Methods in Diagnosis and Prognosis. R. B. H. Gradwohl, St. Louis.—p. 235.
- 147 Roentgen Rays in Diagnosis of Gastro-Intestinal Complications. E. H. Kessler, St. Louis.—p. 239.
- 148 Conservative and Surgical Management of Gonorrheal Pyosalpinx. W. Kerwin, St. Louis.—p. 243.
- 149 Case of Solanin Poisoning from Eating Raw Potatoes. E. H. Roberts, Marshfield.—p. 247.

New York Medical Journal

June 16, CV, No. 24

- 150 Clinical Aspects of Diseases of Ductless Glands. J. Sailer, Philadelphia.—p. 1121.
- 151 Genito-Urinary Diseases and Life Assurance. B. A. Thomas, Philadelphia.—p. 1125.
- 152 Some Misleading Medical Fads of Time. B. Robinson, New York.—p. 1130.
- 153 Massage, Kinesitherapy, and Bandaging in Treatment of Displaced Semilunar Cartilages on Knee Joint. D. Graham, Boston.—p. 1130.
- 154 Digitalis. R. F. Ives, New York.—p. 1135.
- 155 Thymol Treatment of Trichinosis. M. Kahn, Pittsburgh.—p. 1137.
- 156 Radium Treatment of Tinnitus and Middle Ear Deafness. I. Sobotky, Boston.—p. 1138.
- 157 Urologic Diagnosis. F. J. Parmenter, Buffalo.—p. 1139.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Radiology and Electrotherapy, London

May, XXI, No. 12

- 1 Physiologic Basis of Electric Tests in Peripheral Nerve Injury. E. D. Adrian.—p. 379.
- 2 Use of Roentgen Rays in Great War, with New Method for Location of Foreign Bodies. A. G. Straw.—p. 392.
- 3 Case of Pin Swallowing. H. Black.—p. 395.

Journal of Tropical Medicine and Hygiene, London

May 15, XX, No. 10

- 4 *Three Cases of Venereal Granuloma Treated with Tartar Emetic. C. Bonne.—p. 109.
- 5 Case of Recurrent Bilharziosis. J. L. Potts.—p. 110.

4. Venereal Granuloma Treated with Tartar Emetic.—Bonne cites the case of a woman with an inoperable venereal granuloma extending into the rectum and vagina. The septum between vagina and urethra was partly destroyed, and the woman actually passed the urine into the vagina. Of both labia majora the skin on the outer side and the mucous membrane on the inner side were involved by granulomatous tissue. Part of one of the labia was elephantoid. The patient had been in the hospital for longer than a year, and had been treated locally with cauterization, ointments, etc., without any permanent benefit. Then injections of tartar emetic were given in several places wherever the very small veins could be made visible, the solution containing 1 mg. of tartar emetic in 1 c.c. of normal saline. In the first injection 60 c.c. were

given containing 60 mg. of the drug; it was preceded by 50 c.c. of normal saline, and the last traces of tartar emetic were washed out of the apparatus by another 50 c.c. The tartar emetic cannot reach the subcutaneous tissue in this way, if only good care is taken that the point of the needle is in the lumen of the vein. If this condition is fulfilled, the patient does not complain of pain either during or after the injection. The patient stood this first injection well, and after four days a second one was given of 150 c.c., followed by eight injections each of 150 c.c. at intervals of four to seven days. Already after the fourth injection the condition was improved, and after the tenth the granulomatous tissues were replaced by healthy epithelium. The woman did not get back a normal urethra and a normal vagina, of course, and also the elephantoid thickening of the labium had not disappeared, although it had diminished in size. There was still a slight mucopurulent discharge from the vulva, kept up by the abnormal passage of the urine, but the granuloma had disappeared. Equally good results were obtained in two other cases.

Medical Journal of Australia, Sydney

May 5, I, No. 18

- 6 Work Done by Field Ambulance in France. E. M. Ramsden.—p. 371.
- 7 Vincent's Angina in Liverpool Camp. H. H. Willis.—p. 373.
- 8 Diagnosis of Juvenile General Paralysis of Insane. W. A. T. Lind.—p. 374.
- 9 Huntington's Chorea. S. E. Jones.—p. 376.
- 10 Case of Nerve Tumor; Removal and Attempted Heterogenous Transplantation. H. F. J. Norrie.—p. 377.

May 19, No. 20

- 11 Nonrusting Steel and Other Instruments for Exploring, Cleansing and Dressing Wounds and for other Purposes. C. J. Heath.—p. 415.
- 12 War Surgery at Front. C. MacLaurin.—p. 416.
- 13 Raynaud's Disease. P. E. W. Smith.—p. 418.
- 14 Unusual Case of Vesical Calculi. C. E. Todd.—p. 420.

National Medical Journal of China, Shanghai

March, III, No. 1

- 15 Problems Before Medical Profession of China. W. Lien-Teh.—p. 5.
- 16 Nature of Plague Prototoxins. F. Ebersson.—p. 10.
- 17 Spinal Anesthesia with Tropococain. H. A. Cheng.—p. 17.
- 18 Case of Pyonephrosis Caused by Impaction of Renal Calculus. C. H. Fun.—p. 20.
- 19 Chinese Medical Superstitions. K. C. Wong.—p. 22.

Quarterly Journal of Medicine, Oxford

April, X, No. 39

- 20 *Some Actions of Anesthetics Analyzed by Observation of Altered Cardiac Relations to Calcium. W. Burridge.—p. 141.
- 21 *Researches on Perfused Heart: Action of Strychnin, etc., on Tetanus. W. Burridge.—p. 157.
- 22 *Id. Actions of Epinephrin on Addison's Disease. W. Burridge.—p. 163.
- 23 Pathology of Dysentery in Mediterranean Expeditionary Force, 1915. G. B. Bartlett.—p. 185.
- 24 *Diabetes Innocens. G. Graham.—p. 245.

20. Actions of Anesthetics.—The anesthetics, alcohol, chloroform and ether, Burridge claims have each a twofold action on the heart: (a) a depressing action reached quickly on addition of drug to perfusing solution, and disappearing directly after its removal; (b) a favoring action which shows a time factor in its appearance and especially its disappearance. When the depressing action is present more calcium must be added to the perfusing solution to produce effects of a given intensity; that is, to evoke contractions of half the maximum possible amplitude, than is the case in absence of drug. The favoring action is associated with an opposite relation to calcium. The two actions varied with each drug and with its concentration.

21. Action of Strychnin, etc., on Tetanus.—During the course of certain experiments Burridge had occasion to make healthy hearts abnormal. When so made abnormal they were exposed to the action of various drugs and agencies. The experiments showed that in a particular abnormal state three drugs: strychnin, atropin and ergotoxin produced effects not observed under more normal conditions. In the normal perfused heart each of these drugs in large doses depresses the amplitude of contraction, the usual view of the action regard-

ing it as a weakening of the muscle fibers. Burridge did not find, however, that the depressing action of these drugs on spontaneous contractility was accompanied by any corresponding diminution in the amplitude of the contraction evoked by potassium chlorid; that is, the contractile substance can still contract fully. He did find that when their depressing action was present, the heart became less responsive to calcium than was the case before, and that their depressing action could be overcome temporarily by adding more calcium to the perfusing solution. It was also antagonized by epinephrin and digitalis. From the conditions governing the production of this abnormality, and the conditions governing its removal, it is concluded that the particular effect produced by these drugs follows on an ability on their part to cause a degree of relative calcification of the tissues. Tissues brought under the influence of these drugs take up more calcium from the perfusing solution than would otherwise be the case.

22. Actions of Epinephrin on Addison's Disease.—Burridge found that epinephrin has a twofold action on the frog's heart, a primary depressing action resembling inhibition, and an augmenting action, the sympathomimetic action. Three factors are found to be concerned in the depressing action of epinephrin. The relations between epinephrin and calcium are fourfold. The evidence is given that traces of epinephrin render balance between the constituents of an inorganic saline perfusing solution of secondary importance in regard to its suitability as a medium for the manifestation of cardiac activity. It is shown that the behavior of a heart perfused with a well balanced Ringer's solution never approximates to the behavior of the blood containing heart and that the change takes place immediately after the one solution replaces the other. It is shown that as inorganic perfusing solutions become unbalanced in a certain direction, so the behavior of the heart on them tends to approximate to that of the blood containing heart. Such solutions contained amounts of potassium sufficient to interfere with cardiac activity. Traces of epinephrin rendered them capable of maintaining cardiac activity and of preserving in great measure the resemblances between the behavior of the heart perfused with them and of the heart containing blood. On the basis of these experiments it is suggested that the proportions between the inorganic constituents of blood are such as to render it an unsuitable medium for the manifestation of cardiac activity except in presence of epinephrin. The origin of certain symptoms of Addison's disease is traced to such lack of balance.

24. Diabetes Innocens.—Five cases of an innocent type of glycosuria which is not associated with renal disease are cited by Graham. There are at least two types of this disease: (a) in cases in which the output of the sugar is very small and is not appreciably altered by a dose of sugar; (b) in cases in which the output of sugar is rather greater and is increased to a certain extent by a dose of sugar; the level of the blood sugar is also appreciably altered by the dose of sugar. The relation of the amount of sugar excreted and of the amount of sugar in the blood suggests that the sugar is actively excreted by the kidney. The prognosis is good. The diagnosis should only be made after careful sugar tests.

Archives de Médecine des Enfants, Paris

May, XX, No. 5, pp. 225-280

- 25 *Different Character of Measles in Town and Country. J. Camescasse.—p. 225.
- 26 *Antigonococcus Vaccine in Treatment of Vulvovaginitis in Children. Condat.—p. 245.
- 27 Mild Dacryocystitis Complicated with Purulent Meningitis and Sinus Phlebitis. Condat.—p. 254.
- 28 *Adenosarcoma of Right Kidney in Girl of Six. E. Kirmisson and Trétiakoff.—p. 257.
- 29 Present Status of Epidemiology of Whooping Cough. J. Comby.—p. 263.

25. Measles Milder in the Country.—Camescasse declares that his experience with measles has convinced him that city children with measles or having been exposed to it should be sent to some hospital in a rural district. Measles in country children always ran an extremely mild course in his practice as a country practitioner. He has also been impressed

with the similar mildness of the course of the disease since he has been in charge of a hospital in the country near Paris. If we cannot suppress measles entirely, we can at least simplify it, he remarks. His dream, he says, is to have some accessible institution in the woods, with an automobile to pick up in the city the children with measles and those who have been exposed. Measles in itself is bad enough for slum children, but its chief danger is that it throws down the barriers against tuberculosis. If this dream of his could be realized, he adds, the great reduction in the mortality as a whole which would result, he is convinced, might justify the transference to the country of a whole schoolroom of children and their teacher when measles threatens.

26. Vaccine Therapy of Vulvovaginitis.—Condat here reports twenty-four additional cases, bringing to forty the number of little girls with vulvovaginitis whom she has treated with antigenococcus vaccine. She says that it has been constantly effectual; all were cured with one exception. This was a child of over 7, infected by its mother. The vulvovaginitis had kept up for a year, showing no improvement under vaginal injections of potassium permanganate. The thick discharge grew thin and insignificant in the course of the vaccine therapy, but a complete cure was not realized even in a three months' course of the vaccine. In five cases four or six injections answered the purpose; others required up to sixteen and a few still more. In the first series, the children were in the institution and the repose aided in the cure, so that an average of seven injections was all that was necessary. The children were outpatients in this second series, and some had long distances to walk, which rendered conditions for healing less favorable. The treatment was more successful in the younger children, from 18 months to 2 or 4 years old, as the affection was comparatively recent. In older girls it may have lasted a long time before it is discovered, and it is harder to dislodge. There has been no recurrence in any of the children, but two have returned with new infection. It was promptly aborted with two injections of the vaccine. The vaccine is injected into the muscles of the outer front of the thigh. She makes three injections a week until the discharge begins to grow less, then two and then one a week. The course requires from two weeks to an average of two months. Vulvovaginitis in little girls seems to be more frequently encountered now than before the war.

28. Adenosarcoma of Right Kidney in Girl of Six.—The child was brought to the hospital with the diagnosis of acute appendicitis, but the trouble proved to be pneumonia. As this subsided the tumor was discovered and the kidney involved was successfully removed. It was evidently of embryonal origin and had developed malignant features only recently.

Archives Médicales Belges, Paris

April, LXX, No. 4, pp. 289-384

- 30 *Current Anomalies of the Body. A. Brachet.—p. 289.
- 31 War Wound of Neck with Claude Bernard-Horner Syndrome. H. Burger.—p. 309.
- 32 Factitious Conjunctivitis. E. Rasquin.—p. 321.
- 33 Present Status of Heart Block. H. Fredericq.—p. 326.

30. Current Anomalies of the Body.—Brachet is professor of anatomy at the University of Brussels, and he here describes various anomalies of the skeleton, muscles, nervous and vascular systems. He refers only to current ones such as are constantly encountered in the dissecting room, supernumerary or lacking muscles, abnormal location or bifurcation of some peripheral nerve, vein or artery. It is possible, he suggests, that the workings of Mendelian laws may be traced in these anomalies.

Journal de Médecine de Bordeaux

March, LXXXVIII, No. 4, pp. 61-80

- 34 *Technic for Amputations. Fieux.—p. 63.
- 35 *Advanced Dressing Station. (Poste de secours.) Cheyron.—p. 68.
- 36 *Gathering in the Wounded. H. G. Morin.—p. 71.

34. Technic for Amputations.—Fieux bases his technic on study of the present condition of men whom he has had to amputate in the course of the war. In case of much shock he injects hot saline through a conical glass cannula intro-

duced into the large vein of the stump. He sutures the stump, when the surgical toilet can be complete, under forcible eversion, exploring every crevice as far up as it is possible to separate tissues with the fingers. In the twenty-six cases thus treated, he had to cut two or three of the stitches in six cases, but this did not interfere with the regular healing. The surgeon, himself, must watch over the case for the first five or six days, ready to interfere at the slightest sign that all is not going well.

35. The Advanced Dressing Station During an Offensive.—Cheyron's long experience is here crystallized into directions for the equipment, placing and management of the first aid stations and arrangements for bringing in the wounded. He writes from the standpoint of the medical officer of a battalion. It is not an instructive position, as the surgeon is not able to trace further the cases that pass through his hands. He regards Mencièr's iodoform-Peruvian balsam spray as extremely valuable for first aid work when the wounded are coming in in large numbers. (It was described in these columns Dec. 4, 1915, p. 2040.) After the surgical toilet of the wound, he cleans the vicinity with gasoline, and then sprays the Mencièr mixture copiously into all the cracks and crevices of the wound. This can be done by any one. It seems to embalm the tissues in the wound, and wards off septicemia, tetanus and gangrene. Every wounded man should be refreshed with tea, coffee, rum, quinin or kola, and measures applied to keep him warm.

36. Gathering in the Wounded.—Morin describes the methods that have been worked out to ensure the greatest economy of time, of helpers and of material during an offensive movement of the troops.

Lyon Médical

May, CXXVI, No. 5, pp. 205-252

- 37 *Symptoms from Pleura, Lungs and Pericardium in the Course of Acute Articular Rheumatism. J. Mollard and M. Favre.—p. 205.
- 38 *Ileocecal Tuberculosis. Guérin.—p. 214.
- 39 Aneurysm of Internal Carotid and Jugular Bulb. M. Patel and M. Lannois.—p. 227.
- 40 Emetin Treatment of Amebic Dysentery. C. Garin.—p. 249.

37. The Pleura and Lungs in Acute Rheumatism.—Mollard and Favre declare that the pleurisy of acute rheumatism has certain characteristics which distinguish it and give the clue for effectual treatment, as it usually yields promptly to the salicylates. Left untreated, serious lesions may be installed which might easily have been averted. The rapid invasion of the pleura, the fact that both sides are involved, the association with congestion of the lungs and with pericarditis without effusion, and the complete subsidence without sequels are the main features of this rheumatic pleurisy. Even without joint trouble, bilateral pleurisy of this type should suggest the true cause, but whenever symptoms on the part of the pleura accompany joint trouble, the indications for treatment are clear. The pleurisy may persist after recovery from the acute rheumatism, or it may develop with only latent or no joint involvement. In this event it is likely to be mistaken for a tuberculous affection and thus fail to get the treatment it requires. He knows of instances of this, the result being established endocarditis, adhesive pericarditis, etc. Other features are the fixity and the long duration of the pleural effusion, for weeks or a month or more, its moderate amount, the invariable accompanying congestion in the lungs and the usually mild character of the pains in the chest. Under sodium salicylate the pleurisy is arrested and the lung symptoms retrogress. The pleural effusion takes longer to subside.

38. Ileocecal Tuberculosis.—In three of the six cases described the diagnosis of appendicitis had been made at first. When the appendix is removed in such cases, it may be found normal notwithstanding the two or three or more years of discomfort and pains in the appendix region. The cecum at the appendectomy may look merely a little redder than usual. If the stretch involved had been resected at this time the disease would have been eradicated in an early stage. Even when the cecum looks inflamed, this may be merely an inflammatory reaction to appendicitis. Tuffier has reported such a case, the inflammatory tumor subsiding completely

after mere ileocolic anastomosis. Concomitant pulmonary tuberculosis may give the clue. Resection of the stretch of bowel involved is the only safe treatment; the incision should be along the outer margin of the rectus muscle. Separation and hemostasis may be long and difficult, especially if there is much fat around the bowel.

Paris Médical

May 12, VII, No. 19, pp. 389-404

- 41 Amebic Dysentery in France. C. Dopter.—p. 389.
- 42 *Periods of Subnormal Temperature as Epileptic Equivalents after Trephining. P. Carnot and A. de Kerdrel.—p. 395.
- 43 *Reduction of Fractures under Screen Control. F. Masmonteil.—p. 398.
- 44 Typhoid Gangrene in Girl of Five Requiring Amputation. A. Vinache.—p. 402.

42. **Periods of Subnormal Temperature as Epileptic Equivalents.**—The case related throws light on the question of the existence of a heat center in the cortex. The young man had been trephined for a bullet wound of the forehead, and seven months later his temperature dropped below normal for several days at a time, down to 34.2 C. (93.5 F.). This occurred several times, preceding or substituting attacks of Bravais-Jacksonian epilepsy, symptomatic of irritation of the cortex. The trephining followed two hours after the frontal bone had been fractured and part driven in. There was hemiplegia at first, but no aphasia, no headache, no visual disturbances or convulsions for seven months. Then the epileptic seizures and hypothermia developed, with painful contracture, all occurring in connection with each other, at irregular intervals, evidently the result of cicatricial pressure on the frontal lobe.

43. **Reduction of Fractures Under Screen Control.**—Masmonteil combines continuous extension with lateral traction and suspension, with screen control of conditions as compared with preceding radiographs. He gives an illustrated description of the modifications all this requires in the usual apparatus.

Presse Médicale, Paris

April 16, XXV, No. 22, pp. 217-232

- 45 Apparatus for Compound Fracture of the Humerus with Injury of the Elbow. C. Coulon.—Title page.
- 46 *War Neurology. Editorial.—p. 217.
- 47 Resection of Shoulder by Posterior Incision. J. de Fourmestraux.—p. 220.
- 48 Injection of Arsenobenzol in Minimal Dilution. M. Favre and Massia.—p. 221.
- 49 *Carbon Dioxid. (L'anhydride carbonique.) H. Roger.—p. 222.

46. **Present Status of War Neurology.**—This comprehensive review is peculiar in that while recent discoveries and achievements in neurology are described in detail no names are mentioned, and the article is unsigned. It opens with the statement: "If the tax on war profits were applicable to scientific acquisitions, then neurology of all the domains of medicine would have to pay the heaviest tax. For during the last three years it has been enriched in a surprising manner. The war has applied to man experiences hitherto made only on laboratory animals, and the creation of 'neurologic centers' for the wounded has resulted in definite conclusions by the various groups of experts at these centers, and the conclusions are practically identical." The principal scientific truths thus acquired and their practical application are discussed in detail in respect to the brain, spinal cord and nerves, reflex paralysis, neuroses and psychoneuroses. Prostheses to correct sciatic and radial paralysis are among the later acquisitions. The neurologic centers have proved particularly useful in detecting and sifting out the hysteria element. Very few cases of hysteria get past them. It is remarkable that the principal forms of hysteria manifestations are found to be the same at all times, at all ages and in all countries, and persuasive electrotherapy and imperiously applied psychotherapy are proving as effectual for war hysteria as under other conditions.

49. **Carbon Dioxid.**—Roger reviews our present knowledge in regard to the physiologic properties of carbon dioxid and the possibilities of a therapeutic action from it. He also discusses the variations in alveolar carbon dioxid pressure

in different diseases, and urges further study of the combination of carbon dioxid with oxygen recommended by Levi in THE JOURNAL, 1912, 58, 773. It is possible, he suggests, that this mixture might prove useful in gas cases.

Progrès Médical, Paris

May 12, XXXII, No. 19, pp. 153-162

- 50 Treatment of War Deafness. Marage.—p. 155.
- 51 Tetanus Restricted to Wounded Leg. H. Reger.—p. 157.
- 52 War Wounds of the Eyes. Bourdier.—p. 160. Continuation.

Correspondenz-Blatt für Schweizer Aerzte, Basel

May 12, XLVII, No. 19, pp. 593-624

- 53 *Treatment of Gonorrhea in Swiss Military Hospital. G. Huber-Pestalozzi.—p. 593.
- 54 *Heredity of Dementia Praecox. W. Boven.—p. 605.

53. **Treatment of Gonorrhea.**—The experience at the Solothurn military hospital confirms the importance of repose and a bland diet as factors in conquering gonorrhea. Disinfecting and astringent injections were the reliance in treatment. To decide when the men were actually cured, four means of reactivation were tried: sudden stoppage of all treatment; introduction of a No. 20 Beniqué catheter, possibly massaging over it, or an irritating injection of a 1 or 2 per cent. solution of silver nitrate. The drinking of beer was at one time used as a provocative test, but did not prove reliable. In 25 per cent. of the acute cases no further gonococci could be found after ten or twelve days; in 25 per cent. after two or three weeks. In 10 per cent. of the chronic and subacute cases the disease proved refractory.

54. **Heredity of Dementia Praecox.**—Boven describes some recent statistical research on this subject by Rudin. He found 15.86 per cent. cases of dementia praecox among the 4,823 brothers and sisters in 701 families, the father and mother not insane but of the Mendelian type $D R \times D R$. Eliminating the children that had died young or had not reached the critical age, the ratio between the healthy and the dementia members of the families was 24.67 per cent. Applying Weinberg's method of statistical correction, brings this proportion to 4.48 per cent. In another group of thirty-four families with 166 offspring, one of the parents having dementia praecox, the Weinberg ratio is 6.18 per cent. Boven cites these figures as showing that Mendelian laws of heredity do not apply to dementia praecox, at least. The children in these families included 2,176 males and 2,090 females, a normal proportion between the sexes. Rudin mentions that 154 of the parents with the predisposition to dementia praecox married a second time, and there was only one case of dementia praecox among the children of their second marriage.

Gazzetta degli Ospedali e delle Cliniche, Milan

April 12, XXXVIII, No. 29, pp. 449-464

- 55 *Atypical Convalescent Stage after Acute Infectious Diseases. U. Baccarani.—p. 449.
- April 15, No. 30, pp. 465-480
- 56 Horn in Eyebrow of Man of Sixty-Four. (Keratiasis cutanea.) G. Matteucci.—p. 465.
- 57 The Medical Profession after the War. E. Villa.—p. 475.

55. **Atypical Convalescence.**—Baccarani refers to what he calls postinfectious marasmus, the patient, although his infectious disease is over, does not gain but grows weaker, without appetite, the temperature low. This phase is usually transient, and then he enters on convalescence. But in rare cases it is progressive and the cachexia is fatal. He reports two cases of each type, both after typhoid, and points out certain features which render it probable that the trouble with these atypical forms of convalescence is an upset in the system of glands with an internal secretion, but especially of the suprarenals. Conditions are like those in the aged when the suprarenal system is worn out, so that postinfectious cachexia might be called fatal acute old age. The infectious diseases with a protracted course, like typhoid, are the ones most likely to present this atypical convalescence, especially when the cardiovascular symptoms have predominated in the clinical picture. He has noticed that this tendency to atypical convalescence may manifest itself anew

after each infectious disease the patient has to pass through. The cases cited as examples of the transient type were in older children, the fatal case in a man of 69, previously healthy.

Policlinico, Rome

May 13, XXIV, No. 20, pp. 641-668

- 58 *Determination of Pentose in the Urine. G. Testoni.—p. 641.
59 *Utility of Roentgen Examination after War Wounds. P. Masserini.—p. 644. Commenced in No. 18, p. 569.
60 *Hernia and Defective Teeth and Heart as Affecting Military Service. G. Galli.—p. 652.

April, Surgical Section No. 4, pp. 145-192

- 61 *Traumatic Hernia of the Brain. O. Tenani.—p. 145.
62 *Frost-Bite of the Feet. (Osservazioni sulla cura delle congelazioni gravi dei piedi.) A. Chiasserini.—p. 157. (Alterazioni istologiche dei vasi nelle congelazioni.) G. Cavina.—p. 164.
63 Incarcerated Diaphragmatic Hernia. G. Simoncelli.—p. 174.
64 Solitary Cysts of the Kidneys. M. Magnini.—p. 180. To be continued.

58. **Determination of Pentose in the Urine.**—Testoni states that the hydrolysis test for pentose which he describes is so sensitive that it reveals 0.5 mg. of pentose in the urine, even in diabetic urine. For the qualitative test, he decolors 10 c.c. of urine by heating with a little blood charcoal, and evaporates the filtrate to 5 c.c. This is mixed with 9 c.c. of a tepid 0.25 per cent. solution of phloroglucin in glacial acetic acid. Then he adds 1 c.c. of concentrated hydrochloric acid and keeps the tube for thirty minutes in water at a constant temperature of 50 C. Very soon the characteristic color reaction appears, the tint changing to a handsome cherry-red. If the urine contains pentoses alone, there is no need to evaporate it, taking merely 1 c.c. and adding directly 15 c.c. of the phloroglucin solution and 2 c.c. of the hydrochloric acid and bringing just to the boiling point for a few minutes. This test can be made quantitative by preparing a standard solution, as above, with some pentose instead of urine, and comparing the tint.

59. **Roentgen Examination of the Wounded.**—Masserini concludes this long review of the experiences with Roentgen work for the wounded by warning that too much must not be expected of Roentgen examination. The best results are obtained when the radiologist and the physician who had studied the case can work together. He declares that every radiologist should have a practical medical experience, while every physician should be something of a roentgenologist.

60. **Hernia and Defective Teeth and Heart as Affecting Military Service.**—Galli quotes from the military regulations of the different belligerent countries showing that hernia, loss of teeth and heart disease need not summarily exclude the applicant from military service. The French regulations stipulate that exemption is necessary only if mastication is difficult or incomplete from loss or decay of teeth, accompanied by softening, ulceration and fungosities of the gums not susceptible of being cured by suitable treatment. The loss of a large number of teeth, with the gums sound, may serve as the ground for classing the man in the auxiliary service. He states that the German regulations, as long ago as 1909 contained similar provisions. In both France and Germany, he adds, hernia is not considered a ground for rejection unless the inguinal hernia is very large, irreducible on account of adhesions, or difficult to maintain reduced, with the canal much stretched and the anterior abdominal wall weak. In regard to heart disease, similar views prevail, he relates, not only in France and Germany but in Switzerland, Russia and England, namely, that men with heart disease need not necessarily be excluded from the army. He refers to Sir James Mackenzie's "The Recruit's Heart. Memorandum for Medical Examiners." This advocates accepting the recruit if the young man presents no disturbance on the part of the heart during fatiguing test exercises, and if the heart outline is normal, even if he may have impressive objective symptoms such as arrhythmia and murmurs. Galli agrees with him except for the restriction that recruits of this type should be assigned only to the less strenuous posts. "Time alone will show, when the history of the war comes to be written, whether Mackenzie's ultra liberal interpretation is just or not."

61. **Hernia of Brain Tissue.**—Tenani's experience with sixteen cases of hernia of brain showed that what he calls hernia of the first degree subsides spontaneously. When the hernia is stationary, the opening in the skull is made larger, thus relieving the congestion in the protruding part of the brain, and the hernia then subsides, and the brain is freed from its adhesion to parts around. In reference to treatment of progressive hernia, he says that the brain seems to stand the loss of substance remarkably well, and the operative wound soon heals as a rule, but the patient is left below par both in the physical and psychic sphere, emotionally unstable. He used various materials for repairing the breach in the skull; any nonabsorbable substance seems to answer the purpose once fixed immovably in place. The repair should not be attempted until asepsis can be counted on. In prevention of hernia he uses a disk of celluloid, fitted smoothly into the gap, with a small crescentic incision at one edge permitting the passage of a wick of gauze introduced under the dura. The gauze is renewed frequently until there is no further discharge from the dura. Then the disk is taken out and the skin sutured over the gap. By this means drainage is secured, while the brain does not adhere to the smooth surface of the celluloid. He never had any septic complications in his cases.

62. **Trench Foot.**—The gangrene with trench frostbite seems to be the result of thrombosis of the vessels plus hyperplasia of the intima, an actual proliferating endarteritis and endophlebitis.

Riforma Medica, Naples

May 5, XXXIII, No. 18, pp. 477-504

- 65 *Unfermentable Diet in Gastro-Intestinal Dyspepsia. G. Moruzzi.—p. 477.
66 Traumatic Pseudo-Arthritis of the Knee. A. Mori.—p. 480. To be continued.
67 *Paradoxical Oculocardiac Reflex. O. Cantelli.—p. 487.
68 Present Status of Glycuronuria in Liver Disease. L. Ferrannini.—p. 490.

65. **Unfermentable Diet.**—Moruzzi remarks that a protein diet in acid dyspepsia and a starch diet in alkaline dyspepsia are effectual as far as they go, but a third diet is needed for mixed dyspepsias, generally of gastric origin. The diet should be incapable of fermentation, and he says that this condition is realized by a combination of whey and peptone, fermented with very active lactic acid bacilli, and then sterilized. He gives up to 800 c.c. a day of this, with from three to five yolks of eggs. In four or five days, ten or fifteen at most, conditions in the digestive tract return to clinically normal. As there is no putrefaction or fermentation on this food, the inflammatory processes in the intestine die out. He gives no further details as to the preparation of this "third diet." The principle is merely the utilization of the sterilized products of lactic fermentation.

67. **Paradoxical Oculocardiac Reflex.**—Cantelli refers to cases in which the heart beat and pulse are accelerated by pressure on the eyeballs, and this persists for some time afterward. He discusses the mechanism of this phenomenon and remarks that it indicates some possibly still latent deficiency of the cardiovascular apparatus, suggesting necessity for caution in respect to physical and emotional strain.

Rivista Critica di Clinica Medica, Florence

May 19, XVIII, No. 20, pp. 221-228

- 69 *Chronic Primary War Polymyositis with Atrophy. B. Graziadei.—p. 221. To be continued.

69. **War Polymyositis.**—Graziadei reports a few typical cases of this painful affection of the muscles in men who have been exposed to cold and wet on the firing line, even when not in the trenches. In one case the first trouble was in the knees, but this improved after six weeks in the hospital so the man resumed his place at the front, but in two weeks the knees grew painful again as also the muscles of face, neck and trunk, which were rigid and hard, the pains increased at the slightest movements. He was unable to chew or get up, and there was fever up to 104 F. with edema of the feet and eyelids, but the urine seemed to be normal. Small hard nodules appeared on the skin but subsided in a

few days and then reappeared. During and after this phase of what seemed to be acute febrile rheumatism, intense pains and contraction of the muscular masses rendered painful and difficult any attempt to move them. Later they atrophied to a marked degree. Gradual improvement set in after a few months. The toes were still stiff and painful by the end of the second year but the man is able to get around with a cane; the arms can be moved normally.

Prensa Medica Argentina, Buenos Aires

May 10, III, No. 34, pp. 365-376

- 70 *Anastomosis between Gallbladder and Stomach in Treatment of Gastric and Duodenal Ulcers. P. Escudero and E. Finochietto.—p. 365.
- 71 Facilities in Argentina for Climatic Treatment and Prophylaxis of Pulmonary Tuberculosis. T. Castellano.—p. 367.
- 72 Acute Febrile Cyclic Pemphigus. J. C. Navarro.—p. 468.
- 73 *Hemolysins in Spiders' Eggs. (Nuevos datos sobre las hemolisin de las arañas.) B. A. Houssay.—p. 370.
- 74 Toxicologic Study of Partonalgia. A. Buzzo.—p. 371.
- 75 Electrocoagulation in Treatment of Tumors in the Bladder. J. Sabatini.—p. 372. To be continued.

70. **Cholecystogastric Fistula in Treatment of Gastric or Duodenal Ulcer.**—Escudero and Finochietto have noticed that the persons who benefit by gastro-enterostomy are usually those who had hyperchlorhydria before, but later have hypochlorhydria. Their analysis of the cases showed hyperchlorhydria in every case of recurrence of the ulcer. They agree with Paterson and others that the flow of bile and pancreatic juice into the stomach, after the gastro-enterostomy, is what modifies conditions so the ulcer can heal. On this premise, they diverted bile into the stomach by an anastomosis between the stomach and gallbladder, hoping thus to realize the advantages of a gastro-enterostomy without its drawbacks. This operation, they say, respects the gastroduodenal functioning and allows the bile to enter the duodenum by the natural route. It merely adds to the previous condition the presence of bile in the stomach during the course of gastric digestion. They say the operation is simple and easy, and does not interfere with a later gastro-enterostomy if this is deemed necessary. They give an illustration of the technic as they have applied it in two cases of duodenal ulcer. Five and a half months have elapsed since in the first case, and there have been no symptoms at any time. The gastric acidity has been reduced from 2.25 to 0.46 and the weight increased over 15 pounds in thirty-three days. The influx of bile depends on the food; none enters the stomach after drinking water or taking an Ewald test meal, but water and oil or an ordinary meal is followed by the arrival of bile after the first hour. Roentgenoscopy shows that the stomach is evacuated in less than six hours.

73. **Hemolysins in Spiders' Eggs.**—Houssay has found hemolysins in the eggs of three species of Brazilian spiders. Other scientists have brought the list up to fourteen. The hemolytic action of the species here studied seems to be annulled by raw milk. Heating the milk, even to 62 C. (143 F.) deprives it of this property.

Semana Medica, Buenos Aires

April 5, XXIV, No. 14, pp. 399-430

- 76 Honors for Dr. José Penna. R. Kraus and others.—p. 399. (See THE JOURNAL, May 12, 1917, p. 1420.)
- 77 Present Status of Chronic Nephritis. (Fisio-patologia del brightismo.) L. J. Facio.—p. 411. To be continued.
- 78 Gastrulation in Mammals. M. Fernandez.—p. 420.
- 79 Lymphocytosis in Syphilitics. Mayer and Gourdy.—p. 427. Continuation.

Siglo Médico, Madrid

May 12, LXIV, No. 3309, pp. 325-344

- 80 *Infarcts and Stones in the Kidneys without Symptoms. A. P. Martin.—p. 325.

80. **Symptomless Renal Lithiasis.**—Martin relates that a new-born infant was sent to the hospital for an operation for imperforate urethra, as it had voided no urine during its three days of life. The child was small but seemed otherwise normal. He introduced a grooved sound into the urethra, and a large quantity of "uric sand" escaped through the groove, forming a paste with a drop or so of urine.

He applied rectal infusion of a solution of sugar by the drop method, and the next day 5 or 6 gm. of urine was voided containing uric acid crystals. The child nursed well and within two days was voiding apparently normal urine and continued to increase in weight. The rise in blood pressure, thanks to the injection of the sugar solution, overcame and swept out the uric acid crystals which had evidently been clogging the outlet to one or both kidneys. He queries what will be the future fate of infants born with these so-called uric infarcts. Some permanent damage may be left when the uric precipitate is extremely abundant as in some of the cases on record. It may be the nucleus for stones later. Roentgenoscopy is showing that latent, that is, symptomless kidney stones are far from rare, although never suspected until infection becomes installed. An instructive case of this is reported. A robust young athlete developed profuse suppuration in one kidney as a complication of recent gonorrhea, but there was no fever or hematuria and only extremely slight systemic disturbance. Roentgenoscopy revealed fourteen stones, at least, in the kidney. They had evidently developed by concretion on infarcts dating from the earliest infancy. This was manifest from their movability, etc. At the age of 2 and 3 he had voided at one time a dark colored urine, and repeatedly later the urine deposited a whitish gelatinous sediment. After the age of 3 the urine had been constantly apparently normal until the gonorrhea started the kidney trouble. Gonococci and colon bacilli were found in the urine.

Russkiy Vrach, Petrograd

XVI, No. 8, pp. 169-192

- 81 The So-Called Functional Treatment of Fractures, from the Orthopedic Standpoint. G. I. Turner.—p. 169.
- 82 Dissociation of Auricle and Ventricle Functioning with Adams-Stokes Disease. N. I. Leporsky.—p. 176. To be continued.
- 83 *Burns in Children. (Ozhogi u detei.) N. R. Blumenau.—p. 179. Commenced in No. 7, p. 158.
- 84 *Digestion of Different Kinds of Food after Gastro-Enterostomy. (Perevarivanie razn. rodov pishitshi pri dvukhustnom zheludkie.) A. D. Volkoff and E. T. Klopfer.—p. 184.
- 85 The Fever Curve in Typhus. (O likhoradkie pri sipnom tife.) L. A. Silberberg.—p. 185.

83. **Burns in Children.**—Blumenau reviews the experiences of eighteen years at a Petrograd hospital with 186 cases of burns in children from 5 months to 13 years old. Under 1 year old, 50 per cent. of the children succumbed to their burns, but only 20 per cent. at 5. Over 66 per cent. of all the fatalities were in the children under 6. Over 43 per cent. died in the first twenty-four hours; over 41 per cent. within four days, and over 14 per cent. from the sixth to the twenty-first day. Vomiting was a prominent symptom in 50 per cent. of the cases that terminated fatally while it occurred only in 3.6 per cent. of the nonfatal cases. The temperature was below normal only in 6 cases; these children all died within fifteen hours. Over 23 per cent. of the total children had convulsions, but the convulsions developed between the second and fourth day in 50 per cent. of the cases with convulsions; during the first twenty-four hours only in 13 per cent. Albuminuria was extremely rare, and only very slight. A fine rash was observed in 2 per cent. of the cases by the third to fifth day and a coarse rash in a still smaller percentage, but 12.3 per cent. developed an eruption exactly like that of scarlet fever. Voinoff had the same in 11 per cent. of the 318 cases of burns in children in his service.

This scarlet fever eruption developed usually within the first four days in both series. In Blumenau's cases the tongue had the characteristic scarlatinal aspect only in 50 per cent. Desquamation followed in 66 per cent. Fifteen of the children with the eruption suggesting scarlet fever were placed in the scarlet fever ward. One succumbed to otitis and mastoid mischief, and 2 to pneumonia the forty-fourth and twenty-eighth days. The others recovered, but 2 had a return of the scarlet fever, the fifteenth and sixteenth days. The eruption and pharyngitis then lasted about four days, and no desquamation was noticed. The burn in these children involved 6 per cent. and 12 per cent. of the surface of the body; in the 3 children that died, 35, 30 and 5 per cent. In the total 23 children with the eruption of the scarlet fever

type, vomiting occurred in 17.3 per cent. The throat seemed to be normal in 3 of the 23 cases; in 5 there was only slight redness, in the others the redness was pronounced. The clinical picture of the scarlatinal eruption in these cases was thus that so often described as "wound scarlet fever." Voinoff's experience was quite different. The mortality in his 35 cases was over 30 per cent.; the eruption was intense and lasted sometimes for eight days; the tongue and throat were characteristic of scarlet fever and 15 per cent. of the children had necrotic sore throat. Complications of various kinds such as may accompany scarlet fever, were observed in 73.6 per cent. In short, these children had true scarlet fever. They transmitted scarlet fever to others, which never occurred in Blumenau's series. Blumenau presents further evidence to prove that with wound or burn scarlet fever the germs entering by this unusual route are comparatively non-virulent, but at the same time they serve—like a vaccine—to protect against the more virulent. This, he says, seems to be the only plausible explanation for the nondevelopment of true scarlet fever in the 15 children placed in the scarlet fever ward. He urges that children with burns and this scarlatini-form eruption should be isolated in a glass "box" or separate room and not be sent to the contagious ward unless pronounced symptoms develop.

Necropsy was possible only in 16 of the 54 fatal cases among Blumenau's 186 cases. It failed to reveal any internal lesions apparently capable alone of causing death, and he discusses the various theories that have been advanced to explain the early death after burns, and methods of treatment. In the first twenty-four hours the collapse may prove fatal, and this should be combated with camphor, caffeine and digitalis. After the first day, the danger is from absorption of poisons from the dead tissues in the wound. Saline infusion with 1 per cent. sodium bicarbonate in a vein or by the drip method, 1 to 4 liters a day, is useful. Lieber warns against morphin as liable to depress the heart, unless the burn involves more than a third of the surface and the outlook is hopeless. Some advise the continuous bath to wash away the toxins in the burns, but Lieber warns that it may reduce the tonus of the vessels and thus hamper the already suffering heart action. To neutralize the methyl guaninin formed in the burn, Vogt and Heyde recommended (1915) atropin and an isotonic solution of calcium chlorid, cutting away necrotic tissue. Schöne scrubs with a hard brush and soap under general anesthesia. Rovsing also cleans the burned area under general anesthesia, using soap, water and phenol in alcohol, sterilizing the surrounding skin with mercuric chlorid. Then he applies a layer of rubber tissue, projecting 0.5 cm. beyond the edges of the burned area, and over this medicated gauze, then absorbent gauze and a bandage. In the 60 cases Rovsing has reported, healing was prompt and without contractures. Blumenau does not specify the measures that were used in treatment in the 186 cases he here analyzes.

84. Capacity for Digestion of Different Kinds of Food After Gastro-Enterostomy.—The experiments were made on dogs and some of the metabolic findings are tabulated in this preliminary communication.

Actae Scholae Medicinalis Universitatis Imp., Kioto

I, No. IV, pp. 413-489. German edition

- 86 *Action of Inosit and Similar Bodies on the Elimination of Glucuronic Acid. Y. Sasaki.—p. 413.
87 *Elimination of Aromatic Oxyacids in Different Diseases, especially in Nephritis. S. Hara.—p. 425.
88 Asymmetrical Cleavage of Racemic Polypeptides by Killed Bacteria. L. T. Mito.—p. 433.
89 *Asymmetric Cleavage of Racemic Tyrosin by Bacilli. M. Tsudji.—p. 439.
90 Biologic Production of d-Tyrosin. M. Tsudji.—p. 439.
91 *Thymotoxic Serum. M. Ogata.—p. 449.
92 The Principles of the Independent Function and of the Reciprocal Influence of Every Part of the Common Visual Field. G. Kuroda.—p. 473. In English.

86. Action of Inosite and Similar Aromatic Bodies on the Animal Organism.—Sasaki reports experimental research on rabbits and mice to determine the influence on the elimination of the ethereal sulphates from feeding with inosite, phloro-

glucite, cis-chinite and cyclohexanol, all bodies of the oxyhydro-aromatic type.

87. Elimination of Aromatic Oxyacids in Nephritis.—The metabolic findings in forty-five patients, including twenty-one with nephritis, and in thirteen healthy persons are given in a four-page table, with special reference to the elimination of the aromatic oxyacids. In six of the nephritis cases the elimination was within normal range, but in most of the others the reduction below the normal figure was most striking. The reduction in the elimination of the oxyacids in severe nephritis does not depend on the amount of urine voided. There is evidently retention of these substances in the blood, giving warning of impending uremia.

89. Cleavage of Tyrosin by Bacteria.—The bacteria used in the tests with racemic tyrosin were the proteus and the subtilis.

91. Thymotoxic Serum.—Ogata injected rabbits with an emulsion of dog thymus, and thus obtained a thymotoxic serum which he tested on young dogs from ten to sixty days old. Control animals were injected in the same way with normal rabbit serum. The thymotoxic serum was injected subcutaneously during fifteen days. Photographs of the thymus from the dogs afterward show a remarkable difference between the experimental animal and the control, the thymus weighing only 0.75 gm. in the former and 3.8 gm. in the control in one pair. The proportion to the body weight was 1:1,560; in the control animal, 1:376. In another group the thymus weighed 1.3 gm., and 10.2 gm. in the control, the proportionate weight being 1:1,760; 1:313 in the control. In addition to the atrophy and dwindling of the thymus gland, the experimental animals showed smaller and frailer bones than the controls, and their bones contained considerably less calcium and phosphates than in the controls. The serum of rabbits injected with dog ovarian tissue failed to display any action on the thymus gland. The thymus-toxic serum seems thus to be strictly specific.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

April 21, I, No. 16, pp. 1257-1336

- 93 *Infant Welfare Work in the Netherlands. (Zuigelingenbescherming.) G. van Rijnberk.—p. 1262.
94 War Surgery. (Over oorlogschirurgie.) D. R. van der Goot.—p. 1266.
95 *Causes of Nervous Affections. (Oorzaken van zenuwziekten.) J. W. Langelaan.—p. 1280.
96 Case of Otogenous Pyemia without Sinus Thrombosis. Recovery. C. Huyer.—p. 1285.

93. Infant Mortality in the Netherlands.—Van Rijnberk cites statistics to the effect that the infant mortality in the Netherlands for the first ten years of the century was 114 per thousand born living. The country thus stands fifth on the list, only Norway, Sweden, Ireland, Denmark and Scotland showing a lesser mortality. The northern provinces of the Netherlands have the lowest infant mortality, only 61.5, while in the southern region it was 131.5 per thousand. By 1910, the total infant mortality had dropped to 104 per thousand, and it has declined since to 84.5 in 1916. The mortality is higher in towns of 5,000 or less, averaging 95.6; from 5,000 to 20,000, 89.3; from 20,000 to 50,000, 82.1; from 50,000 to 100,000, 86.2, and over 100,000, only 62.9 per thousand. These figures show, he reiterates, that better hygienic conditions in the smaller towns and rural districts will have a wonderful effect on infant mortality, as, other things being equal, the crowded cities would have a higher mortality. Breast feeding is not so universal in the Netherlands as is desirable, possibly owing to the abundance of cow's milk.

His figures are taken from the Year Book of the Infant Welfare Association, and this concludes its report with an appeal to have girls taught in the public schools the care of infants. Girls now marry and rear children without the slightest idea how they should be brought up. They experiment and practice on their first child, and the little victim often succumbs while the mother is learning how to care for it. "And for many mothers, alas, it takes more than one child before they learn." Many dismiss the idea as ultra-revolutionary, saying it is not necessary, as the grandmother and neighbor women show the girl mother how and what

to do. But their counsel is more than likely to be ill advised and perpetuate prejudices and harmful practices, so that the baby has an unnecessarily hard time of it the first year. Rijnberk comments that the tendency to have the school supplant the family is a dangerous one, but it is certain that it would be better to teach the girls of the working classes less history and geography, which is only of indirect benefit, and teach them how to care for infants. This would be a direct practical aid to them in later life, for their own or others' infants, and such a course should be compulsory in the upper grades of the public schools.

95. Causes of Nervous Affections.—Langelaan states that 56 per cent. were women in his 1,112 cases of disease of the nervous system (Amsterdam). Of the male patients, 30 per cent. had syphilis in the antecedents, and 15 per cent. of the women. Tabes and general paralysis seem to run a milder course in women, and affect more the type of a recurring psychosis. Overwork seemed to be the cause of the nervous affection in 15 per cent. of the women and in 4 per cent. of the men. This is most common in girls working too hard in school, in young employed women, and in women approaching the menopause with the care of a large family. He has noticed that women who worked at some time in a factory or shop are more liable to break down than others under family and household cares later. "This testifies" he remarks, "to the persisting evil effect of industrial occupation for women." Another impression he has derived from his experiences is that this tendency in women to nervous breakdown under overwork is connected in some way with the thyroid gland. This gland often shows an inherited inferiority, he says, in the blonde portion of the populace. Alcoholism or tuberculosis in the parents seems to be responsible for this. In the cases in which no evidences of abnormal thyroid functioning are apparent, the women were of a darker complexion as a rule. There were evidences of thyroid upset in 18 per cent. of his female patients, and they were probable in another 7 per cent. Next to syphilis and thyroid upset, alcohol is the main factor in nervous affections. Among other bases for this assertion is the enormous consumption of alcohol in the country. The revenue from the tax on spirits in 1916 was 28 millions. Inherited syphilis kills more children early in life. The evil consequences of alcoholism in the parents do not manifest themselves usually until about the age of puberty, and then mostly in the psychic sphere. The judges in the police courts see more of the consequences of inherited alcohol taints than physicians.

Hospitalstidende, Copenhagen

May 16, LX, No. 20, pp. 473-496

- 97 *Artificial Heliotherapy in Lupus and Surgical Tuberculosis. A. Reyn and N. P. Ernst.—p. 473. Commenced in No. 19, p. 449.

97. Artificial Heliotherapy in Lupus and Surgical Tuberculosis.—Reyn and Ernst have been giving electric light baths in lupus and bone and joint tuberculosis since early in 1913, and here report encouraging results in several hundred cases. They found the carbon arc light best for the purpose, and reiterate that it seems to be able to accomplish alone, without climatic factors, as much as the sunlight in a mountain climate. It is an invaluable aid in the treatment of lupus. The work was done at the Finsen Light Institute at Copenhagen, and the lupus was often of many years' standing, rebellious to all other measures. The entire body was exposed to the rays. These general light baths are thus entirely different from the Finsen treatment which seeks to focus as powerful rays as possible on a small area. The aim with the general bath is to have the body absorb as much of the chemical rays as possible. The exposures are for one quarter to half an hour at first, gradually lengthening them in the course of a week or two to two and a half hours. This was the limit for the exposures. Among the 156 lupus patients all were old, rebellious cases except 30 who began treatment for the first time with these general baths to supplement the local Finsen treatment. The results were better in this latter group. The course lasted from four to eight months. It seems best to give the general light baths every second day, with a powerful current. In the tuberculous cases, some did

better with a current of 20 amperes, others with 75 amperes. The most striking success was obtained with osteitis and arthritis: in many cases the joint process healed without impairment of function. Nine plates of photographs show the "before and after" aspects of the lesions. Fourteen different classes of tuberculous lesions were treated, and the results are tabulated. The experiences here reported emphasize that the chemical rays are the effectual element in Rollier's heliotherapy, and not the mountain climate, as equally good results were obtained with the carbon arc light. The cure was complete and less time was required, naturally, the earlier the treatment was applied.

They emphasize particularly that these results were obtained on outpatients, nearly all adults, the tuberculous process usually of long standing. They came for their light baths, but otherwise were under the same conditions of environment and occupation as before treatment. Reyn and Ernst also insist that this treatment must be applied by persons with surgical training and insight, knowing when operative aid will promote the healing, and when to refrain from interference. Experiences with the mercury vapor quartz lamp, the so-called "mountain sunlight" lamp, proved it less effectual than the carbon arc light. The latter yields rays of all kinds, while the mercury vapor lamp gives off only the short-waved rays with weak penetrating power. The skin tans under the arc light as under sunlight. The details of twenty-one cases with fistula are given in full.

Hygiea, Stockholm

April 30, LXXIX, No. 8, pp. 369-416

- 98 Henschen's Theory of Pulsus Bigeminus Is Unphysiologic. E. Zander.—p. 369.
99 *Neutral Solution of Chlorinated Soda in Treatment of Chronic Suppuration. A. Troell.—p. 384.

99. Hypochlorite Treatment of Suppuration.—Troell describes his experiences with the Carrel-Dakin technic in treatment of forty-five wounded soldiers in the Swedish military hospital at Vienna. When conditions permitted its application in a thorough manner, the results were highly satisfactory.

Ugeskrift for Læger, Copenhagen

May 3, LXXIX, No. 18, pp. 685-726

- 100 Chronic Habitual Constipation from the Clinical and Roentgenologic Standpoint. IV. T. E. H. Thaysen.—p. 685. Conclusion.
101 *Exacerbations of Chronic Disease from the Standpoint of Hospitalization. K. Lundh.—p. 695.
102 *Drug Eruption in Infant. S. Lomholt.—p. 699.

101. Exacerbations of Chronic Affections and Hospitalization.—The boy of 15 had been in the hospital five different times on account of febrile exacerbations of chronic bronchitis with cough, and mitral insufficiency. There was also situs inversus. Tubercle bacilli were found in the sputum three times in the course of a few months. Lundh takes this case as his text to expatiate on the advantages of treating such chronic patients under supervision at home, or in some outdoor colony or other inexpensive sanatorium. The lad had spent 703 days in all in different hospitals, thus costing the state 3,027 crowns. Looking over the local hospital records has shown that eighty-nine similar cases, all with more or less earning capacity, have been given 38,569 days of hospital treatment. The same or better results could have been attained at the outdoor colony, the patients going at night, with hygienic supervision of the home, while the expense would have been comparatively trivial.

102. Drug Eruption in Infant.—The infant was 18 months old. A 10 per cent. mercurial salve was applied for two weeks to patches of eczema back of the ears. Then the dermatitis rapidly became universal and severe nephritis developed, with high fever, 20 per thousand albuminuria, dyspnea and diarrhea. The latter was kept up with compound licorice powder, half a teaspoonful three times a day, and improvement gradually followed. The temperature was normal by the tenth day and recovery then was soon apparently complete. This laxative was given the preference because it contains sulphur. This may combine with the mercurial compounds in the bowel to form an insoluble salt. Sulphur alone would probably have been too heroic for the infant.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXIX, No. 2

CHICAGO, ILLINOIS

JULY 14, 1917

SPLENECTOMY IN THE ANEMIAS

AND OTHER BLOOD STATES ASSOCIATED WITH
ENLARGEMENT OF SPLEEN AND LIVER*

WILLIAM D. HAGGARD, M.D.

NASHVILLE, TENN.

The spleen has a mysterious function. In the embryo it is the manufacturer of white blood cells. This function apparently ceases before birth. After birth the spleen renovates the red blood cells. When diseased, it reverts to its primitive function, and lawlessly produces an enormous proliferation of the embryonic white cells, or a wholesale destruction of the red corpuscles, with great increase in its own size. The spleen is believed to produce a hemolytic ferment which has been interestingly studied by McNee, to exercise a phagocytic function (Kölliker, 1847), and to perform the act of mechanical straining of worn out blood cells especially, as well as bacteria, protozoa and certain toxic substances. It directs a considerable portion of the blood to the liver for further destruction of noxa and final metabolism of nutritive materials. It is well known that it enlarges during digestion and contracts after that function is completed. While a ductless gland, it does not appear to have an important internal secretion, but is powerfully acted on by the products of the suprarenal gland, contracting markedly under its administration. This is probably due to its blood and pulp composition.

In its duty as a filter it sometimes becomes overwhelmed with the infectious agent of general diseases, such as typhoid fever, malaria, syphilis and tuberculosis. Splenic enlargement so resulting may require operation under exceptional circumstances when it is unyielding to ordinary management.

A large spleen often results from toxic causes. It is commonly associated with anemia and with a secondary cirrhosis of the liver. Variations in this association results in such syndromes as Banti's, Gaucher's and von Jaksch's. Splenic anemia is perhaps the most frequent pathologic process participated in by the spleen, except those enlargements associated with such blood dyscrasias as leukemia and pernicious anemia. Both have a considerable incidence and an almost invariable fatality.

Splenic anemia is presumably due to the filtration from the blood of certain toxic substances by the spleen which, when passed on to the liver, produce cirrhosis. There are many varieties, but all have an enlargement of the spleen and some grade of anemia.

The enlargement seems to confer an abnormal potentiality for the destruction of the red blood cells.

Splenic anemia is a primary disease of the spleen of unknown origin. There are progressive enlargement, attacks of anemia, a tendency to hemorrhage, and in the Banti stage a secondary cirrhosis of the liver, with jaundice and ascites. Following splenectomy there is usually complete recovery showing that the spleen itself, if not initiating, is the essential seat of the disease. The restoration seems permanent. One patient was well after the lapse of fifteen years (Türk).

All splenic tumors, with chronic anemia, might be broadly, though not accurately, included under splenic anemia; practically all such cases have been cured by removal of the spleen. Miller speaks of the impossibility of explaining why in splenic anemia there is anemia without icterus, in Hanot's cirrhosis there is icterus without anemia, and in hemolytic icterus there are both icterus and anemia, and why all are so closely related.

Splenectomy has been performed in only a few instances of the adult form of splenic anemia, occurring in the first decade of life. Giffin¹ reports one case in which operation was performed by Balfour and only five others collected from the literature. I have reported elsewhere an additional case of the adult form of splenic anemia (Banti's disease) in a boy, aged 8, cured by splenectomy.²

It was inaugurated with severe gastric hemorrhage, reducing the hemoglobin to 11 per cent. and red cells to less than a million, followed in a few weeks by splenomegaly and ascites. After preliminary transfusion of whole blood the splenectomy was safely concluded with entire and complete recovery.

Gaucher's spleen is often associated with a huge liver. The process begins in infancy or childhood, is extremely chronic, and is characterized by the peculiar large pale round cells with vacuolated protoplasm. If operation is undertaken before endotheliomatous growths appear secondarily in the liver and the other organs, cures have been cited by Herzog and Mayo.

Von Jaksch's disease, the splenic anemia of infancy, might be possibly considered as a form of adult splenic anemia, in spite of the high leukocytosis and lymphocytosis, as these, according to Giffin, may be the result of a peculiar reaction of the infant's blood. Splenectomy is indicated in the graver forms that are not amenable to medical treatment. There are four operative cases in the literature up to the end of 1915.¹ All the patients survived and were either cured entirely or greatly improved.

* Chairman's address, read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Giffin, H. Z.: Splenectomy for Splenic Anemia in Childhood for the Splenic Anemia of Infancy, *Ann. Surg.*, 1915, **62**, 676.
2. Haggard, W. D.: *Tennessee State Med. Jour.*, to be published.

What relation does the rather constant enlargement of the spleen bear to hepatic cirrhosis? The beneficial results in the few cases in which splenectomy has been performed might seem to point to a certain relationship that may give an indication for the operation in certain well studied cases.

Gastric hemorrhage, of unknown origin, instead of always arising from ulcer, has been estimated by Balfour³ to be the result of splenic anemia in many cases. He reports one strikingly suggestive case in which several fruitless operations on the stomach had been performed for grave recurrent gastric hemorrhage; the patient was cured by splenectomy after operation had revealed an enlarged spleen.

Pernicious anemia has been characterized as cancer of the red blood tissue, as leukemia has been described as cancer of the white blood tissue in its riotous profusion and reckless proliferation. It is evidently of infectious origin. The idiopathic variety was a fabrication; it is so uniformly fatal under all forms of treatment that Eppinger suggested splenectomy on account of the decreased hemolysis following the removal of the spleen. He thinks the hemolysis occurs in the spleen pulp sinuses, the blood being diverted there on account of thickening of the obliterated central artery. Although no permanent and definite cure has been made, many patients have been greatly benefited, and it is not impossible that if the operation could be undertaken in the early stage of the disease, before bone-marrow exhaustion occurs, some permanent cures may be effected. A persistently low polymorphonuclear percentage would indicate bone-marrow exhaustion; whereas, a high percentage of reticulated cells with perhaps the Jolly bodies point to increased activity of the bone-marrow. Splenectomy is the greatest stimulant to bone-marrow, but it can exert this stimulation but once. Repeated transfusion before and after operation is the next best therapeutic measure. As the spleen is only an aggregation of lymph glands, and as in addition to the bone-marrow there are many isolated glands around the peritoneal cavity, so-called hemolymph glands, it is not improbable that the explanation of the continued blood destruction after splenectomy in pernicious anemia may be due to the continued and vicarious activity of these glands which have been stimulated to this pernicious destruction of blood cells. After splenectomy the spleen is seen to be crowded with phagocytes and red cells in various stages of destruction, although there is no particular cellular pathologic condition in the spleen. The trouble is rather a perverted chemistry or physiology.

The grave anemias, although presumably of splenic origin, may not only be fathered by the streptococcus, but by the plasmodium, tubercle bacillus, protozoa and other parasites. As has been pertinently said, "If the spleen is the mother of pernicious anemia there must be many fathers."

Schneider⁴ has ingeniously demonstrated that these blood-derived pigments can be obtained from the duodenum by tubage and the quantity estimated by spectroscopic analysis.

In the hemolytic type of anemia, the index of these pigments is increased, and hence these patients are

more suitable for splenectomy. He calls this the "hematopoietic-hemolytic index." It appears that in secondary anemia, carcinoma, chronic sepsis, etc., due to enteric bleeding, this H-H index is low. If blood destruction is great, as evidenced by a high index in the duodenal contents and yet the blood picture is good on account of the ability of the bone marrow to keep up a fair blood supply, splenectomy is followed by a considerable gain, indicating that removal of the spleen does prevent a blood destruction and perhaps allow the bone marrow to supply the deficiency. This is confirmed by a striking reduction in the duodenal blood-derived values after splenectomy. Schneider⁵ concludes that:

Splenectomy apparently, immediately and permanently reduces the excessive blood-derived pigments of pathologic hemolysis to a normal level. There is no proof that a recurrence of a pernicious blood and clinical picture after splenectomy is due to a reestablishment of excessive blood destruction.

Regarding advanced cases of pernicious anemia as an ultimate exhaustion of the bone marrow, although originally a hemolytic process, an estimation of the H-H index of Schneider would allow us to select the favorable cases for splenectomy, as evidenced by the high index of this group. Since some cases of secondary anemia from alimentary hemorrhages imitate closely a pernicious anemia, this test will definitely rule out that group by showing a normal or low index of the pigments.

Percy⁶ thus epitomizes the treatment of pernicious anemia:

Multiple massive transfusion of whole blood, eradication of all local foci of infection present, laparotomy for the removal of the spleen, and the other tissues that show evidence of chronic infection is necessary.

The best results seem to have been obtained in persons below 50 who have had the disease less than a year in whom the blood picture is fairly good and the spleen is moderately enlarged. It has been pretty well determined even by the most ardent advocates that mental, cerebral and spinal cord symptoms are distinct contraindications to splenectomy, and it should be added that the presence of an aplastic bone marrow is equally forbidding. If the hemoglobin is below 35 per cent. and the red blood cells less than 1,500,000, operation should not be undertaken. When the anemia is marked, three or four transfusions should be done as a preliminary.

In the Mayo clinic there were thirty-nine splenectomies for pernicious anemia with three deaths, 7.7 per cent. In the last twenty-nine cases there were no deaths. Krumbhaar,⁷ after a critical study of 153 cases in which splenectomy was performed for pernicious anemia, concludes that:

On account of the improvement that follows splenectomy, it would appear to be not only justifiable, but in many cases an advisable procedure; but in no case should a cure be promised or the operation undertaken except under the most favorable conditions.

Hemolytic jaundice is the most heartening of all the conditions of blood dyscrasia that are benefited or cured by splenectomy. The jaundice begins to pale

3. Balfour, D. C.: Splenectomy for Repeated Gastro-Intestinal Hemorrhages, *Am. Surg.*, 1916, **64**.

4. Schneider, J. P.: The Hematopoietic-Hemolytic Index: A Determination Helpful in the Differential Diagnosis of Types of Pernicious Anemia Amenable to Cure by Splenectomy, *Journal-Lancet*, 1917, **37**, No. 4.

5. Schneider, J. P.: Further Quantitative Study of Duodenal Blood-Derived Pigments, *Arch. Int. Med.*, January, 1917, p. 156.

6. Percy: *Surg., Gynec. and Obst.*, May, 1917, p. 554.

7. Krumbhaar, E. B.: Late Results of Splenectomy in Pernicious Anemia: A Statistical and Critical Review, *THE JOURNAL A. M. A.*, Sept. 2, 1916, p. 723.

almost immediately, and in a few weeks the icterus of many years has faded away forever. It seems like a feat of legerdemain, and it was looked on as incurable until 1911, in which year Micheli performed the first operation.

The disease is not uncommon: Rovsing⁸ says that fifty cases have been observed in Denmark. The acquired form, which usually makes its appearance in the second decade, is much more fatal than the familial, which may last indefinitely with little or no inconvenience, other than the skin discoloration. These patients are more icteric than sick; with the acquired form they are more sick than icteric, according to Chauffard. In addition to the splenomegaly there are anemia and increase in reticulated cells, showing a partial exhaustion of the hemopoietic system. There is a marked fragility of the red cells, by the test of Chauffard and Widal, according to the Eppinger technic.⁹ Their mere fragility causes their easier hemolysis in the spleen. May it not be, as suggested by Meltzer, that, as the blood flows through the irregular alveolar structure of the spleen, the red cells rendered fragile by some unknown agency, encountering the jarring ridges and sustaining innumerable shocks, are broken up mechanically and called to give up some of their hemoglobin? With the jaundice there is no brachycardia, itching or petechiae. There is bile in the stools, bile in the blood, but no bile in the urine; whereas urobilin is present in the urine but not in the blood. Bilirubin is found in the blood serum, and can be measured.¹⁰

The pigmented portion of the hemoglobin molecule when split up by the spleen is thrown off by the liver as bilirubin. In the intestine this is changed into urobilin, and as such is passed out by the kidneys. When the pigment escapes extrusion by the liver, deposition in the tissues causes jaundice, just as in pernicious anemia the lemon tinge comes from the pigment of slaughtered red cells.

May not certain cases of so-called Hanot's hypertrophic cirrhosis in young life that lasts a number of years be in reality acquired hemolytic jaundice, as suggested by Mayo? The obtaining of the H-H index and the test for the fragility of the red cells would be helpful. While true Hanot's cirrhosis is rare, chronic, and generally regarded as incurable, splenectomy may be indicated.

In forty-eight cases of splenectomy, reports of which were collected by Elliott and Kanavel,⁹ for hemolytic jaundice, there were only two deaths, a mortality of 4.1 per cent. These patients should not be operated on during an exacerbation characterized by pain, tenderness and enlargement over the liver and spleen, with increase in jaundice and temperature. This is the typical acholuric crisis, and is often misinterpreted as malaria.

Splenomyelogenous leukemia, as ordinarily encountered, is notoriously inappropriate for splenectomy, but when the full limit of improvement after Roentgen or radium treatment has been obtained and before recrudescence occurs, Mayo thinks splenectomy may be considered in selected cases.

Likewise syphilitic spleen, although quite uniformly amenable to intensive antisyphilitic treatment, may be wholly intractable to the most active and persistent measures. Four such cases are reported from the

Rochester clinic, and were promptly cured by splenectomy and continuation of treatment that was formerly unavailing. There are also reported from the same clinic 135 splenectomies with twelve deaths, 8.5 per cent., for various maladies of the spleen, with abnormal blood states and splenomegaly.¹¹ Attention is drawn to the fact that the spleen must be enlarged many times to be really palpable. In this connection it must be remembered that splenic enlargements always grow forward; they never produce fulness in the loin.

All chronically enlarged spleens which are symptom-producing should be brought into court—the court of exhaustive investigation—to show cause why they should not be removed. We are in danger of rather indiscriminate operation on this organ by those who may be impressed with the glamour of this somewhat impressive operation, but who are not properly equipped to study each case in the most elaborate and exacting way.

SANITATION IN THE TRENCHES

CHAMPE CARTER McCULLOCH, M.D.

Lieutenant-Colonel, United States Army; Professor of Military Hygiene,
Army Medical School,
WASHINGTON, D. C.

From professional friends in the medical centers who are most in touch with the younger physicians I learn that there is a great demand among the latter for medicomilitary literature concerning the present war. Naturally, planning to take up at an early date the duties of what they are beginning to realize is practically a specialty to which our medical colleges have heretofore given no attention, as intelligent professional men and as patriotic citizens they are eager for information that will enable them competently to fill the military offices to which they shortly expect appointment, and to "do their bit," however small, in an adequate and self-satisfying way.

At present, unfortunately, there is a great lack of literature along these lines. Physicians abroad, both at home and afield, are all more or less engaged in the work of the war and have had little time to write; and what has been written, owing to evident difficulties in the transportation of mail, is not always received on this side of the water. Fortunately for our present purposes, this matter is not vital. I have been informed by competent observers from the western front that the German sanitary methods and results are far behind those of the British and French; indeed, there seems to be some evidence that the medical department of the German army, owing probably to the use of antiquated administrative methods, practically broke down in the early part of the war.

Realizing this literary dearth, the medical section of the Advisory Committee of National Defense has patriotically decided to have published at as early a date as practicable a series of pocket handbooks designed for easy use in the field, and treating of those subjects that are most essential in this connection. The series will consist of English manuals, revised and up to date, French translations, and short monographs on special subjects, the latter written mostly by some of our own physicians and surgeons who have already seen service abroad. This plan, when effectuated, will

8. Rovsing: Tr. XI. North Surg. Cong., July, 1916.

9. Elliott and Kanavel: Surg., Gynec. and Obst., 1915, 21, 26.

10. Hooper and Whipple: Am. Jour. Physiol., 1916, 40, 332.

11. Miller, J. L.: Splenectomy in Splenic Anemia, Hemolytic Icterus and Hanot's Cirrhosis, THE JOURNAL A. M. A., Sept. 2, 1916, p. 727.

no doubt take care of one of the most important phases of the matter of medical preparedness for the war.

Pending the publication of these books, which will probably require several months for completion, the want can be partially filled by short journal articles on some of the more important subjects. Of these the most urgent is that of camp sanitation. I regret extremely that none of our many competent army sanitarians has taken up this task. It may perhaps be a case of "angels fearing to tread," owing to the dry nature of the subject and the great difficulty of making its treatment interesting. However, at the risk of subjecting myself to this criticism, I have felt constrained, mainly because of the reticence of more able pens, to enter the breach. Elsewhere¹ I have dealt briefly with what may be called the general principles of military hygiene, which apply in this war just as forcibly

details. This would be better, indeed, than originality for our present purposes. It would be a big start toward the solution of a problem that has always caused us serious trouble in our previous wars, leading to scandals and investigating committees, and "the tumult and the shouting" of popular disapproval and newspaper notoriety. In spite of much natural optimism I have, however, little hope of accomplishing the end aimed at; for are there not already in the air the mutterings of approaching storms, and have not the dreaded criticisms in fact already begun? For my part, I merely feel the "call" to expound the doctrine as it has been revealed to me.

The French ideas on field sanitation have been ably and interestingly presented by Andre Tournade in "*La pratique de l'hygiène en campagne*." (1916). However, I do not find in this work what I consider any

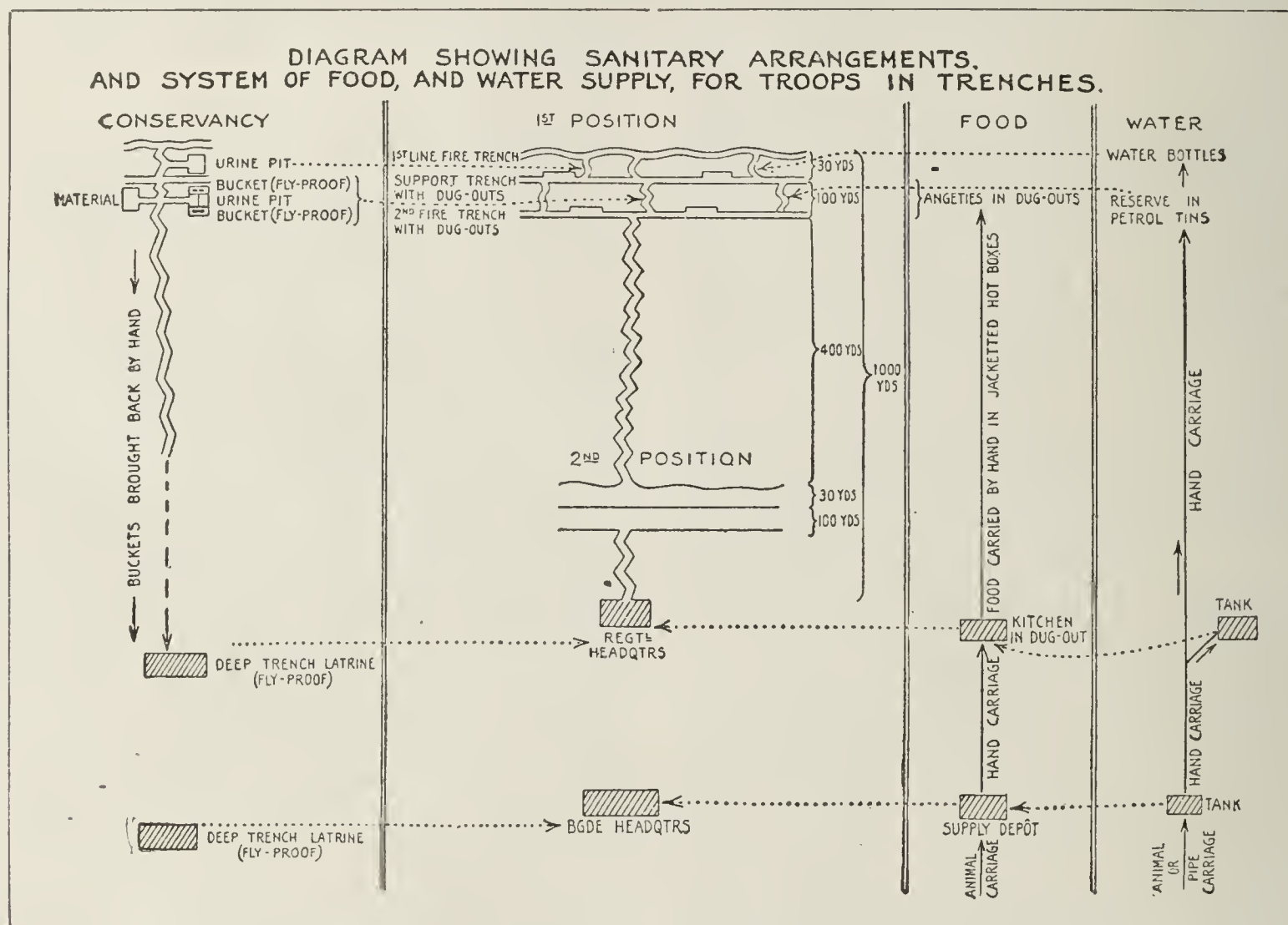


Fig. 1.—Plan of arrangements for food, water, and the handling of excreta.

as in previous ones. This paper is simply an effort to bring the matter up to date by a short description of the particular methods that the peculiar environment abroad has developed in modern trench warfare. I have been greatly aided in this design by having had the good fortune to hear the interesting lectures of Colonel Goodwin of the British mission to the United States covering this subject, and by the recent issue from the press of a revised American edition of Major Lelean's "*Sanitation in War*."² Anything that may prove of value in this paper is really due to these two authors. In fact, I make no claim whatever to originality, unless, indeed, it may be originality to endeavor to arouse interest in a very dry subject or to try to pick the essentials of the subject out of a large mass of

special improvements on the British methods herein outlined.

Major Vedder of the Army Medical Corps has prepared a little handbook entitled "*Sanitation for Medical Officers*" that will be published at an early date.³ This with Lelean's excellent book, and, for reference purposes, the last (second) edition of Havard's "*Military Hygiene*," will cover, in my opinion, all the literature on sanitation necessary for the physician in the field in the coming war. Short orders and circulars on special subjects are issued from time to time by the War Department, and these will serve to keep one entirely up to date along these lines.

To take up the consideration of our subject: In the area behind the front there has been no particular departure from our old established sanitary methods;

1. McCulloch, C. C.: *Med. Rec.*, New York, June 2, 1917.

2. I am indebted to the extreme courtesy of Messrs. P. Blakiston's Son & Co. of Philadelphia for permission to use the illustrations accompanying this article.

3. Under the authority of the Surgeon General of the Army, and of the Council of National Defense.

the general principles, indeed, remain the same in all war areas. In general hospitals and at the base, these being usually situated in towns of some size, systems of water carriage and modern sewage disposal make our sanitary labors light. Fixed incinerators for general refuse are easily established and maintained.

In case no such systems exist, they are installed as necessary. The simple range style of water closet, which was used with excellent results for the workmen on the Panama canal, offers an easy solution of this particular problem, and the same arrangement is applicable to permanent camps. This device is, in effect, an iron trough, with water and sewer connections, that flushes itself automatically at regular intervals. Its chief advantage is in its economical installation and operation as compared with the customary water closet fixtures.

In semipermanent and large standing camps, when it is impracticable to install sewerage systems, it has been found by experience in our army that the deep trench latrine system with fly-proof box covers, in connection with improvised incinerators for refuse, if adequately administered, can be made to meet the sanitary situation satisfactorily. The urine soakage pit, described below, makes a desirable addition to this plan. Another improvement, in connection with latrines, is the use of a barrel, conveniently situated, containing cresol solution for hand disinfection, and provided with a conspicuous label directing that the men wash their hands after using the sink.

This seems a good place to state that the only really safe and effective way of administering these field latrines is to have a sentry posted over them whose duty it is to look out for the details of their operation, particularly with reference to the fly-proofing.

In the European system of billeting troops in villages, it is customary to make the best of existing facilities. The most common arrangement is that which we found in Cuba in 1898; that is, cess pits under the individual houses, which are pumped out from time to time by some form of suction apparatus.

It goes without saying that all our field methods, and in particular those concerned with conservancy, require for the accomplishment of real results the strictest sanitary supervision and inspection.

Experience has shown that at the front proper certain modifications of our usual conservancy plans are advisable, which are in one way a reversion to earlier and discarded methods, although in others they conform much better to the local conditions. The essential thing is that with care we get results, the "acid test" of the success of any kind of campaign.

The vital things in military sanitation are (1) food, (2) water, (3) conservancy, (4) personal habits, and (5) the prevention of special diseases.

I. THE FOOD SUPPLY

One of the most noticeable developments of the European war in this connection has been the increased vogue of the traveling kitchen or field cooker in the zone of advance. According to Lelean, "that now in use is of the 'heat retaining' type which gives en route no smoke which might draw the enemy's fire. It consists of ovens and hot-jacketed boilers arranged around a central furnace, all contained in the body of the wagon. The limber contains hot-jacketed receptacles, compartments for rations, utensils, food, etc. It can be detached from the body and, being drawn by one horse, is used for food distribution while the body continues cooking. The whole is drawn by two horses, weighs 24 hundred-weight, and cooks for 250 men and their officers." On the march it travels with the first line of transport. From these, or from improvised dugouts (Fig. 1) conveniently situated, food is carried by hand in jacketed boxes and covered tins, through the communication trenches to the troops at the front.

A lesson taught us by experience in the Spanish and Boer wars, as well as by the discoveries of modern bacteriology, is the importance, from a hygienic standpoint, of avoiding "carriers" in any work that concerns the preparation and distribution of food. The medical history of all men detailed into company kitchens should therefore be investigated, coupled with a careful examination of their actual physical condition. Much sickness, especially the intestinal varieties of disease, may often be avoided in this way.

It has been found abroad that our former plan of screening entire kitchens can be improved

on by substituting the screening of the food itself, the fly nuisance being better controlled in actual practice in the latter way. Screened cupboards or safes are used for meat, bread, jam, opened tins or other foods that attract flies, and eating utensils are kept covered. Simple muslin squares, weighted at the corners, can be used for much of this work. Covered barrels or tins are employed for the bestowal of refuse, previous to incineration.

Grease in the sullage water resulting from cooking processes is often quite a nuisance, and a simple method of getting rid of it in camp has been devised in the form of a sort of grease trap. A box is filled to a depth of several inches with clean sand, and a

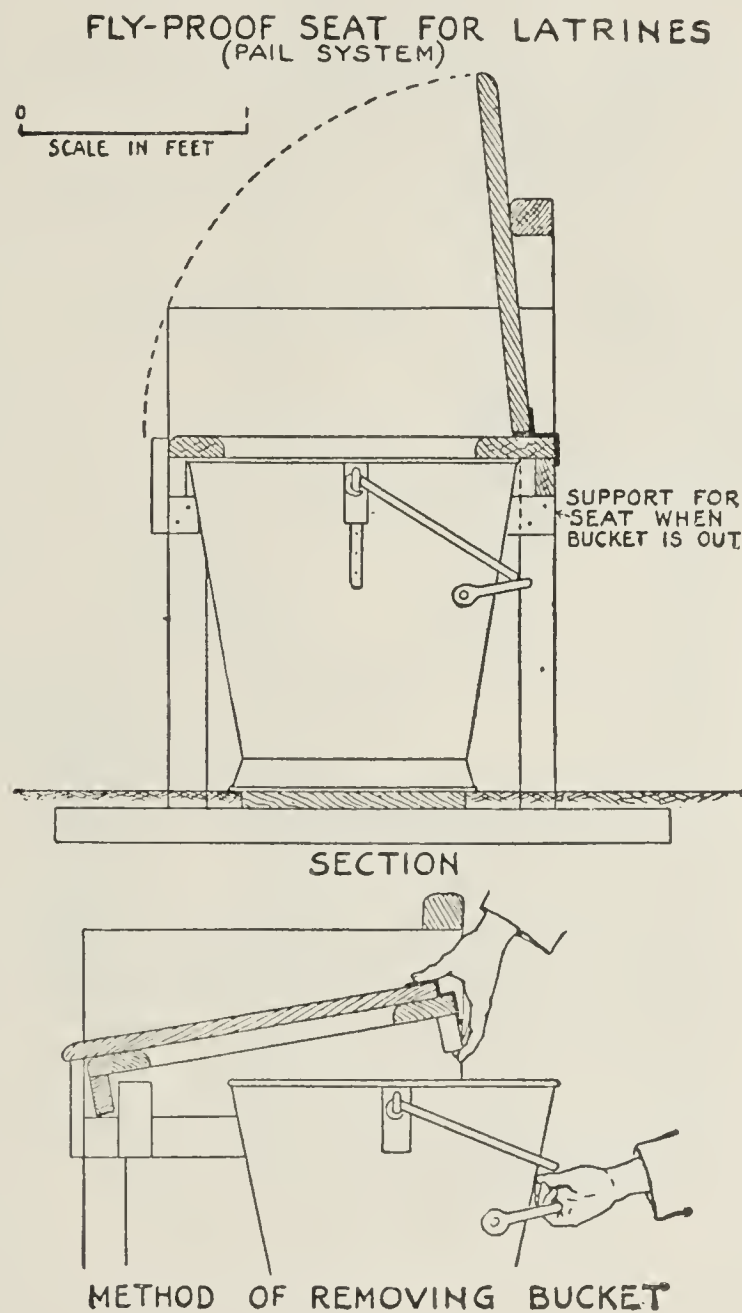


Fig. 2.—Fly-proof container for latrine pail.

vertical partition placed in the middle which dips down at its lower edge for a couple of inches into the sand, making two compartments. The sullage introduced into one side filters through into the other under the partition, leaving most of the grease behind. The effluent is handled as described below for urine. The process works better if gross particles are first removed from the water by running it through a kerosene tin loosely filled with hay. The filtering materials are renewed as required when they become clogged.

II. WATER SUPPLIES

A glance at the diagram (Fig. 1) will show the method of supplying drinking water to the troops in the trenches. Water tanks are set up at distances of 1 000 yards or more from the first line trenches, obtaining their supplies from pipes when such a system is available, or otherwise from horse-drawn water carts. The water in the tanks is, when necessary, sterilized by the hypochlorite process, which seems to act as a bactericide by oxidation with oxygen liberated from the hypochlorite rather than by free chlorin. One part of available chlorin per million acting for half an hour is an effective dose, and this is supplied by 2 gm. of bleaching powder to the ordinary water cart containing 110 gallons. The process requires supervision and examination of the chemical from time to time by titration methods to see that it has not lost its strength. From the tanks the water is carried in kerosene tins by hand through the communicating trenches, and stored as a reserve in dugouts back of the support trench. The soldiers' water bottles are filled there. Cavalry soldiers are supplied with sterilizing tablets for use in the bottles themselves.

III. DISPOSITION OF EXCRETA

The conditions to be met abroad with respect to this point are practically those of a siege. Various methods were tried in the earlier part of the war. One of the simplest was a sort of reversion to the old stink-pot idea of the Chinese; that is, the material, collected in buckets, was thrown over into the enemy's trenches. Reprisal on the part of the enemy led to a tacit mutual abandonment of this plan. Moreover, the use, under any conditions, of pits, buckets, etc., in the first-line fire trenches led to results so disagreeable and even insanitary that the attempt, made for the sake of convenience, had also to be abandoned.

The only practicable solution of this important problem has been found in the system of disposal employed

at present by the British, which is to use bomb-proof pits or dugouts leading out of the "communication" trenches. The position of these trenches and the associated pits will be readily understood by an inspection of the accompanying diagram (Fig. 1).

The ideal method, and one that is practicable in most cases, is to use, in the pits, individual buckets or tins with improvised handles, enclosed in simply constructed fly-proof boxes, or at least in boxes having a fly-proof lift-off seat, that will fit closely on the top of the pail. Lids should be made self-closing (Figs. 2 and 3). The pails when about two thirds full are replaced by clean ones, and carried back by hand for final disposition of their contents. Fresh buckets are filled about one quarter full with dilute cresol solution (1:360),

after the internal surface has been rubbed with crude oil, when this is available. In some cases, especially when incineration of the contents of the buckets is to be carried out, sawdust, instead of cresol, to a depth of one quarter to one third, is employed, and the same material added by a scoop after each act of defecation—100 pounds of sawdust per day per regiment will suffice. Whenever spillage occurs during removal, the soiled area should be treated at once with a 5 per cent. cresol solution. When possible to provide it, a concrete floor for the bomb-proof pit is a great improvement. Bomb-proofing usually means in this connection simply a sufficiently thick layer of earth between the roof of the excavation and the surface of the ground.

It naturally adds much to the efficiency of this system if the urine can be handled separately, particularly in incinerator methods. This is done in some cases by separate urine

buckets, in others, as in the diagram (Fig. 4), by urine soakage pits. These are constructed by digging holes in the ground at a convenient place in the bomb-proof pit about 4 feet in each dimension, loosening the earth at the bottom, and then filling up with stones or perforated tin cans to near the top; a layer of brush or grass or sacking is placed over the stones, and the whole filled up with earth level with the surface of the ground. Funnels painted white, so they can be easily seen at night, may be built into the four corners of the urine pit, or a galvanized iron trough, conveniently situated to catch the urine, may be led into it (Fig. 4). Loose plugs of hay should be placed in the funnels, and with all soiled areas of the contiguous ground surface, as well as urine troughs when present, be treated with 5 per cent. cresol solution about twice daily.

The under as well as the upper surface of the above described box-seats should be swabbed with cresol.

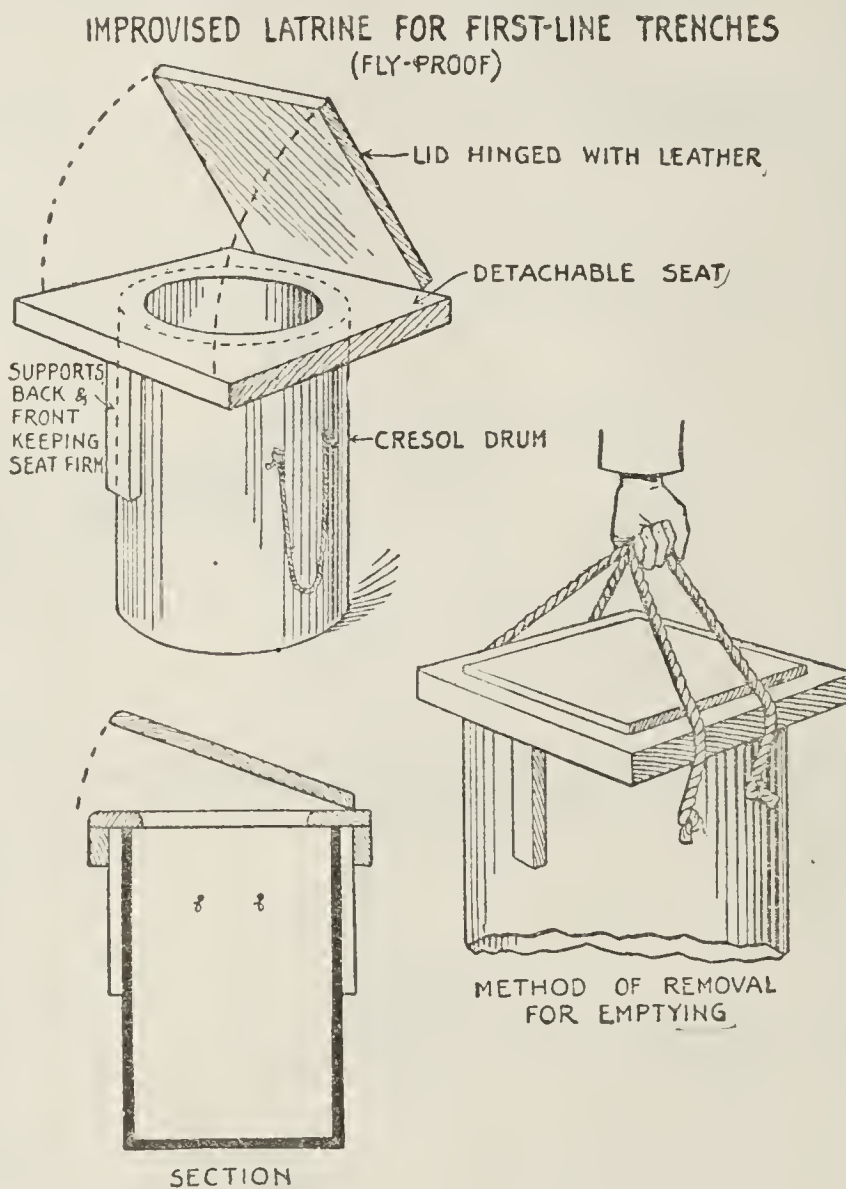


Fig. 3.—Fly-proof cover for latrine pail.

Cleaned buckets, cresol solution, sawdust, toilet paper, and other necessary materials are stored in a bomb-proof dugout situated off the communicating trench, conveniently near to the bucket and urine pits (Fig. 1).

As to final disposal, the buckets are carried back by hand and (1) buried, (2) incinerated in destructors, or (3) emptied into deep trench latrines. In any case the buckets are at once cleaned, best over a concrete washing platform and with the aid of dilute cresol solution, followed by the use of dry sawdust and a stiff brush.

1. In disposition by burial, the contents of the buckets are emptied into a quartermaster's sanitary cart (*Anglice* tumbrel) and carted away to the reception area, where they are trenced into the ground daily and covered with not less than 12 inches of earth. Urine or sullage water is best treated separately by first passing it through a sedimentation tank, and then irrigating it out on to shallow furrows on the land selected, through wooden or earthenware channels. Pools should be avoided by feeding out the effluent as evenly as possible. The areas treated in this way are with difficulty kept in a sanitary condition with regard to flies and, in the thickly inhabited areas of northern France, are often hard to find available.

2. The ideal method of disposal, and that selected wherever practicable, is by incineration in some suitable form of destructor. This apparatus can also handle other forms of dry camp refuse, which in addition serves as fuel. The British use successfully the Horsfall and the Meldrum types of destructors or some improvised modifications of them.

The unit or Horsfall portable destructor is constructed of iron walls with firebrick lining. It serves 1,000 men, if the urine has been previously drained away from the solids into a soak pit, and at an expenditure of not over 100 pounds of fuel per day. In this type of incinerator the furnace is separated from the bottom of the flue by a baffle plate, thus forming a combustion chamber in which the solid excreta are burned. This is the essential thing in the plan of this apparatus as, besides aiding combustion, offensive gases are thus oxidized and made inodorous. Very careful firing and stoking is necessary for its proper working, a supply of one half fecal matter and one half other refuse at each feeding giving the best results. The English Sanitary Notes (1916) state that improvised incinerators of the Horsfall type may be easily made with bricks or kerosene oil tins filled with ash and clay and wired together, the important thing being to be sure that a proper combustion chamber is provided.

The central or Meldrum type of destructor works on a larger scale and serves from 5,000 to 8,000 men. Being fixed and necessarily located further back from the front than the smaller Horsfall type, cartage of the buckets for part of the distance is required. A drying shelf over the fire is a very useful addition to the fixed incinerator. It is in these incinerator methods, as stated above, that the sawdust is an especial improvement over the cresol solution for the pails.

The foregoing are of the closed types of incinerator. The open types, while easily adapted to ordinary refuse, are for obvious reasons extremely difficult if not impossible of application to the disposal of excreta.

3. In the use of the pit system of deep trench

latrines for the final disposition of excreta on a large scale, holes are dug in a suitable place from 10 to 12 feet square and about 4½ feet deep. The English call this arrangement the "American oil-pit," and it is in fact a sort of compromise between the burial and incinerator methods just described. It is, I believe, the method now most used by the British. It certainly has the advantage of simplicity and can be made to work satisfactorily, if not perfectly, by proper supervision and care. Everything depends on the method of handling. A fly-proof cover is placed over the pit. The contents of the buckets brought back by hand from the bomb-proof pits in the communication trenches are emptied into the pit with kitchen and other camp refuse, including old tins which have previously been perforated. Urine is handled in this method by having a false bottom to the pit made of corrugated sheet iron, with numerous perforations through which the liquid material runs. In other cases the bottom of the trench is made to slope down toward a smaller and deeper pit on one side, into which the urine runs. Once a day, the fly-proof cover is removed from the trench,

some hay or straw added, kerosene oil is poured over the material contained in the pit, and the whole burned over. The heat generated serves to evaporate the liquids. When the contents have reached within about 3 feet of the surface, the pit is filled in with earth and a new one dug.

Closely allied in principle to the subject of the disposal of human excreta is that of the disposition of horse manure, itself a vital question around army camps, on account of the enormous breeding of flies that always takes place, when some scientific and adequately administered plan of prevention is not carried out. The picket lines, which are, for convenience, nearly always in the immediate vicinity of camps, should be cleaned off carefully every day and the scrapings as well as gross manure removed. The line

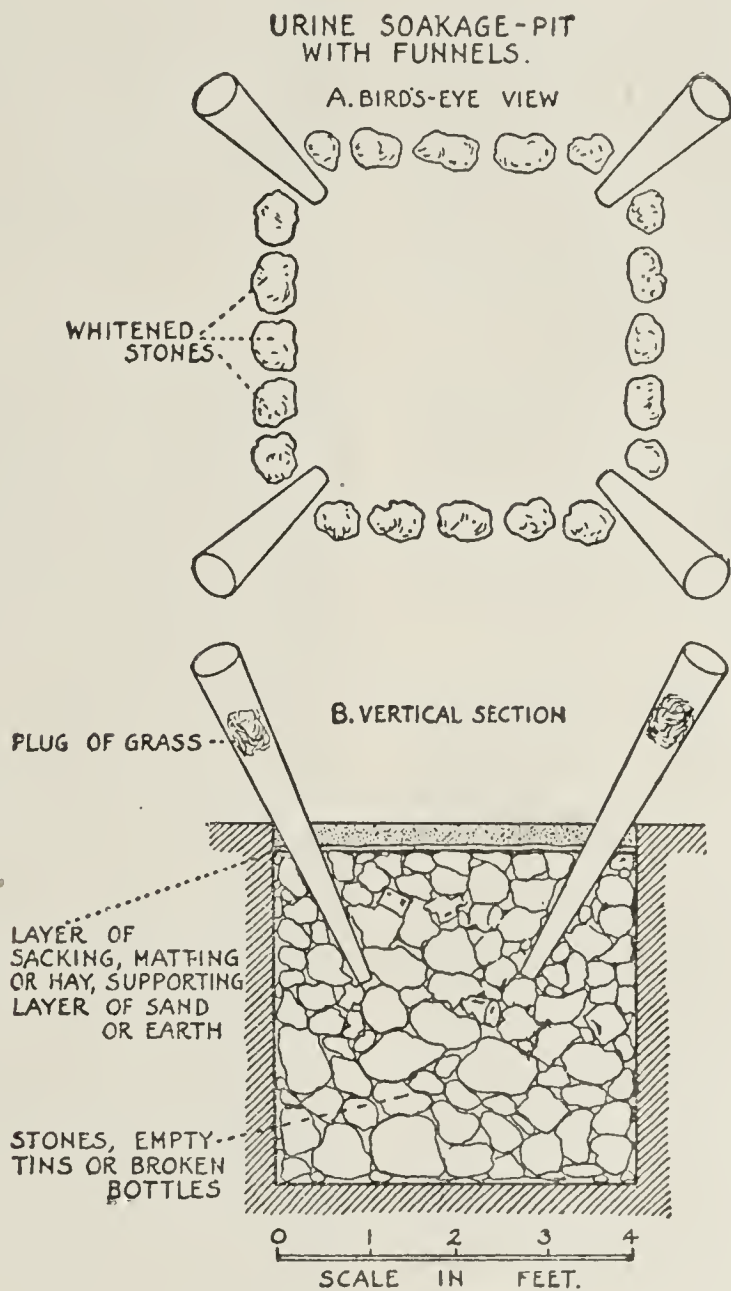


Fig. 4.—Urine soakage pit.

should be burned over at least once a week with the aid of kerosene.

The difficult problem is to dispose of the manure thus collected. The ideal plan, and the one followed whenever practicable, is to burn it in specially designed incinerators. I have seen this satisfactorily done in the ordinary rock pile incinerators that we have used for some years past in the disposal of refuse in our American camps. Good results are difficult of accomplishment, however, and require much labor and care. Abroad, more elaborate methods have been put into practice, and though the construction of the required apparatus is more difficult than in the case of the rock-pile incinerator, the subsequent working is much easier and more economical.

One plan is to construct a wire frame or grid. This is of any required length, and is made in rectangular basket shape, the bed being 4 feet wide and 4 feet deep, and elevated about 2 feet above the surface of the ground. Any kind of wire may be used, such, for example, as that found binding up bundles of hay. The meshes of the trough or basket are about 5 inches square. The incinerator is set broadside to the prevailing winds. The bars at the bottom are made to run from side to side rather than longitudinally.

Another type of manure incinerator is a rectangular open brick pit, built like the former, above the ground. Its internal dimensions are from 9 to 10 feet each way, enclosed by a brick wall 9 inches thick and about 5 feet high. Air inlets are arranged below on the sides at the ground level, and are about 15 inches square. Just above these is laid a row of Decauville rails, turned with the flange up and about 3 inches apart, to form the grate bed.

Either of these devices burns manure quite effectively, with the aid of a little kerosene. To save fuel the manure should be first spread on an improvised drying platform, best built of concrete, situated alongside the incinerator.

In default of incinerators, manure should be carted as far as practicable away from camp and piled in a dump on firm, dry ground, according to the English method of "close packing." A compact rectangular block is the best shape, not over 5 feet high. Each new load of manure should be beaten down tightly with shovels into the sides of the heap, and the surface and sides treated by spraying with a solution of borax ($\frac{3}{4}$ pound to 1 gallon of water). The whole is finally covered over with about 12 inches of earth. The theory is that the heat developed by fermentation in the interior of a mass of this kind will prevent fly breeding by killing the larvae.

We thus attempt by the methods described above to attack the fly evil at its source; that is, to prevent breeding. Surprising results can be had by hard work and careful supervision. However, none of these plans in actual practice ever works quite perfectly. Some flies will get into the best managed camp, and even there we must attack them with zeal and the use of fly traps, sticky paper, poisoning (3 per cent. dilution of liquor formaldehydi in sweetened milk makes a bait attractive as well as destructive to flies) and the wire "swatter." The matter of screening I have already considered.

Animal carcasses, such as those of horses, are liable to cause great nuisance and must be suitably disposed of. The simplest method is to eviscerate the body and bury the entrails and other viscera. The remains of the animal are then covered over with hay or dry

grass, a quart or so of kerosene is poured on, and the whole is set fire to. This does not usually accomplish complete incineration, but has the effect of sterilizing the surfaces of the ground as well as of the body, so that flies are not attracted and no particular nuisance results.

As to the disposal of human bodies, it is probable that, scientifically speaking at least, when they are in large numbers and in thickly settled areas, the method of incineration is most sanitary and generally satisfactory. A stone cairn is constructed, and on this alternate layers of bodies and wood are placed. Kerosene or tar is poured freely over the bodies and fuel and the whole set fire to. Combustion is usually efficacious and no further measures necessary. The method is said to have been used with success in Manchuria. The British, for sentimental reasons, have not adopted it in the present war, and I believe they have had no particular trouble in carrying out the usual methods of disposal by burial. It is extremely probable that we shall follow their example in this particular, though of the sanitary advantages of the cremation method there can be little doubt.

IV. PERSONAL CLEANLINESS

This question, always important in sanitation, and especially so in armies on account of the unavoidable crowding, takes on added importance in the present war, owing to the recently discovered fact that the body louse is the transmitting agent of typhus fever. The recent epidemic of this disease in Serbia will be readily recalled to mind, and it requires little stretching of the imagination to conceive of its possible introduction at any time on the western front.

In conditions such as prevail at present in northern France and Belgium it is, of course, impossible to banish the louse entirely; the attempt must be made, however, to reduce to the minimum this unpleasant and dangerous accompaniment of army camps under what amounts, in this respect, to siege conditions; hence the phrase, "delousing." Adequate personal cleanliness of body and clothing is the only preventive or, I should say, palliative for this pest. The individual can, no doubt, do a great deal along these lines to meliorate his own condition. Army sanitarians must also do everything possible to afford facilities for the necessary delousing, by wholesale, of the troops. This can be effected only by the establishment of divisional or other bathing plants for the soldiers, in connection with adequate facilities for the washing and disinfection of clothing on a large scale. I have recently described these matters in considerable detail elsewhere,⁴ so I shall here pass them over with the mere mention of their great importance. The periodic examination of the men (at least once a week) to determine the fact of infestation by lice is of great value in this connection.

The personal use, besides frequent bathing, changing and washing of the clothing, of certain local applications has been found by the British to be quite effective. For killing adults, a powder known as the N. C. I. is dusted on the underclothing. This powder is composed of naphthalene, 96 parts; creosote, 2 parts, and iodoform, 2 parts; about two thirds ounce is required for each man. A special ointment has been found to have the effect of asphyxiating the young as they hatch out of the ova. This is rubbed into the interior seams of the various articles of clothing, in the

4. McCulloch, C. C.: *South. Med. Jour.*, July, 1917.

quantity of about 1 ounce once a week. It is composed of crude mineral oil, 9 parts; soft soap, 5 parts, and water 1 part. The body, from the neck down, may also be anointed with this paste. A recent method said to be successful is to impregnate articles of underclothing by dipping and wringing them out in a solution of 1 per cent each of naphthalene and sulphur in benzene or gasoline. This is the English "antiparasitic vest," and it is not especially irritating to the skin.

It is not very difficult to free the person from lice by these methods, but early reinfection in the billets and quarters can hardly be prevented, so eternal vigilance is as necessary here as it is in the pursuit of political liberty.

Infected buildings and huts should be treated with two hours' exposure to sulphur dioxide fumigation by the Clayton apparatus. Clothing and blankets may be disinfected on a large scale in the same way. Scalding the underclothing and ironing the seams of the outer clothing with a hot flatiron is sometimes quite effective, in default of more thorough methods.

It may be well to add a brief account of a few of the simpler methods of field disinfection in actual use abroad.

1. There is the portable emergency steam apparatus known as the Thresh disinfector. Its principle is that of the modern steam disinfector, that is, it has a central chamber into which the articles to be treated are placed and through which the current of steam flows, surrounded by an outer chamber or jacket, into which steam is first admitted and which serves to prevent condensation and loss of heat. Infected articles are put in at one end of the apparatus and after treatment are taken out sterilized at the other end to avoid subsequent contamination at the sterilizer itself. Steam at ordinary atmospheric pressure, evolved from a concentrated saline solution, is used in the field apparatus and is safe and adequate for practical purposes. Half an hour's exposure is sufficient, and the usual sized apparatus will accommodate sixty blankets, or their equivalent in clothing, at each charge. By using a sufficient number of these disinfectors, it is quite possible to supply an installation that will cover the large amount of work required in connection with the modern elaborate plants for divisional baths.

2. The field box disinfector works on the same principle, but is much simpler than the Thresh apparatus. It consists of a jacketed metal box, with openings at top and bottom through which there is conducted steam generated in a separate metal boiler, heated over an improvised stone furnace. The only disadvantage of this apparatus is its rather small capacity.

3. The so-called "Serbian barrel" is an improvisation that has been much used and with good results on the British front in Belgium. The bottom end of a barrel is perforated with holes, and the top replaced by a flat metal lid, weighted down so as to fit tightly. Sandbag collars are wound around the top and bottom of the barrel, to retain the steam; the whole being then placed over a metal boiler; and this in turn rests on a brick or improvised adobe furnace, which has a flue at one end. The barrels with separate boilers are often set in series over a long narrow furnace. A container of 60 gallons' capacity will handle seven blankets at a time. As many as eighty of these Serbian barrels have been used at one time in a divisional bathing plant, where the Thresh disinfectors were not available.

(To be continued)

ARGYRIA LOCALIS DUE TO ORGANIC SILVER PREPARATIONS*

GEORGE MANGHILL OLSON, M.D.

MINNEAPOLIS

A pronounced bluish green, slate gray or dark brown permanent pigmentation of the skin is a very unfortunate accident that may follow the local therapeutic use of argyrol and the various other organic silver preparations.

The generalized argyria or argyria universalis following the internal use of silver nitrate, or occasionally its local application, has been well studied and recognized since the classical paper on this subject by Frommann¹ in 1859.

The localized argyria or argyria localis following the local use of silver nitrate, and that occurring as an occupational argyria in workers in silver, is also well known, very valuable papers having been written on this subject by Blaschko² and Lewin³ of Berlin in 1886, and more recently by Koelsch⁴ in 1912.

Comparatively little work has been done and very little has been published on the localized argyria due to the local use of argyrol and the other organic silver compounds. At times the local use of argyrol and protargol results in a generalized argyria, as reported by Davidson.⁵ This, however, is quite unusual, and the resulting argyria that may follow the local use of the organic silver compounds is nearly always localized or argyria localis.

Synonyms: Argyrosis, argyriasis, argyris.

THE ORGANIC SILVER PREPARATIONS

Argyrol and protargol, with albargin in Germany, are probably the most important of this group. Other organic silver compounds are argentamin, argonin, ichthargan, sophol and cargentos.

CASE REPORT

The patient, Miss M., first came under my observation in November, 1916. Four years previously she had sustained a fracture of the nose, the laceration of the soft parts extending to the right lower eyelid.

Her physician, in addition to other measures, dropped argyrol into the right eye. The argyrol made its way into the lacerated tissue of the right lower eyelid, nose and cheek. The conjunctiva was not affected.

The resulting bluish green and slate gray pigmentation has been very unsightly, and for its relief the patient had consulted oculists and physicians in this country and abroad. The extreme edge of the pigmentation in the middle of the cheek disappeared spontaneously. Fifteen or twenty bichlorid of mercury injections had been given in the remaining pigmented area, and according to the patient, a slight improvement had resulted from these injections.

During the past two years the condition has been stationary.

Under the administration of hexamethylenamin, 5 grains three times a day, the condition improved at once, and in two weeks half of the area of the pigmentation was gone, and the rest of the area of pigmentation was considerably lighter in color. The hexamethylenamin was then increased to 10 grains three times a day. The improvement continued but was not as marked as during the first two weeks. After six weeks the hexamethylenamin proved irritating to the stomach and kidneys, and was discontinued for a time.

* Read before the Section on Dermatology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Frommann: Virchows Arch. f. path. Anat., 1859, **17**, p. 135.

2. Blaschko: Monatsh. f. prak. Dermat., 1886, p. 197.

3. Lewin: Berl. klin. Wchnschr., 1886, p. 417.

4. Koelsch: München. med. Wchnschr., 1912, **59**, 304.

5. Davidson: Jour. Cutan. Dis., August, 1916, p. 605.

Approximately 75 per cent. of the pigmentation had disappeared at this time.

The hexamethylenamin treatment was first used by Crispin⁶ in argyria universalis due to collargol. Hexamethylenamin was given for a cold, and the patient and physician were astonished to note that the silver pigmentation became several degrees lighter in color.

REVIEW OF THE CASES REPORTED

The majority of the cases of argyria of the skin due to organic silver preparations have involved the upper and lower eyelid and the adjacent skin. Conjunctival argyria, due to argyrol, etc., is still more frequent, but the majority of these cases do not involve the skin.⁷

Post,⁸ under the title "An Experience with Staining the Skin by Argyrol," reported an argyria of the skin of the upper eyelid, the pigmentation extending almost to the eyebrow. In this patient the condition was due to the injection of argyrol following an operative procedure. In this article he mentions two other cases.

Davidson,⁵ in 1916, reported a case of generalized argyria due to urethral injections of argyrol and protargol. Undoubtedly some cases of localized argyria due to urethral injections or instillations of organic silver salts have been overlooked or not reported.

A case of generalized argyria due to the internal administration of collargol was reported in 1914 by Crispin.⁶

CLINICAL SYMPTOMS

Following the repeated simple application of argyrol, etc., the staining comes on very slowly and gradually, and the discoloration or pigmentation constitutes the only symptom. If the solution has suddenly penetrated into the connective tissues following an injection or if argyrol has been applied to a lacerated wound, pain and swelling are present. However, the pain and swelling are not severe, and usually the only symptom presented is the pigmentation or discoloration. The argyrol solution stains the connective tissue in the cutis and subcutis at once, and, provided the epidermis is thin, as in the eyelids, the bluish green discoloration becomes apparent immediately. In places where the epidermis is thick and the argyrol solution has found its way only into the deeper parts of the subcutis, the pigmentation may not appear for some days, or until the stain is taken up by the tissues directly beneath the epidermis.

The color is usually bluish green, although often there are present varying shades of slaty gray and brown. The depth of the pigmentation varies according to the amount of silver in the preparation used. Thus a 5 per cent. solution of argyrol (25 per cent. silver) gives a very much more intense bluish green color than a 5 per cent. solution of protargol (8.3 per cent. silver).

The epidermis is rarely affected, but when involved shows a brown or black color.

About the eyelids the dark gray and bluish green pigmentation is decidedly more apparent when the patient is cold or tired.

HISTOPATHOLOGY

The pathology of argyria due to organic silver compounds is very similar to that of argyria due to silver nitrate. The silver pigment shows an especial affinity

for the elastic tissue fibers. These fibers contain the granules of the silver pigment in combination as elastin silver.

The collagenous tissue fibers are stained diffusely and, provided the argyrol is in sufficient amount, stain a quite intense brown.

The silver pigmentation is usually marked in the subpapillary layer and about the hair follicles and cutaneous glands. The connective tissue cells show very little tendency to take up the stain.

The epidermis and the epithelial cells of the sweat and sebaceous glands are nearly always free from pigmentation, but occasionally show a diffuse brown color.

CHEMICAL NATURE OF THE SILVER DEPOSITS

The exact nature or formula of the silver deposits is a matter of doubt, but it seems very probable that the silver is present as silver albuminate or as complex albuminoid or organic compounds, and not as reduced silver or the oxids of silver.

Kanitz⁹ has quite clearly pointed out that the silver deposits in the tissues, even in argyria due to metallic silver in occupational argyria, and that due to silver nitrate, are probably present as complex organic compounds. Unna¹⁰ has called this combination elastin silver when affecting the elastic tissue fibers, and collagen silver when affecting the collagenous tissue fibers. Many writers, however, state that the silver deposits in argyria are present as the chlorid or subchlorid,¹¹ sulphid,² carbonate,¹² the various oxids of silver,¹³ or even as minute particles of metallic silver.¹⁴

While it seems most probable that the greater part of the silver is present as a complex organic or albuminoid compound, a small part of the silver may be present as the oxid, chlorid, sulphid, carbonate or as metallic silver.

PROPHYLAXIS

The danger of argyria from the use of the organic silver preparations is not great provided certain precautions are taken in their use.

The results obtained in our animal experiments with argyrol show that fresh solutions give the same picture and degree of argyria that old solutions do. In other words, the argyria is due to argyrol as such, and not to decomposed substances in old solutions.

The intact epidermis and epithelium of the mucous membranes practically never take up the silver stain, unless the solutions are used steadily for a long time.

Ulcerated parts, as ulcer of the cornea and burns, where the epithelial layer is lost, readily take up the stain.

In chronic inflammatory conditions the epithelium of the mucous membranes becomes more susceptible to the organic silver solutions.

There is especial danger in forcibly injecting the solution of organic silver into the tear duct, urethra and similar places, as the stain may be forced into the loose connective tissues.

Argyrol, protargol and the other organic silver compounds should never be used in or near lacerated wounds.

9. Kanitz: Arch. f. Dermat. u. Syph., 1909, **94**, 49.

10. Unna: Histopathology of the Diseases of the Skin, 1896, p. 1189.

11. Burdon-Cooper: Ophthalmoscope, June, 1917.

12. Posey and Wright: Diseases of the Eye, Nose, Throat and Ear, 1903.

13. Fuchs: Text Book of Ophthalmology, Duane Translation, Ed. 4, 1913.

14. Warthin: Reference Handbook of the Medical Sciences, 1913. Skramlik: Abstr., Practical Medicine Series, 1916, **3**, 93.

6. Crispin, A. M.: Argyrism Following the Use of Collargol, THE JOURNAL A. M. A., May 2, 1914, p. 1394.

7. Lystad: Tidsskr. f. D. Norske Lægefor., 1908, p. 685.

8. Post: Am. Jour. Ophth., St. Louis, 1903, p. 86.

Patients should never be allowed to use solutions of argyrol, etc., as a home treatment for any great length of time. They should be required to report at least every two weeks, any slight degree of argyria looked for, and, if found, the use of the solution should be discontinued.

PROGNOSIS

The general opinion regarding argyria in general is that the prognosis is bad or hopeless. The prognosis in generalized argyria due to the internal administration of silver nitrate, in which condition there is a large amount of silver in the tissues, is undoubtedly almost hopeless.

However, this is not true as regards the localized argyrias due to organic silver preparations. The amount of silver in the tissues in these cases is small, and without question, in some of these patients, the pigmentation disappears spontaneously. Even in cases of localized occupational argyria due to metallic silver, the pigmentation occasionally fades, as in the case reported by Teleky.¹⁵

In Warthin's patient,¹⁴ the argyria being general and due to colonic irrigations with silver nitrate, there was, after several years, a very marked lessening of the color, which Warthin ascribed to the fact that the patient had become adipose, the fatty tissue concealing the pigmentation.

TREATMENT

It obviously is impossible to destroy the silver present in the discoloration of argyria, and thus the problem is entirely different from that involved in the removal of such discolorations as that due to melanin in moles, etc.

Theoretically, there are three methods by which the stain might be removed. The first method is the employment by injection or otherwise of some remedy to form a permanent colorless combination with the silver. This is probably impossible, as all silver salts, especially in the presence of organic material and light, tend to break down and give a brown or black discoloration.

The second method by which the condition might be remedied is the use of such agents as blistering and electrolysis. These methods cause a local inflammatory reaction that probably results in a partial removal of the silver granules by the wandering cells.

The third and most important method is the use, either internally or by injection, of remedies that form soluble compounds with the silver pigment in the tissues, these resulting soluble compounds being absorbed and probably excreted by the kidneys.

The remedies in this third group must be sought either empirically or by experimentation on animals.

Remedies such as bichlorid of mercury, that in strong solutions completely decolorize argyrol in the test tube, are of little use in the tissues, while remedies, such as hexamethylenamin, that have a weaker effect on argyrol in the test tube, may be more useful in removing the argyrol stain in the tissues.

Sodium iodid internally 5 to 10 grains three times a day is recommended by Post.⁸ Larger doses of sodium and potassium iodid have been given internally. Local injections of sodium iodid have also been used.

From the results obtained in Crispin's patient and in my patient, I believe that the hexamethylenamin treatment gives promise of being of value in this condition. This drug is given in 5 to 10 grain doses three

times a day. A lessening of the stain should occur within two weeks. However, the pigmentation fades slowly, so that it is necessary to continue treatment for some months, allowing intervals of rest so that no irritation of the stomach or kidneys results.

Hexamethylenamin might also be used as a local injection, as Burnam¹⁶ reports that it is not irritant in man in 1:7,500 and 1:250 solutions. In rabbits a 50 per cent. solution is not irritating when given hypodermically.

As far as I know the hexamethylenamin treatment has been used in only two cases, and while the results obtained in these two patients have been quite striking, the drug must be tried in many more patients with argyria due to organic silver salts, before we can come to any definite conclusions. The treatment, however, is inexpensive, easily given, and certainly deserves a trial in every case of argyria.

EXPERIMENTAL ARGYRIA¹⁷

In our early experiments the dog, guinea-pig and rabbit were injected with argyrol, etc., or these organic silver preparations were applied to lacerated wounds. In the rabbit the resulting argyria was more clearly seen, probably because of the thinness and translucency of the epidermis of the rabbit, so that in the later experiments rabbits exclusively were used.

In the rabbit immediately after the injection of fresh or old solutions of argyrol, protargol, etc., the typical bluish green color of argyria is seen. This is very beautifully shown in the ear of the rabbit where the tissues are very thin and translucent. The bluish green color is not due to a bluish green color of the silver deposits, but to the fact that the brown argyrol solution in the tissues appears bluish green when seen through the uninvolved translucent epidermis.

Small amounts of argyrol, as 0.4 c.c. of a 5 per cent. solution, do not prove irritating when injected into the rabbit, and but little swelling or induration results. The injection of large amounts of argyrol or protargol may prove irritating and result in large firm swellings.

The histopathology of argyria in animals is similar to that in man. The elastic tissue especially is involved, showing fine granules of silver pigment. The epidermis and the epithelium of the sweat and sebaceous glands are very rarely pigmented with the silver stain.

EXPERIMENTAL THERAPY

The chemical composition of argyrol is changed when it comes in contact with the tissues, so that decolorization of argyrol in the test tube with various chemical substances does not necessarily show that these chemicals will decolorize the silver deposits in argyrol argyria.

However, it is of interest to note that in addition to mercuric chlorid, potassium iodid, solution of formaldehyd, ammonia and hexamethylenamin will decolorize argyrol solutions. Five grains of hexamethylenamin will decolorize 1 c.c. of a 1:20,000 solution of argyrol.

At the outset of our experimental work in the therapy of this condition, we had hoped that we would be able to rapidly clear out the silver pigmentation by injections of hexamethylenamin, while in the untreated

16. Burnam, C. F.: An Experimental Investigation on the Value of Hexamethylenamin and Allied Compounds, *Arch. Int. Med.*, October, 1912, p. 224.

17. Work on experimental argyria carried out at the Research Laboratories of the Department of Medicine (Division of Dermatology), University of Minnesota Medical School.

15. Teleky: *Wien. med. Wchnschr.*, 1913, p. 2886.

animals the silver pigmentation would undergo no change. Thus we would be able to show conclusively the efficacy of hexamethylenamin in this condition. This we were unable to do.

The action of hexamethylenamin given over a comparatively long period of time is not so clear, as in all animals there is a marked tendency toward the spontaneous absorption of the silver pigment. In the dog and rabbit over half of 0.4 c.c. of a 5 per cent. solution of argyrol is absorbed in about two months. Thus the control animals were of little value to us as a measure of comparison with the treated animals.

In our first experiments the pigmentation apparently cleared up more rapidly in the treated than in the untreated control animals, but in our later experiments we were unable to see very much difference in the rate at which the pigmentation cleared up. In no case were we able to completely clear up the pigmentation by injection of hexamethylenamin.

SUMMARY

1. A very unsightly permanent pigmentation of the skin may follow the local use of argyrol and the various other organic silver preparations.

2. The use of freshly prepared solutions of argyrol does not diminish in any degree the danger of argyria.

3. The bluish green or slate gray color is not due to a bluish green or slate gray color of the silver deposits, but to the fact that the dark brown silver deposits appear bluish green or slate gray when seen through the uninvolved translucent epidermis.

4. The occurrence of localized argyria following the use of argyrol, protargol, etc., is uncommon, but the resulting blemish is so unsightly that every care should be taken in the use of these substances. The solutions should never be forcibly injected into any cavity or canal as the tear ducts, urethra, etc., and should not be applied when the skin or mucous membrane is not intact.

5. The general opinion is that the condition is irremediable. The conclusions drawn from this paper warrant a more hopeful prognosis.

6. Local measures, such as blistering and electrolysis, are possibly of some value in causing an inflammatory reaction that favors absorption of the silver deposits.

7. The hexamethylenamin treatment should be given a trial in every case of argyria due to organic silver compounds.

ABSTRACT OF DISCUSSION

DR. WILLIAM A. PUSEY, Chicago: I have had occasion to see some of the cases of localized argyria produced by the injection of argyrol into the lachrymal duct. I am greatly interested in Dr. Olson's suggestion of hexamethylenamin. I always thought the condition beyond relief, and I am glad to know of this possible means of improving it. While he was talking of deposits of silver in the tissues, I thought of some other accidents which have come to my notice of essentially the same character. In the case of argyria, a soluble silver salt enters the tissues and is deposited as an insoluble form of silver. It is really a tattooing from within. I have seen three or four very unpleasant accidents from the precipitation of insoluble substances which have been used on ulcerated skin surfaces as local applications. The most striking case of this sort was that of a woman who came to me a few years ago with an eruption over her shoulders which looked like a follicular purpura. A solution of copperas—sulphate of iron—had been used as a local application, with a resulting deposit of iron oxid in the corium. The skin had healed over this and there was left a permanent deposit of iron oxid in the skin, tattooing it a dark mahogany red. In

sections it was proved with a potassium ferrocyanid reaction that this deposit was iron. I have also seen a white tattooing of the skin from solutions of lead acetate on surfaces where the epidermis in spots was completely destroyed. The use of local applications, therefore, which may deposit insoluble substances in the corium, if there is superficial ulceration of the skin, is always attended with risk of accidental pigmentation after it.

DR. WILLIAM B. TRIMBLE, New York: Like every one else, I have heard of a number of cases of pigmentation about the eye following the use of argyrol, but know personally of only one case. In this patient as I understood it, the argyrol was injected in the lacrimal duct and caused the heavy pigmentation under the eye. My main reason for entering the discussion, is to call attention to the fact that I have tried on two occasions to produce pigmentation in isolated patches of leukoderma by the use of argyrol. The argyrol was diluted until, in my judgment, the proper shade was produced, and then injected under the skin. It was unsuccessful in both attempts. Seemingly, it is hard to produce pigmentation when it is desired, only to have it occur at times when one is least suspecting it.

It occurred to me that exposure to air might have something to do with the process, and the reason for the failure of argyrol to pigment when injected subcutaneously was probably due to the fact that it did not come in contact with the air. In injecting it in a suppurating lacrimal duct it is exposed to the air, and perhaps also to some rays of light.

DR. GEORGE MANGHILL OLSON, Minneapolis: The treatment with hexamethylenamin was tried on only two patients. The experimental work was not conclusive.

Regarding the absorption of the argyrol, of which Dr. Trimble spoke, there is no question that in many cases the patients recover spontaneously. Only a certain percentage of them remain permanently pigmented. In my patient the pigmentation remained four years. Most of the slight cases due to argyrol, especially about the eye, clear up in one, two or three years without any treatment.

THE RELATIVE VALUES OF PUBLIC HEALTH PROCEDURES *

CHARLES V. CHAPIN, M.D.

Superintendent of Health

PROVIDENCE, R. I.

What constitute the most effective lines of effort is the most vital question confronting every public health administrator. Money is the measure of most effort, and appropriations are limited. In what way shall the appropriation for the health department be expended so as to save the most lives and prevent the most sickness? Are our municipal health departments making the best apportionment of their funds? Are health officials devoting the most effort to that which will best conserve the health of the people? If any city is doing this, it has a model health department.

Certainly many cities are not doing it. It is hard to break away from tradition. Most persons think largely in terms of the past. Institutions are of slower growth than knowledge. It is a pity that they cannot be kept in closer alinement. Though it would be sad, indeed, to chase every pseudoscientific will-o'-the-wisp that happens across our path, it is even worse to cling tenaciously to the dead ashes of discredited theories.

Modern municipal health work began at a time when it was believed that municipal house cleaning was the chief, if not the sole, legitimate field of official sanitary activity. Sanitary science has progressed by leaps and bounds. Sanitary administration has been a lag-gard. It would be most interesting to see what sort

* Read before the Institute of Medicine, Chicago, April 24, 1917.

of health department would be organized if all tradition could be ignored. Given an appropriation of, say, 75 cents per capita, how would a commission of modern scientifically trained and experienced public health men organize a health department, if they were permitted to discard tradition and take cognizance only of the present day findings of sanitary science? Our health departments are not made in this way. They are the result of growth. One function after another has been grafted on the original duty of nuisance abatement, but the growth has not been well balanced. Health work does not extend according to any well thought out plan, but one duty after another is added, now by this person and now by that. Sometimes the health department is expanded at the instance of a group of earnest reformers having much sympathy for human ills, but little versed in medical and sanitary science. Sometimes a city councilman, getting his knowledge from the syndicated science of his Sunday paper, assumes to tell how the health department should be run. Again, it may be the new health officer himself who, in order to justify the political overturn of his office, seeks to reorganize the health work of his city after a few hours' study of some passing book on "sanitation." Rare, indeed, is it that competent advisers are called in to plan a health department so as to utilize most effectively the best scientific knowledge of how to preserve the health of the city, and it is more rare still for the politician to permit such a plan to be put in practice.

RELATIVE VALUES

Even those health officers who have given the subject much careful consideration do not feel sure of the relative values of different lines of health work, and it was to help clarify my own ideas as well as to assist in what I believe will be a helpful discussion that the attempt was made not long since to assign numerical values to the various functions of a municipal health department. It is said that no science can progress unless accurate measurements are made of the things dealt with. In accordance with this idea, it seemed desirable to indicate by figures the value of garbage disposal and of the diagnostic laboratory, of plumbing inspection and of baby nurses, and thereby learn how to apportion the funds and energies of the department.

In attempting to make such a distribution we must constantly bear in mind that the appropriation cannot be exceeded. A certain percentage of the funds may be set aside for contagious disease work, a certain percentage for school inspection, a certain percentage for vital statistics, and so on, but they must all add up to 100 per cent. exactly. If we should yield to the behests of every enthusiast, championing his hobby, the sum might be 200 or 300 per cent., resulting in a most uncomfortable deficit. So, too, time and strength are limited, as well as money. No man can work more than sixty minutes in an hour. To assign values to functions, so that time and money may be apportioned accordingly, is the purpose of the schedule here presented.

Unfortunately sanitary science is as yet far from an exact science. Its measurements are crude. For many things we have no measurements, but only estimates or guesses. It is desirable, however, to correlate even our guesses.

The table of values is intended to indicate the relative importance which should be attached the func-

tions which are commonly performed by a health department in any average northern city at the present time. The apportionment must vary somewhat according to location, stage of sanitary development, character of the population, etc. In the South, where there are much hookworm, typhoid fever and other diseases spread through fecal infection, excreta disposal must receive special attention. Where *Anopheles* and *Stegomyia* abound, antimosquito measures come to the forefront. If the rodents of a city are plague infected, or likely to become so, the rat must be fought. A well sewered city can appropriate money for other lines of work which in less fortunate places must be devoted to the never ending task of privy sanitation. Every city must plan its health work to suit local conditions, but there will probably be only minor variations from the generalized type.

Experience is the best teacher. Methods which have been successful in the past must be followed in the future. There has been a marked decrease in the death rate during recent years, but it has not been all along the line. The bulk of the improvement has been confined to a few diseases. Thus in Providence,

TABLE 1.—RELATIVE VALUES OF HEALTH WORK

	Vital statistics	60
	Education	80
	Laboratory	50
	Control of nostrums	50
	Care of sick poor	50
Food.....	Adulteration	0
	Sanitation	10
Milk.....	Adulteration	3
	Sanitation	17
	Privy sanitation	60
Nuisances.....	Housing	20
	Plumbing	10
	Nuisances	10
	Refuse removal	0
	Fly and mosquito control	10
	Nurses	80
Infant mortality....	Supervision of midwives	10
	Babies' boarding houses	5
	Milk stations	5
	Consultations	20
	Prenatal clinics	10
	School inspection	80
Contagious diseases	Home isolation	100
	Hospitalization	50
	Immunization	50
	Veneral diseases	20
	Nurses	60
Tuberculosis.....	Dispensaries	40
	Hospitalization	40
		1,000

in sixty years, there has been a decrease in the annual number of deaths amounting to about 600 per hundred thousand living and confined practically to typhoid fever, smallpox, scarlet fever, diphtheria, tuberculosis, diarrheal diseases and other diseases of infants.

It is not for a moment claimed that all of this reduction is due to conscious effort on the part of the community, though I believe that a good part of it is. Thus there has been a reduction in the death rate from pulmonary tuberculosis of about 240; but as it began long before any efforts were made for the control of the disease, we must believe that much of the reduction is due to unknown causes. As the decrease in recent years has been fairly rapid, and has followed well thought out methods of control, it is perhaps not unfair to assume, as I have done, that a drop of 65 deaths per hundred thousand may be attributed to present day methods of combating this disease. On the other hand, probably the whole of the decrease in typhoid fever is due to municipal effort. It seems fairly conservative to claim, as a result of community health work, at least half of the decrease in acute communicable disease above referred to which has

occurred in Providence. The figures in Table 2 appear reasonable as a statement of the deaths prevented by official control and also of the chief means by which the lives were saved.

TABLE 2.—MEANS OF SAVING LIFE

Typhoid fever	10	by direct control
Typhoid fever	50	by privy control
Scarlet fever	60	by direct control
Diphtheria	20	by direct control
Diphtheria	30	by free antitoxin
Diarrhea, over 1 year	15	by privy control
Tuberculosis, pulmonary	65	by direct control
Tuberculosis, other	15	by direct control
Infant mortality	70	by nurses, etc.
Infant mortality	10	by milk control

Total 345

By putting the facts in a different form, it appears that community activities have been effective in saving these 345 lives in the ratios given in Table 3.

TABLE 3.—RELATIVE VALUES OF COMMUNITY ACTIVITIES

Direct control of contagious diseases	26
Direct control of tuberculosis	23
Antitoxin	9
Control of privies	18
Prevention of infant mortality	21
Control of milk	3

Total 100

These are old and tried lines of public health work, and must hold the largest place in apportioning the activities of a municipal health department.

There are many other activities, the value of which cannot be measured at all, or only in the crudest sort of way. Some of these we know are of great importance, while others are still in the experimental stage and, though we cannot tell just how much they are worth, must be given a fair trial. In our table of values they can be given only an arbitrary rating.

BASIC FUNCTIONS

Of fundamental importance is the collection and tabulation of vital statistics. It is only by this means that evils can be located and remedies found. It is as difficult to put a health value on vital statistics as it is for a merchant to put a money value on his ledgers; but as the merchant decides to expend on his book-keeping enough to get correct results, so the municipality must spend enough on its vital statistics to make them tell the truth. Perhaps this is fairly indicated by the relative values here assigned.

The education of the public in matters pertaining to health is another basic function, which, until recently, has been much neglected and is now often injudiciously performed. The leaders of thought and action in each community must be made familiar with the successes of modern sanitary science and the means by which they are obtained. To teach the politicians is another story; but if the leaders think the public health worth while, the politicians will, too. To reach the great masses of the people is more difficult still, particularly the foreign peoples in our cities. The literature which is read and digested by the thoughtful farmers and merchants of the country falls on stony ground in the foreign quarters of our cities. The movie may help somewhat, but the personal influence of the school-teacher, the nurse and the social visitor have thus far seemed to accomplish most. An arbitrary value must be assigned to this function also. One is tempted to write the figure large, but the knowledge that the sum of our values cannot exceed 1,000 reminds that we must not rob Peter to pay Paul.

The great leavening force in modern health work has been the diagnostic laboratory, the handmaid of epidemiology, as it has been called. To control disease, either by prevention or by cure, we must first find it. This the laboratory helps us to do. The remarkable apparent decrease in the case fatality of typhoid fever during the last twenty years or so has been due almost entirely to better diagnosis by the help of laboratory methods, so that many cases are now discovered and properly cared for which formerly would have been unrecognized. Not only has the laboratory taught us to recognize mild infections of typhoid, diphtheria and syphilis where they were not before suspected, but it has taught us by this experience to look for the atypical in other diseases, in which the laboratory can as yet give no direct help, as in scarlet fever and smallpox. Doubtless the laboratory in all our larger cities is continually saving lives, but there is no way of measuring this any more than there is for the merchant, to return to our former simile, to place a money value on his yardstick and his scales, yet he could not do business without them. The diagnostic laboratory is worth all that it costs, and perhaps its value is not unfairly indicated in the schedule.

The care of the sick poor outside of the hospital is not usually considered a health function. Yet there are a number of cities in this country in which it is performed by the health department. In one or two it is treated seriously, for there are some who consider it primarily a health rather than a charity problem. Sickness and poverty are closely related, and the poor, from both necessity and indifference, neglect sickness. To secure for them prompt and efficient care should save many lives and discover much early infection. About one quarter of the cases seen by the physicians to the poor in Providence are acute infections, and a considerable percentage of the others are such as usually come within the cognizance of a health department. This function must be performed efficiently. Slipshod methods, superficial examination and perfunctory prescribing are not much better than nostrum taking, pure and simple. As the medical care of the sick poor is in a chaotic, transitional and experimental stage, a moderate value has been assigned to it. It is not impossible, however, that in the not distant future the municipality will furnish or direct, by adequately paid physicians, medical service, and not only for the poor, but also for a considerable part of the population. This function should be performed by the health department so as to be properly coordinated with the other activities of that department.

THE NOSTRUM EVIL

Closely connected with the last subject is the elimination, or restriction, of the nostrum evil. If it is proposed to get rid of the latter, good medical service must be supplied in its place. The one common excuse of the poor for patronizing medicines is that they cannot afford to pay a physician. Conversely, I have confidence that a conscientious efficient medical service for the poor will do more than anything else to wean them from nostrums. This dual purpose is frankly acknowledged by those active in the restriction of venereal disease. An active campaign is waged against nostrums and the advertisers, and at the same time efficient clinics are organized. This combination, needed for the proper treatment of venereal disease, is probably needed just as much for all other diseases. The campaign against nostrums, which has

been waged so heroically by the American Medical Association, has also been entered into by some state departments of health. A few cities, too, have taken active measures to the same end. While energetic action is not always feasible, probably nearly every municipal health department could do something, and many of them could do a great deal to eliminate this sickness-prolonging and death-dealing evil. An experimental value must be assigned to this function also.

SANITATION AND FOOD CONTROL

According to popular notion, the principal functions of a city health department are sanitation and food control. When a health department is mentioned, most people think first of an inspector of nuisances. To them municipal housecleaning is the chief duty of the "board of health." Improved housing, plumbing inspection, garbage disposal, street cleaning, "clean-up week" and antifly campaigns are even now, by our most intelligent people, considered the chief business of the health officer. If the latter does not put his whole heart and soul into such concerns, but neglects them that he may apply himself to the cure of syphilis, the provision of nurses for tuberculosis, the establishment of infant welfare stations, the prevention of blindness in babies, or the improvement of the eyesight of schoolchildren, he may find himself in marked disfavor.

Some municipal sanitation is of great and direct value in the prevention of disease. The improper disposal of human excreta is the chief cause of typhoid fever, cholera, the infectious diarrheas and dysenteries, and hookworm infection. Where there is no system of excreta disposal, as in some of the rural portions of our country, and where the summer is long, this subject may well, at first, have a large part of the health department's attention. In a thoroughly sewered northern city, with few privies, and decent housing, excreta disposal requires comparatively little attention. The inspection of plumbing is important from a health standpoint only so far as it relates to excreta disposal. We need good plumbing as we need good chimneys, and both are essentially parts of building inspection. So also, nuisance inspection, except as it relates to excreta disposal, is concerned far more with esthetics than it is with health. The odors of decay which strike terror to a careful housewife are really not half so annoying as the exhaust from an automobile, or the fumes from the oil on the macadam road. Neither will cause real sickness; nor are papers and tin cans in the vacant lot a source of disease. All these things shock our sense of decency, and they ought not to be; but why burden the health officer with the arduous task of remedying them? The police should do all that, but they usually decline.

In a considerable portion of our cities, the health department is charged with the removal of garbage and often of other kinds of refuse. This has only the most indirect and tenuous connection with health, though no one questions for an instant that it should be done and done promptly and well; but it is essentially a function of the department of public works.

Concerning the relation of housing to health, except for the grosser forms of bad housing, we know very little. That better houses encourage higher standards of living is probably true; that higher standards of living mean higher wages is not improbable; that the sickness rate decreases as wages advance is doubtless true, and that the restriction of crowding and an abun-

dance of light and air facilitate personal as well as household cleanliness and so check the spread of infection is quite likely to be the case. The beneficial effects of good housing on health are largely indirect. Much besides housing affects health indirectly. A good trolley system, industries that pay high wages, a clean city government, an effective school department, must all react favorably on health. If the health officer went into every scheme for civic betterment, his labors at reform would leave him no time to look after syphilis and tuberculosis, diphtheria and ophthalmia. He had best concentrate his fire where it will do the most good and where he is, or should be, most competent to direct the attack.

Much has been written about the fly and his wicked work. In some places he is more dangerous than in others. Where the summer is long and privies are many and there is much initial infection, this insect may be a considerable menace. It is difficult to see how it can be so in a well sewered northern city. Last year Boston had the lowest typhoid death rate of any American city, 3.5 per hundred thousand living; but Boston has not carried on any effective antifly campaign. Providence has its full quota of flies, and is otherwise not a very clean city; yet our typhoid death rate has fallen from 69.4 to 5.1 by means of pure water, the abolition of privies and the following up of cases. The diarrheal death rate has fallen from 252 to 106. If we could get rid of all our privies and pasteurize all our milk, our typhoid rate might vie with Boston without our touching a fly. To exterminate flies is costly. If the people wish to pay for abating this nuisance, well and good. As a citizen I would vote for it; but if as a health officer I had \$10,000, I would not swat the fly but would open a venereal clinic, or hire some nurses for the supervision of tuberculosis.

In nonmalarial regions the mosquito, like the fly, is a nuisance, but not a menace to health, the mosquito should be held down to the lowest limit, and most citizens are willing to pay the cost. It may even be that the special appropriation would best be spent by the health department, as biologic knowledge is more likely to be found there than elsewhere in the city government; but it should not be counted as an expenditure for health. Of course, in a malarial region mosquito control is a most important health measure which has received altogether too little attention.

Another time-honored and popular means of promoting the public health is control of the food supply. This control naturally is divided into the prevention of adulteration and the promotion of cleanliness. Though there is much lurid literature on the dangers of impure food, as a general thing adulterants are as likely to be healthful as unhealthful. Adulteration, with rare exception, is an economic and not a health problem. There is almost as much nonsense written about ptomain poisoning as there is about adulteration. "Ptomain poisoning" is the popular name for disorders arising from bacterial changes in food. Of such we really know little except that they are not nearly so common as is believed, and that the routine inspection and condemnation of cabbages and corned beef, as practiced by our city health officials, probably has no effect in restricting the somewhat rare occurrence of such poisonings.

That food is not rarely infected with human secretions and excreta by those who handle it, and thus becomes a real factor of importance in the transmission of dis-

ease is certain. It is worth while to try to check this, though the efficiency of some of the popular "sanitation" of markets and restaurants may be questioned. The elimination of infected food handlers also gives some promise, but its true value is yet to be determined. The small value here assigned may arouse protest, but who will argue that the laboratory is not five times as important, or baby nurses eight times as important, or the direct control of contagious diseases ten times as important as is food sanitation?

Milk should be considered apart from other foods. It is certainly of great importance in infant feeding, though the close dependence of infant mortality on the character of the milk supply has probably been considerably exaggerated. Many cities have markedly reduced the infant death rate without greatly improving the cleanliness of the milk. Doubtless the most effective way to eliminate the danger from milk is to require the pasteurization of all milk, or at least all except a limited amount of a certain high standard, for infant feeding. The watering of milk is an adulteration which does affect health, for a variable composition sadly interferes with exact methods of infant feeding, and likewise increases the danger of infection.

OTHER ACTIVITIES

Firmly believing, as I do, that all the medical activities of the municipality should center around the health department, I naturally consider the medical inspection of schools a proper function of this department. As a matter of fact, it is somewhat of a cooperative undertaking, and neither the school department nor the health department can properly carry it on without the free and generous assistance of the other. Tact and forbearance are needed on both sides to carry on this important work, no matter which department has it in charge. The vast majority of both teachers and medical men connected with school inspection are satisfied of its great value, but it touches school life in so many ways that a statistical demonstration of its benefits is by no means easy. Without such statistical data, it is difficult to assign a definite value to this function. The one given in the table is only tentative, and may well be subject to revision.

Another and quite new activity is the campaign against venereal disease. That this is of great importance no one denies; as to methods, however, we are still in the experimental stage. We do not as yet know what results can be obtained, though the future is promising. It does not seem unreasonable, as is here indicated, to devote 2 per cent. of the energies of the health department to this object.

ACTIVITIES WITH DEMONSTRABLE RESULTS

The sum of the values thus far assigned is 400. That is, to the activities of the health department which we have reason to believe are worth while, but the utility of which we cannot very well measure are allotted four tenths of the energy of the department. There are thus left six tenths, or 600 units on our scale, to be divided among those activities, the worth of which can be measured, with some degree of approximation, in terms of deaths prevented. These allotments are made in accordance with my judgment as indicated in the first portion of the paper.

While it is difficult to estimate the real worth of school inspection, that other branch of child welfare work known as the prevention of infant mortality has a value which is demonstrated perhaps more

decisively and accurately than is any other form of preventive medicine. In practically every instance in which a community has undertaken to save the lives of its babies, it has been successful. The chief means has been the education of the mother. Wherever that has been successfully accomplished, the infant death rate has fallen. Taking the actual reduction of eighty per hundred thousand of the population in Providence, and assuming that seventy of this is due to specific effort made for that purpose, we should, according to our plan, allot a value of 126 to baby welfare work; but as this is such a promising field I have ventured to steal a little from the control of contagious diseases, and as a final estimate, 130 has been allotted. How this shall be divided among the different kinds of infant welfare work will depend somewhat on individual judgment, and may soon change as a result of wider experience. Perhaps the division here indicated may receive a fair degree of approval.

The direct control of the communicable diseases by isolation and immunization was an important duty of the health department even in that period of the last century when the dominance of the filth theory of disease had relegated it to a subordinate place. According to the best evidence at hand, there has been a marked decrease in the amount of several important contagious diseases against which fairly active measures have been taken for a considerable series of years. In cities in which the records have been kept for from fifty to seventy years, and active restrictive measures have been carried on for some time, typhoid fever, scarlet fever, diphtheria and small-pox have shown a phenomenal decrease. That this decrease is due in large part to the measures which have been taken I believe is true. Even the decreased virulence, which is responsible for part of this decrease, I have elsewhere suggested is probably partly due to the selective restriction of the more virulent, and hence more easily recognizable strains, by our methods of isolation. Among methods of control, isolation in the home is probably the most important. To secure this, special medical inspectors or trained epidemiologists have the chief place, but visiting nurses are becoming more and more useful. It will perhaps be a surprise to some that the hospitalization of acute contagious diseases is not given a higher value, as it has often been alleged that complete hospitalization would stamp out disease. This, however, it fails to do because of the unrecognized sources of infection. Hospitals are needed and needed badly for those patients who are so situated that home isolation is impossible, or who are in need of hospital care. So far as the spread of disease is concerned, the majority of patients can be taken care of fairly well at home. The great expense of the hospital is justified fully as much on humanitarian as on sanitary grounds. Its value as a health measure is perhaps fairly indicated by the rating here given.

Vaccines and curative serums are most valuable in the control of infectious diseases. Experience has shown that the use of these agents depends in great part on the initiative of the city or state. In one way or another, by furnishing at low cost, or perhaps without charge, and often by administration, the sanitary authority can succeed in popularizing methods of prevention or cure which otherwise would be little used.

A modern campaign against tuberculosis makes use of many means, and is often correlated with various private agencies. Outside of diagnosis and general

education, perhaps the most important municipal activities are nursing, dispensary service and hospitalization. There may be a difference of opinion about the relative value of these, but the figures given perhaps fairly represent present day views. Certainly hospitalization, which a few years ago was considered of first importance, has been relegated to a secondary place.

It may be asked why the protection of the water supply does not find a place in this discussion. It might perhaps do so, but it is more properly a function of the state department of health to guard water supplies, though some of the larger cities have resources sufficient for independent action. It is rare that a local health officer has any management in water works. It is his important duty to show by his morbidity statistics whether or not the water is above suspicion. So, too, industrial hygiene is omitted because it also is more often, controlled by state officials. A number of newer activities, such as the campaign against cancer, or the degenerative diseases, or the prevention of mental disease, are omitted because it was deemed unwise to let this discussion get too far afield, and better to deal with actualities rather than with possibilities.

THE AIM OF COMMUNITY HEALTH WORK

It is particularly urged that the values here assigned are not final. Even among the most careful students of sanitary science there would doubtless be considerable difference of opinion. Some of these differences would disappear after free discussion. It is partly the purpose of this attempt at valuation to bring out such discussion. Minor changes might be made, but no discussion will ever demonstrate that plumbing inspection is worth more than baby nurses, or that swatting the fly is as effective as abolishing the privy vault. The purpose of the paper is not to enter a special plea for the exact values here presented, but to show the need for perspective in planning health undertakings. If relative values had been carefully considered, the ill balanced health department which was recently brought to my attention would never have grown up. In a city of 100,000, home isolation receives only such time as the health officer can spare from his executive duties, while money is available for six nuisance inspectors. There is a fumigator, but no diagnostic laboratory; three food inspectors, but no baby nurses; and several plumbing inspectors, but no welfare stations or prenatal work, and no Wassermann tests or venereal clinics.

The figures given in the schedule are intended to indicate, though ever so roughly, the real health-conserving value of certain common functions of municipal health departments. It is not intended that either money or time should be apportioned in exactly these ratios. The cost of an adequate hospital for the care of advanced cases of tuberculosis would be many times greater than a good system of dispensaries and follow up nurses. With limited funds, the dispensary and nurse comprise the most economical and effective undertaking.

If the health work of the future is to be successful we must remember first that the old, ill founded idea that health work is to be centered on the environment has been displaced by the modern one, well supported by the data of science, that it is concerned directly with men and women. We would all like to live in spotless, flyless towns. Streets should be clean, yards tidy, houses neat, every garbage can covered, the

cellar whitewashed, never a tin can on a vacant lot, every market white tiled, all bread wrapped in paper, and every laundry immaculate. This is for what we have campaigns and health weeks and for which appropriations can be obtained; but it would have little effect on the death rate. Mothers would continue to feed their babies with pickles and cookies; scarlet fever would spread; diphtheria would claim its toll; people would forget to be vaccinated; schoolboys would strain their eyes at their work; careless syphilitics would become paretics; ill treated poliomyelitis would make cripples; the man with "grip" would swallow tonics and cough medicines until he gave up work and his infant child died of tuberculous meningitis, and lifelong blindness would result from ophthalmia.

Municipal housecleaning will not cure these evils, but education, isolation and good medical care will. Community health work must have a broader outlook. It must do more than cleanse and isolate. It must make use of the best medical knowledge, not by stealing or begging it, but by paying for it, to prevent and cure disease. Many activities must be coordinated. Much has been done. There is more to do. Until there are unlimited money and unlimited talent available, let us earnestly study to do that which pays best.

PRIMROSE DERMATITIS AND ITS RELATION TO ANAPHYLAXIS *

C. AUGUSTUS SIMPSON, M.D.

Dermatologist, Episcopal Eye and Ear Hospital, and George Washington University Hospital Dispensary; Associate in Dermatology, George Washington University Medical School; Dermatologist, Washington Asylum Hospital

WASHINGTON, D. C.

My interest in this lesion dates back one year or more, during which time I have been able to demonstrate that the primrose plant has been the exciting cause of at least ten cases of dermatitis. Like other American dermatologists I believe that this form of dermatitis is far from uncommon and is on the increase, probably owing to the growing popularity of the plant.

The *Primula obconica* seems to have been imported into Europe from China in 1883. Several years later it made its appearance in America, and since then several dermatologists in this country have made it and its resulting dermatitis the subject of some interesting papers. Foerster,¹ Zeisler² and Montgomery especially have given excellent reports and clinical data of cases under their observation. All of them, however, rely on one article (Nestler's³), for their analysis of the poisonous principle of the plant. Nestler was more or less of a pioneer, and though his observations were good as far as he went, his analysis was most superficial and limited. He did not say that the active poison was an oil, as some American abstractors imply and quote him as saying. He confined his description in this regard to what he termed poisonous material, which he repeats several times in his article, and then

* Read before the Section on Dermatology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Foerster, O. H.: *Primula Dermatitis*, THE JOURNAL A. M. A., Aug. 20, 1910, p. 642.

2. Zeisler, Joseph: *Some Uncommon and Often Unrecognized Forms of Toxic Dermatitis*, THE JOURNAL A. M. A., June 20, 1912, p. 2024.

3. Nestler's *Hautreizende Primelu*, Berlin, 1904.

goes on to mention its solvents. Nestler was under the impression that every one could be poisoned by the primrose, and after many efforts succeeded in producing a dermatitis on himself. He did recognize a varying sensibility of different individuals, however, and suggested its relation to the reaction of anaphylaxis.

In my cases of primrose dermatitis I have been struck by the lack of well-marked isolated areas of intense irritation and vesiculation with the outline of the twig and leaf such as one sees in rhus poisoning. Rather has the irritation been of a more irregular, diffuse, ill-defined, erythematous character. As a result of this apparent difference in the irritability of the two poisons, the sufferers from primrose dermatitis seldom complain of the pain, tenderness and irritation that one sees in rhus poisoning. The subjective symptoms of itching, however, appear, on the other hand, to be much more intense in primrose dermatitis. In addition to this annoying symptom the patient soon begins to show signs of irritability from lack of sleep and rest. To add to the injury a number of my cases had been diagnosed as scabies and so liberally anointed with sulphur ointment as to complicate the picture with a sulphur dermatitis.

There is nothing difficult in the diagnosis. The dermatitis, which is usually limited to the hands, lower arms and the face, strikes one as being entirely artificial. In any vague cutaneous irritation involving the above mentioned locations, one should always inquire if the sufferer handles or comes in contact with flowers. As to be expected, the removal of the source of irritation soon terminates the outbreaks, and a soothing zinc and tragacanth lotion with some such antipruritic as phenol (carbolic acid) or menthol relieves the itching and heals the lesions.

Considering the frequency of primrose dermatitis, it is rather odd that so little has been done in the search for the exciting poison. A comparison of the literature on this lesion with that dealing with rhus poison emphasizes this very clearly. The work of Syme⁴ and Ford⁵ in regard to this form of dermatitis venenata deserves praise, although the work of both has since been refuted. Syme was no doubt dealing with more than a simple glucosid, while Ford's attractive immunity and antitoxin theory built on his idea that glucosids produce specific antibodies has been attacked from several directions. I mention the foregoing experiments in order to point out the difficulties one encounters when one attempts to isolate the active principle of a plant, for we are still without this knowledge regarding rhus.

As I mentioned before, Nestler made no attempt to isolate the active poison in the primrose, while his explanations of the mode of action of what he termed poisonous material rested on the theory of anaphylaxis.

Without any knowledge of the active principle of the plants it is doubly hard to understand their mode of action giving rise to almost any hypothesis, anaphylaxis being the most frequently suggested.

The lack of information on primrose poison can only be compared with the confusion which has arisen over the mode of action of this and other poisons. The known susceptibility and immunity of certain persons to these substances so frequently observed by dermatologists are so imperfectly understood that they are apt to be confused with other reactions.

My excuse, therefore, for this preliminary paper is an effort to clarify two past misconceptions, namely:

1. An effort to further the quest for the active poison of *Primula obconica* and to correct our past ideas that this was an oil.

2. An attempt to clarify and prevent the confusion of the vague term, "cell hypersensitiveness," with that better understood and demonstrable reaction, anaphylaxis.

The question of producing an active and passive anaphylaxis, the investigation of the immunity to the primrose, and an attempt to isolate the active principle of the plant, engaged my attention in the following experiments.

EXPERIMENTS

In order to show that primrose dermatitis does not depend on the general irritability of the skin, a reaction such as one often sees in some patients after the application of almost any degree of traumatic or chemical irritant, I applied a leaf of the plant to the arm of a patient who was in the midst of an attack of urticaria and who not infrequently suffered from an idiopathic eczema. Twelve hours later there was no sign of dermatitis or irritation, and the outline of the leaf on the skin was barely noticeable.

For control skin tests I then made an extract of leaves by grinding them up with sterile bird sand in sterile physiologic sodium chlorid solution. For controls I made a similar extract of lily stems and the blooms of narcissus, two flowers that not infrequently produce dermatitis in susceptible handlers. As an additional control I used sterile bird sand and physiologic sodium chlorid solution. These were separately filtered and superficially inoculated into the arms of several susceptible and normal persons. In no case did I get a reaction in the controls, while the primrose extract produced a severe dermatitis in the susceptible patient which spread quite beyond the area of inoculation.

I then attempted to produce active and passive anaphylaxis in two guinea-pigs by an intraperitoneal injection of a sensitizing salt solution extract of the primrose; in two other pigs the sensitizing injection was composed of serum obtained from one of my susceptible patients. Five days later I reversed the injections, this time giving the serum to the primrose animals and the primrose to the serum animals. In one other animal both the sensitizing and anaphylactic intraperitoneal injections, five days' interval, were of primrose extract. In this work only one of the animals died or showed signs of shock the same day the second injection was given. On repetition of the test on another pig, however, the animal lived three days and died not of shock but from what I believe to have been actual plant poison, an indurated abdominal lesion being present similar to that which Ford found in his animals after injecting rhus extract.

In my efforts to learn the part played by the plant protein in the dermatitis, I prepared an extract of the leaves by grinding them up in sterile bird sand and a 10 per cent. salt solution. This was filtered through paper until the solution was clear and was then made very faintly acid by the addition of a few drops of diluted nitric acid, after which it was placed on ice for twelve hours. At the end of this time the solution was heated just to the boiling point, which caused a rather heavy murky precipitate to form. The mixture was then centrifuged for four minutes and the clear supernatant liquid was pipetted off, leaving the precipitate which gave the Millon test for protein. I inoculated a concentrated extract of this precipitate into two scarified areas on the arms of two of my susceptible patients, who were kept under observation for ten days. During this time neither patient experienced the slightest subjective or objective symptom of a skin reaction.

On another lot of leaves I made an effort to isolate an alkaloid. Two extracts were prepared, one being an acidulated water mixture, the other a mixture of ether, chloroform and alcohol. These were allowed to digest twelve hours, after which they were evaporated to dryness over a sand bath.

4. Syme: Johns Hopkins Thesis, 1906.

5. Ford: Jour. Infect. Dis., 1907, 4, 541.

The residue of both mixtures was tested with Meyer's reagent or potassium mercuric iodid, and showed no evidence of an alkaloid.

I next prepared a decoction of leaves in distilled water which was digested twelve hours. The mixture was then digested six hours with litharge, the precipitate washed to free it from any tannin or coloring matter, then filtered, and the filtrate evaporated without heat. The result of this process was a dry, brownish, deliquescent, coarse powder which under the microscope contained many needle-shaped crystals. A small particle of this powder which was dissolved in sterile water and applied to the right arm of a susceptible patient produced intense edema, irritation, itching, burning and inflammation that extended beyond the area inoculated. This reaction appeared in thirty minutes, increasing in intensity for eight hours, and was well marked thirty-six hours later. This patient did not suffer from dermatographia, and the solution did not cause a reaction in normal individuals. I was justified in considering this substance as a crude glucosid.

Another lot of leaves were extracted with alcohol, let stand three hours and the alcohol distilled off. The residue was extracted with acetone for three hours, after which the mixture was allowed to evaporate spontaneously. The result of this was an oleoresinous mixture which caused an intense irritation when applied to the left arm of the same patient, but which was unlike the glucosid mixture in that it acted slower, was quiescent several hours and not until twelve hours later did the subjective and objective symptoms equal these on the other arm. This oleoresinous compound did not irritate the skin of normal patients, and part of it was frozen in ice and salt to see if it contained a stearopten, such as menthol in peppermint. No such crystal formed. The oleoresin was now digested in alcohol and acetone solution for three days, after which it was filtered and the filtrate evaporated to dryness over a sand bath. After the filtrate had been evaporated to a dark brown powder eliminating any oil, a particle of the powder was dissolved in diluted alcohol and applied to the arm of a susceptible patient. This called forth a severe dermatitis which spread beyond the point of irritation. The active poison of the oleoresin was most probably an acid.

COMMENT

We, therefore, most probably have two active poisons in *Primula obconica*, one obtained by precipitating an extract with litharge and of a glucosid nature, the other a slower acting poison which appears to be an acid constituent of the resin, both, however, independent of any oil.

Many of the cases of dermatitis venenata reported in recent years have been ascribed to anaphylaxis until almost every unusually severe skin and systemic reaction that occurs during the administration or application of a drug is cited as an instance of this disturbance. The frequently seen skin reactions to quinin,⁶ iodine,⁷ iodoform,⁸ mercury and salvarsan have been cited by some as examples of the reaction. One is irresistibly struck by the clinical similarity of these reactions to the mucous membrane and skin hypersensitiveness seen in hay-fever and tuberculosis, both of which are supposed to be examples of anaphylaxis. In the cases of susceptibility of certain individuals to primrose poison we are also dealing with cases of hypersensitiveness which certainly more closely coincide with our conceptions of true anaphylaxis than many of the reactions cited above. The plant at least contains a proteinlike substance which in this respect, unlike iodine, mercury, salvarsan and other chemicals, fulfils one of the rudimentary requirements for a true specific anaphylaxis.

I have shown, however, that the skin irritability is not due to protein sensitization; therefore the reaction which may superficially resemble an anaphylactic reaction in reality has no direct relation to it.

In other words, we have gone far astray in our efforts to explain drug hypersensitiveness, and in our haste have distorted the theory of the reaction of anaphylaxis in order to try to make it explain a totally different phenomenon. Some such confusion resulted before the terms contagion and infection were better understood and more clearly defined.

It seems timely, therefore, to sound a word of warning against this misnomenclature and to recall to mind that while anaphylaxis is not entirely understood there are certain fundamental requisites necessary in order to produce a true reaction.

Richet⁹ was one of the first to suggest that anaphylaxis depended on the previous injection into or the presence in the body of some sensitizing substance or antigen. Another demonstrated fact is that such an exciting antigenic substance must necessarily be of a protein nature. The suggestion that pure lipoids, unmixed with proteins, cause antibodies has been refuted by Miller,¹⁰ Richet, Thiels,¹¹ and others. Zeiler¹² questions the validity of experiments that tend to show that certain chemicals combine with the proteins of the blood or tissues to form a foreign protein and cause hypersensitiveness. Zinsser¹³ says that to date not a single exception to this has been found, nor is any to be expected. The sole contestor of this being Ford,¹⁴ who could not have produced antibodies to his glucosid for the reason that he was not working with a pure glucosid but a compound substance. Von Adelung¹⁵ was unable to duplicate Ford's results, while Stevens and Warren¹⁶ and MacNair¹⁷ claim that the substance he was dealing with was not a true glucosid or a compound of rhamnose, gallic acid and fescitin, but an unknown compound. The recent report by Novy and DeKruif,¹⁸ which tends to show that anaphylactic shock can be produced in an agar sensitized animal by a second injection of agar or even distilled water, is another effort to prove the nonspecificity of the reaction. A somewhat similar line of reasoning regarding Witte's peptone was advanced by Biedel and Kraus.¹⁹ Different lots of this substance, however, were afterward found to contain toxic and nontoxic qualities which Brieger²⁰ says accounts for the conflicting anaphylactic results. The origin of both Witte's peptone and agar, of course, throw more doubt on such reports. Novy and DeKruif in comparing agar with Witte's peptone apparently do not recognize this.

Zinsser states that the analogy between cases of drug hypersensitiveness and the phenomenon we classify as anaphylaxis is a striking one, but he agrees with Friedman²¹ that they depend on quite different processes. For instance, in drug hypersensitiveness, increased and continued administration or application

6. Boerner, Fred: A Skin Reaction to Quinin, THE JOURNAL A. M. A., March 24, 1917, p. 907.

7. Friedberger: Ztschr. f. Immunitätsforsch. u. exper. Therap., 1912, 12, 241.

8. Block: Ztschr. f. exper. Path. u. Therap., 1911, 9, 509.

9. Richet: Compt. rend. Soc. de biol., 1898.

10. Miller: Jour. Path. and Bacteriol., 1913, 17, 249.

11. Thiels: Ztschr. f. Immunitätsforsch. u. exper. Therap., 1913, 16, 160.

12. Zeiler: München. med. Wchnschr., 1912, 59, 401.

13. Zinsser: Infection and Resistance, p. 307.

14. Ford: Jour. Infect. Dis., 1907, 4, 551.

15. Von Adelung, Edward: An Experimental Study of Poison Oak, Arch. Int. Med., February, 1913, p. 148.

16. Warren: Jour. Am. Pharm. Assn., 1907, 80, 518.

17. MacNair: Jour. Infect. Dis., 1917, 20, 485.

18. Novy, F. G., and DeKruif, P. H.: Anaphylatoxin and Anaphylaxis, THE JOURNAL A. M. A., May 26, 1917, p. 1524.

19. Biedel and Kraus: Wien. klin. Wchnschr., 1909, No. 11.

20. Brieger: "Die Ptomaine," 1, p. 14, and Hammersten, Physiological Chemistry.

21. Friedman, quoted by Zinsser: Infection and Resistance, p. 408.

of the drug increases the reaction, while in true anaphylaxis the reaction, if not leading to sudden death, decreases and finally ceases with continued administration of the antigen. Also in drug sensitization we are dealing with a primary poison against which in the reacting animal a neutralizing substance is formed, a condition quite different from that seen in hypersusceptibility against primarily harmless proteins. Zinsser further states that in true anaphylaxis not only are specific antibodies present in the blood, but the production of passive anaphylaxis in animals shows that this antibody, if originating and residing in the fixed cells of the body, must necessarily also circulate in the blood stream.

In primrose dermatitis, although an example of hypersensitiveness to drugs and chemicals, the requisites of anaphylaxis are not fulfilled; and while superficially similar, the confounding of the two quite different processes is incorrect. As I have shown in primrose dermatitis, it is not possible to sensitize an animal either actively or passively with the poison of the plant, that no specific amboceptors are present in the blood of susceptible patients, that the protein of the plant has nothing to do with the reaction, and that this being the case it is as impossible to produce an anti-toxin to the poison of the plant as it is to produce a condition of artificial specific sensitization.

The cases of skin "anaphylaxis" above cited seem to be examples of cellular or epithelial irritability, and being so are considered symptomatic expressions of local cell hypersensitiveness established spontaneously and not dependent on toxins or any immunologic process. The antibodies, if concerned in the reaction, are present only in the sensitive cells, the protoplasm of which, Block showed, has an increased affinity for that particular poison.

I did not attempt to produce a protein from the bloom of the plant, as it has been proved that the active poison is secreted from glandular hairs of the leaves, and that poison has no relation to a protein for two reasons: 1. A protein made from the leaves and stem causes no skin reaction in hypersensitive patients. 2. The poison is soluble and can be extracted by absolute alcohol, which does not dissolve proteins.

1219 Connecticut Avenue N.W.

ABSTRACT OF DISCUSSION

DR. PHILIP KILROY, Springfield, Mass.: While this paper needs no discussion, it should not be let pass without an expression of gratitude to the author. It is a demonstrative paper which should get rid of the tendency to give mystical explanations of very commonplace facts. The tendency to look for a mystical anaphylactic reaction has gone so far that I expect soon to be told that the sore caused by a burn is the anaphylaxis of some previous burn. Those of us who have been stung by a nettle or a wasp know that the result is only the irritation of the skin by an irritating substance. That the result is greater in one person than in another requires no explanation other than that assigned by Dr. Simpson. Some people will get a violent dermatitis from a sun exposure that will not even tan the skin of others.

DR. WALTER J. HEIMANN, New York: I regret that Dr. Simpson did not carry his work to what seems to me to be completion. His work has been confined to leaves and stems, while I think he should have done something on pollen, and perhaps on petals. I believe as he pursues his investigation he will take up these features. In using the word "hypersusceptible" I think Dr. Simpson has weakened his own case. Hypersusceptibility we have assumed to be due to previous exposure to an alien protein. What Dr. Simpson means, I believe, is an ordinary susceptibility.

In any kind of chemical dermatitis the majority of people do not react to the pathologic agent. Those who react are considered susceptible, and the others are not considered susceptible. Those who react very strongly might be considered hypersusceptible. In spite of Dr. Simpson's endeavor to be clear, his use of the word is unhappy, as it refers to allergic phenomena, which in his experiments are not present.

DR. C. AUGUSTUS SIMPSON, Washington, D. C.: I undertook this work in order to clear up the confusion which has resulted from the reports of iodine and quinine eruptions, which are cited as examples of anaphylaxis. If we understand that true anaphylaxis depends on a presensitization of the individual with a protein, then it is obviously impossible for a chemical, alkaloid or a glucoside to perform this function.

In regard to the question asked by Dr. Heimann, I will say that I did not work with the pollen of the flower for two reasons: First, the poison that causes the dermatitis does not reside in the flower or pollen, but is a product of the glandular hairs of the leaves; second, the poison can be extracted from the leaves by digesting them in absolute alcohol, which does not dissolve or extract proteins. In view of the work of Wells and Osborne on plant proteins, I have no doubt that a true protein could be extracted which would naturally produce a true anaphylactic reaction in animals. This, however, is not the object of this paper. I have tried to show that the well-known specific susceptibility to the primrose (dermatitis) has no relation to anaphylaxis.

THE PREVENTION OF ENDEMIC TYPHUS IN CALIFORNIA

JAMES G. CUMMING, M.D., DR.P.H.

AND

H. F. SENFTNER, M.D., DR.P.H.

Director and Assistant Epidemiologist, respectively, Bureau of Communicable Diseases, California State Board of Health

BERKELEY, CALIF.

During early civilization, typhus fever was the predominant disease, whereas typhoid was of secondary prevalence. With the advancement of civilization, however, and the adoption of personal hygiene, typhus has receded. On the other hand, with the increasing density of population and the resulting contamination of food and water supplies, typhoid has become pandemic. Except under war conditions, epidemics of typhus are now rare, although the disease is endemic on the Great Plateau of Mexico, in parts of Ireland, France and Russia, in Algeria, Egypt, Hungary and certain provinces of the Balkan States. The recent Serbian epidemic, still fresh in our memories, is an instance of war-borne typhus.

TYPHUS IN EASTERN UNITED STATES

The three chief visitations of this disease to the United States occurred in New York in 1881 and 1882, and again in 1892 and 1893, and in Philadelphia in 1883. Sporadic cases have not been uncommon in our seaports. Furthermore, it has recently been shown that the syndrome known as Brill's disease is in reality typhus fever. In 1909, Dr. Nathan E. Brill reported 200 cases of an acute infectious disease of unknown origin observed by him in the wards of the Mount Sinai Hospital. He had previously reported seventeen cases of the same disease. The important phases of the disease are thus summarized by Brill:¹

An acute infectious disease of unknown origin and of unknown pathology characterized by a short incubation period

1. Brill, Nathan E.: An Acute Infectious Disease of Unknown Origin: A Clinical Study Based on 221 Cases, *Am. Jour. Med. Sc.*, April, 1910.

(four to five days), a period of continuous fever, accompanied by intense headache, apathy and prostration, and profuse and extensive erythematous maculopapular eruption, all of about two weeks' duration, whereupon the fever abruptly ceases, either by crisis within a few days or by rapid lysis within three days, when all symptoms disappear.

When Brill's second paper appeared in 1910, Anderson and Goldberger,² of the United States Public Health Service, had recently returned from the City of Mexico, where they had been making a study of Mexican typhus or "tabardillo." These investigators were impressed with the similarity between the disease described by Brill and typhus fever as observed by them in Mexico. They were given the opportunity of drawing blood from a patient with Brill's disease in the wards of the Mount Sinai Hospital. This was inoculated into monkeys. One of these animals, after ten days' incubation, developed a fever which reached its maximum six days later, and fell by rapid crisis fourteen days after the rise began.

To determine the relationship of typhus fever to Brill's syndrome, these workers tested the susceptibility of animals that had recovered from Brill's disease to Mexican typhus, and the converse of this. It was found that an attack of Brill's disease in the monkeys conferred on them immunity to Mexican typhus, and that Mexican typhus conferred on them immunity to an attack of Brill's disease. It was thus shown that Brill's disease, so called, and typhus are identical, and since the endemic typhus of New York, with which Brill worked, was regarded as of European origin, it was concluded that the typhus fever of Europe and that of Mexico are identical.

Cases of continued fever of more than six to seven days' duration were taken from the records of the Massachusetts General Hospital, and from this investigation Roger Lee concluded that Boston and vicinity gave a ratio of one case of typhus to forty-seven of typhoid, a proportion probably prevalent in many of the Eastern coast cities. In 1912 there were thirty-six cases of typhus treated at the Mount Sinai Hospital and nineteen at the Jewish Hospital. Moreover, cases

were reported as far west as Chicago and Milwaukee. During 1911 and 1912, J. E. Paullin³ observed seven cases of typhus in Atlanta which were reported by him. With a more accurate identification of this disease it has become evident that it has not disappeared from the United States, but, on the contrary, it has been present more or less continuously, especially in the large Eastern cities, since the epidemics of the eighties and nineties.

TRANSMISSIBILITY

In the latter part of 1909, Nicolle infected an African ape with the blood drawn from a human patient with typhus.⁴ Shortly after this announcement he reported the successful transmission of typhus from an ape to a monkey by the bite of a louse.⁵ From the

epidemiologic conditions which prevailed in Tunis, he was able to rule out the flea and the bedbug as carrying agents. In February, 1910, Anderson and Goldberger⁶ reported the transmission of typhus from a human case to a monkey by means of the body louse. Other experiments with the flea and the bedbug were negative, and those with the head louse—*Pediculus capitis*—though suggestive, were not conclusive. During the same year Ricketts and Wilder,⁷ in two experiments, transmitted typhus to a monkey by the bite of the body louse. In one instance the virus was transmitted from man to monkey, in the other from monkey to monkey. Furthermore, these investigators infected a monkey with typhus

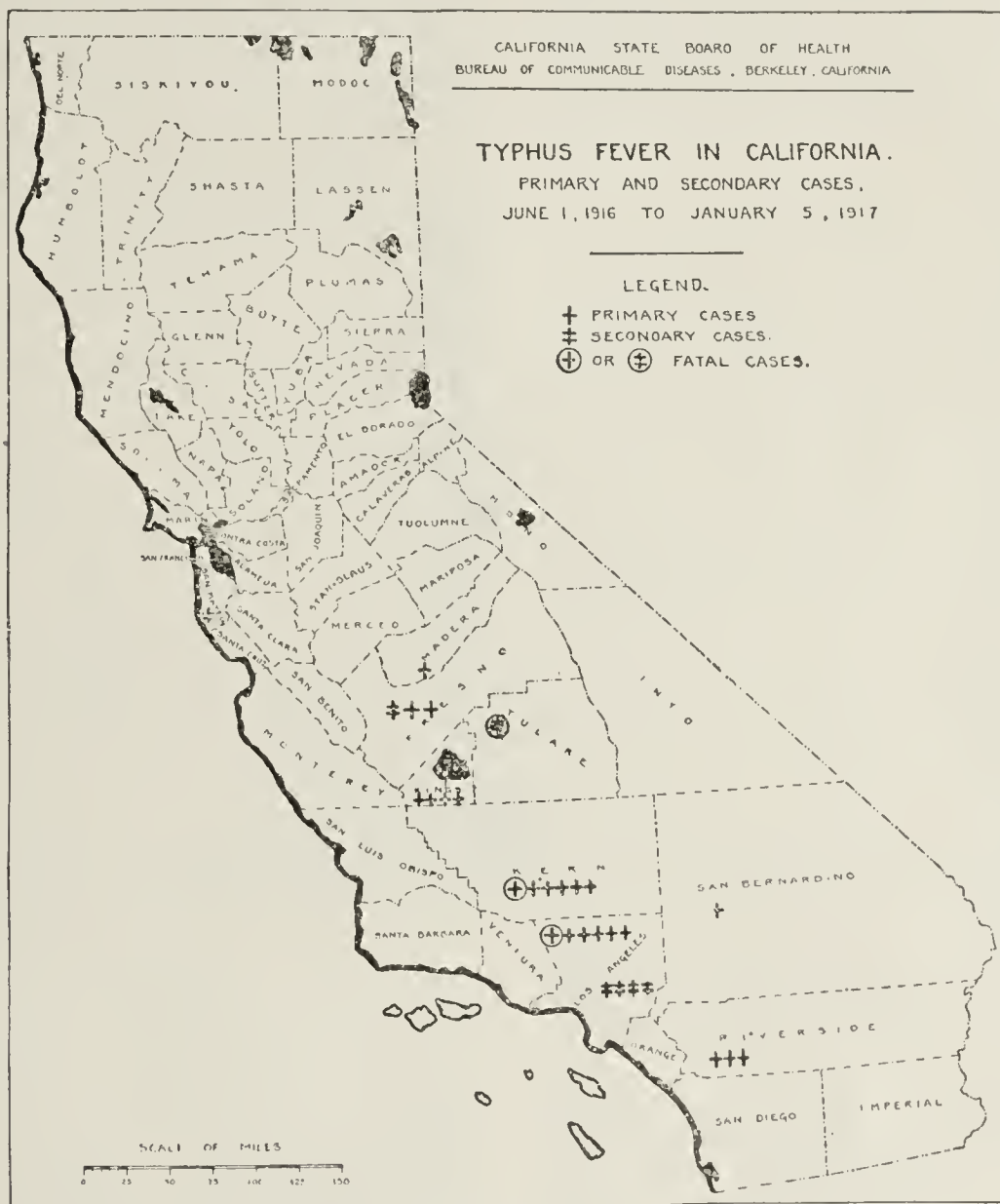


Fig. 1.—Location of primary and secondary cases of typhus in California.

through the introduction of the abdominal contents of infected lice through small incisions. The achievements of Nicolle, and the confirmation of his findings by other workers, have demonstrated the mode of transmission of typhus fever and made plain the practical methods of preventing the disease. These, when intelligently applied, have worked remarkable results.

3. Paullin, J. E.: Typhus Fever in Atlanta, Ga., Pub. Health Rep., Jan. 10, 1913.

4. Nicolle, C.: Reproduction experimentale du typhus exanthématique chez le singe, Compt. rend. Acad. d. sc., 1909, **149**, 157.

5. Nicolle, C.; Comte, C., and Conseil, E.: Transmission expérimentale du typhus exanthématique par le pou du corps, Compt. rend. Acad. d. sc., 1909, **149**, 486.

6. Anderson, John F., and Goldberger, Joseph: On the Infectivity of Tabardillo or Mexican Typhus for Monkeys and Studies on its Mode of Transmission, Pub. Health Rep., 1910, **25**, No. 7.

7. Ricketts, H. T., and Wilder, Russell M.: Further Investigations Regarding the Etiology of Tabardillo, Mexican Typhus Fever, THE JOURNAL A. M. A., July 23, 1910, 309.

2. Anderson, John F., and Goldberger, Joseph: The Relation of So-Called Brill's Disease to Typhus Fever, Pub. Health Rep., Feb. 2, 1912, p. 149.

Thus, according to Nicolle, in 1909 there occurred in Tunis 838 cases of typhus fever; but in 1912, after efforts had been put into effect to control the disease in the light of recent research, there occurred only twenty-two cases. The only prophylactic measure resorted to was the destruction of lice found on the patient and his clothing and on persons and clothing in the vicinity of the patient suffering from typhus. The successful campaign of the American Red Cross, under the leadership of Dr. Richard P. Strong, against typhus among the Serbian troops by the use of the coal oil bath and the steam sterilization of clothing, is a remarkable achievement based primarily on the results of Nicolle's original investigations.

That the body louse is the transmitter of typhus has received ready support from students of the epidemiology of this disease. The spread of typhus presents all the characteristics of an insect-borne disease. Typhus fever prevails in epidemic form only in overcrowded, filthy surroundings. To quote from Hirsch, "The history of typhus is the history of human wretchedness."

TYPHUS IN CALIFORNIA

In the spring of 1916, it was reported that in Mexico thousands were afflicted with typhus fever. The civil war in that country, with its accompanying wretchedness, had led many of the inhabitants to emigrate to the United States. California had been free from typhus for years until the summer of 1916, when there occurred twenty-four cases, twenty-one of which were investigated. With the exception of one case, all the patients were of foreign birth and tongue, making it difficult to obtain accurate data concerning their subjective symptoms.

In general it may be said that prodromal symptoms were absent or insignificant. In about half the cases the fever was ushered in by a chill. The rise in temperature was rapid, reaching its height (from 103 to 105 F.) about the third day. Mild delirium, muscular weakness and intense headache were early symptoms. With the rise in temperature, the face became flushed and the conjunctivae injected, developing later into conjunctivitis. There was no coryza or sore throat; hemorrhage from the nose and ears occurred in one case, and that late in the disease. A mild cough and moist bronchial râles were not uncommon early symptoms. As the fever reached its height, there appeared the typhus rash on the abdomen, then on the chest, back, arms, thighs, forearms and legs. Within thirty-six hours it was fully out and remained until recovery or death. The spots varied in size, from one tenth to one half inch in diameter. They were irregular and had a fairly distinct outline, but were not perceptibly elevated. During the first few days the rash may be referred to as a mulberry rash, and it will disappear on pressure; this later becomes a darkish-brown maculopetechial rash, and does not disappear on pressure. As shown by von Franckel, the characteristic exanthem is primarily a periarteritis which leads to stenosis and by thrombosis formation to circumscribed disturbances of the circulation, and to interstitial hemorrhages which convert the inflammatory reseolae into petechiae. The interstitial hemorrhages prevent the disappearance on pressure of the typhus spots. The fever reaches its maximum in about three days, remaining elevated at from 103 to 104 F. without marked morning remission for about fourteen days, at the end of which time it falls by

crisis or rapid lysis. As stated by Dr. C. C. Pierce of the United States Public Health Service, "the most dependable symptoms are the rash, headache, bronchitis, mental confusion, dry coated tongue, nervous tremor and continuous fever." From eight of the patients in the cases investigated, blood was drawn and injected into guinea-pigs. As in five of the cases blood was drawn after the crisis, no temperature was produced in the animals inoculated from these. In the other three the guinea-pigs developed, at the end of an incubation period of from ten to twelve days a temperature of several days' duration. All the strains of typhus fever so isolated were carried through four generations.

The disease is not fatal in guinea-pigs; an elevation of temperature and slight indisposition are the only signs of illness. We have observed that typhus fever produces no distinct pathologic condition in guinea-pigs such as is found in Rocky Mountain spotted fever. In our laboratory strain of spotted fever, isolated from the Ventura County patient of July, 1916, and carried through the eightieth generation at the State Hygienic Laboratory, the following lesions are noted: enlarged axillary and inguinal lymph glands, swollen spleen, and in males, orchitis with occasional superficial necrotic areas.

The eruptions of these two diseases, more especially the character and development of their skin lesions, are very similar, and in the absence of the chief aid in differential diagnosis — namely, a definite history of a louse or a tick bite — the results obtained through guinea-pig inoculations will clear up the diagnosis.

Early in the spring of 1916, typhus fever began to appear in California among newly arriving Mexican immigrants employed in railroad section camps. From June 1 to Oct. 1, 1916, there had occurred in California twenty-six cases of typhus, with one fatality. Five of these cases were secondary, and all, with the exception of two, were among railroad employees. Owing, however, to the increasing number of cases in five southern counties of California, so that during September alone there were reported fifteen cases, the state board of health viewed with apprehension the possibility of extension of typhus fever from these immigrants to the larger cities where it might become endemic. The situation began to call for more intensive control measures to prevent the disease from becoming a menace to the California centers of population. The expediency of this procedure is shown by a study of the disease in Eastern cities, where endemic typhus has existed since the early eighties. It was necessary, however, before enacting regulations, to review the situation as a whole; naturally, methods employed for its control would have to depend on conditions peculiar to this state. As already stated, most of the cases were primary; they had occurred chiefly among recently imported railroad Mexican section laborers, and there had been five secondary cases. Furthermore, there was an increasing number of cases each succeeding month. The appearance of the secondary cases made it evident that the transmitting agent of the disease (the body louse) was prevalent in section camps. Actual investigation of forty-four camps showed a 60 per cent. head louse and a 35 per cent. body louse infestation. This condition among immigrant Mexican laborers and their families was directly due to the unhygienic living conditions in war ridden Mexico

whence they had come. Up to October, the state required merely the usual quarantine measures on all reported cases and their contacts. With these regulations in force, however, the number of typhus cases continued to increase so that in September alone there were fifteen cases. As Mexico was the only available source of labor, it was decided to urge the cooperation of the railroads in applying modern preventive measures in the control of typhus rather than to put in force the older procedure of prohibiting the importation of such labor.

The situation was presented to the railroad authorities, and appreciating that modern science provided an alternative to a ban on labor, they heartily cooperated in carrying on the special typhus control regulations. These included: first, the enforcement of louse-eradication measures in the section camps; second, the establishment of observation camps, and third, the reporting to the state of all new arrivals from Mexico.⁸ The regulations provided for bunk house sanitation, weekly sterilization of bedding and clothing, gasoline saturation of all footwear, and a weekly bath with equal parts of kerosene and warm water for all camp occupants, this to be followed by a complete change of clothing; these measures to be enforced and supervised by the foreman of each section gang.

The deputizing of the section foreman as the local supervisor of these control measures was made because he was at all times a resident at the section camp, and therefore cognizant of the extent to which the delousing regulations were being complied with by the section laborers. Moreover, the large number of camps and the wide area over which they were scattered made the matter of even a single visitation by a delousing train impracticable from the standpoint of expense, efficiency and time. The section foreman control method had, therefore, the advantage that all the section gangs could be deloused, not only immediately, but frequently, the foreman being directly responsible for the enforcement of the regulations. The railroads made this matter not merely one of expediency but of educative value as well, by printing the regulations in Spanish and in English, and by posting them in each section camp.

In the observation camps all newly arriving Mexicans were kept for a period of fifteen days—the incubation period of typhus fever. These camps consisted of a dozen pitched tents or of box cars, one guard tent, two foreman's tents, a box car or extra large tent for bathing and delousing purposes, a water car, two commissary cars and three or more modern, well screened, well ventilated toilets. Two

or more guards were stationed at such a camp. During the first month there were a number of escapes from these camps, whereupon the railroad companies provided railroad police guards, thus preventing the scattering of possible typhus contacts. From Oct. 15, 1916, to March 1, 1917, a total of 2,355 men were detained and deloused in the railroad observation camps. The several importing companies furnished the state, from El Paso, the name of each immigrant and the observation camp to which he had been sent. The railroads made a similar report relative to the date of his arrival at and release from this camp.

The purposes of these observation camps were two: first, to centralize all possible imported typhus cases; second, to provide a place where the railroads' Mexican immigrants could be deloused before being distributed along the lines of the railroad traffic. It should also be appreciated that the several railroads within the state at once lent their hearty cooperation in carrying out the delousing regulations in the section camps, and in addition,

each railroad depending on imported labor maintained an observation camp, although such maintenance was a difficult problem from an operative standpoint.

It will be noted that these observation camps, established in October, 1916, served the same purpose as do now the federal delousing stations which were put into operation Jan. 1, 1917. When in view of these control measures instituted at the border by the United States Public Health Service, the advisability of modifying or abolishing the special regulations was suggested, it became necessary to determine whether or not they had served their purpose—that of minimizing louse infestation in the section camps. Obviously,

should a patient with typhus in the incubation period—although freed from lice at the border—enter a louse-infested camp, his infestation would result in infected lice and the possibility of secondary cases.

No further cases of typhus having occurred in railroad section camps after Oct. 25, 1916, about March 1, 1917, there were reinspected thirty-two section camps, occupied by 824 individuals. Among these, less than 1 per cent. showed evidence of head lice, while no body lice were found. The observation camps were also inspected, and the remarkable cleanliness of some very recent arrivals therein, as contrasted with those imported prior to Jan. 1, 1917, evidenced the value of the efficient delousing work done at the border by the United States Public Health Service.

Up to the time of border control, the state's campaign necessitated the following field work: twenty-four field investigations covering the examination of 518 railroad Mexican section camps, and the inspection of 5,042 men, women and children.

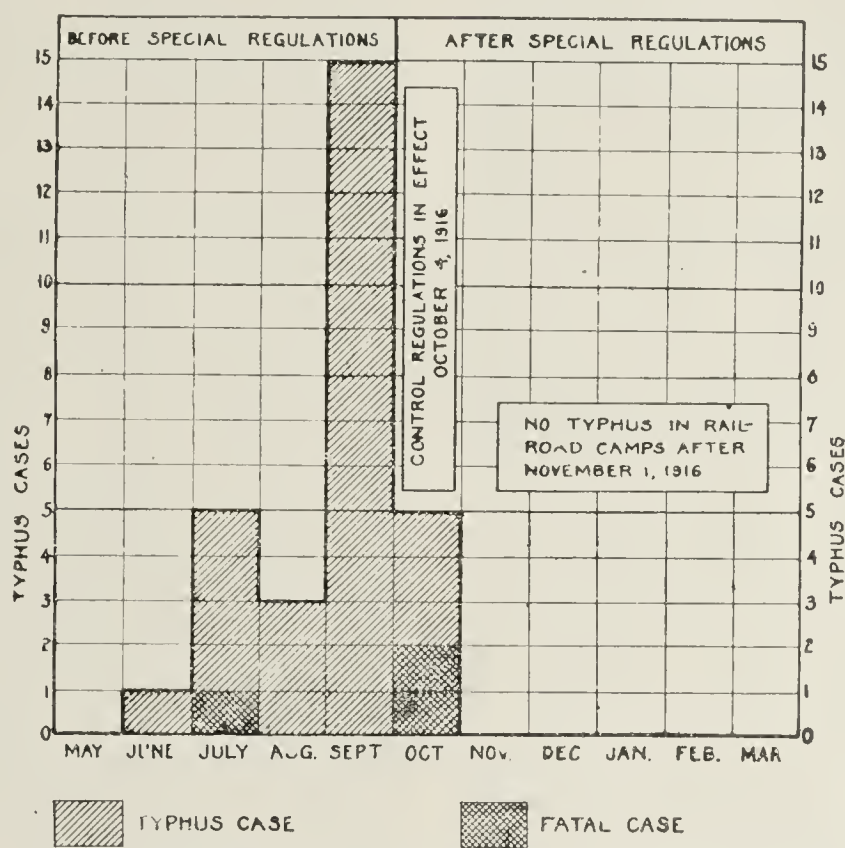


Fig. 2.—Incidence of typhus in railroad camps in California and results following enforcement of special state control regulations.

8. Cumming, James G.: Special Regulations for the Control of Typhus in Railroad Section Camps, Month. Bull., California State Board of Health, October, 1916, p. 202.

In comparing the typhus situation before and after the institution of the special control regulations, the records showed that from June 1, 1916, to Oct. 1, 1916, four months, there had been twenty-four cases, of these, five secondary; while in the ensuing period from Oct. 1, 1916, to March 1, 1917, five months, there had been only seven cases, of these, one secondary case. Five of these had occurred in October, and the remaining two were nonrailroad cases direct from Mexico. Among the thirty-one cases there had been three deaths, giving a mortality of 9.7 per cent.

The necessity for the control measures taken in October by the state is shown by the increase in the typhus incidence; for, while in June, July and August there had occurred only nine cases of typhus, the record for September alone was fifteen cases. The effectiveness of the state's control measures is clearly demonstrated in that shortly after these measures were applied the typhus incidence dropped to five cases in October, none in November, one in December, and one Jan. 4, 1917, the latter two being the nonrailroad cases previously referred to. Since Jan. 4, 1917, no case of typhus fever has been reported in California. In October, 1916, there was louse infestation to the extent of 35 per cent. for *Pediculus vestimenti* and 60 per cent. for *Pediculus capitis*; while the March 1, 1917, reinspection showed no body lice and only 1 per cent. head lice. It was therefore concluded that:

1. Louse infestation in railroad section camps had been reduced to a minimum.
2. All the railroads should be requested to continue their supervision of camp hygiene.
3. The federal delousing work at the border made no longer necessary the maintenance of observation camps as delousing stations.
4. Imported sporadic cases of typhus might occur, but, under present conditions, there should be no secondary cases.
5. The special typhus regulations for railroads had accomplished their purpose and were therefore no longer necessary.

This received the approval of the state board of health, and the regulations were accordingly abolished at its meeting in March.

Acupuncture Vaccination Method.—According to Dr. H. W. Hill (*Am. Jour. Pub. Health*, March, 1917) acupuncture vaccination is thus performed: The arm is washed with soap and water, then with alcohol and finally with ether. A small drop of vaccine is deposited on the clean surface. The vaccinator's hand is closed on the arm from behind so as to draw the skin tight in front, and a sewing needle point, held slanting nearly parallel with the arm, is pressed against the skin through the drop of vaccine. Then it is that that one-thousandth inch of the point snicks through the upper layer of the skin, carrying the vaccine with it. The needle is instantly withdrawn, and similar punctures are made beside each other until a dozen punctures are made in the space of one-sixteenth square inch or less. With a bit of gauze the surface vaccine is removed. Three sets of punctures are advised at the angles of a triangle, each side of which is 1 inch. A strip of gauze may be pinned to the inside of the shirt sleeve; no other dressing should be used. In persons who are still protected by a former vaccination or by having had smallpox, the punctured surface will redden, swell slightly and become somewhat itchy for a day or two immediately following the puncture. This is the anaphylactic reaction. In persons not so protected, the puncture spot will redden and swell in four or five days, and a smooth, pearly button about the size of a large pea will arise, which in about ten days will separate, leaving a small round scar.

LYMPHATIC-NODULAR KERATOCONJUNCTIVITIS (PHLYCTENULES) *

L. J. GOLDBACH, B.S., M.D.

Fellow of the American College of Surgeons

BALTIMORE

Phlyctenular keratoconjunctivitis has always impressed me as a distinct ocular evidence of a systemic dyscrasia; in other words, these nodular exudates indicate a weakened, anemic constitution. The impoverished patient requires more than general tonics, something more definite and specific in the line of treatment. As an increased heart beat would be suggestive of some abnormality, so I take this eye condition to be a symptom of some abnormal constitutional condition. As interstitial keratitis is a manifestation of inherited syphilis, these nodular lymphoid infiltrates are evidences of a strumous diathesis or tuberculosis — if not tuberculosis, then something very similar, bearing in its symptomatology a striking resemblance to tuberculosis. These nodular exudates are warnings, and not outspoken evidences of tuberculosis.* The absolute certainty, as clinical evidence of it, must remain unanswered for the present. The proof is not sufficient to warrant such an assertion, yet in the large percentage of these cases it distinctly gives evidence of an intimate association with tuberculosis. We all know of tuberculous cases undergoing spontaneous arrest, and these may be some of the cases that give symptoms accompanying tuberculosis but not made manifest by our present methods of examination. Of course further evidence must be forthcoming, but I believe a proper interpretation of this local sign will be a great aid to us in saving and restoring vision.

Since the vision which has been lost depends so much on the location of the resulting corneal opacity, it is not possible to generalize in regard to it.

It is by a thorough and complete physical examination of all cases showing these nodular lymphoid deposits on the corneoscleral border, especially when ulcerating, that we can get some evidence of tuberculosis in one of its many manifestations. In some of the thirty-nine cases which form the basis of this study we have distinct and clear evidence of tuberculosis.

I would not style the nodules tuberculous simply because giant cells are seen in some of their sections. If organisms are found they are a secondary infection, due to the lymphoid cellular exudates breaking down. This nodular cellular infiltrate is a manifestation of a disease and not the cause of disease. There is an underphysical tone, a latent tuberculosis, that causes nodular infiltrates to appear on the corneoscleral border. To me it is an exhibition of a tuberculous condition or one very closely allied to tuberculosis — call it scrofula.

In seven of the thirty-nine cases, pulmonary tuberculosis was found. I hold that when tuberculosis is fully established we shall not find this eye condition. These nodular exudates are seen only in a beginning tuberculous infection and not when tuberculosis is fully established. It is more of a manifestation of tuberculosis, especially in childhood, though we saw these cellular infiltrates in four cases in adult life.

In sixteen cases we found some form of tuberculosis. Fourteen of the patients had tuberculous adenitis.

* Read before the Section on Ophthalmology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

One of the sixteen had tuberculous wrist joint; one had a tuberculous hip.

Eight of the patients, while not having positive pulmonary signs, had suggestive lung involvement, as apical moist râles, impaired notes, dull percussion, and spotty infiltrates. One had an indurative mediastinitis. Three, from roentgenographic reports, showed upper apical infiltration. One had tuberculous arthritis.

Thirty-two of the patients had positive von Pirquet reactions; fifteen of them +, ten ++, four +++, and two had a slight positive reaction.

Dr. J. H. Elliott¹ of Toronto says, "It has been our experience that every child that has phlyctenular conjunctivitis has given a tubercular reaction."

In four of the cases the tubercle bacillus was found in the sputum. Three of the patients were sent to the state sanatorium for tuberculosis.

Eighteen of the patients had adenoids and diseased tonsils. The interesting point about these cases was the fact that in microscopic sections the tubercle bacillus was found in six cases.

The eczema seen in these cases is caused by the profuse lachrimation, and the constant epiphora is the irritant to the skin and nares. Nasal obstruction aids the eczema and the excoriation of the skin surfaces. Improper nasal respiration in the upper air passages, caused by congestion and intumescent turbinates, prevents the proper flow of tears to the nasal cavity. The mucous membrane of the tear duct and its sac becomes swollen and the lumen is narrowed, so that the tears do not have proper drainage to the nose. The eczema is a secondary factor, an association and not a cause of the eye condition:

Thirteen of the patients had a negative Wassermann reaction. Two had positive reactions; one of the latter patients, aged 20, had a nodular exudate on the conjunctiva with slight photophobia, lachrimation and a negative von Pirquet reaction. Roentgenoscopy revealed infiltration beneath both clavicles. Because of the negative signs of a tuberculous involvement, and of a positive Wassermann reaction, the patient was placed on antisyphilitic treatment. The condition of the second patient, aged 25, was similar to that of the first, and the same treatment was given.

In seven of the cases some member of the family had tuberculosis, four in parents (three paternal and one maternal), two in sisters, and one in a paternal uncle.

The age of these thirty-nine cases varied from 1 year to 30. There were thirty females and nine males. Eighteen patients were white and twenty-one colored. The cornea and conjunctiva were involved in thirty cases. Corneal ulceration was present in eighteen. The conjunctiva was involved in nine cases. Both eyes were involved in twenty-one cases, the right eye twenty-nine times and the left eye eleven times.

When local treatment was required for corneal ulceration we used atropin in 1 per cent. solution and protective glasses. When there was no corneal ulceration, sodium borate drops were ordered.

I have carefully gone over the cases and itemized each particular case for study: After the eye was seen and diagnosis made, the patient was referred to the Phipps Clinic for Tuberculosis for a physical examination and a skin test. It is needless for me to say that the work in that department is so thorough that the

diagnosis will not be questioned. In fact, when one is working on a special subject, sometimes the enthusiasm gets the better of discretion, and one is liable to err. The reference of these cases to another department is bound to result in more accurate reports, and the results in the long run will be more valuable.

With their varied experience, the physicians in this clinic are unusually competent to make physical examinations and are especially skilled in giving the tuberculin injections. The dosage, temperature, pulse and respiration are followed more accurately. It is important to know how to administer tuberculin. It is a dangerous drug; and unless used skilfully, more harm than good will come from its administration. The minimum dose was 0.000001 gm.; to the small dose often repeated I think is due the success in giving tuberculin. The tuberculin used was the bouillon filtrate and was made in the Phipps Clinic for Tuberculosis. I feel confident that had it not been for their skilled and expert administrations of tuberculin, the results would not have been what they are. Unless the ophthalmologist has had experience in this line of work, it is better to have the work done by men who are doing that kind of work every day; they are more capable of judging the proper dosage, and the interval in time.

At least forty injections are necessary in an average case, and prolonged tuberculin injections a necessity for good results. Any rise in temperature is an indication of too large an amount of tuberculin, and with any redness or soreness at the point of injection, the dose should be diminished. Small doses often repeated constitute the treatment; this is so important that I wish to lay special emphasis on it.

In some of the thirty-nine cases we had a positive von Pirquet reaction, but the physical examination showed "no active pulmonary signs"; nevertheless we tried tuberculin to see if it improved the ocular condition. We were surprised in seeing the nodular exudate disappear. To satisfy the patient, sodium borate drops were ordered. This improvement in the patient I attribute to the tuberculin. These cases show no manifest tuberculosis, but probably have some latent form. If tuberculin improves the condition, there must be some association between the nodular exudates and tuberculosis.

When the patient was under tuberculin treatment, relapses were very few; in fact, there was only one distinct case, and that was very slight. When other methods were employed, recurrent attacks were often seen.

Some of the patients returned for observation; the eyes appeared in good condition, there were no active inflammatory signs, and the general remark of the patients was that they were much improved.

It is necessary in some cases and at certain intervals to give another course of tuberculin injections. By this means we are more than able to hold the corneal ulceration in check and prevent opaque areas through the cornea. I feel confident that with the proper administration of tuberculin, accurate taking of pulse, temperature and respiration, and the general condition kept under surveillance, we can get good results from this way of handling the cases. It is far from perfect, but better than giving general tonics, with no special medicine given for a special ailment. The word "tonic" would not carry far if one were questioned why and for what reason the tonic was given.

1. Elliott, J. H.: *Tr. Natl. Assn., Study and Prev. Tuberc.*, 1916, p. 45.

Norman² says:

Under tuberculin treatment the process of ulceration was arrested very much more quickly than by ordinary methods alone, and the resulting area of corneal opacity was correspondingly diminished. Another advantage is a remarkable freedom from relapse, but to ensure this we find it necessary to give the full course of fourteen injections in all cases.

The eyes were carefully observed and notes made after each injection, stating progress, or retrogression, or whether the eye was quiet.

The Department of Laryngology handled the cases of adenoids and tonsils. This removal was a great aid in the treatment. The examination of the adenoids and tonsils for microscopic diagnosis was thorough. Finding six cases with tubercle bacillus I think is exceptionally interesting. Their interest in the cases made the examination thorough and complete. Six cases were found positive for tubercle bacilli in the sections.

SUMMARY

I am not claiming this manifestation as a certainty of tuberculosis, but that in a majority of cases, if we use all methods of diagnosis we will find some evidence of symptoms that go with tuberculosis. In the seven cases showing active pulmonary signs (four of the patients having the tubercle bacillus in their sputum) it is satisfying to know that we aided the patients in getting the proper treatment.

The eye manifestation will at least make us think of a tuberculous involvement and will aid us in trying to check a tuberculous tendency. Tuberculin injections when properly given are a great aid in our treatment. I have outlined eleven distinct points:

1. The nodular cellular lymphoid deposits, ulcerative and nonulcerative (phlyctenules) of the corneo-scleral border are local eye manifestations of a constitutional dyscrasia, strongly suggestive of tuberculosis—if not tuberculosis, then something very closely associated, bearing a striking resemblance in its symptomatology to tuberculosis.

2. While the microscopic sections of these nodules show giant cells, it would not follow that the nodules are tuberculous, but rather indicate that the cellular infiltrate is a manifestation of the disease and not the cause.

3. The treatment has been hygienic and sanitary: sodium borate drops in nonulcerative case, and in corneal ulceration 1 per cent. atropin and protective glasses; tuberculin bouillon filtrate given in doses varying from 0.000001 gm. to 15 mg. At least thirty-five to forty treatments are demanded, and as high as fifty or more. Prolonged tuberculin treatment is important, and in doses averaging 0.0001 mg. I think at stated intervals it is advisable to renew tuberculin treatments. During tuberculin treatment eyes rapidly improve, and there were no recurrent attacks with the exception of one case, which was slight. Temperature, pulse and respiration were carefully watched. Any rise or tenderness and redness at the point of injection would indicate too strong a dose. The patient should *sustain toxins given with no reaction*; this is important.

4. Of the thirty-nine patients seven had pulmonary phthisis.

5. Sixteen had some form of tuberculosis as cervical adenitis or tuberculous bone.

6. Thirty-two had a positive von Pirquet reaction.

7. Eighteen had adenoids and diseased tonsils; the tubercle bacillus was found six times in microscopic sections.

8. Four showed tubercle bacilli in their sputum.

9. Eight physical examinations were suggestive of some form of lung involvement.

10. Thirteen had a Wassermann test with eleven negative.

11. Seven had a member of their family with tuberculosis.

322 North Charles Street.

THE PATHOGENESIS OF OPHTHALMIA ECZEMATOSA

A PRELIMINARY REPORT *

MICHAEL GOLDENBURG, M.D.

Assistant Surgeon, Illinois Charitable Eye and Ear Infirmary

CHICAGO

The acute interest of the profession in phlyctenular disease has been maintained for some time past, for two principal reasons: first, because the disease itself offers so much calculated to attract continued attention—its prevalence, complications, sequelae, and frequent recurrences—and second, because the problem of its pathogenesis is still *sub judice*, no one claim having succeeded in gaining a firm foothold in science.

As long as the etiology of ophthalmia eczematosa remains obscure, treatment will be empiric. Had we succeeded in accidentally finding a specific for the cure of phlyctenular disease such, for example, as we have in quinin for malaria and in mercury for syphilis, the fact that we have no absolute knowledge of the real causal factor would be only of academic interest; but, as will be seen, we have not been fortunate in discovering a specific as yet, and hence any investigation aimed at the finding of a cure of this troublesome malady must be in the form of a search for the causal factor of this form of ophthalmia.

Ophthalmologists throughout the world became much interested when a few years ago the teaching was promulgated that ophthalmia eczematosa, or phlyctenulosis, is due to either the tubercle bacillus or its toxins. Naturally the recognition of tuberculosis in some form as the cause of phlyctenular disease led to the application of a supposedly rational therapy. The entire antituberculous therapy, as tuberculin, ferruginous tonics, fresh air and overfeeding, was utilized against this disease, but unfortunately with no special result. The fact that the von Pirquet and other cutaneous tubercle tests yielded a surprisingly large number of positive reactions justified that therapy, but the comparatively insignificant clinical results certainly prove practically conclusively that the etiology of ophthalmia eczematosa is not tuberculosis.

The only other important theory which has been advocated by competent observers is that the disease is due to intestinal fermentation. As will be seen later on, therapeutic experiments to confirm this hypothesis have proved negative.

It seemed to me that in this era of advanced pathology the inability to demonstrate the underlying cause of any form of ophthalmia must stand out as a reproach and that some light must be reached if a

2. Norman, A. C.: Tuberculin in Ophthalmic Practice, Hospital, London, 1915, 58, 9.

* Read before the Section on Ophthalmology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

systematic search for it be made. That such a road is not devoid of difficulties is known to every one who has tried to secure diagnostic laboratory data of this disease. Might it not be that perhaps in this case the microscope and serologic tests are not the signs of the proper road? I did not answer that question when, a few years ago, utilizing a clinical material which exceeds 500 patients, I undertook to make an inquiry into the cause of ophthalmia eczematosa.

In presenting to the profession the results of this investigation no claim is made that this report is exhaustive, nor is it the intention to submit a detailed recapitulation of the scientific labors on this subject available in contemporaneous literature; but the mere narration, it is believed, is sufficiently convincing to show that the evidence, new though it be, is based on undisputable facts.

To begin with, the doubt of the tuberculous origin of the disease, justified by the repeated observation that patients treated for tuberculosis fared no better than those given other routine therapy, should cause the elimination of this theory from all calculations; but this, too, was included in the projected investigation.

Surgical therapy, and the use of vaccines and anti-toxins have shown so conclusively negative results that these early were eliminated, not only as curative agents, but also as measures to indicate the causal factor or factors.

A plan was adopted to try with great care any drug at all likely to benefit the disease itself or at least its symptoms, on the presumption that if a really valuable agent be found an explanation of its rationale could possibly be arrived at and the desired goal reached. To prevent error, the routine practice of administering several drugs at one and the same time was abandoned, and each drug selected was studied singly. Boric acid, argyrol, protargol, silver nitrate, zinc sulphate, yellow mercuric oxid, mercuric chlorid, ethylmorphin hydrochlorid (dionin), atropin and similar drugs were subjected to thorough and prolonged therapeutic tests. It is evident that practically the entire ophthalmic, bactericidal and mydriatic armamentarium has been exhausted. The result of this inquiry can be given in one brief sentence: Not one of these drugs, with the single exception of atropin, had any real influence on the course of the disease. The findings are based on control observations, namely, that the drugs named, atropin excepted, had identically the same therapeutic results as those seen from the application of placebos. Atropin gave decided symptomatic relief, and in all probability was not without some curative influence.

It is interesting to note, however, that while the corneal phase of this disease does not respond to our classic bactericidal treatment, true corneal ulcer becomes clean and covered by epithelium; but this is as far as one can attain, for it continues to remain in a state of irritation, not unlike a nerve ending disturbance, similar to herpes zoster ophthalmicus, but milder than in this condition until the clinical entity has run its course.

In view of these results, all drugs were discarded and topical treatment restricted to the use of atropin irrespective of whether the cornea, conjunctiva or limbus was involved.

The evidence of the ineffectiveness of topical therapy clearly shows that the condition under consideration is not a localized disease, but a local manifestation of a systemic disturbance. The finding of the true underlying systemic cause, therefore, became the

most important problem. The question which presented itself was by what method the desired result might be attained, since the aimless employment of the entire diagnostic armamentarium could have led only to confusion. Physical examination of the patients yielded the following data, which gave some index as to the best manner of search:

The greatest prevalence of the disease is between the second and twelfth years of life. Patients under 2 years of age are rarely seen. Seventy-five per cent. of the children were fairly well nourished. It is noteworthy that some of the most severe cases seen were in plump, ruddy children, to all appearances presenting an excellent degree of health.

This does not bear out the assertions of certain authors that phlyctenular disease is usually observed in anemic children with what is best described as a tuberculous habitus. The sexes were equally represented. The majority of the patients belonged to the poorer classes, in which the families are large, and in which the environment from a hygienic standpoint is not wholly bad, except that individual parental control is exceedingly limited, the children being left almost entirely to their own resources. Adenopathy was manifest in the submaxillary, anterior and posterior cervical regions, the lymph glands being plainly discernible on palpation but rarely painful on pressure. The tonsils and adenoids were frequently enlarged and diseased. Skin and hair were characteristically dry. Erosions around the nostrils and behind the ears, especially where the two skin surfaces come in contact, were seen frequently. These erosions, which proved to be an intertriginous eczema, were often observed also in the inguinal folds, especially in very young children. Seborrhea of the scalp was not infrequent in the same class of children. A history of cough and loss of weight was seldom secured. Urinalysis, with special reference to the presence of albumin, sugar and indican, invariably gave negative results.

The routine eye examinations for this class of cases revealed nothing unusual as regards the clinical picture of the conjunctiva, limbus or cornea, and presented no statistical data of special significance. Could these manifestations be explained by tuberculosis? The most thorough search to sustain such a diagnosis by all available clinical agents proved futile. While there is no lack of ophthalmologists who still believe tuberculosis or tuberculous toxins to be the cause of phlyctenular disease, there are authorities who have emphatically rejected this theory.

Macnab,¹ quoting Axenfeld, says:

Axenfeld has thoroughly disposed of the contention that phlyctenules are true tubercular lesions, and Mueller, in a series of transplantation experiments in which fresh phlyctenules were introduced into the anterior chamber of rabbits, failed in every case to produce a typical tubercular lesion.

John W. H. Eyre,² hunterian professor and examiner in bacteriology of the Royal College of Surgeons, in his hunterian lecture on tuberculosis of the conjunctiva, says:

That many of those subject to phlyctenules give evidence of the existence of tuberculous infection in some portion of their tissues is no evidence that the conjunctiva lesion is also tuberculous, and until some responsible observer has demonstrated the presence of the tubercle bacillus in an extended series of phlyctenules, I see no valid reason for regarding

1. Macnab, Angus: *Diseases of the Cornea*, New York, William Wood & Co., 1907.

2. Eyre, J. W. H.: *Lancet*, London, 1912, **1**, 1319.

phlyctenulosis of the conjunctiva per se as a form of tuberculous of the conjunctiva.

L. V. Hamman,³ chief of the Phipps Tuberculosis Dispensary of Johns Hopkins Hospital, and co-author of Hamman and Wolman's work, "Tuberculin in Diagnosis and Treatment," says that if phlyctenulosis is a tuberculous manifestation it certainly some time should show the presence of the tubercle bacillus, and that the tuberculous toxin theory is fast losing ground.

George S. Derby⁴ of Boston, who has treated a great many of these conditions with tuberculin, says:

I have had considerable experience with tuberculin in the treatment of phlyctenulosis, and I feel doubtful whether any of these cases have been much benefited by it.

Brown and Irons⁵ of Chicago recently reported on 100 cases of disease of the uvea, and in only two cases did they have a focal reaction with the subcutaneous test. This demonstrated the rarity of tuberculosis of the eye.

In common with the most universally accepted teachings, I have long abandoned the use of the skin test after the second year of life. In patients under that age only 35 per cent. gave a positive reaction, and that usually was a delayed local reaction, while the subcutaneous tests, which have been tried in a relatively small number of cases, rarely proved positive. Therapeutically the topical and subcutaneous use of tuberculin proved without effect. Tuberculosis as a factor in phlyctenular disease can therefore be absolutely set aside.

Attempts to secure cultures from phlyctenules have not given satisfactory results, owing to the great difficulty in securing unmixed material from the papules even before they ruptured. As a rule the same flora was encountered which is commonly found in all conjunctival sacs, namely, staphylococcus, pneumococcus, diplococcus, *Micrococcus catarrhalis*, xerosis bacillus and others. Reliable workers have found the contents of unruptured phlyctenules to be absolutely sterile.

While syphilis suggests itself as a possible factor, though no one has so far seriously considered it, this can be eliminated, since in the available material no data for such a diagnosis were even remotely present.

Finally, the removal of enlarged and diseased tonsils and adenoids for the purpose of influencing the ophthalmia, which had been strongly advocated some time ago, was subjected to a thorough test, but in spite of numerous radical enucleations no appreciable effect on the course of the disease could be demonstrated.

There remains the theory of intestinal putrefaction, which even at the present time has many advocates. The histories of all patients under observation show that their parents have seldom observed offensiveness of the stools. I made the Obermeyer test for indican in twenty-five cases, but no trace of this was discovered in the urine. This, however, need not be accepted as conclusive evidence for the absence of intestinal putrefaction. Though intestinal putrefaction could not be demonstrated through urinalysis, a number of patients were treated on the assumption that the intestinal disturbances actually existed. Suitable drugs, such as salol, calomel, acetylsalicylic acid, sodium salicylate, bismuth, sodium bicarbonate, liquid petrolatum and lactic acid bacillus either in pure bouillon

culture, in tablet or in powder form, were administered, each single drug being subjected to a prolonged test.

It is interesting to note that, of all of the drugs used, calomel appeared to produce the most favorable results. This led to the adoption of an empiric routine, namely, atropin locally and calomel internally, as the most effective medicinal therapy.

It may be added that for some time the favorable results obtained from this combination encouraged the conviction that intestinal putrefaction was the solution of the problem, and the tentative acceptance pointed to the next step to carry the treatment to logical finality through the addition of the appropriate dietetic measures.

When the parents of the afflicted children were questioned, it was learned that fully 98 per cent. of the patients consumed an excessive amount of carbohydrates, especially in the form of sweets. At first I was inclined to pay scant attention to this feature. Further questioning, however, elicited the statement that these very children had little desire for plain, nutritious food. With a view of ascertaining whether or not this faulty diet had any decisive influence on phlyctenular disease, a practically carbohydrate-free diet was instituted in a series of cases as the single and sole method of treatment, excluding even the topical use of atropin, with the gratifying result that the children so treated did far better than with calomel and atropin alone. Later medication and diet were combined with exceedingly satisfactory results. The diet prescribed consisted of plain foods, as bread, butter, milk and eggs. This dietary cannot be regarded as ideal, but was the best available for external reasons.

These results were so striking that many interested colleagues who were familiar with this series of experiments admitted the striking improvements, but questioned the direct relation of the dietary to the favorable phenomena. As I was convinced that the dietetic regimen alone and unaided was the principal cause of the favorable course of this disease, another series of experiments was made which left no room for further doubt. A number of children whose affections had been under complete control were taken off the dietetic regimen, and given foods rich in carbohydrates. Almost at once this disease reappeared with the acuity of a pronounced relapse. These experiments were repeated at frequent intervals, and invariably yielded the same results.

The experience became so convincing that whenever patients presented themselves with a relapse, faulty diet was assumed and invariably admitted. Again and again the observation was made that relapses occurred when the parents ceased to exercise control over their children, enabling the latter to yield to the temptation to consume sweets. Naturally the question suggested itself whether the dietetic error, shown to exercise a decided influence on the course of the disease, was to be sought in the carbohydrates per se, or merely in the sweets. To answer this question, a control test was made in which ample doses of saccharin were administered as a substitute for the sweets. It was now uniformly observed that this coal tar product did not in the least show any unfavorable influence on the ocular manifestations, proving conclusively that the carbohydrates per se must be held responsible. Whether the unfavorable influence of carbohydrates is to be ascribed to faulty metabolism, or to a limited ability of assimilation of the carbohydrates, the excess probably under-

3. Hamman and Wolman: Tuberculin in Diagnosis and Treatment, p. 209.

4. Derby, G. S.: Disease of the Optic Nerve in Myxedema, THE JOURNAL A. M. A., Sept. 21, 1912, p. 1045.

5. Brown and Irons: Paper read before the Chicago Ophthalmological Society, 1916.

going chemical changes, which in turn yield toxic or irritating agents sufficiently effective to produce eczematous manifestations, must for the present remain an open question. As regards the *modus operandi* of whatever processes are responsible, we must look to physiology for an explanation.

It will be recalled that some time before the investigation was completed, the routine treatment of atropin topically, calomel internally and a carbohydrate-poor diet was found to yield the best results. The rationale of the administration of calomel needs no defense; but this drug has no bearing on the favorable influence of atropin, the latter having proved effective even without calomel. How can this be explained? Might it not be that in phlyctenular disease we have actually to deal with a part of the picture of exudative diathesis as propounded by Czerny,⁶ and that the external phenomena are the result of irritability or hypertonia of the vagus system?

If this is the case, atropin, and not calomel, is therapeutically the drug best suited. Accordingly, calomel was abandoned and atropin administered internally instead, in a series of cases, as suggested by the practice of Krasnogorski⁷ and Leopold,⁸ who prescribe a solution of atropin of 1 grain to the ounce of water in doses of 3 drops every three hours, and daily increase the dose by 1 drop until the physiologic effect is reached. A number of patients were treated by this method without stopping the topical applications of atropin and restriction of diet. The tolerance manifested by these children for this powerful drug is quite remarkable, some consuming as high as $\frac{1}{3}$ grain daily.

This form of treatment has now been extensively followed for the past eight months, and the results have been so greatly superior to any routine followed heretofore that, with the present experience as a basis, one cannot but say that absolute control of the symptoms of phlyctenular disease is assured by it. It must be emphasized, however, that while atropin best controls the symptoms, permanence of therapeutic results will depend on a strict adherence to a suitable diet even long after all the symptoms have disappeared.

It is realized that, in the presentation of the observations, workers accustomed to exact laboratory methods will find much that is not free from objections. It is conceded that in the further investigation of phlyctenular disease laboratory workers can find many unexplored avenues for scientific research. The investigation of the blood for the presence of acetone alone presents quite a problem. Chemical studies of carbohydrate metabolism and neurologic study of the vagus system are other fields of interesting activity. But the evidence so far submitted, clinical though it be, is too persistent and too extensive to be ignored.

SUMMARY

1. Ophthalmia eczematosa or phlyctenular disease is not a true pathologic entity but symptomatic manifestation of a systemic disturbance.

2. Tuberculosis, syphilis and sepsis can be excluded with certainty as causal factors.

3. Phlyctenular disease is in all probability one of the expressions of vagus system irritability produced by some toxic agent, resulting from faulty carbohydrate chemism.

4. Correction of the chemism by carbohydrate-free diet and control of the vagus hypertonia through the topical and internal use of atropin yield the best and quickest possible therapeutic results.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. GOLDBACH AND GOLDENBURG

DR. RICHARD J. TIVNEN, Chicago: As to Dr. Goldenburg's second conclusion, that tuberculosis can be excluded with certainty as a causal factor, I must differ with him. Personally, I believe that phlyctenular trouble is an ocular manifestation of tuberculosis, basing my opinion on a study of fifty cases treated with tuberculin diagnostically and therapeutically, as well as a study of the observation of numerous observers.

Dr. Goldenburg has not, in my opinion, submitted any precise scientific data, nor does such research work and observation as he has presented warrant him, in my judgment, in making such a sweeping, positive assertion. It is admitted by those favoring the tuberculous theory that their contentions are far from being proved. It is true, as Dr. Goldenburg says, that the tubercle bacilli have not been found in the phlyctenule; that transplantation experiments with fresh phlyctenules into the anterior chamber of the eyes of rabbits have failed to produce a typical tuberculous lesion. These are the two evidences which at this present time prevent the acceptance of the tuberculous theory. It has been advocated that the failure to obtain success in these may be, perhaps, due to the peculiar vagary of the phlyctenule itself, a peculiar stage of its development or a faulty method of identification. Be that as it may, however, precise clinical observation cannot or should not be ignored. Certainly there is no class of patients who present clinically more significantly the stigmata of a tuberculous process than do these children with phlyctenular trouble. The majority are poorly nourished, of minus resistance, come from bad hygienic surroundings, many present, as Dr. Goldbach and others have shown, tuberculous foci in other parts of the body—the lungs, bones and glandular system. Their phlyctenular trouble itself is, like most tuberculous processes, stubborn, sluggish and prone to recur with each drop or remission in the body resistance. In addition to these clinical observations, tuberculin diagnostically and therapeutically does give a positive response in an astonishingly large number of cases and its therapeutic administration does, according to competent observers, give improvement.

DR. HUNTER H. TURNER, Pittsburgh: The perversion of carbohydrate metabolism or the tuberculous theory cannot explain the variations which characterize phlyctenulosis. It is generally conceded that the ocular manifestation is secondary. Where, then, and of what character is the primary lesion? The fact that the process remains limited, in many cases, to only one and always the same eye, over a period of years, is proof positive of a tissue pathology, if not of the eye then of some contiguous structure which may be unilateral. I am firmly convinced that the essential lesion in these cases is a low grade, chronic ethmoiditis with obstruction to drainage. The outer wall of the labyrinth forms the inner third of the bony orbit and is frequently defective. Skillern says that it is common for sinusitis to occur in children during the course of measles, scarlet fever, pertussis, influenza, pneumonia, etc., and that the resulting tissue devitalization favors a secondary infection which may persist indefinitely. All ophthalmologists know how frequently the primary attack of phlyctenulosis follows these acute infectious diseases. Skillern quotes Hajek to the effect that indiscretions in diet will produce an exacerbation of a chronic sinusitis. The several elements which may influence unfavorably the local sinus lesion are: diseased tonsils and adenoids; obstruction to ethmoidal drainage by deflected septum, spurs, or "tight" nostrils, which in children usually result from faulty eruption of the teeth; any general toxemia, of which the chief is intestinal in origin. Hypertrophied pathologic tonsils and adenoids produce a stasis in the lymphatic flow with intumescence and boggiess of the intranasal and intrasinus mucosae and interference with sinus drainage. The

6. Czerny: Exudativa Diathesis, Jahrb. f. Kinderh., 1905, p. 199; Scrofulosa and Tuberculosis, *ibid.*, 1909, p. 529.

7. Quoted by Leopold (Note 8).

8. Leopold, J. S.: Atropine Treatment for Exudative Diathesis in Infancy, Am. Jour. Dis. Child, October, 1915, p. 288.

retained infected sinus contents accumulate under pressure, are forced into lymphatic channels and carried along to the tissues of the conjunctiva or cornea, where they lodge and produce the typical phlyctenular lesions. The removal of such diseased tonsils will effect a relief of the condition only when they are the sole exciting factor.

DR. GEORGE F. SULLIVAN, Hoboken, N. J.: I do not agree with Dr. Goldenburg that we can immediately cast aside the theory of tuberculosis. According to the title of the paper this is an ophthalmia eczematosa. Almost all skin men agree at present that infantile eczema or eczema in the adult is a protein sensitization. That is, there is anaphylaxis to certain proteins. If such is the case, a high protein diet would increase the eczema instead of decreasing it, inducing anaphylaxis. In eczema Dr. Bulkley gives a diet of rice, bread and butter and water. He usually keeps the patients on this diet four to six days, and most of them clear up wonderfully. Twenty or thirty years ago Dr. Herman Knapp in his questionnaire usually gave as the first question, "Does the child eat cinnamon buns, fresh bread, tea or coffee?" The question was usually answered in the affirmative. He immediately placed them on a rigid protein diet, as one would patients with tuberculosis or adenopathy. There is a general adenopathy in 50 per cent. or more of the cases, which is indicative of tuberculosis, and the first thing you do is to place them on a tuberculosis regimen—give them fresh eggs, milk, air baths and cod liver oil. I think cod liver oil is a great help, and I think tuberculin in long continued treatment is efficacious. If tuberculin therapy was carried out long enough we would see better results. Dr. Derby found that 88 per cent. responded to the von Pirquet test. In these cases I feel that it does not make much difference whether one gives atropin internally or in the eye, provided it is used weak enough; $\frac{1}{100}$ of 1 per cent. locally will give practically the same results as if given internally in larger doses. Mercury is given empirically. We do not know whether it does any good or not, but atropin is an antispasmodic and the results have been through its influence on the ciliary muscle.

DR. H. W. WOODRUFF, Joliet, Ill.: It seems to me that the one fact we should bear in mind is that we should try not to become men of one idea. We set up a certain theory or idea and make everything focus in that direction. There are certain facts that stand out clearly in connection with this disease, and one is that these cases seldom occur where the children have the best surroundings. That of course fits in with tuberculosis, but at the same time it fits in with many other diseases. I do not see that we have gone far in taking up this question of the exudative diathesis. I have read what I have been able to find on that subject and I do not see that we have advanced any further than when we talked about scrofula. We had no definite explanation about scrofula; then came the theory of tuberculosis. Now we are asked today to take up the theory of the exudative diathesis. It is fortunate indeed that we are still able to treat these diseases even when we do not know absolutely the cause; in fact, there is no one cause; it is a combination of conditions.

DR. A. E. DAVIS, New York: I want to speak of the treatment. I have been using the tuberculin treatment for some years and I am still more favorably impressed with it than when I began. I agree with Dr. Woodruff that we do not know what causes it; we are still guessing; but we do know the result of treatment. My belief is that we stop the tuberculin treatment too quickly in these patients. For instance, we have a child with phlyctenule and the other discrasia of scrofula. We put it on a diet, local and constitutional treatment, and perhaps tuberculin. As soon as these little phlyctens disappear and the child picks up some we turn him loose. What is the result? If you get him early in the spring, he has another attack before summer comes on. I have found that if we give them four months' treatment the tendency is not for a recurrence. That is the point I should like to impress on the section, that we do not give the treatment long enough. I also like to get some reaction from the tuberculin injections. I do not believe in keeping them too

low. We ought to know when we get the effect, and when we get a reaction, drop back a little and hold it there.

DR. LEO J. GOLDBACH, Baltimore: These patients had thorough physical examinations; blood tests and roentgenograms were made. They were referred to different departments for special examinations. Our social worker followed up each case, making them come back for treatments and observation by giving inducements. We did get some results. I agree with Dr. Davis that it is important to keep up the tuberculin treatment. We have some cases that have had sixty injections or more. With thorough examinations and team work we intend to follow up these cases. The phlycten is a manifestation, and the tubercle bacillus will not be found in the sections. It is an ocular manifestation of some systemic discrasia, probably tuberculosis.

DR. MICHAEL GOLDENBURG, Chicago: In reply to Dr. Tivnen, I would suggest that he try in his next fifty cases the régime he suggests, minus the use of tuberculin, and I am sure he will get just as good results. I have tried it, and if he will try the treatment I have outlined in a series of cases I will positively promise him better results and in half the time.

In regard to this condition occurring in poor people, it is true it is much more common in poor people, not because they are poor or because their food is poor, but because they are members of large families where the mothers are unable to give the children individual attention. In private practice or in adults, where I have been able to obtain intelligent cooperation, I have not had a relapse in the past three or four years. Dr. Tivnen quotes Finkelstein: "Finkelstein mentions an alimentary intoxication due to carbohydrate intolerance."

As to Dr. Turner's suggestion of sinusitis as a causal factor, I have examined the nasal passages of a great many of these children and could find no cause for thinking as he does. The rhinorrhea present is largely due to excessive lacrimation and patent tear ducts.

As to Dr. Sullivan's suggestion of anaphylaxis, I tried to account for this condition on these grounds a few years ago, but could make no headway. I went into their dietary thoroughly and found they consumed an excess of carbohydrates, not proteins. It is to be regretted that very little appears in the literature on carbohydrate metabolism after the second year of life; everybody seems to be working on proteins. As to the action of atropin, it has been my experience that in the severe cases, as soon as the pupils are thoroughly dilated, the local symptoms subside, and not before. In fact, if a child did not show improvement in a few days I could say that the pupils were not dilated, even before I separated the lids. Atropin at first has a simulating action, and during this stage it acts on the vagus.

Standardizing War Relief.—Winthrop D. Lane in the *Survey*, April 14, 1917, describes the plan of organization of the Red Cross into departments of civil and military relief, which are made distinct. Base hospitals, hospital units, emergency nursing corps, etc., have been organized by the military department. There has also been created within the military department the bureau of Red Cross Supply Service, with branches in Boston, New York, Chicago, New Orleans, Denver and San Francisco, with a director in charge of each. The objects of this service are to afford full information of the standard kind and quality of all supplies for military relief; to collect, inspect and store until needed supplies produced for that purpose; to distribute supplies of the right kind and quality at the right place at the right time, and to have the ability to do so on every request of the army or navy; to stimulate the production of useful, standardized material, not only by chapters and members of the Red Cross, but by all interested organizations and citizens generally. The Red Cross by proclamation of President Taft in 1911 is the only volunteer society authorized by the government to render aid to the land and naval forces in time of war, and all other societies or organizations desiring to render similar assistance must do so through the Red Cross. The organization of the new bureau of supplies will tend to prevent confusion, duplication, delay and waste in the matter of supplies.

THE EARLY DIAGNOSIS OF DIABETES

A SIMPLE METHOD INVOLVING STRAIN ON THE
CAPACITY OF THE TISSUES TO UTILIZE
GLUCOSE *

THOMAS ADDIS, M.D.

SAN FRANCISCO

The essential difference between the normal and the diabetic organism is the inability of the latter to utilize as much glucose as the former. This much may be said with certainty even though the structural defect of which this functional disability is the expression remains obscure. The evidence for and against it was discussed by Allen in 1913. He added new experimental evidence of his own in its favor, and since that time further data have been accumulated by others till there is now no reasonable room for doubt.

Accuracy in early diagnosis usually follows the ability to demonstrate one or other of the essential links in the chain of the causation of disease. The early diagnosis of typhoid and of syphilis is possible because the typhoid bacillus and the *Spirochaeta pallida* can be found. In these instances one of the ultimate factors in the etiology is demonstrable. But it is not necessary to reach ultimate causes in order to attain certainty. In the diagnosis of hemophilia, for instance, the recognition of the slow rate at which prothrombin is converted into thrombin suffices, although the exact structural anomaly from which that phenomenon arises is unknown. So, in diabetes, ignorance of the fundamentals of its pathogenesis is no reason why knowledge of its proximate causation should not be utilized for the recognition of the condition in its early or latent stages. When the symptoms of polyuria, thirst, weakness and loss of weight have developed, the loss of power to utilize sugar does not require demonstration; its results are already plain. But it is important from the point of view of treatment that a diagnosis should be established before and not after these symptoms have appeared. This is always possible, and in the future will be more and more frequently accomplished. It is possible not because of any special astuteness on the part of the physician in the recognition of a complex of slight clinical indications, but as an indirect result of the finding of one objective sign—glycosuria; and this sign will be more frequently used as an opportunity to determine or to exclude the existence of the diabetic condition, as the practice of having the urine examined for sugar apart altogether from the existence of diabetic symptoms becomes more and more widespread.

Glycosuria is found before other symptoms and signs of diabetes have developed; sometimes long before. It is one expression of a loss of the capacity to assimilate sugar, and it happens to be the one which is most easily and accurately measured. But it can never be taken as the sole basis for a diagnosis of diabetes, for glycosuria may arise from other causes than failure to utilize glucose. Nondiabetic glycosurias are frequently encountered.

Some years ago we determined the frequency of glycosuria in ambulatory patients coming to the outpatient department. In a series of 2,165 consecutive urinary examinations, a positive Benedict's test was found in 192. All gave a positive or doubtful reduction of Fehling's solution. In thirty-three of these

cases, the reducing agent was shown beyond doubt to be glucose. Typical ozazone crystals were isolated, and a definitely positive fermentation test obtained. Of these thirty-three cases, only twelve could be diagnosed as diabetes. In the remainder, no symptom or sign of that condition could be found. Thus, roughly, there was a patient with glycosuria but no other evidence of diabetes among every hundred coming to the clinic. It was the frequency of glycosuria demonstrated in this study which led to the development of the method now described. Its use has shown that nondiabetic glycosuria is more often encountered than diabetic.

Each type of glycosuria has a different cause, and a distinction between them must rest on their causation. Only diabetic glycosuria is due to a deficiency in the capacity of the tissues to utilize glucose. In order to separate it from other forms, it is necessary to demonstrate some characteristic arising directly from its specific cause. Its cause is a failure of one of the functions of the body, and the measure of the degree of this failure is the quantity of sugar lost in the urine. It is a generally applicable principle that a defect in function becomes more and more apparent, the greater the strain to which it is subjected. If the tissues were called on for successively increasing amounts of work in assimilating glucose, we should therefore expect to find evidence of a correspondingly increasing failure of function in the form of larger and larger quantities of glucose in the urine. In the test the increasing amounts of work are given in the form of 0, 25, 50, and 100 gm. of glucose taken on four consecutive days. Under these conditions it is only in the cases in which the glycosuria arises from failure to utilize glucose that a sharply rising curve of sugar excretion is found. The details of the test are given in the instructions we are in the habit of handing to outpatients:

INSTRUCTIONS FOR OUTPATIENTS

1. GENERAL

The test consists in the study of the urine after giving a measured amount of a special sort of sugar. On the first day, a measured amount of water but no sugar is taken in order to find out the amount and character of the urine when no sugar is taken. On the second day, 25 gm. of sugar are taken with water at the beginning of the day, on the third 50 gm., and on the fourth day, 100 gm. Each day, the test extends over a period of four hours, beginning from the moment you rise from bed. The urine must be passed at the end of the second and at the end of the fourth hours. It is very important to note the exact time of taking the water, or the water with the sugar dissolved in it, and the urine must be passed exactly two hours later.

All the urine passed at the end of the second hour goes into one bottle, and all the urine passed at the end of the fourth hour into another bottle. This is an important point. We cannot get reliable information unless the total amount of urine is brought. Write your name on the bottle and put "No. 1" on the first bottle, and "No. 2" on the second, and bring or send them to the hospital. At the end of the fourth hour on each day, the test is ended for that day, and you can eat or drink as you please.

2. INSTRUCTIONS FOR THE FIRST DAY

A. In the morning when you rise from bed:

1. Pass all urine.
2. Immediately afterward drink 1 pint of water (if you have not a pint measure, use an empty pint milk bottle as a measure.
3. Make a note of the time.
4. Take no breakfast.

* From the Laboratory of the Medical Division of Leland Stanford Junior University, School of Medicine.

- B. Exactly two hours later:
1. Pass all urine and collect all of it in a corked bottle to which you will attach the label marked "First Day—Specimen 1."
 2. Immediately afterward, drink a pint of water.
 3. Make a note of the time.
 4. Take two boiled eggs or poached eggs without salt, but take no other food.
- C. Exactly two hours later:
1. Pass all urine and collect all of it in a corked bottle to which you will attach the label marked "First Day—Specimen 2."
- This is the end of the test for the first day.
Write your name, address, and clinic number (the number on the card you received at the history room) on the labels and bring them any time before 3 p. m. on the same day.

Similar detailed instructions are given for the other days, with the exception that the patient is told to take 25 gm. of glucose on the second day, 50 gm. on the third day, and 100 gm. on the fourth day, dissolved in the first pint of water.

COMMENT

During the past three and a half years this test has been used in over 100 cases of glycosuria. There were of course instances of failure to collect all the urine, but surprisingly few. In nearly all cases the results were quite definite, and we have not found a case in which a diagnosis based on the test has later proved to be incorrect.

In Table 1 examples are given of cases in which a diagnosis of diabetes was made. The characteristic common to all of them is the considerable relative increase in glucose excretion with increase in the quantity taken. It is on this evidence of a relation between the extent of the failure to assimilate glucose and the degree of strain imposed on the assimilative function that the diagnosis is based.

TABLE 1.—EXAMPLES OF CASES DIAGNOSED AS DIABETES MELLITUS

Patient	Amount of Glucose in Urine			
	First Day	Second Day	Third Day	Fourth Day
	Intake=0 Gm. Glucose Gm.	Intake=25 Gm. Glucose Gm.	Intake=50 Gm. Glucose Gm.	Intake=100 Gm. Glucose Gm.
1.....	0.0	0.6	3.8	11.6
2.....	0.0	0.5	3.0	12.3
3.....	0.0	0.5	3.5	14.8
4.....	0.0	1.1	6.2	20.4
5.....	0.0	1.1	5.1	....
6.....	0.2	1.2	2.0	4.4
7.....	0.1	7.5	9.4	14.8
8.....	0.9	5.8	14.5	22.4
9.....	8.2	18.1	29.9	49.7
10.....	4.3	20.5	25.7	24.4

In cases such as the first four we have cited, the patients are frequently without diabetic symptoms, and were asked to go through the test because sugar had been found in a routine examination of the urine. These are instances of the early diagnosis of diabetes.
Patients with diabetes in whose urine sugar is found on the first day of the test when no glucose is taken have almost always already developed such symptoms as polyuria and loss of weight. There is great variation, however, in the severity of the symptoms. Patient 6, for instance, had no symptoms, although in Case 7 they were very pronounced. In Case 6 there was considerable doubt in making a diagnosis of diabetes. The increase in the amounts of sugar excreted

was so small that it was thought he might have a renal diabetes; the subsequent course, however, showed that there was a true diabetes, though of a very mild type.
Pronounced renal insufficiency may apparently alter the curve of glucose excretion. Patient 10 had chronic glomerular nephritis, and died a few months after the test in uremia.
When sugar is found in the urine only after 100 gm. of glucose, a further dose of 150 gm. may be given. We found that none of these cases showed a significant increase in glycosuria after 150 gm., but no doubt there is a stage in the development of true diabetes at which

TABLE 2.—EXAMPLES OF CASES DIAGNOSED AS NON-DIABETIC GLYCOSURIA

Patient	Amount of Glucose in Urine			
	First Day	Second Day	Third Day	Fourth Day
	Intake=0 Gm. Glucose Gm.	Intake=25 Gm. Glucose Gm.	Intake=50 Gm. Glucose Gm.	Intake=100 Gm. Glucose Gm.
1.....	0.0	0.0	0.0	0.0
2.....	0.0	0.0	0.3	0.0
3.....	0.0	0.9	1.0	0.1
4.....	0.0	0.6	2.9	2.5
5.....	0.0	0.0	2.9	2.0
6.....	0.0	0.7	0.8	2.2
7.....	0.0	0.3	0.6	1.1
8.....	0.0	0.5	0.8	0.6
9.....	0.3	0.3	0.3	0.3
10.....	0.0	0.0	0.0	0.0

there will be no sugar after 50 gm., a little after 100, and a considerably larger amount after 150 gm. At that time, however, there is not likely to be the occasional trace of sugar in the urine after carbohydrate food which attracts attention to the need for testing the capacity of the tissues to assimilate glucose.
In Table 2, examples of nondiabetic glycosuria are given. The characteristic common to all is the want of a relationship between the amount of sugar ingested and the amount excreted. With increase in the quantity of glucose taken, there is no increase or only a trivial increase in the quantity of sugar found in the urine.
The first four cases are instances of the type of glycosuria which is most frequently encountered. A patient comes to the clinic in a state of nervous tension. A little sugar is found in the urine. But when he goes through the test there is usually, as in Case 1, no sugar found in any of the specimens, though sometimes small amounts are found not steadily augmenting on the successive days, as in Cases 2, 3 and 4. Such glycosurias are probably analogous to the experimental glycosuria which may be induced by epinephrin. There is a sudden conversion of glycogen in the liver into glucose with a consequent temporary hyperglycemia and the loss of a little sugar in the urine. We have seen several instances of first class risks having been rejected by insurance companies on account of this evanescent and harmless glycosuria. The same error is doubtless now being made in the medical examination of recruits.
In Cases 5 and 6 there were symptoms of hyperthyroidism. There is a good deal of evidence which goes to show that this also is an epinephrin glycosuria. But here the state of excitation is more continuous than that which is seen in neurotic persons under strain, or in almost any one in the excitement produced by some physical accident. As a consequence, the glycosuria is more constant. Yet since it is not dependent on any

loss of capacity to assimilate glucose, it can be distinguished from the diabetic type. Both, it is true, are due to an excess of sugar in the blood, in the one case to an overproduction of sugar from glycogen, and in the other to a failure of the tissues to use the sugar brought to them. In the patient with hyperthyroidism, the ingestion of sugar tends as in the normal person to produce for a short time a slight increase in the sugar content of the blood; but it is very temporary, and with every round of the circulation more and more of the excess is removed by the tissues. There is a limit to the rate of absorption of sugar from the intestine, and the greatest rate of absorption is less than the capacity of the tissues to take up the absorbed sugar, so that it comes about that the ingestion of increasing quantities of sugar leads to little or no increase in the sugar excreted in the urine. In the diabetic, on the other hand, when sugar is taken there is hyperglycemia which lasts longer and rises higher, the greater the quantity consumed.

Patients 7, 8, 9 and 10 probably had renal diabetes. Most of the examples of this condition which we have seen have been in pregnant women. Here there is no hyperglycemia, but the kidney threshold for sugar is lowered. The increase in the blood sugar content following sugar ingestion may lead to a slight increase in the glycosuria, but there is not the marked increase seen in diabetes, and, as it happens, our results in these cases have not been hard to interpret. If there should be doubt, an estimation of the blood sugar during a period when sugar is present in the urine will decide the question.

It is, of course, obvious that this method has not the accuracy or conclusiveness of a determination of the capacity of sugar utilization by the intravenous injection of sugar with the Woodyatt pump, for there are doubtless considerable variations in the rate of absorption of sugar from the intestine. But what it lacks in accuracy is more than counterbalanced by its applicability and simplicity. This test is better than the common practice of giving 100 gm. of glucose. If sugar is found in the urine after such a single dose, it may be an epinephrin or a renal as well as a diabetic glycosuria. It is the steeply rising curve of sugar excretion, not the mere presence or amount of sugar in any one collection of urine, which is of diagnostic value.

Finally, it should be noted that the usefulness of the method is not confined to the early diagnosis of diabetes. It is important that a carbohydrate-free diet should not be given to a woman with a lowered kidney threshold for sugar during pregnancy, and it is worth while to save patients with hyperthyroidism from a diet from which the sort of food best fitted for them is excluded.

PRIMARY NONPIGMENTED SARCOMA OF THE SKIN*

JOSEPH ZEISLER, M.D.

AND

ERWIN P. ZEISLER, M.D.

Professor of Dermatology and Syphilology and Instructor in Dermatology and Syphilology, Respectively, Northwestern University Medical School

CHICAGO

Primary, nonpigmented, isolated sarcoma of the skin is of relatively infrequent occurrence. The majority of dermatologists have seen but few cases, if one may judge from the scarcity of reports on the subject. Advanced sarcomas of the skin and subcutaneous tissues are more frequently encountered by the surgeons because of the large size attained by these growths and the necessity of surgical removal. Hartzell¹ has remarked that the sarcoma of the surgeon differs widely from that of the dermatologist.

The classification of the cutaneous sarcomas is still a debated question. In recent years the group of malignant pigmented tumors formerly regarded as melanosarcoma has been classed by most pathologists as nevocarcinoma or malignant melanoma. The various sarroid, lymphoid and myeloid tumors, as well as Kaposi's hemorrhagic sarcoma, have also been separated from the pure sarcomas of the skin. The nonpigmented sarcomas are usually subdivided into localized or single, and multiple or generalized forms. Histologically they are further divided into spindle cell (fusocellular), round cell (globocellular), giant cell and mixed cell. It is our purpose briefly to consider

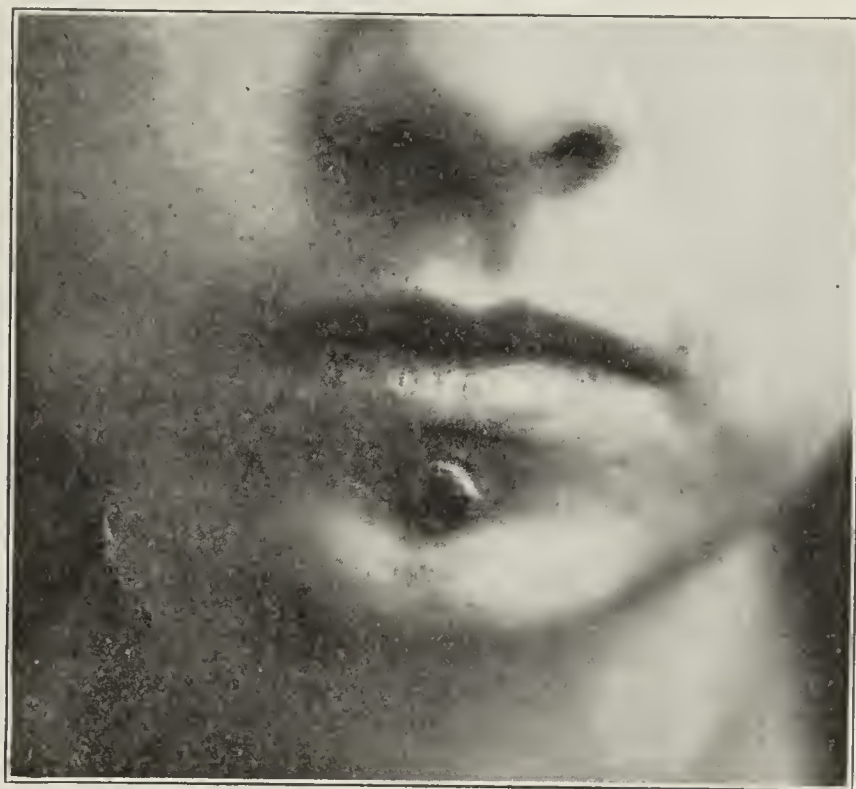


Fig. 1 (Case 1).—Primary fibrospindle and giant cell sarcoma of the skin.

the clinical and histologic aspects of the primary, solitary nonpigmented variety and to report two cases which we have had the opportunity to study in their early stages.

REPORT OF CASE

CASE 1.—History.—Miss G. F., aged 21, came under observation in December, 1915, with a hard nodular tumor of the skin below the lower lip. This was first noticed in February, 1915, as a small nodule which increased slowly but steadily in size. The patient denied that there had been any abnormality of the skin previous to the appearance of the tumor at that site. In August, 1915, the growth was about the size of a pea and was excised by her physician. Within a few weeks there was a recurrence, and it has rapidly grown to its present size. There has been no pain, no bleeding, and no discomfort aside from the unsightly appearance of the growth.

Present Condition.—Midway between the lower lip and the chin was a yellow, xanthomatous-looking, platelike nodule situated deeply in the derma (Fig. 1). The tumor was about

* Read before the Section on Dermatology at the Sixty-Eighth Annual Session of the American Medical Association, New York June, 1917.

1. Hartzell: Jour. Cutan. Dis., 1893, p. 21.

1 cm. in diameter, round, circumscribed, and considerably elevated above the surrounding skin. Minute blood vessels were seen over its surface. Its consistency was hard, almost cartilaginous, and the tumor mass could be palpated for fully 0.5 cm. in the depth of the subcutaneous tissue beyond its visible border. Through the mucosa of the lip the tumor was readily felt as a platelike mass extending close to the mucous membrane. There was no enlargement of the submental or other cervical glands. No other cutaneous growths were present. A careful physical examination revealed no evidence of visceral metastases. Examination of the blood and urine was negative.

It was at once apparent that we were dealing with an unusual tumor of the skin, and the possibility of an isolated xanthoma or an osteoma was thought of on account of the cartilaginous feel of the tumor. Under local anesthesia the tumor was widely excised and the cavity cauterized with silver nitrate. Subsequently flat radium applicators were employed both externally and through the mouth for 60 milligram-hours in broken doses until a distinct reaction was produced. The wound healed perfectly in three weeks, leaving a smooth scar without infiltration. There have been no recurrences up to the present time and no evidences of metastases.

Histologic Examination.—Grossly the specimen on cross-section was found to be yellowish throughout and peculiarly hard. Histologically the findings with ordinary stains were as follows: The epidermis was thinned but otherwise normal. The papillae were mostly obliterated. The entire corium and subcutaneous tissues were replaced by a solid mass of cells of various kinds (Fig. 2). In the subpapillary zone was a loose meshwork of spindle-shaped cells with a few plasma cells and small multinucleated cells. In the deeper strata were found interlacing bundles of spindle cells running in various directions, surrounding small thin-walled blood vessels and mingled with numerous large giant cells. There was considerable fibrillar intercellular substance. The blood

vessels were small, few in number and closely mantled with spindle cells. Under higher magnification the predominating cells were seen to be typically spindle-shaped, with large vesicular nuclei, distinct nucleoli and tapering protoplasm. Many small multinucleated giant cells were present containing from six to twelve deeply stained oval nuclei centrally situated and surrounded by a narrow rim of cytoplasm. In the deeper layers of the tumor were found larger giant cells with from thirty to sixty ovoid nuclei peripherally arranged around a clear central zone (Fig. 3). No mitotic figures were found. Elastic tissue was absent. All the normal glandular and collagenous structures of the corium had been destroyed and replaced by the tumor cells. On account of the clinical resemblance of the tumor to xanthoma, sections were stained with sudan III and osmic acid. None of the characteristic fat containing xanthoma cells were found. The histologic diagnosis was a primary spindle cell and giant cell sarcoma of the skin. This diagnosis was verified by Dr. Robert Zeit, professor of pathology in Northwestern University.

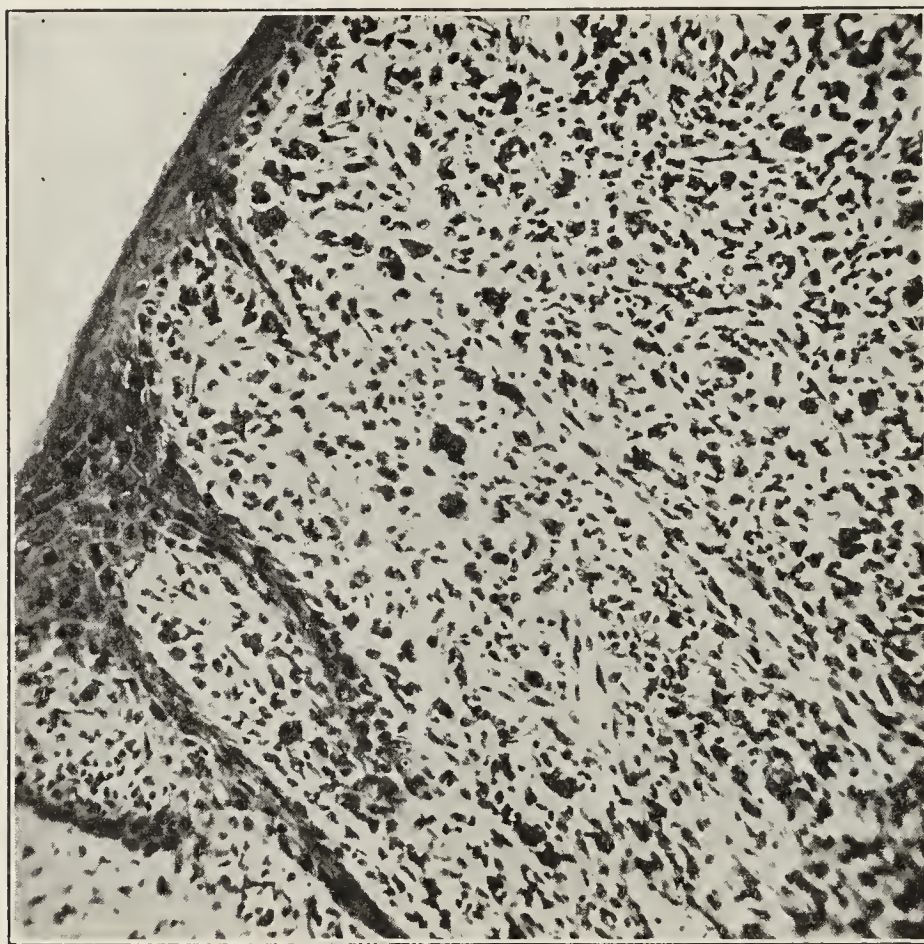


Fig. 2 (Case 1).—Low power photomicrograph showing spindle cells and multinucleated cells ($\times 170$).

COMMENT

On account of the interesting and unusual features of this cutaneous neoplasm, particularly the finding of multinucleated cells, some of which resembled more the Langhans and foreign-body type of giant cell than the myeloplax type, a thorough search of the literature was made for similar cases. Unna² was the first to describe a true giant cell sarcoma of the skin, a bluish-red tumor of the face composed of spindle cells with several nuclei, with a gradual transition to multinucleated giant cells which predominated in the deeper portions of the tumor. Unna states that spindle cell sarcomas rarely show giant cells, while in the round cell forms, cell division is so rapid as to prevent the formation of giant cells. Rahel-Zipkin³ has reported a solitary cutaneous sarcoma of the groin with giant cells of the Langhans type. Pasini,⁴ at the International Congress at Rome in 1910, presented a case almost identical with ours under the title "sarcoma fusi-gigantocellulare della pelle." This was

a small isolated tumor in a woman, aged 23, situated in the cutis and subcutis of the thigh, which had recurred twice after excision. Careful histologic study showed this tumor to be composed of large and small fusi-form cells and large giant cells of variable form, with voluminous nuclei differing from the ordinary giant cell and Robin's myeloplaxes and resembling more those of bone marrow. A number of instances of multiple giant cell sarcomas of the skin were collected by Crocker⁵ in 1903, and a few additional cases have been reported since then. Odstrcil⁶ reported a rare case of primary multiple giant cell sarcoma of the skin with

metastases in the inner organs in a 6 months old boy. Brotman⁷ has described a case under the title "sarcoma cutis gigantocellulare" occurring in a child of 11 with yellowish-brown tumors resembling juvenile xanthoma situated on the eyelids, neck, elbows and groins. Microscopically, those showed large numbers of multinucleated giant cells among the spindle cells.

It is evident, therefore, that a true giant cell sarcoma of the skin, that is, one in which giant cells are present in large numbers and are an essential element in the development of the tumorlike spindle or round cells, must be very rare. Pathologists have not definitely determined the origin of the giant cells in sar-

2. Unna: *Histopathologie der Hautkrankheiten*, 1894, p. 754.

3. Rahel-Zipkin: *Virchows Arch. f. path. Anat.*, 1906, **186**, 240.

4. Pasini: *Gior. ital. d. mal. ven.*, 1912, **46**, 353.

5. Crocker: *Diseases of the Skin*, Ed. 3, 1903, p. 1019.

6. Odstrcil: *Arch. f. Dermat. u. Syph.*, 1912, **111**, 869.

7. Brotman: *Rusk. Jur. Kozhn.*, 1, ven. polienz., 1912, **33**, 137; abstr., *Jour. Cutan. Dis.*, 1913.

coma. Mallory⁸ suggests that there are two types of giant cells: (1) the giant cell due to multiple mitoses, signifying rapid proliferation under favorable nutritive conditions and representing a true tumor cell, occurring in some forms of fibrosarcoma and (2) the giant cell due to fusion of endothelial leukocytes attracted to the tumor by foreign bodies like fat crystals or lime salts around which they have fused. This type is found in the so-called giant cell sarcoma of bone and in the "epulis" tumor of the lower jaw, which is thought by some pathologists to be inflammatory tissue full of giant cells. A few instances of giant cell sarcomas outside of the skeletal system have been recorded in the tendon sheaths of the hands, the uterus, mammary gland, and the subcutaneous tissues. Some of these cases, described as myelomas of the tendon sheaths, have been found to contain cholesterol, and therefore belong to the xanthomas. In every case of sarcoma of the derma or subdermal tissues containing large numbers of giant cells, some possible connection with the underlying bone substance should be sought for in accordance with the theory of embryonal rests or embryonic defects.

REPORT OF CASE

CASE 2.—*History*.—F. W., man, aged 22, was first seen in October, 1915, in consultation with Dr. Irving F. Stein. The patient presented a bean-sized nodule in the skin above the left elbow. Two months previously the arm had been burned by a belt, causing a wound which closed and opened alternately, discharging a dark bloody fluid. Four weeks later he first noticed the cutaneous nodule at the site of the injury. The nodule was bluish-red, and had a hard pearly border, and a crater in the center admitting a probe. There was a slight bloody discharge, but no pain or tenderness. The nodule was rather deeply situated in the cutis. The regional glands were not enlarged. Examination of the rest of the body was negative. The blood and urine findings were normal. The nodule was widely excised under cocaine and epinephrin, and serial sections in paraffin were made. The wound healed within ten days, and there has been no recurrence.

Histologic Examination.—A solid mass of tumor cells occupied the entire corium and extended into the subcutaneous tissue. The epidermis overlying the tumor was thinned and ulcerated at the center of the growth. At the periphery, the infiltrating character of the growth was clearly seen (Fig. 4), small bundles of tumor cells growing between and destroying the collagenous bundles and lymphatic spaces. Under the high power, typical oat-shaped cells were seen, closely massed together in interweaving bundles with little intercellular fibrous tissue. No mitoses were found. All the normal cutaneous appendages as well as the elastic tissue were destroyed in the zone of growth of the tumor cells. Beyond the periphery of the tumor, both elastic fibers and glands were preserved. There was considerable hemorrhagic extravasation at the zone of ulceration, and there were numerous dilated thin-walled blood vessels around which the spindle cells were closely approximated. A small amount of golden-

yellow blood pigment was deposited in the tumor cells occupying the subpapillary space. No giant cells were present. The histologic diagnosis was a pure spindle cell sarcoma of the cutis undergoing ulceration in its early stages. The interesting feature of this case was that it represented a primary spindle cell sarcoma, developing apparently in normal skin after an injury.

COMMENT

The literature contains scattered references to the localized types of cutaneous sarcoma, the spindle cell forms being more frequently observed than the round cell forms. Unna has described the pathologic features of these growths in great detail, and regards the fusocellular form as the main type of sarcoma involving the cutis proper. When the fibrous element is pronounced, the term "fibrosarcoma" is employed, and this represents the most benign type of sarcoma, which frequently originates in a scar or fibroma, grows slowly, and seldom metastasizes. The tumors which arise apparently from the adventitia of the blood ves-

sels, in which the vascular element is pronounced, are called by some authorities "angiosarcoma," although Mallory and other recent writers object to this term. According to Johnson,⁹ the true fibroblastic sarcomas arise in the connective tissue of the corium or subcutaneous tissues and are composed of small or large spindle cells. The small round cell sarcomas he regards as lymphoid in character and the large round cell forms as endotheliomatous. In general the cells of the sarcomas are subject to great morphologic variation, and may appear spindle shaped in one part and round in another.

Etiology.—The origin of the cutaneous sarcomas is as obscure as that of other tumors. The recent experimental studies on the cultivation of sarcoma cells

in vitro and on the growth of fowl sarcoma have supplied many interesting data but have not cleared up the etiology. The chicken sarcoma of Rous is considered by some pathologists as an infective granuloma. The most recent observations which may throw some light on the etiology of sarcoma are those of Leyton.¹⁰ He inoculated rats with an emulsion of rat sarcoma passed through a Berkefeld filter, and in four out of eighteen rats a tumor developed exactly like the spindle cell sarcoma. He considers the active cause of sarcoma a streptothrix, the spores of which pass through a Chamberland filter.

The chief fact to be emphasized in the etiology of the solitary cutaneous sarcomas, judging at least from the literature, is that they rarely originate in the normal cutis but usually begin in some preexisting lesion, such as a congenital nevus, scar, fibroma, lymphangioma, sebaceous cyst, dermoid cyst, "wart" or other

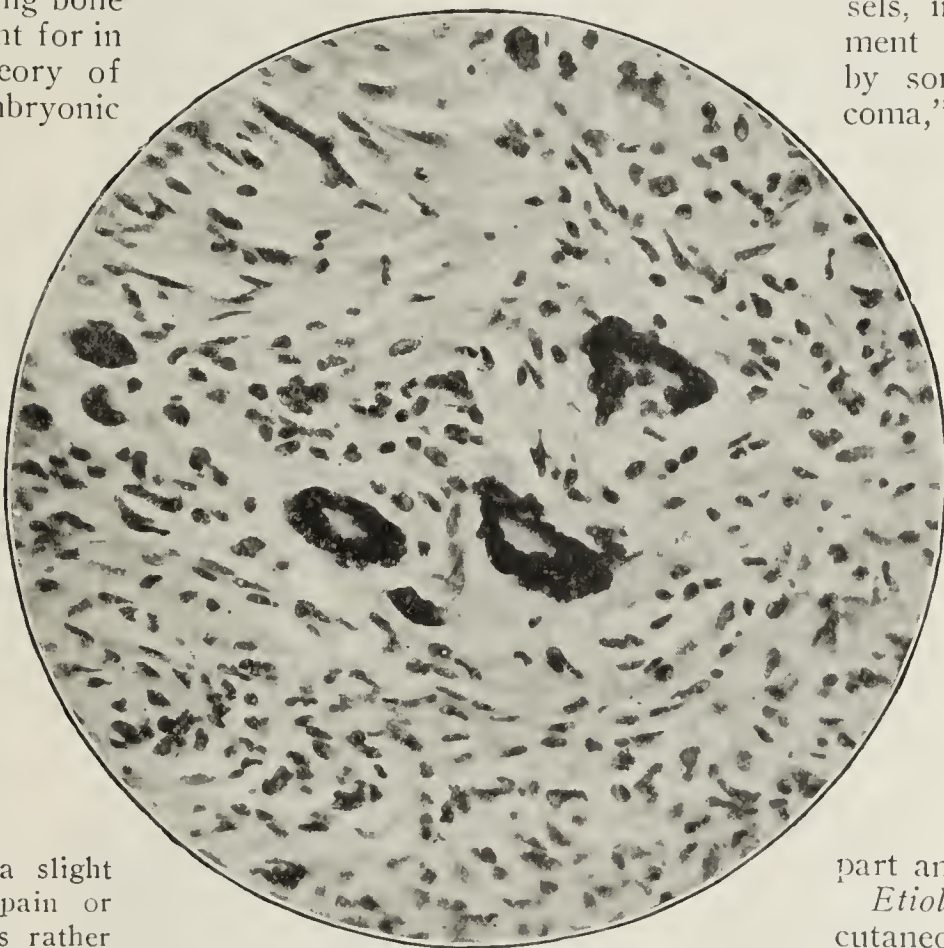


Fig. 3 (Case 1).—High power photomicrograph showing giant cells and spindle cells ($\times 325$).

8. Mallory: Pathologic Histology.

9. Johnson: Jour. Cutan. Dis., 1901, 19, 305; 1903, 21, 23.
10. Leyton: Lancet, London, March 4, 1916.

benign growth. The malignant transformation is probably in many instances due to irritation or trauma. In neither of our cases was a history of a preexisting abnormality obtainable, and an injury was definitely related to the malignant change in the one case. It has been argued that the experimental proof of the development of a malignant tumor as a result of injury is lacking; but clinical evidence, particularly in the case of the sarcomas, shows that a single trauma is of great etiologic importance. Seckel¹¹ has reported the sarcomatous degeneration of a benign "wart" in the arm of a girl aged 20, as a result of irritation. Heredity may play a possible rôle, and a number of cases of congenital sarcoma of the skin are recorded. The development of a cutaneous sarcoma early in life is also a not infrequent occurrence. Dubreuilh¹² has personally observed five cases of round cell sarcoma of the skin in young children from 1 to 7 years of age, three of which began as isolated tumors. He has collected numerous reports of other cases of congenital nonpigmented sarcoma from the literature, most of which were, however, disseminated tumors. These cases show that the theory of embryonic defects must be considered in the etiology.

Clinical and Pathologic Characteristics.—

According to the observations of Funk,¹³ Perrin,¹⁴ Unna,² Johnson⁹ and others, the primary spindle cell sarcoma begins as a reddish-brown or blue-brown, pea-sized macule or as a flat nodule situated in the corium. The fibrosarcoma begins frequently as a white or yellow platelike nodule. The regions of predilection are the head, neck and extremities, rarely the trunk. Further development of the tumor produces either a hard smooth node, or a soft, fungating or even pulsating tumor. Occasionally a diffuse infiltration of the skin results by involvement of the subcutis. The tumor is usually pea to cherry sized, but may even grow to the size of an orange. When the tumor begins in the subcutis it may at first be a mobile nodule with a fibrous capsule, and is easily shelled out. The overlying skin may be unchanged, but later becomes red from pressure. Ulceration is quite frequent, and may take place early. The cutaneous sarcoma enlarges both by proliferation of its own elements and by invasion of the surrounding tissues. It may exist as a localized lesion for months, and dissemination takes place by the formation of secondary nodules in the neighboring or distant skin, subcutis and rarely skin nodes and internal organs. Vascular metastases are more common than are lymphatic. Johnson⁹ gives as the six clinical

features of the spindle cell fibrosarcomas: (1) slight malignancy; (2) absence of metastases in skin nodes and viscera; (3) extremely slow spread; (4) tendency to progression in one spot with spontaneous involution in others; (5) absence of pigment, and (6) superficial character of ulceration if any is present.

The clinical features of the primary round cell sarcomas of the skin belong to two types, according to Hazen¹⁵: 1. A pale red vascular nodule begins in the apparently normal skin, which bleeds easily and tends to ulcerate. 2. A nevus breaks down and undergoes malignant change. Perrin describes a type of round cell sarcoma which begins in the hypoderm as an isolated tumor, and is fatal within two years. Pusey¹⁶ has observed two instances of solitary round cell sarcomas, both occurring on the finger. In one of these cases death occurred within twelve months after excision. Darier¹⁷ has recorded a small round cell sarcoma involving the nose which clinically resembled a rhinoscleroma. In general these tumors are extremely malignant, growth is usually rapid, and metastases are more frequent both in the distant organs and in the regional glands. The small round cell forms are especially malignant.

Diagnosis.—The non-pigmented solitary sarcomas have such variable clinical characteristics that the diagnosis can usually not be made definitely without microscopic confirmation. It is particularly important to differentiate localized granulomas, g u m m a, epithelioma, f i b r o m a, hemangioma and other benign growths of the skin. The rapid growth and breaking down of a fibroma should at once

arouse the suspicion of malignancy. Granuloma pyogenicum has frequently been mistaken for sarcoma. In a case occurring in the practice of Dr. Joseph Zeisler, a young girl presented a

curious, pedunculated dark red, friable tumor of the eyelid, which bled easily and might readily have been mistaken for sarcoma. The microscope showed the typical granulation tissue characteristic of granuloma pyogenicum. Wherever there is any doubt about the diagnosis of a solitary cutaneous neoplasm, the tumor should be excised as a whole and examined microscopically.

Prognosis.—The spindle cell tumors appear to be less malignant than the round cell forms. The excellent results obtained in our two cases show that early surgical removal is frequently followed by cure. The statistics of Bloodgood¹⁸ are interesting in this connection. In a series of six sarcomas arising from congenital nevi there was only one cure. In eight sarcomas designated as hemangiosarcomas, there were

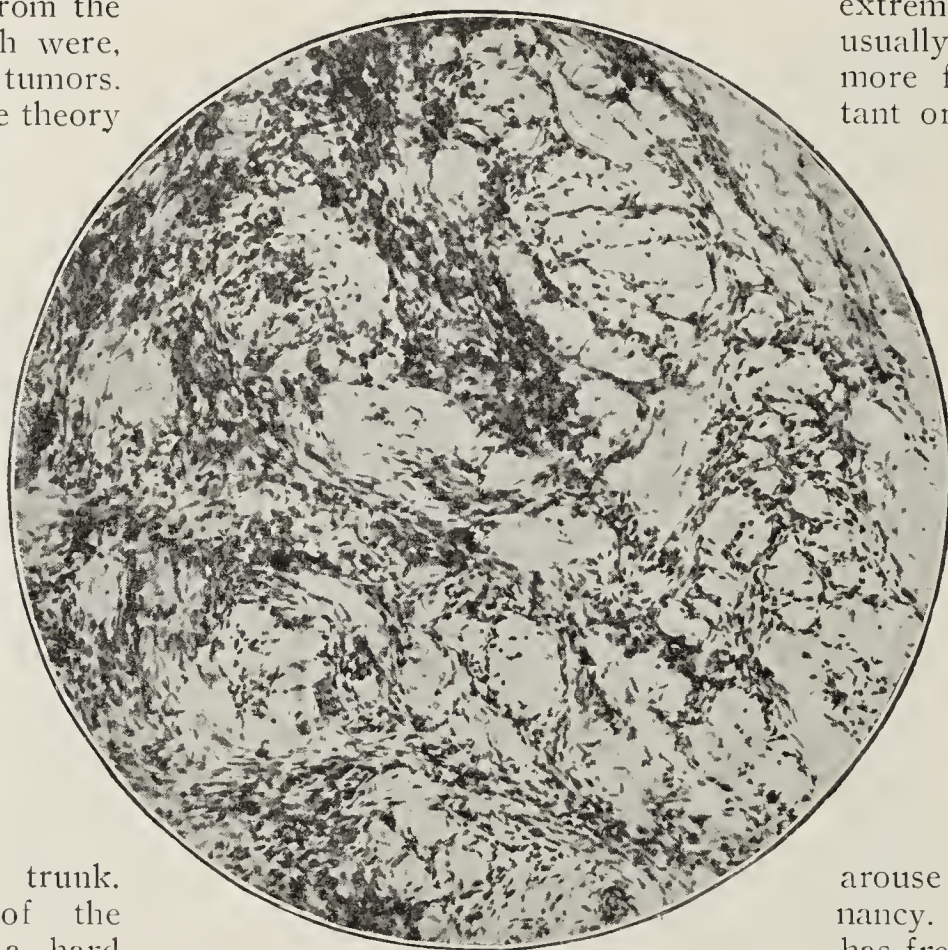


Fig. 4 (Case 2).—Low power photomicrograph of early spindle cell sarcoma of the skin showing infiltrative type of growth at border of lesion ($\times 110$).

11. Seckel: *Centralbl. f. allg. Path. u. path. Anat.*, 1906, p. 515.
12. Dubreuilh: *Ann. de dermat. et de syph.*, May, 1911.
13. Funk: *Monatschr. f. prakt. Dermat.*, 1889, pp. 18 and 60.
14. Perrin: *La pratique dermatologique*, 1904, 4, 20.

15. Hazen: *Skin Cancer*, St. Louis, 1916, p. 138.
16. Pusey: *Principles and Practice of Dermatology*, 1907, p. 896.
17. Darier: *Ann. de dermat. et de syph.*, May, 1911.
18. Bloodgood: *Progr. Med.*, December, 1912.

no cures. Of nineteen skin sarcomas originating in scars, six of the spindle cell variety were cured by operation. The cases not cured were of the round or pure spindle cell type. Bloodgood states that the first appearance of a growth in scar tissue differing from a keloid is an indication for radical removal of all scar tissue. Seven cases of sarcoma originating in fibroma were treated, with four permanent cures, all of the fibrospindle cell variety.

Treatment.—Prevention is of great importance, and early surgical removal of all benign growths of the skin exposed to irritation or trauma is indicated. After a sarcoma has developed, immediate surgical removal is preferable, and the excision should be made as wide as possible. This should be followed by treatment with radium or the Roentgen ray to prevent recurrences. In the treatment of inoperable sarcoma, the results of Wickham and Degrais with radium have been sufficiently encouraging to justify the use of this agent.

CONCLUSIONS

1. Primary spindle cell sarcoma of the skin may exist for a considerable time as a localized lesion.

2. Early excision will prevent the dissemination of a localized cutaneous spindle cell sarcoma.

3. A primary nonpigmented sarcoma of the skin composed of spindle and giant cells is a rare type of cutaneous sarcoma.

4. The diagnosis of nonpigmented sarcoma cannot be made with certainty without microscopic confirmation.

30 North Michigan Avenue.

ABSTRACT OF DISCUSSION

DR. J. M. KING, Nashville, Tenn.: Three years ago a man came to me with a non-pigmented nodule on the left forearm, midway between the elbow and wrist, located in the skin. He habitually picked up the nodule and rolled it between thumb and finger. He observed that the tumor slowly enlarged. I could not make a clinical diagnosis, nor could a surgeon whom we had in consultation, but for fear of sarcoma, we advised excision, microscopic examination, and, if needed, treatment with Roentgen ray. The pathologist reported a "small spindle-cell sarcoma." The patient received Roentgen-ray exposure. Dr. Bainbridge of New York saw this man last summer, and afterward wrote me that there was no recurrence, but considerable atrophy about the site of the lesion, and advised excision of the scar.

May I be permitted to report an unusual case, probably of sarcoma? The patient, a man, aged 55, had a lesion which started on the left hip just below the crest of the ilium. After two or three years a superficial ulceration set up, spreading to the size of the palm. The border was very irregular and the ulcerated part extremely painful and tender. He was seen in New York by Dr. A. R. Robinson and Dr. Prince Morrow. Syphilis was their diagnosis. I made a biopsy, but

the pathologist could not make a diagnosis. The patient could not take the iodid prescribed by Dr. Robinson. Without the administration of any medicine, I applied the Roentgen ray, with a perfect result as far as curing the lesion was concerned. But two years ago, ten years after he was well, an inguinal gland enlarged, was removed and examined, with the report of sarcoma. Later another sarcomatous gland was removed. Now there are two enlarged glands lying just inside the pelvis. The old scar is smooth and well and there are no other signs of primary sarcoma.

STILL'S DISEASE

WITH REPORT OF A CASE*

ARTHUR S. ROSENFELD, A.B., M.D.

PORTLAND, ORE.

The first recorded cases of chronic arthritis in children were the fifty reported by Moncorvo in 1878.

Then Still¹ of London, in 1897, reported twenty-two cases, in twelve of which there was a special clinical picture different from the ordinary forms of so-called "chronic rheumatism." To these his name was given. Following Still's description, further cases were described by Weber, Whole, Paynton, Hingston and Newlin. By 1904, twenty cases had been described in England and only one in Germany. Piske² reported two cases in 1913 from the Kinderklinik at Kiel. He ascribed the scarcity of the German cases to the fact that the clinical picture had been relatively unknown, and in most textbooks was not mentioned, or if so, briefly.

This chronic deforming disease of the joints in children bears a great many points in common with the arthritis deformans of adults. It becomes a matter of some difficulty to place it properly in our

present unsatisfactory classification of chronic arthritis, as we are beginning to realize that arthritis is generally if not always secondary to a process elsewhere in the body, and so far no definite etiology has been proved for Still's disease. It was originally described by Still as a clinical entity and by some is still held to be such. Garrod³ is inclined to place these cases in the group of rheumatoid arthritis occurring at an early age, but makes the reservation that there are some arguments to support the view that they are a distinct



Fig. 1.—The patient; note flexion and rigid adduction of thighs.

* Read in part and patient demonstrated before the City and County Medical Society, Portland, Ore., Jan. 17, 1917.

1. Still, G. F., in Albutt and Rolleston: System of Medicine, Ed. 1, 1897, 3, 17; Med.-Chir. Tr., London, 1897, 80, 47.

2. Piske, J.: Med. Klin., 1913, 9, 2.

3. Garrod, A. E., in Albutt and Rolleston: System of Medicine, 1910, 3, 17; Proc. Roy. Med. and Chir. Soc. London, 1896-1897, N. S., 9.

malady. McCrae⁴ regards it as arthritis deformans occurring in childhood, the only question being at what age to draw the line between the two. Elsner⁵ and Osler concur in this opinion, stating that the trend of modern opinion is that these arthritic conditions are dependent on an infectious process. Still thought it probably was a form of infectious arthritis due to the

invasion of some micro-organism. The presence of pleural and pericardial adhesions, the enlargement of the spleen and glands, fever and acute symptoms are in favor of this view. Ibrahim⁶ regards it as of tuberculous origin related to the cases which Poncet⁷ has described. Levi and Rothschild attribute the condition to a functional disturbance of the thyroid gland; but the therapeutic test of gland feeding has given no results. With regard to the theory of sepsis, blood cultures taken during the acute febrile stages of the disease have

seemed to recover completely from this, and remained well for the following year. At the age of 6, her present symptoms began. The disease began with fever, sweats and rheumatic pains. There were swelling, tenderness, and limitation of motion of the small joints of the fingers. The process slowly spread until it involved in order the knee joints, elbow, neck, feet, and lumbar spine. It finally involved the temporo-maxillary and hip joints. For the past year and a half she had been unable to open the jaw widely. During these years there had been spells of fever when all her symptoms became worse, and remissions when she was fairly comfortable. The deformity came gradually with the progress of the disease. She had not walked in nine years. The patient's mother herself noticed the swelling of the glands in the region of the joints affected; she said that at times they reached the size of a small walnut and were plainly visible. Aside from the joint symptoms, the child had always been weak and pale. She had not developed according to her years, and appeared as a child of 8 or 9 years of age. The secondary sex characteristics were absent. The mentality had always been clear. She had been troubled with headaches and toothaches.

Physical Examination.—In the midst of an exacerbation, the patient appeared weak, pale, acutely ill and in pain. There was hyperhidrosis. She was fairly well nourished. The head was large and held rigid on the neck. The temporal and parietal bosses were prominent. There was moderate exophthalmos. The mouth could be opened only about one third. The tongue was coated. The breath was offensive. Inspection of the pharynx and tonsils was impossible on account of limitation of motion of the jaw. The teeth and gums were in miserable condition. There was intense

pyorrhea alveolaris. The upper incisors were carious and worn down to short stumps. There was evidence of decay in the other teeth. There was general glandular enlargement involving the cervical, maxillary, epitrochlear, axillary, and inguinal lymph nodes. The glands in the neighborhood of the affected joints especially were enlarged, some to the size of a hazelnut. They were firm, discrete, and not tender. There was symmetrical enlargement of both lobes and isthmus of the thyroid; there was no bruit or thrill. Examination of the heart revealed precordial heaving, with exaggeration of the apex impulse. There was a presystolic thrill at the apex. The heart was enlarged to the right and left. There was a presystolic murmur ending in sharp shock of the first sound, which was then followed by a soft blowing systolic murmur trans-

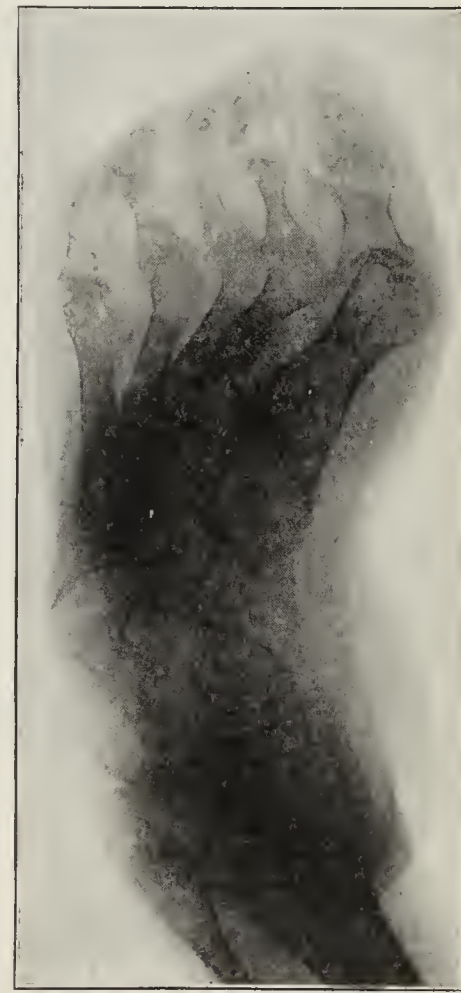


Fig. 3.—Clubfoot deformity.



Fig. 2.—Deformity of fingers and wrist joint; note rarefaction of ends of long bones and underdevelopment of diaphyses of radius and ulna.

proved negative. Heredity, bad feeding, privations and faults of hygiene are not prominent in cases reported. Pathologically there is nothing distinctive about the disease. The picture is one of periarticular enlargement with little bony change other than some rarefaction. There is no osteophyte formation nor erosion of cartilage. The glands and spleen show enlargement, but on gross section appear normal. A lymph gland removed during life showed microscopically merely a hyperplasia of the lymphoid cells with increase also in the plasma cells such as we are accustomed to see in the beginning of Hodgkin's disease.⁸

REPORT OF CASE

History.—A girl, aged 16 years, born in Portland, Ore., with unimportant family history; had been born normally and had developed normally up to the fifth year. Measles had been her only illness. There was no history of tonsillitis, chorea, endocarditis, or other acute infection. At the age of 5, she had an attack of what was called "rheumatism." She

4. McCrae, Thomas, in Osler and McCrae: *Modern Medicine; Arthritis Deformans*, THE JOURNAL A. M. A., Jan. 9, 1904, p. 94; Jan. 16, 1904, p. 161.

5. Elsner, H. L.: *Monographic Medicine*, 4, 110; 6, 1088-1092.

6. Ibrahim: *Handbuch der Kinderheilkunde*.

7. Poncet, A., and Leriche, R.: *Gaz. d. hôp.*, 1912, pp. 85, 485.

8. In addition to the references already given, the following will be found of interest:

Bulletins of the Committee for the Study of Special Diseases, Cambridge.

Nathan: *Am. Jour. Med. Sc.*, 1906, 131, 55; *ibid.*, 1906, 132, 857.

Pribram, A., in Nothnagel: *Specielle Pathologie und Therapie*, 1902, 7, Part 5.

Willner, O.: *Centralbl. f. d. Grenzgeb. d. Med. u. Chir.*, 1911 14, 241-249; 289-293; 321-325.

mitted to the axilla. The action was regular. The aortic and pulmonic second sounds were exaggerated. The abdomen was full and distended, with no masses or tenderness. The liver was felt one finger's breadth below the free border of the ribs, and was firm, smooth, and not tender.

There was stiffness of the cervical spine. The head was held erect. Motion of the jaw was limited. There was fusiform swelling and tenderness of the shoulder joints with pain on motion. The swelling appeared to be periarticular. The condition of the elbows, wrist joints, and

interphalangeal joints was similar. The elbows were flexed at 90 degrees and almost immobile. The wrists also were flexed. The fingers were deformed. There was scoliosis of the lower dorsal and lumbar spine with rigidity simulating "poker spine." The thighs were flexed on the abdomen and held in rigid adduction. The legs were flexed on the thighs



Fig. 4.—Elbow joint in full extension.

with almost complete immobility. In the knee joints there was the same deformity as described in the other joints. There was double rigid flat foot with deformity of the toes. In no joint could crepitus be elicited. There was extreme muscular atrophy of the arms, thighs, and legs.

Blood examination revealed: hemoglobin, 55 per cent.; red blood cells, 4,500,000; white blood cells, 13,800; polymorphonuclear neutrophils, 61.5 per cent; polymorphonuclear eosinophils, 2 per cent.; large and small lymphocytes, 29 per cent.; large mononuclears and transitionals, 7.5 per cent. The urine was clear amber, acid, with specific gravity of 1.015, and a very faint trace of albumin; sugar was absent; there was a very faint trace of indican. There were microscopically a few white and red blood cells. The Wassermann test was negative. The von Pirquet tuberculin test was negative.

Roentgenoscopy revealed no new bone formation or ankylosis in any of the articulations. The joint surfaces appeared intact. The swelling in each case was periarticular. The epiphyseal ends of the bones seemed unduly large in comparison with the narrow undeveloped shafts. The epiphyses also showed a marked rarefaction of the bony substance such as has been described in the cases of so-called rheumatoid arthritis. Roentgenograms of the teeth revealed abscesses at the roots of each of the incisor teeth. It was impossible to obtain satisfactory plates of the other teeth.

Further Course of the Disease.—The patient came under my direct care Oct. 31, 1916. She was at that time in one of her periods of pyrexia. Her daily temperature ranged from 101 to 102 F. The joints were tender and swollen and she seemed to be in great pain, especially in the hip joint and the lumbar spine. Sweating was profuse. The lymph glands

in the neighborhood of the joints were all greatly enlarged, and the spleen likewise. This condition lasted for several weeks, when there was slight spontaneous abatement of the symptoms. The child had never been entirely free from pain in all the years of her illness.

In the search for a definite focus of infection which might have been responsible for the joint changes and other disease symptoms with which the patient had been afflicted, attention became focused on the possibility of a long standing oral sepsis. On account of the extreme pyorrhea alveolaris, the visible decay of the teeth and the Roentgen findings, it was decided to remove this source of infection. The patient was accordingly put under ether anesthesia and all the teeth showing any signs of decay—about eighteen in number—were extracted, Jan. 25, 1917. In each case there were found either carious roots or small abscesses about the roots. Cultures were taken from several of these abscesses and put on glucose-serum-agar slants.

They each showed a staphylococcus and a streptococcus in chains and pairs. The 2 days old mixed cultures were washed and inoculated intravenously into three rabbits. On the fifth day two of the rabbits were slightly lame. Rabbit 1, which received the larger injection, was lame in the front legs and was killed. Necropsy revealed negative urine; increased serous fluids in the elbow joints; slight vegetations on the mitral valve; white annular plaques—about eight or ten—in the intima of the ascending aorta; the latter were the only lesions of this type ever encountered in a routine examination of several hundred rabbits inoculated with various cultures. The lungs were slightly hyperemic. Cultures from the elbow gave cocci in pairs. Rabbit 2, which



Fig. 5.—Lateral view of knee joint; note rarefaction of epiphyses of bones and periarticular swelling.

received a smaller dose, was slightly lame in the front legs. It was killed. Increased serous fluid in the wrist joints and shoulders were found, but no pus. There were no other lesions. Cultures from the shoulder were negative. Cultures from the wrist revealed a growth which was extremely slow in broth, but which grew rapidly on enriched agar, and had the following characteristics:

The stroke showed abundant white, smooth, waxy, raised, glistening growth, and after standing a few weeks, it turned to an orange yellow. Microscopically it occurred in pairs and short chains, but also manifested a division in two planes. Cultural characteristics were: no gas in dextrose, levulose, mannite, maltose, inulin, lactose, or saccharose, but distinct acid reaction in dextrose and levulose and slight in maltose.



Fig. 6.—Lateral view of clubfoot deformity.

The culture was kept for several weeks, after which a third rabbit was inoculated. It promptly developed a purulent arthritis from which the original organism was recovered. Further work will be done on the nature of this organism.

Vaccine Treatment and Result.—A vaccine was prepared from the cultures, and treatments were at once instituted, starting with a small dosage and gradually increasing until a dose of 600,000,000 was reached, as follows:

March 3, 1917, 60,000,000; March 14, 120,000,000; March 24, 240,000,000; April 19, 360,000,000; April 25, 480,000,000; May 1, 600,000,000; May 7, 600,000,000. With the exception of the injection of April 19, when the patient suffered a local reaction, headache, malaise, pain in the right knee joint but no fever, the vaccine treatments have caused no focal or constitutional reaction. The improvement in the patient's condition following the oral cleaning and the institution of the vaccine injections has been quite marked and most gratifying. Since the end of January there has been a complete abatement of all the acute symptoms. There have been no spells of fever or rheumatic pains. The lymphadenitis has subsided, with the exception of a few axillary nodes which are still palpable. The spleen also is still enlarged. The child's general condition has become vastly improved, her weight has increased, and she has attained a state of vigor and well-being which would better allow operative interference for her deformities should such orthopedic measures be considered. This period is the longest that she has ever remained without fever or rheumatic pains, and while it is rather premature to say what the end-result will be, still I deem it worth while to give this preliminary report in view of the striking improvement.

COMMENT

Evidence and deductions made from one case are necessarily inconclusive. I do not claim to have discovered a specific etiologic agent for this most unfortunate and rare affliction. I should, however, like to add my voice to those who regard this disease as one of the many pathologic states resulting from focal infection. The case corresponds in almost every detail to those of Still's classical description, and we are able to demonstrate in addition a potent source for toxemia. Whether this oral sepsis was causative in the case or merely an incidental feature I am unable to state with any conviction. Significant facts are the arthritic changes produced in rabbits when inoculated with cultures from the child's mouth, and the improvement in her condition which was demonstrated after removal of the septic focus. It may be that some day Still's idea as to the specificity of this disease will be substantiated. Until then, let us act on the assumption that focal infection can and does produce a similar syndrome.

1117-1118 Selling Building.

EXOSTOSES, OR GONORRHEAL SPURS OF THE OS CALCIS

E. P. MERRITT, M.D.

Instructor in Urology, Atlanta Medical College; Urologist, Georgia Baptist Hospital
ATLANTA, GA.

There is little to be found in the literature concerning spurs of the os calcis due directly to gonorrhea, though each textbook on orthopedic surgery touches



Gonorrheal exostoses of os calcis.

on it lightly. The condition is painful to the patient, and is often placed under the erroneous diagnosis of arthritis.

Three patients have come under my observation suffering from this affection, giving histories of good health and no discomfort previous to an attack of gonorrhea. Other etiologic factors which must be thought

of in connection with painful heels are flat foot, syphilis, achillobursitis, etc.

"Ossifying periostitis leads to the formation of bony excrescences, exostoses or osteophytes. First there is a proliferation of the osteogenic layer of the periosteum, then partial ossification, and finally complete bone formation with firm attachment to the underlying bony structure. The osteogenesis is essentially the same, but the periosteal bone depositing cells are working in a tissue the seat of productive fibrosis, so that the calcium salts are not laid down in an orderly manner along the surface of the bone. These changes may be circumscribed or diffuse, and cause irregular elevations or general thickening of the bone. The exudate may be merely fibrous tissue or a soft albuminoid material, usually leading to periosteal thickening, but occasionally invading the bone or marrow."

The usual modes of invasion of the gonococcus to remote bony structures are either lymphogenous or hematogenous. Other bony structures are not exempt from invasion, and especially is this true of the vertebral column. The print of a roentgenogram reproduced herewith will give an outline of the body exudate which caused this patient much discomfort to even put his foot down. It also gives a clean-cut diagnosis of the condition.

The treatment consists in cure of the gonorrheal infection of the urethra and its accompanying organs, and removal of the exudate by operation.

REPORT OF CASE

A farmer, aged 25, white, single, with negative family history, had had the usual diseases of childhood, but had otherwise been healthy until two years before I saw him, when he contracted gonorrhea. With the onset was a profuse discharge and a swelling of the penis. About one week afterward he had to go to bed on account of arthritic pains in both ankles and severe pain in the back and shoulders. The ankles were swollen and very tender. The pain left the shoulders and back in a few days, but the ankles kept the patient in bed for eight weeks. When he was up and walking again the left heel seemed to be quite sensitive to pressure, and since then it had been an effort for him to walk on it. Roentgenoscopy revealed the cause. He was treated by the urethra regularly since then. I first saw him, Jan. 12, 1917. There were pus and shreds in all three glasses of urine. Microscopically there were gonococci in the secretion from the prostate and the vesicles.

The patient gave a negative history of syphilis, but the Wassermann reaction was + + + +. He was put on anti-syphilitic treatment, and the gonorrhea was treated vigorously for four weeks. He went back home feeling much better, except that the left heel had not improved in the least. He was advised to return and have the bony deposits removed, as one of the previous patients under my observation had done for the same condition, with complete recovery.

CONCLUSIONS

1. The bony structures of the body are sometimes invaded by the gonococcus which cause pathologic changes, with discomfort.

2. Gonorrhea is credited with many distressing deeds, and justly so; in fact, it is not held responsible as often as it should be.

Taking Advantage of Home Climate.—Many live, work and sleep in a quite unsuitable atmosphere, and at the same time the outdoor atmospheric conditions may be very good. A person may live in a locality with a favorable climate and yet actually himself live in a very inferior atmosphere. Indoor climate and outdoor climate are two quite different things, and usually the outdoor climate is far the better.—Asst. Surg.-Gen. J. W. Frask, *Public Health Reports*.

Special Article

MEDICAL SERVICE IN THE BRITISH AREA ON THE WESTERN FRONT

THOMAS HERBERT GOODWIN, C.M.G., D.S.O.

Colonel, Army Medical Service

ENGLAND

Since coming to the United States some two months ago, I have been asked numerous questions with regard to the conditions of warfare on the Western front, the nature of medical work, the necessity for medical men, etc. Some of the senior medical men in this country have suggested to me that I should write a short article for *THE JOURNAL*, giving information on the foregoing points; it is very difficult—if not impossible—to realize fully the strenuous and difficult conditions of modern warfare when one is far removed from the area of conflict, and it is consequently no matter for wonderment that a considerable amount of misconception exists with regard to the present campaign.

ORGANIZATION

The system in the British army for the collection and evacuation of the wounded from the front line to the base hospitals is briefly as follows:

With each battalion of infantry, regiment of cavalry, or brigade of artillery is a medical officer with a small detachment of medical and sanitary personnel, and suitable medical and surgical equipment. Before an action this officer forms a "regimental aid post," in a dugout or position of shelter, to which the wounded of his regiment are brought by the regimental stretcher-bearers. Here they are attended to, dressings are applied, fractures immobilized, etc., and, after a very short stay—probably not more than half an hour—they are removed by the personnel of the field ambulance *bearer* division to the advanced or main dressing stations, which are formed by the field ambulance *tent* division. The means of ambulance transport with the field ambulance bearer division consists of: twenty-seven stretcher squads, each consisting of four bearers with a stretcher; seven motor ambulance wagons, and three horse ambulance wagons.

From the dressing stations the wounded are conveyed by the motor ambulance convoy, which consists of fifty ambulance cars with four medical officers, to the casualty clearing stations. At the casualty clearing stations a very large amount of surgery is carried out. Patients with such wounds as those of the abdomen or head are taken to the casualty clearing stations from the front as quickly as possible, in order that early operation may, if possible, be carried out under advantageous circumstances.

A casualty clearing station is always situated close to a railway station, and the wounded are conveyed thence by ambulance trains to the stationary and general hospitals on the lines of communication and at the base. It is difficult to lay down definite rules as to the distances between the various units mentioned above, as these distances vary so much with local conditions and the military exigencies of the time being; but the following may be accepted as an average under normal conditions:

1. Front line trenches to regimental aid post, 500 yards or more.

2. Regimental aid post to advanced dressing station, half a mile to 1 mile.

3. Advanced to main dressing station, $1\frac{1}{2}$ miles.

4. Main dressing station (field ambulance) to casualty clearing station, 5 miles.

SUPPLIES

Our medical and surgical equipment and supplies are obtained by the various units, as required, from the advanced and base depots of medical stores, which are medical units administered entirely by the medical service.

The amount of medical supplies required by an army in modern warfare is very large indeed.

To mention a few details I may say that, up to the end of last year, we have furnished our armies with $37\frac{1}{2}$ millions of bandages, 35,000 miles of gauze, 3,000 tons of absorbent cotton and lint, 243 complete Roentgen-ray outfits, etc. In addition to these medical and surgical supplies there are many — almost innumerable articles which, although not in the authorized scale of equipment for hospitals, are nevertheless of immense value in adding to the comfort of a hospital and the consequent well-being of the patients, and everything which improves the physical and mental condition of a patient conduces toward his rapid recovery to health and consequently his early restoration to the fighting line.

Among such articles I might mention pianos, phonographs, books and pictures, games, papers, warm slippers and special articles of clothing and many other comforts.

THE RED CROSS

As a medium for obtaining such articles, which to my mind are of immense value to the efficiency of every hospital, there is the magnificent Red Cross organization, which is always ready to give us every possible assistance, and whose aid also in furnishing motor ambulance cars has been immense.

The work of the Red Cross in assisting the medical services in time of war is of the utmost value.

DUTIES OF MEDICAL OFFICERS

A few words as to the duties and life of a medical officer in the various units:

The medical officer attached to a regiment has a happy — and also a busy — life. Sanitation and disease prevention will occupy a considerable portion of his time, especially during the periods when his unit is not engaged in actual fighting. He will find that an earnest desire for the welfare of the men, combined with a modicum of tact, will insure any of his sanitary recommendations being cordially received and promptly acted on.

His endeavors will invariably receive the fullest meed of gratitude from both officers and men.

When his unit is in action he should on no account lose touch with it, and even if, at times, he can do little more than first aid, yet his presence will be of immense value and moral support to the troops with whom he is working.

The officers of the field ambulances have a strenuous life, and their work is interesting and responsible in the highest degree. They see everything that is going on, and, being near the fighting line, they see plenty of the stress and excitement of a modern battle.

The work which they do is of extreme value to the welfare of the patients, for on the initial treatment of the wounded in the dressing stations is dependent, to a considerable extent, their subsequent progress toward recovery.

For an officer who is keen on more purely professional work, the casualty clearing stations afford an immense scope in the direction of urgent surgery, abdominal and cranial operations, etc., while the base hospitals offer an enormous range of professional work and experience of every description, both medical and surgical, in addition to the numerous special departments of Roentgen-ray work, bacteriology, etc.

As regards sanitation, that subject is always with us wherever we may be, from the front line to the base, so that, whatever a medical officer's individual tastes may be, and in whatever part of the field he may find himself, I think that he will always discover scope for his energies and a life full of absorbing interest.

I may state here that every possible endeavor is invariably made by the authorities to meet the

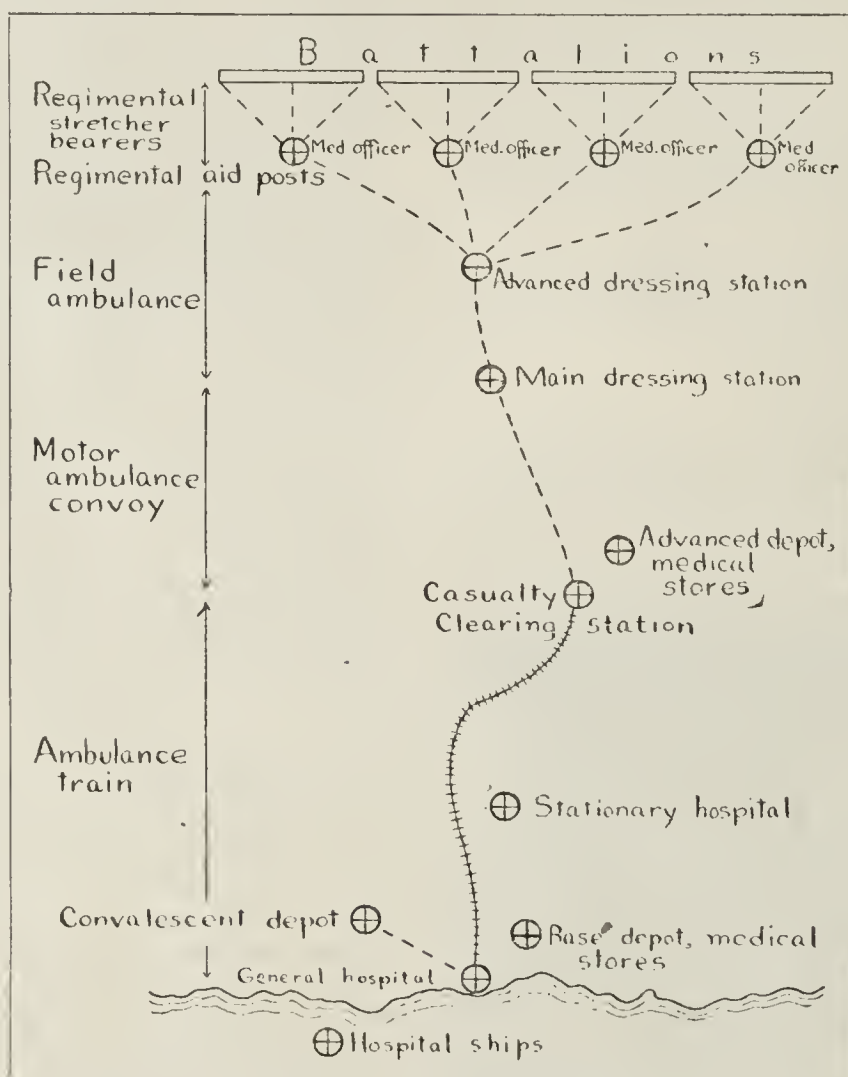
wishes and capabilities of the individual officer, so that — so far as military exigencies permit — every officer may find himself allotted to a post suited to his capabilities and attainments.

There is at present a considerable shortage of medical men in Europe, and this shortage has been seriously felt by Great Britain. The following few facts may serve to explain some of the causes of this shortage:

1. Great Britain has at present on hand five separate campaigns — East Africa, Mesopotamia, Egypt, Saloniki and France.

2. The British armies have increased from a comparatively few thousands to millions, and the medical service has had to expand correspondingly.

3. The number of hospital beds in the British Isles alone is at present over 300,000, and this number does



System of collection and evacuation of the wounded.

not take into consideration the numerous convalescent homes and depots. The number of beds in France is large and is steadily increasing. In Malta alone we have over 27,000 beds, and in Egypt, Saloniki and the other theaters of war are large numbers.

4. We are now maintaining in the field a large number of medical units, for example, over 300 field ambulances, 100 stationary and general hospitals, besides hospital trains, ships, etc.

5. While not approaching the huge figures which one sometimes hears of, losses in the medical service are still considerable. On the western front, from the commencement of the war up to date, we have had 195 medical officers killed in action, and 707 wounded, while there have been sixty-two deaths from illness.

Taking all these facts into consideration, it may readily be understood that we are, in Great Britain, feeling a serious shortage of medical men, and it will not cause surprise when I state that in several districts in England there is only one physician to every 5,000 inhabitants, and some districts in which the ratio is only 1:6,000.

One of my duties when I came over with Mr. Balfour's mission was to ask for medical men and nurses from the United States temporarily to assist their British allies on the western front, and to this appeal there was a prompt and generous response. Six base units from the United States are now hard at work in France, and a total of 253 medical men and 434 nurses have already gone over. The assistance which they are giving our army is invaluable, and the work which they will accomplish will be enormous.

May I venture to suggest that the medical profession of the United States should profit by our mistakes and shortcomings, and I would, with all diffidence and deference, point out that the American army will probably increase as ours has increased, and that the medical service will necessarily expand to a corresponding extent. Consequently, it would appear to be an indisputable fact that enormous numbers of medical men will be needed, and in view of this fact, and judging from the past experiences of England, early organization, and the speedy enrolment of all available medical men would be absolutely necessary in order to avoid the possibility of a lamentable breakdown in the future.

Lepers in Colombia.—The number of lepers in Colombia under detention is 4,175, according to the report of Vice Consul Claude E. Guyant of Barranquilla (*Commerce Reports*, Nov. 25, 1916), who quotes the figures of the central board of hygiene in Bogota. They are detained at the three leper stations: Agua de Dios, where there are 2,489, Contratacion, where there are 2,077, and at Caño de Loro, where there are 149. The Agua de Dios station is located near Bogota and has two hospitals for men and one for women, each with a physician and an apprentice, and each having a pharmacy. They are managed by the Sisters of Charity. There is also a general dispensary where the average number of patients treated monthly is 1,600. The three hospitals house 389 patients. The remainder live in separate houses, some of which are privately owned. There are two schools for boys and one for girls, where manual training is also taught. The Contratacion station has two hospitals with a capacity of sixty patients each. There is a school for boys and one for girls, and two asylums for the children. The medical work is in charge of three physicians, who also attend patients in the dispensary and in private houses. The Caño de Loro station is on an island in Cartagena Bay, and houses 149 patients, and has a hospital with a capacity of twelve. New and larger buildings are projected.

Clinical Notes, Suggestions, and New Instruments

OPERATIVE ANAL SPECULUM

ORVALL SMILEY, M.D., INDIANAPOLIS

The accompanying illustrations show a simple and efficient operative anal speculum devised to overcome the numerous difficulties usually encountered in the average anal operation.

It offers the following advantages:

1. It is simple and easily applied after the anus has been dilated manually.

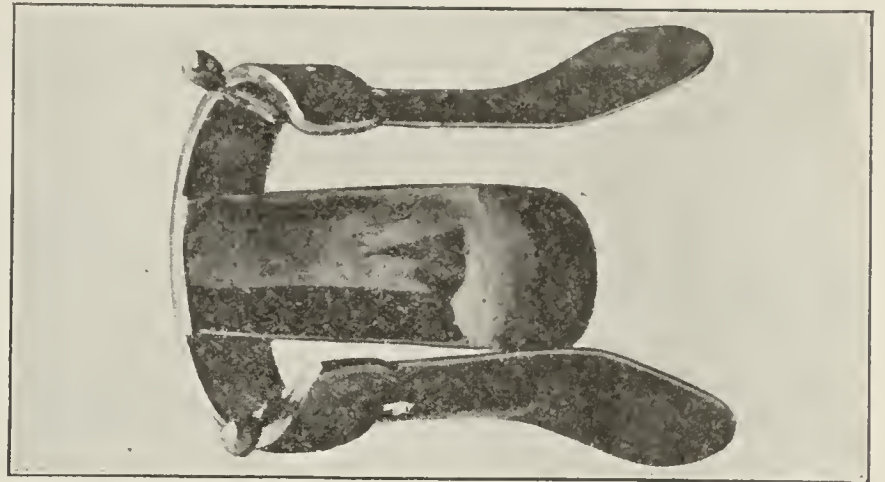


Fig. 1.—Operative anal speculum.

2. It stays in place when once adjusted.
3. It takes the place of an assistant holding a large, cumbersome instrument.
4. It keeps the caliber of the anus constant during the operation.
5. It is easily adjusted.
6. It gives large, roomy working space over any area desired.
7. It is light, produces no trauma, and is not in the operator's way.



Fig. 2.—Parts of operative anal speculum.

8. The opening in the ring gives ample room for operative procedures, and affords a clear and distinct view of the field of operation.

The speculum consists of a piece of metal 1 cm. wide and 3 mm. thick, the shape of the letter C, with the opening 3 cm. wide. At the middle is attached one blade 5 cm. long. At the point of attachment it is 2 cm. wide, and at the distal end, 2.5 cm. The blades are curved outward at the distal end, the edges being rounded so they will not cut. The other two blades are attached after the first has been introduced into the anus by slipping the groove in the blade over the head of a pin on the inner side and near the distal end of the C piece. This holds the blades firmly in place. Thus they are easy of access, and are easily taken off and put on.

219 Newton-Claypool Building.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address . . . "Medic, Chicago"

Subscription price Five dollars per annum in advance

*Contributors, subscribers and readers will find important information
on the second advertising page following the reading matter*

SATURDAY, JULY 14, 1917

DANGERS AND DISADVANTAGES IN CERTAIN WAR-TIME FOODS

The high prices and the scarcity of many common food products have naturally stimulated interest in possible substitutes either for human consumption or for feeding to the domestic animals whereby foods suitable for human use may in turn be conserved. Attention has been directed from time to time in THE JOURNAL to some of the newer possibilities. Our London correspondent¹ recently noted that there are not merely a few but rather dozens of different edible wild species of the animal and vegetable kingdoms, commonly distributed, easily identified and procured, and suitable to simple processes of cooking. Mention was made of the edible frog, various species of seaweed, and nearly fifty esculent fungi. Our correspondent ventures that persons living in the country where such supplies are easily obtainable should be able to supply, during at least three quarters of the year, two thirds of their needs from the fields, woodlands, lanes and streams in their immediate neighborhood. Physicians are frequently consulted for dietary advice, and it may not be amiss to issue a warning about the dangers from certain highly undesirable foods suggested by war-time conditions.

Certain newspaper and magazines in this country are advocating the use of rhubarb leaves for greens. Advice to use the leaves as a substitute for spinach has been promulgated from at least one popular educational center. Because the rhubarb leaves contain certain substances—presumably oxalic acid—in sufficient quantity to make them toxic at times to some persons at least, and because disastrous results have followed their culinary use, the U. S. Department of Agriculture has issued a warning to housewives against using this portion of the plant for food.² How timely these instructions are is borne out by the report of a death from eating rhubarb leaves recently reported in THE JOURNAL.³

Even the edible portions of vegetables like rhubarb owe whatever dietary advantages they possess to com-

ponents other than the familiar nutrients. Thus the rhubarb contains about 95 per cent. of water, and the food-fuel value of an entire pound of the edible portion cannot possibly exceed 100 calories. Desirable flavor, bulk, salts and perhaps vitamins must not be allowed to obscure the almost entire lack of the substantial proteins, fats or carbohydrates in such foods. Precisely the same consideration applies to edible seaweeds and mushrooms. The latter harbor an additional menace for those who are not thoroughly conversant with the poisonous species. Every summer brings stories of poisonings from eating toxic mushrooms. We are not attempting to minimize the agreeable relief from monotony which the use of such plant products may afford; but they should be used with a clear understanding of precisely what they do or do not contribute to the ration. They serve as vehicles rather than as sources of energy.

It may not be amiss to call attention to a semiofficial report⁴ that thousands of pounds of poisonous Burma beans are being foisted on the people of the Middle West as a cheap substitute for navy beans. They are said to have been imported from the Orient. Although about the size of a medium shaped navy bean, the toxic species have a faint yellowish tinge with many fine lines or rays out from the eye like spokes on a wheel. There are some colored ones of light brown, dark brown, mottled and speckled, various shades of brown and red brown. An equally poisonous, small, flatter Burma bean is more readily distinguished from the navy bean. We are warned to guard against these two beans and also other dangerous beans from the East Indies, such as the Java, which is even more deadly.

The toxicity of the castor bean, containing the highly poisonous protein ricin has long been known. The poisonous principle of the Oriental varieties just mentioned is said to be a glucosid which yields hydrocyanic (prussic) acid through the action of suitable enzymes. Prohibition or restriction of the importation of these dangerous species into some of the countries of Europe is stated to be in force at present.

THE STUDY OF CANCER IN PLANTS

In recent years the plant pathologist of the United States Department of Agriculture, Dr. Erwin F. Smith, has repeatedly expressed the belief that a diligent study of tumors in plants will help to solve the cancer problem. His fundamental conception may be thus expressed: Cancer occurs in many kinds of plants, in which it passes through an essentially parallel course of development to that of cancer in man and animals, some allowance, of course, being made for differences in the structure and development of plants. His concept is, that fundamentally plants and animals are alike,

1. London Letter, THE JOURNAL A. M. A., May 12, 1917, p. 1421.

2. Don't Use Rhubarb Leaves, Weekly News Letter, U. S. Dept. Agriculture, May 23, 1917, p. 2.

3. London Letter, THE JOURNAL A. M. A., June 23, 1917, p. 1923.

4. Circular Letter of Information from Brookings, S. D. No. 643, June 19, 1917.

that physical and chemical laws apply equally, that is, uniformly, to all living things, and hence that discoveries relative to the fundamental cell mechanics of animals apply equally to plants, and vice versa.¹

As Smith and his associates have discovered a relationship between certain plant tumors and a flagellate schizomycete named by them *Bacterium tumefaciens*, they have become strongly imbued with the idea of a microbiotic genesis of cancer in man. To the biologist, Smith wrote in 1916, the conclusion is almost irresistible that human cancer must be due to a parasite, and that one parasite may well be the cause of the most diverse forms, as we have seen to be the case in plants.

The study of the cancer problem has undergone so many evolutionary changes that any one who has followed the progress of experimental medical sciences may well hesitate to become unduly enthusiastic about even the most plausible of etiologic novelties. Nevertheless it is alike interesting and desirable to follow up every promising lead for new indications of modes of approach and methods of attack. The great importance of the questions at stake makes it well worth while to encounter many failures if only some progress can be made in the long run. It is interesting, therefore, to note the latest indications in the pathology of plant tumors. Smith² had suggested earlier that if crown gall in plants is a disease clearly due to the bacterium which he isolated, it ought to be possible eventually to go a step farther and determine what by-products of the organism are the direct cause of the overgrowth.

A beginning in this direction has now been made. It has been found that the substances produced by the *Bacterium tumefaciens* in simple culture mediums include aldehyd, ammonia,amins, alcohol, acetone, and acetic and formic acids.³ Applications of some of these by various procedures to plants subject to crown gall have actually given rise to tumors. They are described as either vascularized hyperplasias, mixed hypertrophy and hyperplasia, or simple hypertrophies. In them the cells are much more closely compacted than the parent cells, and free from chlorophyl. The cells of the hypertrophies are frequently a hundred times the volume of the cells from which they have originated. In the acetic alcohol tumors there has been a great increase in the number of the cells, that is, the development of a true hyperplasia, while in the hypertrophies the component cells appear to be the original cells greatly enlarged.

Smith has called attention to the fact that among the substances enumerated are compounds, namely, ammonia,amins and fatty acids, such as Jacques Loeb⁴ has observed to be efficient in starting growth in unfer-

tilized eggs of certain lower forms. Their action, he states, in all probability is purely physical, that is, due to withdrawal of water from neighboring cells by increase of osmotic pressures, whereupon the cells so acted on begin to grow; at least it is possible to obtain the same phenomenon in plants with a great variety of substances, not the product of parasites and not likely to come into contact naturally with the growing tissues. Analogies may be misleading as well as useful in experimental science. They are at any rate helpful if they stimulate us to adopt new points of view.

THE AVAILABILITY OF GOAT'S MILK IN PLACE OF COW'S MILK

The investigations of the past few years have given a substantial scientific foundation to the long established belief in the superiority of milk in the feeding of children even beyond the nursing age. Dietary experience and rational empiricism have pointed to the unique value of this food, despite the wealth of propaganda in favor of all sorts of proprietary preparations, especially those compounded from the cheaper cereal grains. Assertions that milk "cannot be tolerated" have frequently been contradicted by the institution of a modification of its quantity or percentage composition. The cases of actual idiosyncrasy to milk can now be detected with some clinical precision, and allowance can be made for them. Never have the unique tissue-building and growth-promoting virtues of milk been more clearly emphasized than at present when, because of the war, provision for the nutrition of many children must be made on an enormous scale not only by individual families but also by communities and even governments. "A quart of milk a day for every child" is likely to be a popular slogan, as it ought to become a current practice.

Along with the admitted need of milk comes the question of maintaining the supply. The growing scarcity of farm hands, the increased cost of feeding milch cattle and the possible shortage of fodders suggest a consideration of any promising economic and physiologically valuable sources of milk other than cattle. Goat's milk has often been proposed;¹ indeed, there are records to suggest that it has a peculiar adaptability to feeding infants and young children in cases in which they must be given artificial food, and neither modified cow's milk nor the proprietary infant foods are fed with success. For several years the New York Agricultural Experiment Station at Geneva conducted an investigation of the value and use of the milch goat, regarding which few dependable data seemed to be available, despite the fact that this animal is widely used in some foreign countries. Extensive analyses over long periods showed that the total solids

1. Smith, E. F.: Jour. Cancer Research, 1916, 1, No. 2; Science, 43, 871.

2. Smith, E. F.: Crown Gall of Plants: Its Cause and Remedy, Bureau of Plant Industry, Bull. 213, U. S. Dept. Agriculture, 1911.

3. Smith, E. F.: Chemically Induced Crown Galls, Proc. Nat. Acad. Sc., 1917, 3, 312.

4. Loeb, Jacques: Artificial Parthenogenesis and Fertilization, 1913.

1. Sherman, D. H., and Lohnes, H. R.: Practical Study of Goat's Milk in Infant Feeding as Compared to Cow's Milk, THE JOURNAL A. M. A., June 6, 1914, p. 806.

of the milk ranged in general between 11.4 and 11.9 per cent., the fat amounting as a rule to from 3.5 to 3.8 per cent.² A chemical study of the goat's milk indicated no essential difference between the constitution of its casein and that of cow's milk. Marked and probably important differences were observed in the salts of the ash as compared with the ash of both cow's milk and human milk.³

Enough experience is on record, though much of it is in the nature of personal testimony rather than the conclusion of professional judgment, to make it not improbable that babies tolerate equally well similar amounts of goat's milk and cow's milk when used with the same diluents. We naturally turn, therefore, to the economic aspects of the milch goat problem. An annual yield of from 700 to 900 pounds of milk represents good production for selected goats. On this basis the New York statistics, in which careful account of costs was kept, show cows to be cheaper producers of milk and milk solids than goats, at least under the prevailing condition. If the goat is to compete with our dairy cattle, it must apparently be on some other grounds than those of economy in milk production.

IS THERE A CEREBRAL HEAT CENTER?

The circumstances which result in a nearly constant body temperature as the result of an accurate balance of heat production and heat loss in the organism are, to say the least, highly suggestive of some regulatory process on the part of the central nervous system. Starling⁴ has remarked that whether this function of temperature regulation can be specially localized at any part of the central nervous system, so that it would be possible to speak of a heat center in the same way as we speak of a respiratory or vasomotor center, is doubtful.

It has been suggested that the thermogenic center—that responsible for regulating heat production—is situated at a lower level than the thermotaxic system which presides over and determines the balance between heat production and heat loss. Barbour⁵ of the Yale University School of Medicine, while admitting that we may not give the "heat centers" too narrow an anatomic limitation, insists that it has long been recognized that the region of the basal ganglions (especially the caudate nucleus of the corpus striatum) plays an important part in the coordination of those processes which affect body temperature. The most important of these processes include (1) those tending to raise body temperature: oxidations in the muscles and other tissues (heat production), and peripheral

vasoconstriction (heat sparing); (2) those tending to lower body temperature: inhibition of oxidations (lessened heat production), peripheral vasodilatation, increased respiration, and sweating (heat dissipation). He asserts that the central apparatus which coordinates these processes can, like other nervous mechanisms, be influenced by cold and heat and by drugs. Such agents can never alter the nature of the nervous response; only quantitative changes which we term stimulation and depression can be elicited.

The observations of Barbour⁶ that local cooling of the corpus striatum causes increased respiratory exchanges and heat production, while warming has the opposite effect so that heat centrally applied acts as an antipyretic, point to some central localization of heat-regulating factors. Barbour and Prince⁷ go so far as to assert that metabolic processes can be diminished by an agent (heat) whose activity, under the conditions of the experiment, is restricted to a limited region of the central nervous system. Heat centrally applied reduces body temperature, therefore, not only by favoring heat dissipation but also by diminishing heat production.

Recently Sachs and Green⁸ of the Washington University Medical School, St. Louis, have taken issue with some of these contentions. No temperature changes could be demonstrated by them by stimulating the caudate nucleus faradically. The results of central irrigation by the Barbour method are reported to be variable, and a rise in temperature with cold or a fall with heat application could not be consistently observed. These studies, therefore, it is said, do not confirm the view that there is a cerebral heat center. Perhaps we shall act wisely for the present if we conclude, with Starling, that the facts at our disposal are still too meager to warrant any definite localization of the heat-regulating function in the central nervous system, or any such accurate analysis of the regulating function as has already been suggested.

6. Barbour, H. G.: Die Wirkung unmittelbarer Erwärmung und Abkühlung der Wärmezentra auf die Körpertemperatur, *Arch. f. exper. Path. u. Pharmacol.*, 1912, **70**, 1.

7. Barbour, H. G., and Prince, A. L.: The Control of the Respiratory Exchange by Heating and Cooling the Temperature Centers, *Jour. Pharmacol. and Exper. Therap.*, 1914, **6**, 1.

8. Sachs, E., and Green, P. P.: Further Observations on Cerebral Heat Centers, *Proceedings of the American Physiological Society, Am. Jour. Physiol.*, 1917, **42**, 603.

Arsenic in Cremated Bodies.—A recent Japanese work reports the findings on examination of the remains of six cremated persons who had died from arsenical poisoning. Cremation is said to be almost universal in Japan. In three of the six cases the findings were positive; in another they were negative probably because too small a quantity had been used for the tests, only 40 gm. instead of the 100 gm., the amount usually used. No arsenic can be detected chemically in the intestine and excreta when no arsenical medicine or material has been used, if only the minimal amount of material is tested. If more than this is taken for the test, minute quantities of arsenic may be found due to contamination. This extraneous arsenic is usually found as an accumulation on the outside of completely disintegrated bones or fragments, but if well preserved bones are carefully cleansed on the outside this source of error may be eliminated.

2. Jordan, W. H., and Smith, G. A.: Goat's Milk for Infant Feeding, *Bull.* 429, New York Agr. Expt. Sta., February, 1917.

3. Bosworth, A. W., and Van Slyke, L. L.: The Casein and Salts in Goat's Milk, *Technical Bull.* 46, New York Agr. Expt. Sta., December, 1915.

4. Starling, E. H.: *Principles of Human Physiology*, Ed. 2, Philadelphia, Lea and Febiger, 1915, p. 1177.

5. Barbour, H. G.: The Pharmacology of Temperature, *Brit. Med. Jour.*, Sept. 13, 1913.

Current Comment

"EAT WISELY"

There is no dearth of advice about "what to eat" or "how to cut down the meat bill" or "foods we ought to know" or similar themes in these stirring days of rising costs of living. Some of the instructions are formulated in terms of menus which only a skilled housewife can easily interpret; others are expressed in the increasingly more popular language of calories with its implication of energy and consequent strength; still others abound in the platitudes of the food faker who has his "daily column" to be filled. We have rarely seen a more specific, sane and clearly understandable propaganda than that recently formulated by the Bureau of Home Economics of the New York Association for Improving the Condition of the Poor.¹ In a leaflet aimed to suggest such meals as will be best for growing children, an expert's advice is summarized under this caption: To get the best results, spend money for food as follows:

1. Spend from one fourth to one third of your food money for bread, cereals, macaroni and rice.
2. Buy at least from a third to half a quart of milk a day for each member of the family.
3. Spend as much for vegetables and fruits together as you do for milk. If you use half a quart of milk for each member of the family, this may not always be possible. Then spend as much for vegetables and fruit as a third of a quart of milk a day would amount to.
4. Spend not more for meat and eggs than for vegetables and fruits. Meat and eggs may be decreased with less harm than any of the other foods mentioned. The amount spent for meat may decrease as the amount spent for milk increases.

THE JOURNAL concurs in these recommendations.

PHYSICIANS AND THE SELECTIVE DRAFT

There seems to be considerable confusion regarding the medical profession and the selective draft, and conflicting statements have been made regarding the approximate number of physicians coming within the age limits making them eligible for conscription. A reliable estimate of the number of physicians subject to draft may be reached in the following manner: Statistics show that the average age of students on graduating from medical school is between 25 and 26. Graduates of the last six or seven years only, therefore, would be subject to conscription. The number of those graduating at an age older than 26 during the last six years would be fully, if not more than offset by those who graduated at an age earlier than 26 in years prior to 1912. In the last six years — 1912-1917 inclusive — there were 22,478 graduates. Of these, 806 were women, leaving 21,672 physicians subject to conscription. Of the actual decrease of physicians by death, the larger proportion is from physicians of older age. It is believed that deaths of those who would otherwise be subject to conscription would be fully covered by 1,672, which would leave approximately 20,000 physicians subject to draft.

1. Food for the Family, Publication 120, Bureau of Home Economics, New York Association for Improving the Condition of the Poor. Copies of this publication may be obtained from the New York Association for Improving the Condition of the Poor, 105 East Twenty-Second Street, New York City, at 5 cents a copy.

AN INDICATION OF PROGRESS

The Army Medical Department recently called for bids on a list of medicaments for the United States Army. There were sixty-five items. Of these, sixty-four are either in the U. S. Pharmacopeia, the National Formulary, or have been admitted to New and Nonofficial Remedies by the Council on Pharmacy and Chemistry of the American Medical Association. Of the sixty-four all are in "Useful Drugs" except three: Oleum Gossypii Seminis, Pilulae Aloini Compositae and Pilulae Catharticae Compositae, the latter two being needlessly complex, irrational relics of an earlier period in medicine. Similar lists compiled nineteen years ago undoubtedly would have contained double this number of drugs, and would have included proprietary mixtures, more or less secret in character, together with some of the shotgun variety of discarded remedies.

EXPERIMENTAL RAT-BITE FEVER

The question of the causation of rat-bite fever in man was recently discussed in THE JOURNAL.¹ The Japanese investigators, Futaki, Takaki, Taniguchi and Osumi,² in contrast with those who have designated a streptothrix as the microbiotic cause of the disease, conclude that the etiologic agent is a protozoon, *Spirochaeta morsus-muris*, which they have detected in the bodies of human patients. It generally disappears on recovery, only to reappear during the relapse of the characteristic paroxysms of fever. Ogata was the first to transmit rat-bite fever to susceptible animals, guinea-pigs, by causing rats to bite them. This has now been confirmed.³ Only a part of the rats caught at random were capable of transmitting the infection in this way. A rat which did not transmit the disease to one guinea-pig by biting did not confer it on another; conversely, a rat which conveyed the disease by biting one animal would also convey it by biting another. The clinical course and manifestations of the fever in bitten guinea-pigs afford most of the symptoms which are now looked on as characteristic in man. There are swelling and congestion of the bitten parts, enlargement of the subcutaneous lymph nodes, fever, and loss of weight. The progress of the fever appears to be less regular than is the case in human patients. There are acute changes in the suprarenals and the kidneys. Rats and mice can be inoculated from the guinea-pigs so that spirochetes will always appear in their peripheral blood. Thus the former animals are mediums but not victims of the disease, whereas guinea-pigs are both. Inoculations have also been successful in the monkey. As yet the exact conditions under which the disease is transmitted by bites has not been discovered. The specific spirochete has not been detected in the mouths of rats. It must be recalled in evaluating all such assertions as to protozoal infection that pathogenic and nonpathogenic spirochetes have been observed in many animals. The identification of the organism used in these experi-

1. Spirochetes and Rat-Bite Fever, editorial, THE JOURNAL A. M. A., May 19, 1917, p. 1482.

2. The Cause of Rat-Bite Fever, Jour. Exper. Med., 1916, 23, 249; Spirochaeta Morsus Muris, N. Sp., the Cause of Rat-Bite Fever, Second Paper, Jour. Exper. Med., 1917, 25, 33.

3. Ishiwaru, K.; Ohtawara, T., and Tamura, K.: Experimental Rat-Bite Fever, First Report, Jour. Exper. Med., 1917, 25, 45.

mental inoculations by bites and other methods must, we are told, be left to further study. It seems to differ from that which Futaki, Takaki, Taniguchi and Osumi² found in two patients with rat-bite fever. Like their organism, however, the spirochetes found by Ishiwara, Ohtawara and Tamura disappear from the blood of the affected animals as a result of the injection of salvarsan. This observation is not without significance.

PROTECTING THE INTERESTS OF ABSENT PHYSICIANS

One of the most gratifying developments of the present war situation is the manifest desire on the part of the medical profession as a whole to do everything possible to protect the interests of those members called on for active service. Each issue of THE JOURNAL for weeks past has contained numerous items recording the action of various medical societies on this subject. In most cases, the plan proposed is for those physicians who remain in civil practice to care for the patients of their absent colleagues and to remit a certain amount, generally one third, of the proceeds of such practice to the families of the absent physicians. It is also generally agreed that physicians called out for military service shall have their patients referred back to them so far as possible, on their return to private practice. Variations of this plan are reported from different organizations. The Richmond (Virginia) Academy of Medicine has appointed a committee which will not only oversee the distribution of professional income, but will also assist in rerenting or subletting houses and offices for absent physicians. The Oklahoma County Medical Society has adopted a variation, based on the old communistic principle "from each according to his ability." Each member has been asked to report to the secretary his gross income for 1916. He will then be asked to contribute, in proportion to his earnings, to a fund from which monthly payments will be made to physicians in active service. The information furnished the secretary is to be confidential, and both the president and the secretary, who are to administer this fund, will be under bond. Other variations have been suggested and it is hoped that plans will be worked out in all societies that will be fair to all and capable of simple and easy administration.

THE BASE HOSPITAL AND THE ICE MACHINE

Ice is a peculiar substance with numerous uses and of varying supply. A base hospital in Alaska or Siberia should naturally be able to obtain all the ice which it needs — and there has been a suggestion that some base hospital may be sent to Russia; but there is also a bare possibility that a base hospital may be sent to France or Mesopotamia — wherever that is — or to the Mexican border. This statement is introductory to an incident that seems worth relating. The medical staff of a base hospital in a certain city asked the local Red Cross chapter for recommendation and money to purchase a portable ice-machine. One

of the local Red Cross directors, having spent several vacations in France, intimated that the only use the medical staff had for an ice-machine was to utilize its product in the preparation of mint juleps and gin rickeys, not to mention vermouth and absinthe concoctions, of which those less traveled had not even heard. He could see little use for an ice-machine as part of the equipment of a base hospital. Unfortunately no one had informed him of the uses to which ice is put in such institutions. He did not think of the ice bag; he did not know of the uses of the "cold pack" in fever; he did not realize that ice is necessary for the preservation of biologic mediums and in other laboratory and hospital work. Ice is not only a valuable, but practically an essential thing in the hospital. In any event, the base hospital in question secured authorization directly from Washington to purchase its machine. The story is told because of the obvious moral. Medical supplies, medical work, medical actions, are each best governed by medical men.

"KNOCKERS" AND "KICKERS"

Most of the physicians in the training camps for medical officers are happy. Ordered to duty, they severed home ties, closed their offices, made tremendous personal and financial sacrifices and departed to spend three months or even three years in intensive driving, fatiguing studying and training. And yet the attitude of practically every one of them is that of a boy, out camping for a lark, with a certain seriousness of purpose to learn and to improve ever in the mental background. There are a few who kicked when they received their orders, grumbled when they obeyed, fussed when they arrived in camp and "knocked" when they were not "kicking." Kicking in a human being may be an evidence of spirit and then again, as in the army mule, it may be a form of "cussedness." The kickers are not popular in camp, and even when they received the extra privileges they kicked for, no one has envied them the possession. Practically all are beginning to realize that our government has faced a difficult problem in its best possible manner and are satisfied to make the best of what time and human ability have permitted. Gradually army discipline and intercourse with other and better men are bringing the few grumblers into line. Some of the worst "knockers" are gradually becoming the best "boosters."

Syphilis and the Army.—In a recent monograph, G. Thibierge of Paris, in drawing the balance sheet of syphilis, remarks that every soldier contracting syphilis now may be considered as representing at the very least one less soldier and one less mother of a family in the years 1936-1945. He insists on the necessity for hospital treatment for every syphilitic soldier during the contagious phase of syphilitic lesions. The same rule should apply to officers, but may be difficult to enforce in their case. It should be inevitably applied to factory workers, he emphasizes, as the danger of their infecting others is particularly acute. The government has insisted on the necessity for hospitalization for syphilitic soldiers in the contagious stage (decree January, 1916), and Thibierge adds that leave of absence from the hospital should not be given.

Medical Mobilization and the War

Delay in Issuing Commissions

Many physicians who made application for commission in the Medical Reserve Corps have received notice that their request for commission has been granted, but have not received the commission, although more than ample time has elapsed since the notice was received. The delay probably is caused by the fact that, the applications have to go through the regular form of entry in the Adjutant-General's Office after approval by the surgeon-general; the commissions must be made out and are then signed by the Adjutant-General and by the Secretary of War. During each of the past few weeks from 750 to 1,000 men have been recommended for commission in the Medical Reserve Corps alone; in addition similar commissions are being made out to thousands of men in other departments of the service. This necessarily means an overwhelming amount of work for the Adjutant-General's Office, for the Adjutant-General and the Secretary of War. We understand that so far as the Medical Reserve Corps commissions are concerned the Adjutant-General's Office is at present several weeks in arrears; hence the need of patience on the part of those who are looking for their commissions. Of course no one is ordered into active service until he has received his commission.

Free Vaccination for Civilians

As a means of preventing the interstate spread of diseases either by military forces or by the civilian population, the United States Public Health Service has arranged to vaccinate without cost any person who may apply at certain stations designated by this department. Vaccination will be given against any one or all of the following diseases: smallpox, typhoid fever and paratyphoid fever. If desired, a certificate of vaccination will be issued to the person vaccinated. Monthly reports will be sent to headquarters giving the names of those vaccinated, their addresses and the date of vaccination. Application for vaccination should be made to representatives of the United States Public Health Service at the following named points:

Alabama—Fort Morgan, Mobile.	Missouri — Kansas City, St. Louis.
Arizona—Douglas, Naco, Nogales, Tucson.	Montana—Sweet Grass.
Arkansas—Little Rock, Newport.	New Jersey — Gloucester City, Perth Amboy.
California—Angel Island, Cal exico, Eureka, Fort Bragg, Los Angeles, Monterey, Port Hartford, San Diego, San Francisco, San Pedro, Santa Barbara, Tia Juana.	New Mexico—Fort Stanton.
Connecticut—New Haven, New London.	New York—Albany, Buffalo, New York, Niagara Falls, Ogdensburg, Ellis Island.
Delaware—Port Penn.	North Carolina—Beaufort, Edenton, Elizabeth City, Newbern, Southport, Washington, Wilmington.
District of Columbia—Washington, Hygienic Laboratory.	North Dakota—Portal.
Florida—Biscayne Bay, Boca Grande, Cedar Keys, Cumberland Sound, Fernandina, Jacksonville, Key West, Pensacola, Port Inglis, St. Andrew, St. Georges Sound, St. Johns River, St. Joseph, Tampa.	Ohio—Ashtabula Harbor, Cincinnati, Cleveland, Gallipolis, Sandusky, Toledo.
Georgia—Brunswick, Savannah.	Oregon — Astoria, Marshfield, Newport, North Bend, Portland.
Idaho—Eastport.	Pennsylvania — Erie, Philadelphia, Pittsburgh.
Illinois—Cairo, Chicago.	Porto Rico—San Juan, Ponce.
Indiana—Evansville.	Rhode Island—Newport, Providence.
Iowa—Burlington.	South Carolina — Charleston, Georgetown, Chisolm.
Kentucky—Louisville, Paducah.	Tennessee—Memphis, Nashville.
Louisiana — Morgan City, New Orleans, Quarantine.	Territory of Hawaii—Honolulu.
Maine—Bangor, Boothbay Harbor, Calais, Eastport, Houlton, Machias, Portland, Rockland.	Texas — Brownsville, Del Rio, Eagle Pass, El Paso, Galveston, Hidalgo, Laredo, Port Arthur.
Maryland — Baltimore, Cambridge, Crisfield, Solomons.	Vermont—Newport.
Massachusetts—Boston, Gallops Island, Gloucester, New Bedford, Provincetown, Vineyard Haven.	Virginia—Alexandria, Fort Monroe, Irvington, Newport News, Norfolk, Richmond.
Michigan—Bay City, Detroit, Escanaba, Grand Haven, Ludington, Manistee, Marquette, Menominee, Port Huron, Saginaw, Sault Ste. Marie.	Washington—Anacortes, Bellingham, Blaine, Everett, Hoquiam, Marcus, Oroville, Port Angeles, Port Townsend, Seattle, South bend, Sumas, Tacoma.
Minnesota — Duluth International Falls.	Wisconsin — Green Bay, La Crosse, Manitowoc, Milwaukee, Sheboygan, Superior.
Mississippi — Gulfport, Natchez, Pascagoula, Vicksburg.	Alaska—Cordova, Juneau, Ketchikan, Seward, Valdez.

A Sanitary Corps for the Army

The Secretary of War has approved the creation of a Sanitary Corps under the Medical Corps of the Army which will include experts in sanitation, bacteriology, sanitary engineering and men skilled in supply, transportation and storage in connection with medical department work. This law will make it possible for the Medical Corps to make use of trained men not graduates in medicine. The total number of officers in the corps may be approximately equal to but not exceeding one officer for every 1,000 of the total strength of military forces.

Identification Tag for Personnel of the Navy

Officers and enlisted men in the United States Navy will hereafter wear a metal identification tag which will give the wearer's name and date of his birth and enlistment, and in the case of an officer, his rank and date of his appointment, on one side, and on the reverse side, an etching of the fingerprint of the right index finger. Officers of the Navy regard this as the best system of identification known. The tag will be worn suspended from the neck by a wire encased in a cotton sleeve.

War Hospital Construction Fund

The following statement has been issued under the authorization of the Navy Department:

President Wilson has sent to Congress the recommendation of the secretary of the navy for an appropriation of \$2,200,000 for emergency hospital construction at points not now provided with hospitals or where hospital facilities are not suitable or sufficient for the needs of the navy.

Surgeon-General Braisted, in urging this appropriation, pointed out that the Medical Bureau's original estimate of \$3,200,000 was reduced to \$1,000,000 in the urgent deficiency act, and that the additional amount is required to meet pressing needs. He said:

"Emergency hospital construction, now under way and approaching completion, at Portsmouth, N. H.; Newport, Philadelphia, Norfolk, Charleston, S. C.; Pensacola, New Orleans, and Great Lakes will cost nearly \$1,000,000 without equipment, and will therefore exhaust the present appropriation.

"Plans are being rapidly completed for temporary emergency hospital buildings at New York, Annapolis; Jamestown, Va.; Quantico, Va.; Key West, Great Lakes, Mare Island, and Puget Sound, which will cost about \$1,800,000. In addition to those mentioned, other hospital buildings are necessary at Portsmouth, N. H.; Newport, and Norfolk, which will cost several hundred thousand dollars more.

"All the buildings mentioned as under way and contemplated are of an emergency type of construction and of a temporary character, as required by the terms of the act making provision therefor. The contracts generally require completion in sixty days or less."

Fracture as a Cause for Rejection

Dr. F. A. Barnes of Montana asks whether a fracture of the femur or tibia which has to all intents and purposes completely recovered in the usual time, without deformity, is a cause for rejection.

According to "Rules for the Examination of Recruits": "Old, ununited fractures, fractures with shortening or callous formation sufficient to interfere with function, old dislocations, unreduced or partially reduced, complete or partial ankylosis of a joint, and relaxed articular ligaments permitting of frequent voluntary or involuntary displacement are causes for rejection."

"Excessive curvature of a long bone, and extensive, deep, or adherent scars interfering with motion are causes for rejection."

Rigidity of Examination in Various Branches of the Service

A physician inquires whether persons are accepted for one branch of the service after rejection in some other branch, and if so, which is the least rigid examination?

In the army all men are examined according to a definite routine examination which is practically the same for all branches of the service, varying only in questions of weight and height for the different branches of the service, and in special vision tests for some branches. For infantry, coast

artillery and engineers, the applicant must be not less than 5 feet, 4 inches in height and weigh not more than 190 pounds; for cavalry, he must be not less than 5 feet, 4 inches and not more than 5 feet, 10 inches, and weight not more than 165 pounds; for field artillery, the applicant must be not less than 5 feet, 4 inches and not more than 6 feet in height, and weigh not more than 190 pounds. A variation not exceeding a fraction of an inch in height for cavalry and field artillery is permissible if the applicant is in good health and is in other respects desirable as a recruit.

Official Publications for Medical Reserve Officers

Lieut. S. G. Schwarz, M. R. C., Humbird, Wis., writes: "Where may I get the Manual for the Medical Department of the United States Army? I wrote to the Superintendent of Documents, Washington, but he said they were not on hand. I find that most of the articles on medical military matters refer quite frequently to this book, and if one cannot secure the reference, he is greatly inconvenienced."

ANSWER.—The following War Department publications will be furnished, without cost to Medical Reserve Officers, by writing the following letter:

(Place Date)

From: First Lieut. John Doe, M. R. C., U. S. Army.

To: The Adjutant General of the Army, Washington, D. C.

Subject: Requests War Department publications.

1. Request that there be forwarded to me at the above address single copies of the following publications for my official use:

Manual of the Medical Department, 1916.

Army Regulations, corrected to April 15, 1917.

Field Service Regulations.

Drill Regulations and Service Manual of Sanitary Troops.

Manual for Courts Martial.

Circular 26 W. D. 1909.

Circular 2 W. D. 1916.

G. O. No. 66 W. D. 1910.

G. O. " 112 W. D. 1911.

G. O. " 23 W. D. 1912.

G. O. " 45 W. D. 1916.

JOHN DOE.

Acne as a Cause for Rejection

A physician of Vintondale, Pa., inquires whether acne vulgaris of the back in a young man, otherwise of good health, would bar him from the Officers Reserve Corps. According to the "Rules for Examination of Recruits" acne is not a cause for rejection unless situated on the face and so pronounced as to amount to positive deformity.

Qualifications for Medical Officers and the Draft

A physician of Colorado asks a series of questions of such nature as to make a reply in THE JOURNAL seem worth while.

1. What is the prospect of doctors under the age of 35 being called to service in the Medical Corps?

ANSWER.—The age limit for the draft is 21 and 31. It has been estimated that about 20,000 physicians are subject to the draft. Of the 10,000,000 persons subject to the draft, about 700,000 names are to be drawn now. Of this number, 500,000 are to be selected. Approximately, therefore, one in twenty of the persons registered will be drafted. Hence, the physician's chance is one to a thousand.

2. If a doctor applies for a commission in the Medical Reserve Corps and is accepted, does he have to serve?

ANSWER.—The physician who accepts a commission in the Medical Reserve Corps in time of war must go where ordered and when ordered.

3. Is it possible for Seventh Day Adventists to get relief from duty, such as examining troops and such other work except caring for the sick, on Saturday?

ANSWER.—Army officers, medical and otherwise, work when ordered to do so.

4. Our denomination is planning to organize a base hospital. If it does, will it be possible for a doctor of that faith to apply for a commission and be placed in said hospital if he should get his commission?

ANSWER.—Yes. Probably.

How to Conserve the Food Supply

The following instructions as to what the private citizen can do toward winning the war through the conservation of food and fuel have been formulated by Mr. Herbert Hoover, United States Food Administrator:

SAVE THE WHEAT.—One wheatless meal a day. Use corn, oatmeal, rye or barley bread and non-wheat breakfast foods. Order bread twenty-four hours in advance so your baker will not bake beyond his needs. Cut the loaf on the table and only as required. Use stale bread for cooking, toast, etc. Eat less cake and pastry.

Our wheat harvest is far below normal. If each person weekly saves one pound of wheat flour that means 150,000,000 more bushels of wheat for the Allies to mix in their bread. This will help them to save DEMOCRACY.

SAVE THE MEAT.—Beef, mutton or pork not more than once daily. Use freely vegetables and fish. At the meat meal serve smaller portions, and stews instead of steaks. Make made-dishes of all left-overs. Do this and there will be meat enough for every one at a reasonable price.

We are today killing the dairy cows and female calves as the result of high price. Therefore, eat less and eat no young meat. If we save an ounce of meat each day per person, we will have additional supply equal to 2,200,000 cattle.

SAVE THE MILK.—The children must have milk. Use every drop. Use buttermilk and sour milk for cooking and making cottage cheese. Use less cream.

SAVE THE FATS.—We are the world's greatest fat wasters. Fat is food. Butter is essential for the growth and health of children. Use butter on the table as usual but not in cooking. Other fats are as good. Reduce use of fried foods. Save daily one-third ounce animal fats. Soap contains fats. Do not waste it. Make your own washing soap at home out of the saved fats.

Use one-third ounce less per day of animal fat and 375,000 tons will be saved yearly.

SAVE THE SUGAR.—Sugar is scarcer. We use today three times as much per person as our Allies. So there may be enough for all at reasonable price use less candy and sweet drinks. Do not stint sugar in putting up fruit and jams. They will save butter.

If everyone in America saves one ounce of sugar daily, it means 1,100,000 tons for the year.

SAVE THE FUEL.—Coal comes from a distance and our railways are overburdened hauling war material. Help relieve them by burning fewer fires. Use wood when you can get it.

USE THE PERISHABLE FOODS.—Fruits and vegetables we have in abundance. As a nation we eat too little green stuffs. Double their use and improve your health. Store potatoes and other roots properly and they will keep. Begin now to can or dry all surplus garden products.

USE LOCAL SUPPLIES.—Patronize your local producer. Distance means money. Buy perishable food from the neighborhood nearest you and thus save transportation.

GENERAL RULES

Buy less, serve smaller portions.

Preach the "Gospel of the Clean Plate."

Don't eat a fourth meal.

Don't limit the plain food of growing children.

Watch out for the wastes in the community.

Full garbage pails in America mean empty dinner pails in America and Europe.

If the more fortunate of our people will avoid waste and eat no more than they need, the high cost of living problem of the less fortunate will be solved.

HERBERT HOOVER, United States Food Administrator.

Safeguarding the Interests of Physicians During Military Service

In addition to those previously reported, a large number of medical organizations have taken steps to look after the material interest of those physicians who are called on by the government for medical services. Among others, the Southern Oregon Medical Association, the Cincinnati Medical Lyceum, the Allen County (Ohio) Medical Society, the Connecticut State Medical Society, the San Francisco County (California) Medical Society, the Harrison County (West Virginia) Medical Society and the Wabasha County (Minnesota) Medical Society have made arrangements by which the practices of physicians called out by the government will be taken care of by members of the society. In most cases, it is provided that one third of the proceeds of such work shall be remitted to the family of the absent physician and that patients, treated by other physicians during his absence, shall be referred back to him on his return. Variations of this plan have been adopted in some instances. The Richmond (Virginia) Academy of Medicine has established a bureau which will rent houses, apartments and offices and maintain the insurance policies of absent members. In St. Louis, a registration committee has been appointed which will distribute the work of absent physicians among those remaining at home. The Oklahoma County Medical Society has asked each member to report his gross income for 1916. With this as a basis,

each member will be assessed a certain amount each month for the support of families of members in military service.

Have The Journal Sent Direct

Medical officers on active duty in training camps or elsewhere can have THE JOURNAL sent directly to them from this office if they will inform us promptly of each change of address. Address, the Subscription Department.

Orders to Officers of Medical Reserve Corps

ALABAMA

To El Paso, Texas, Provisional Field Hospital Co., Lieut. Octavius M. Spencer, Birmingham.

ARIZONA

To Nogales, Ariz., Capt. Leon Jacobs, Yuma.

ARKANSAS

To report by telegraph to commanding general S. D. for duty and station, Lieut. W. A. Dashiell, Little Rock.

CALIFORNIA

To Presidio, San Francisco, for duty with Ambulance Co. No. 2, Lieuts. Bruno F. Sandow, Oakland, and Lionel D. Prince, San Francisco.

CONNECTICUT

To Camp Wilson, Ft. Sam Houston, Texas, Lieut. M. J. Sheahan, Derby.

To Ft. Benjamin Harrison, Lieut. F. G. Goodridge, Pomfret Center.

DELAWARE

Honorably discharged, Lieut. H. A. Cleaver, Wilmington.

DISTRICT OF COLUMBIA

Honorably discharged, Capt. J. J. Repetti, Washington.

FLORIDA

To Army Medical School, Washington, D. C., Lieut. Herbert L. Bryans, Pensacola.

To Jacksonville, Fla., Capt. G. E. Henson, Jacksonville.

ILLINOIS

To Ft. Benjamin Harrison, Lieut. W. W. Coen, Springfield.

KANSAS

Honorably discharged, Capt. Samuel Murdock, Sabetha.

KENTUCKY

To Ft. Oglethorpe, Lieuts. Morton M. Moss, Bowling Green, and Marvin S. Veal, Daniel Boone.

Par. 100 S. O. 132, June 8, War D., relating to Lieut. Charles K. Berle, Louisville, is revoked.

LOUISIANA

Honorably discharged, Lieut. C. L. Gauden, Elizabeth.

MAINE

Honorably discharged, Lieut. B. Hayden, Livermore Falls.

MARYLAND

To Washington, D. C., Major T. C. Janeway, Baltimore.

MASSACHUSETTS

To Allentown, Pa., Lieut. Albert E. Small, Melrose.

To Army Medical School, Washington, D. C., Lieuts. William A. R. Chapin and Richard A. Rochford, Springfield.

To Washington, D. C., Lieut. Cassell C. Tucker, Boston, and report in person to the commandant Army Medical School for a course of instruction, Lieut. Charles H. Watt, Fall River.

To Report in Person to Commanding General, N. E. for duty, Major Dunlap P. Penhallow, Boston.

To 4th Engrs. N. A., Lieut. Albert A. W. Ghoreyeb, Boston.

MICHIGAN

To Ft. Benjamin Harrison for instruction, Lieut. William J. Du Bois, Grand Rapids.

To home, Capt. Ernest N. Dolman, Detroit.

Honorably discharged, Lieut. C. L. Washburne, Ann Arbor.

MINNESOTA

To Ft. Benjamin Harrison, Capt. Harold L. Lamb, Sauk Center.

To Ft. Riley, Lieut. Jared W. Daniels, St. Peter.

To Washington, Lieut. Arthur T. Henrici, Minneapolis.

Sick leave one month, Lieut. Frank H. Clay, St. Charles.

MISSISSIPPI

To Ft. Oglethorpe for instruction, Lieut. David W. Walley, Richton. Par. 39, S. O. 130, June 6, 1917, War D., relating to Capt. H. Greenberg, Fayette, is revoked.

MISSOURI

To Ft. Riley, Major H. C. Herrick, St. Louis.

NEW JERSEY

To Ft. Oglethorpe, Capts. Richard Hirsch, Jersey City; E. J. G. Beardsley, Spring Lake Beach; Albert G. Bising, Weekawken and Lieut. Ord L. Sands, Orange.

To Home, Lieut. A. A. Strasser, Arlington.

NEW YORK

To Allentown, Pa., Lieuts. Harry L. Bibby, Joseph W. Gardam and Morton P. Lane, New York City.

To Allentown, Pa., with Ambulance Co. No. 7, Lieuts. Max P. Cowett, Royal A. Schaaf and Rowland P. Stanley, New York City.

To Ft. Benjamin Harrison for instruction, Lieut. Constantine J. MacGuire, New York City.

To the New York Academy of Medicine, New York, N. Y., Capt. Brooks H. Wells, New York City.

To West Point, N. Y., for duty, Capt. William H. Haskin, New York City.

To Report by Telegraph to Commanding General N. E. Dept., Lieuts. Ignatius L. Stein, Long Island; Leoc. G. Weishaar, Mt. Vernon; and Warren Wooden, Rochester.

Honorably discharged, Lieuts. Otto R. Eichel, Albany, and J. F. Ranken, Brooklyn.

OKLAHOMA

To Nogales, Ariz., Base Hospital No. 5, Lieut. Fenton M. Sanger, Oklahoma.

OHIO

To Army Medical School, Washington, D. C., Lieut. Anton B. Spurney, Cleveland.

To Cleveland, Red Cross Ambulance Co. No. 4, Lieut. Frank S. Gibson, Cleveland.

To Ft. Benjamin Harrison, Capt. C. C. Waller, Warren, and Lieut. H. M. Metcalf, Elyria.

Par. 48, S. O. 140, June 18, 1917, War D., relating to Capt. C. T. Hunt, Miamisburg, is revoked.

OREGON

To Ft. Riley, Lieut. Ernest D. Everett, Lakeview.

PENNSYLVANIA

To Ft. Benjamin Harrison, Lieuts. James M. McKibbin, Buck Valley, and Lauren C. Thomas, Latrobe.

To Ft. Oglethorpe, Lieuts. Josiah T. Bunting and F. S. Ferris, Philadelphia.

To New York, N. Y., course of instruction in laboratory work, Lieut. James H. Austin, Ardmore.

To New York, N. Y., and Report in Person to the Commanding General, Eastern Department, for further orders, Lieut. Paul C. Wittman, Philadelphia.

To Plattsburg Barracks, N. Y., Lieuts. Robert H. Bolling, Philadelphia, and C. W. Lincoln, Wayne.

To Washington, D. C., and report in person to the commandant army medical school for a course of instruction, Lieut. Henry E. Keely, Philadelphia.

To Washington to active duty, Lieut. Cyril F. Lauer, Pittsburgh.

To 5th Regt. of Engrs., Lieuts. Henry C. Flood and Paul H. Walter, Pittsburgh.

Assigned with reserve engineers, Lieut. Samuel Brister, Philadelphia.

Honorably discharged, Lieuts. J. L. Herman, Gordonville; Charles A. O'Reilly, G. G. Ross and J. E. Talley, Philadelphia.

SOUTH CAROLINA

To Gettysburg, Pa., Lieut. Robert H. Crawford, Rock Hill.

To Ft. Oglethorpe, Major Francis L. Parker, Charleston.

TEXAS

To Ft. Oglethorpe, Lieut. James S. Reid, Hearne.

To Washington, D. C., Army Medical School, for a course of instruction, Lieut. Frederick S. Wright, Brownsville.

VIRGINIA

To Boston, Lieut. John W. H. Pollard, Lexington.

To Ft. Oglethorpe, Capt. Thomas C. Firebaugh, Harrisonburg.

WASHINGTON

To Ft. Worden, Wash., Lieut. Richard C. Hill, Irondale.

To report by telegraph to Commanding General, Western Dept. for duty and station, Capt. Win. E. Joiner, Seattle.

WEST VIRGINIA

To Ft. Oglethorpe, Lieut. Calvin E. Clay, Martinsburg.

Orders to Officers of the Medical Corps

Major M. A. Reasoner, M. C., to station at Chicago.

Capt. M. C. Stayer, M. C., to station at San Francisco.

Capt. J. P. Fletcher, M. C., to station at Louisville.

Major A. M. Whaley, M. C., as surgeon at Ft. Myer, Va.

Capt. E. G. Huber, M. C., to station at Fort Snelling.

Officers of Medical Corps to Washington for examination for promotion: Lieut. Cols. Carl R. Darnall and Champe C. McCulloch, Jr.; Majors William H. Moncrief and Allie W. Williams; Capts. Raymond C. Bull and Douglas W. McEnery.

Capt. Henry P. Carter, M. C., from further duty at Ancon, C. Z., and at the earliest practicable date to Petersburg, Va., for duty, relieving Major John R. Bosley, M. C., who will return to proper station.

Officers of Medical Corps from duty in Hawaii and to United States and report in person to commanding general, Western Dept., for further orders: Lieut. Col. Powell C. Fauntleroy, Major Eugene H. Hartnett, Capt. Lauren S. Eckels and Capt. Raymond W. Bliss.

Major Robert C. Loving, M. C., to station at San Antonio, Texas.

Officers of Medical Corps from duty in Philippine Dept. to United States on first available transport and report in person to commanding general, Western Dept., for further orders: Major John L. Shepard, 1st Lieuts. Charles L. Gandy and William W. Vaughan.

Major Edwin W. Rich, M. C., to Camp Stotsenburg, Pampanga, for duty, relieving Major Paul C. Hutton, M. C., who goes to Manila for duty.

Major Henry H. Rutherford, M. C., to Manila for duty as assistant to department surgeon.

Capt. William T. Cade, Jr., M. C., to Atlanta, Ga., as camp sanitary officer during construction of cantonments.

Capt. William K. Bartlett, M. C., to Fort Des Moines, Iowa, for duty.

Capt. William R. Dear, M. C., to duty as attending surgeon, Philippine Department, with station in Manila.

Capt. Fletcher O. McFarland, M. C., to Manila, Cuartel de Espana, for duty, relieving Lieut. Col. James S. Wilson, M. C., who will proceed to Fort William McKinley, Rizal, for duty.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

New Operating Room Provided.—The city commissioners of Mobile have appropriated \$10,000 for the erection of a modern operating room at the City Hospital, for the use of the clinical staff of the University of Alabama School of Medicine.

Personal.—Dr. Seale Harris, Birmingham, who was operated on for appendicitis in New York, is reported to be convalescent.—Dr. Benjamin B. McCleskey, Bessemer, has been appointed sanitary inspector and placed in charge of the local health office.

ILLINOIS

Physicians' Association Incorporated.—Papers of incorporation were issued at Springfield, June 22, for the Illinois National Physicians' Home Association.

Sanatorium for La Salle County.—Plans for the proposed La Salle County Tuberculosis Sanatorium have been submitted to the supervisors. The institution will cost \$65,000 and will accommodate about fifty patients.

State to Combat Tuberculosis.—Dr. George Thomas Palmer, Springfield, has been appointed assistant director of the state department of health and is in charge of the defense of Illinois troops from tuberculosis, which is said to have been so prevalent in the European armies.

War on Mosquitoes.—The Western Suburbs Anti-Mosquito Association, which includes the suburbs of Maywood, Forest Park, River Forest, Melrose Park, Bellewood, Oak Park, the forest preserves and Aurora, will endeavor to eliminate the mosquito from the western suburbs of Chicago, by spraying crude oil on the surface of all ponds and swampy places.

Appellate Court Rules on Cook County Hospital Civil Service Examinations.—As is generally known, appointment to the attending staff of the Cook County Hospital is made from an eligible list obtained as the result of a competitive examination conducted by the Cook County Civil Service Commission. On Dec. 7, 1911, an examination was held and those who passed received notice to that effect. Before the eligible list was actually prepared or posted, however, numerous complaints were made of unfairness in the methods of calling and holding the examination, and in the marking of the papers. The civil service commissioners instituted an investigation and appointed a committee of physicians of Cook County to advise in regard to the question as to the fairness and justice of the markings based on experience. The committee reported that it did not think the civil service commission would be justified in accepting the markings.

The commission at a meeting held Sept. 3, 1912, passed a motion stating that it found: (1) that the examination was divided in such a manner that the applicants who were entitled to take more than one of the thirteen separate tests could not do so because these tests were held simultaneously by the examiners; (2) that some of the tests were held for alleged places which do not and never did exist, and (3) that a special committee of physicians appointed by this commission to investigate the experience markings in this examination had found after careful investigation that the standard of experience prescribed was wantonly departed from in numerous cases to the advantage of certain applicants, and that the committee had reported that they did not think the civil service commission would be justified in accepting the original markings. The commission unanimously ordered that the report of the examiners be rejected and set aside, and that new applications be received.

Among those who passed were several who contended that the commission had no power to enter this order, and that in doing so they were improperly influenced; that on being notified they became entitled to have their names placed on the eligible list and were entitled to appointment. Suit was brought in the name of Dr. Aime P. Heineck et al. to compel the civil service commission to reverse its action. April 24, 1915, a writ of mandamus was issued against the commission in the circuit court to compel them to reverse their action canceling the examination held Dec. 7, 1911, and to

restore the eligible list which resulted from that examination. Last week presiding Justice Goodwin of the appellate court rendered an opinion reversing the decision of the circuit court, stating that it was within the power of the commission to set aside the examination and that there is no evidence to sustain the contention that the commission was improperly influenced or acted fraudulently or dishonestly. "The power of the commissioners" said Justice Goodwin, "must, of course, be determined by the terms of the statute, and while commissioners are authorized to appoint examiners, the statute expressly directs that the commissioners shall control all the examinations, and later provides that they shall investigate the action of the examiners. The purpose of these provisions is clear. The provisions of the statute were intended to create conditions under which appointment to positions in the county service should be on the basis of merit. To this end a commission is created, charged with the duty of faithfully carrying out the provisions of the statute, and in this work it is empowered to secure the assistance of examiners, but in that connection the statute makes it very plain that it shall retain the duty of controlling the examinations and investigating the action of the examiners whom they appoint. To say that it has these powers and duties and no power to set aside an examination, which in its opinion had been irregularly or improperly conducted, would be a distinct contradiction in terms. The legislators might provide that the action of the examiners should not be subject to control or investigation, but they have not chosen to do so. Hence it necessarily follows that when an investigation of the action of the examiners discloses facts which, in the opinion of the commissioners, convince them that an examination has been unfairly or improperly conducted, it is not only within their power, but it is their duty, under the statute, to set that examination aside. It may be argued that such a power invites abuse, but to this it may be answered that the power seems clearly and unmistakably given by the statute, and, moreover, it would seem that it is impossible to create a system for the appointment of public officials and employees, whose fair operation will not depend to some extent upon the fidelity of the commissioners appointed to supervise its workings."

Chicago

Physicians' Club Election.—At a recent meeting of the board of directors of the Physicians' Club of Chicago, Dr. Arthur M. Corwin was elected president, Dr. Henry W. Cheney, treasurer, and Dr. William D. Napheys, secretary. The other directors are Drs. John Weatherson, Daniel N. Eisendrath and A. Augustus O'Neill.

Personal.—Dr. Henry Linderth was injured in a collision between two street cars, July 7.—Dr. Charles F. Stotz has been elected president and Dr. Moses Sahud, secretary of the Northwest Branch of the Chicago Medical Society.—Prof. R. G. Hoskins of the Northwestern University Medical School has been appointed editor of *Endocrinology*, the bulletin of the Association for the Study of the Internal Secretions.

Care for Soldiers and Sailors, and their Dependent Families.—The following committee has been appointed to arrange for the care of soldiers and sailors of the United States and their dependent families: Drs. E. Wyllys Andrews, Arthur Dean Bevan, Frank Billings, Joseph P. Cobb, Arthur M. Corwin, John M. Dodson, Allen B. Kanavel, Lewis L. McArthur, Albert J. Ochsner, A. Augustus O'Neill (chairman), William E. Quine, Thomas E. Roberts, John A. Robinson, George H. Simmons, Homan Spalding, Samuel C. Stanton, Daniel A. K. Steele and Clarence L. Wheaton (secretary).

Colony for Dementia Praecox Needed.—Dr. William J. Hickson, in his preliminary report regarding the new venture of examining for mental troubles, individuals who have been brought repeatedly before the court of domestic relations, morals court, boys court and juvenile court, states that 50 per cent. of those brought into these courts have been punished more than once, and frequently several times for the same offense, and that practically all of them are feeble-minded or suffering from dementia praecox. He suggests that a colony for these patients be established where they can be cared for in winter and in summer; that they be scattered in groups under proper restrictions to build roads for the state and take part in other public improvements.

INDIANA

Sanitary Troops Mustered In.—Ambulance Company No. 1 and Field Hospital Company No. 1, Ind. N. G., at Fort Ben-

jamin Harrison, were mustered into the federal service, June 22.

Personal.—Dr. Eugene B. Mumford has been elected director and Dr. Homer W. Cox, physician in charge of the Summer Mission for Sick Children at Fairview Settlement, near Indianapolis.—Dr. J. Rilus Eastman, Indianapolis, narrated his experiences in Vienna at the weekly luncheon of the Indiana University Association of Indianapolis, June 25.

Favors Continuous Session.—The Indiana State Board of Medicine, Registration and Examination has voted in favor of admitting to its examinations, during the present war emergency, graduates of medical schools which have continuous sessions for junior and senior classes. This method shortens the time required for obtaining the degrees by about eight months, since the student continues work through the summer. There is no reduction in the number of hours devoted to medical study.

IOWA

Floods Delay Dedication.—On account of the floods, the program for the opening of the Graham Hospital, Centerville, could not be carried out, June 6, and the dedicatory exercises were, therefore, postponed until June 12.

Hospital Changes Owners.—Drs. Otto O. Svebakken and Charles W. Rominger have sold their private hospital at Waukon to the Nurses' Medical Benevolent Association. The new management will assume charge about September 1.

Woodbury County's Record of Service.—Seventeen physicians of Woodbury County are in the government service or waiting to be called. Eight of these are in the National Guard and nine in the Medical Officers Reserve Corps.

New Health Regulations.—New rules and regulations of the Iowa State Board of Health have been printed and mailed to all mayors, city and township clerks, health officers and county auditors of the state. Any physician in Iowa who will make request to the state board of health that a copy be sent to him, will receive a copy of the new rules and regulations.

Des Moines Valley Physicians Meet.—The forty-sixth annual meeting of the Des Moines Valley Medical Association was held recently in Ottumwa and the following officers were elected: president, Dr. Charles H. Magee, Burlington; vice presidents, Drs. Laris P. Torrence, Blakesburg, and M. F. Moore, Ottumwa, and secretary-treasurer, Dr. Elias B. Howell, Ottumwa (reelected).

MISSOURI

Club Election.—At the annual meeting of the Medical Women's Club of Kansas City the following officers were elected: Dr. Dora E. Bowman, president; Drs. Alberta Moffett Green and Luella Brommel, vice presidents, and Dr. Adeline Goodrich Soule, secretary, and Dr. Avis E. Smith, treasurer.

Personal.—Dr. Godfrey O. Cuppaidge, Moberly, has been elected president of the state board of health, succeeding Dr. Francis H. Matthews, Liberty, resigned.—Dr. John F. Binnie, Kansas City, has resigned from the Municipal Hospital and health board, and has been succeeded by Dr. Leslie Miller.—Dr. J. L. Eaton has been elected superintendent of State Hospital No. 4, Nevada, and Dr. Frank L. Long, Farmington, was reelected, and Dr. Prentiss S. Tate, Morley, assistant physician to the institution.—Dr. Marion O. Biggs has been reelected superintendent of the Fulton State Hospital.—Dr. James C. Welch, Salem, has been appointed physician to the state penitentiary.—Dr. Arthur C. F. Brown, Kansas City, was severely beaten and robbed by highwaymen, recently.—Dr. William J. Bell, St. Joseph, has returned from the western front in France.

St. Louis

Personal.—Dr. Frederick Hagler, who has been stationed at Grudens, Germany, for the last year, has returned to the United States.—Dr. George Wade Wilson has been appointed chief surgeon to the police department, succeeding Dr. Harry M. Moore.

NEW YORK

To Rebuild Sanitarium.—The building of St. Gabriel Sanitarium, Saranac Lake, which was destroyed by fire last January, is to be replaced by a new structure. Work will be begun on the new structure next month. The estimated cost of the new building is between \$750,000 and \$1,000,000.

New York City

Diet Kitchen Needs Funds.—The New York Diet Kitchen Association has issued an appeal for \$10,000 with which to continue its work. The association is now caring for 2,500 babies in its eight health stations.

City Commends Straus Milk Stations.—A resolution, recently adopted by the board of aldermen, commends Nathan Straus for his establishment of milk stations in this city, which it is estimated have saved the lives of 250,000 babies.

Boat Ambulance Launched.—St. John's Guild has launched a new 38 foot gasoline ambulance, the gift of Isaac N. Seligman. The launch will be used to transfer patients between the Floating and Seaside hospitals maintained by the guild.

Institution for Blind Acquires Site.—The New York Institute for the Education of the Blind has acquired a new 18 acre site, fronting on Pelham Parkway, Williamsbridge Avenue, Astor and Bronxwood avenues. It is estimated that the cost of the group of buildings to be erected on this site will approximate \$1,000,000.

New Bay Ridge Hospital.—The contract for the new Bay Ridge Hospital to be erected at Seventh Avenue and Ninety-Second Street, Brooklyn, has been let. Only the main wing of the hospital is to be built at present, which will cost \$135,000. This structure will provide for sixty beds, including two free wards, and several private rooms. When completed several other buildings will be grouped about this wing.

Women Give Hospital Unit.—The New York Infirmary for Women and Children, backed by the National American Woman Suffrage Association, has offered a mobile hospital unit to the government. Dr. Caroline S. Finley is director of this unit. The organization committee has among its members Dr. I. von Sholly, Dr. Mary Lee Edward and Dr. Alice Gregory. The unit starts with a nucleus of twelve doctors, twenty-one nurses, and three orderlies.

Last Year's Poliomyelitis Epidemic.—Detailed information regarding the poliomyelitis epidemic in this city in 1916 has been published by the department of health and constitutes No. 16 of the *Monograph* series. It contains 391 pages and is divided into thirteen chapters, dealing respectively with the history, etiology, epidemiology, insects as carriers of the disease, poliomyelitis in New York in 1916, pathology, symptomatology, diagnosis and differential diagnosis, prognosis, record of treatment employed, discussion of treatment and prophylaxis. In an appendix are collected rules and regulations, reproductions of placards, leaflets, press bulletins, statistic tables, etc. Owing to the expense of publication the *Monograph* will cost \$1.50. Copies may be obtained through medical book dealers or from the Department of Health, 149 Center Street.

OHIO

Personal.—Dr. Clement N. Clark, Canton, fell while inspecting a new building, June 25, and suffered severe contusions.—Dr. Leander F. Cain, Caldwell, charged with illegal practice, was found not guilty, June 23.—Dr. Henry Baldwin has been reelected superintendent of the District Tuberculosis Hospital, Springfield, and Dr. Robert H. Grube, Xenia, has been chosen as president of the board of trustees.

Promotions.—The following promotions have been made at the School of Medicine of Western Reserve University: Drs. Paul J. Hanzlik, to be assistant professor of pharmacology; Cyrus Harwell Fiske, to be assistant professor of biochemistry; Roy Wesley Scott, to be associate in physiology; Julius Moses Rogoff, to be senior instructor in experimental medicine for two years; Roy Bartlett Metz, to be associate in ophthalmology; Joseph Edgar McClelland, to be instructor in pediatrics; Carlos Eugene Pitkin, to be instructor in diseases of the nose, ear and throat; Chester Dale Christie, to be instructor in medicine; Marion Arthur Blankenhorn, to be instructor in medicine.

Cincinnati

Merger of City Boards Proposed.—Merger of the health and public welfare boards of the departments of the city, with one head having direct supervision, was advocated recently before the charter commission by Dr. Otto P. Geier, formerly superintendent of charities and corrections.

Personal.—Dr. Wade W. Oliver, assistant professor of bacteriology in the University of Cincinnati, has been appointed professor of bacteriology in the College of Medicine of Long Island College Hospital, Brooklyn.—Dr. Joseph Ransohoff has resigned on account of the age limit fixed by the War Department as director of the Cincinnati District

Base Hospital Unit and has been succeeded by Dr. William Gillespie.—Dr. John M. Adams has been reelected department medical director of the Grand Army of the Republic.—The degree of Master of Science has been conferred on Dr. John M. Withrow by the Ohio Wesleyan University, Delaware.—Dr. Charles S. Dreyer has been commissioned lieutenant, M. C., Ohio N. G., and assigned to the Third Ambulance Company.

OREGON

New Examiners Appointed.—D. D. Young, McMinnville, has been appointed by the government a member of the state medical examining board as a representative of the osteopathic school.—Ross A. Farr, Astoria, has been reelected a member of the Oregon State Board of Pharmacists.

South State Physicians Meet.—At the annual meeting of the Southern Oregon Medical Association, held in Grant's Pass, May 8, the following officers were elected: president, Dr. William W. P. Holt, Eagle Point; vice president, Dr. George C. Knott, Glendale, and secretary-treasurer, Dr. Alvane C. Seely, Roseburg (reelected). Medford was selected as the next place of meeting.

Eugenic Board to Organize.—Dr. R. E. Lee Steiner, Salem, has sent out notices calling together for organization the new state board of eugenics, provided for in the bill passed by the last legislature and composed of the members of the state board of health, the superintendents of the two state hospitals, the warden of the state penitentiary and the superintendent of the state school for feeble-minded.

Personal.—Capt. George E. Houck, Roseburg, M. C., Ore. N. G., has been appointed chief surgeon of the medical department with rank of major.—Dr. J. Ray Pemberton, Salem, has been appointed physician to the state prison, in place of Dr. W. Carlton Smith, called in the national service.—Dr. Jesse P. Truax, mayor of Grant's Pass, suffered a fracture of the clavicle, caused by the overturning of his automobile near Merlin recently.—Capt. Waldo L. Cheshire, M. C., Ore. N. G., Eugene, has been promoted to major and detailed as chief surgeon in the Oregon Artillery.

PENNSYLVANIA

Laboratory Transferred.—The new William H. Singer Memorial Laboratory, Pittsburgh, was formally opened and presented to the Allegheny General Hospital by G. Harton Singer, May 23. The laboratory, which has cost over \$250,000, is the gift of Mrs. Singer, her son and her two daughters.

Personal.—Dr. John B. Carrell, Hatboro, has been reappointed consulting physician to the State Hospital for the Insane at Norristown.—Dr. Warren H. Butz, Allentown, has been appointed physician to the Traylor Shipbuilding Corporation, Cornwells, where he has a camp of 3,000 men, and where the corporation is building a hospital for the use of its employees.

Tuberculosis Society Merged with Charities Board.—At the annual meeting of the Bethlehems Branch of the Pennsylvania Society for the Prevention of Tuberculosis, June 11, it was decided to ratify the question of placing the work of the society in the hands of the Associated Charities Organization of the Bethlehems. Dr. William P. Walker was reelected president and Dr. Walter D. Chase, first vice president of the organization.

Medical Society Holds Patriotic Meeting.—At the annual outing meeting of the Allegheny County Medical Society, at the Pittsburgh Field Club, there was a patriotic demonstration. Addresses were made by Col. T. H. Goodwin, of the English 'Commission; Drs. Franklin H. Martin, Chicago; Charles A. E. Codman, president of the state association; Samuel G. Dixon, president-elect, and Henry D. Jump, president of the Philadelphia County Medical Society.

Personal.—Dr. Henry H. McIntire has been promoted from assistant medical examiner for the Baltimore and Ohio system at Connellsville to medical examiner for the company at St. Louis.—Dr. Lawson has been appointed assistant medical examiner for the Baltimore and Ohio system at Connellsville.—Dr. George W. Gault, Marysville, has been appointed coroner of Perry County for a second term.—Dr. Bradford A. Booth, chief medical inspector in the Bureau of Infectious Diseases, Pittsburgh, retired, June 15, after twenty-nine years spent in the city service.—Dr. Clara S. Keiser has been appointed superintendent of the Neversink Mountain Tuberculosis Sanatorium, Reading, succeeding Dr. Addison M. Rothrock, called into the United States service.

—The University of Pittsburgh has conferred the degree of LL.D. on Dr. Thomas Alexander Forsythe, founder of the Forsythe Dental Infirmary, Boston.

National Guard Changes.—Commissions have been issued for the following medical officers: Major Eugene Swayne, Philadelphia, assigned Field Hospital No. 3; Major Daniel E. Sable, Pittsburgh, assigned First Field Artillery; Lieut. Robert B. Mackey, Lackawanna, assigned Thirteenth Infantry; Lieut. Alvin E. Bulger, Pittsburgh, assigned Eighteenth Infantry; Lieut. Theodore A. Little, Erie, assigned Sixteenth Infantry; Lieut. Harry Z. Hibshman, Philadelphia, assigned Field Hospital No. 3, and Lieut. Joseph J. Furner, Pittsburgh, assigned Ambulance Company No. 1.—The following appointments are announced in the medical section of the Pennsylvania National Guard Reserve: Majors George M. Coates and Ross H. Skillern. The resignation of the following medical officers has been accepted: Lieuts. William C. Le Compte, Bristol; Thomas M. Toomey, Francis F. Borzell, Philadelphia; Meade Wiant, Pittsburgh; Charles W. Shirey, Pittsburgh, and Swithin Chandler.—Lieut. Charles G. Steinmetz, Jr., has been transferred from the Third to the First Infantry.—Ambulance Company No. 3 was mustered into the service at Lancaster, May 31.

Philadelphia

White Collection Given to University.—Mrs. J. William White, widow of the late distinguished surgeon, has presented to the University Museum all the archeological and ethnological collections of her husband.

Yellow Fever Death.—Yellow fever caused the death of Jose Mariato, a Spanish sailor on the Danish steamship *Bryssel*, which has been held at Reedy Island Quarantine Station since July 1. This vessel was bound to Philadelphia from Antilla, Cuba, with a cargo of raw sugar. Mariato died yesterday afternoon, after he had been taken to the Government Hospital on Reedy Island. It is thought that he contracted the disease in the interior and not at the port of sailing. It is not believed that any of the other men on the ship are suffering from the disease, however, the authorities held the ship in quarantine until July 8.

Personal.—Dr. Peter F. Moylan has been made a Knight of St. Gregory by Pope Benedict XV.—Dr. Alfred Gordon delivered the commencement address at the College of Physicians and Surgeons, Boston, on "Race Betterment, Based Upon Principles of Physical and Mental Prophylaxy."—Dr. Alonzo E. Taylor, since 1911 connected with the medical laboratory of the University of Pennsylvania, has been appointed by Secretary of Commerce Redfield as a member of the advisory board of the Export Control Council.—Dr. Ernest LaPlace was selected as chief orator for the municipal Independence Day celebration at Independence Hall.

CANADA

Hospital Opened.—On July 5, Right Honorable Walter Long formally opened the new extension of the Ontario Military Hospital, Orpington, Kent, England. The capacity of that hospital is now doubled, with accommodation for 2,800 patients.

Compulsory Military Training Approved.—The board of governors of the University of Manitoba, Winnipeg, have approved compulsory military training for all male students. It is also proposed not to admit any unmarried male of 20 years to attend lectures or take examinations, unless he furnishes satisfactory reasons why he has not enlisted.

Workmen's Compensation, Ontario.—The Workmen's Compensation Board of Ontario has sent to all practitioners in the province memoranda as to the amendments made in the act at the recent session of the Ontario Legislature. The board, after July 1, 1917, will pay all professional charges, nursing and hospital when necessary, of a reasonable nature, for a period not exceeding one month from the disability. The doctors' accounts are to be rendered direct to the board, and it is expected that the charges will be reasonable, not exceeding what would ordinarily be charged to the workman if he himself were paying the account.

Personal.—Capt. Allen E. Thompson, M. C., C. A. M. C., Coaticook, Que., who has been home on leave of absence from France, has returned. On the first day of the big push on the Somme last year, while attending wounded under fire, he was awarded the Military Cross.—Dr. Marchant B. Whyte, superintendent of the Isolation Hospital, Toronto, has been appointed director of medical services in connection with the board of health of that city. His responsibility now

extends over the Isolation Hospital, the schoolchildren and the various clinics maintained by the public health department.—Lieut.-Col. George R. Philip, Toronto, recently returned from overseas, has been appointed A. D. M. S. of the Petawawa Camp, near Ottawa, Ont.—The transfer of Capt. J. D. H. Barnett, A. M. C., from casualties, and his appointment as medical officer of the 248th Battalion, have been approved.

GENERAL

Anesthetists Offer Services.—The American Association of Anesthetists, at its fifth annual meeting, adopted resolutions offering its services and moral support to the government in the interest of efficient anesthesia in the army and navy, especially in the instruction of those who are to have charge of the administration of anesthesia in the service.

Public Health Reserve.—Resolutions appropriating \$300,000 for the creation of an officers reserve corps in the United States Public Health Service, and providing for the pay of officers of that service detailed to war duty with the army, navy and coast guard were passed, June 18, by the Senate, and sent to the House of Representatives.

Bequests and Donations.—The following bequests and donations have been recently announced:

Lakeside Hospital, Cleveland, \$200,000 by the will of Washington S. Tyler, Cleveland, one-half of which is to be used for constructions and the income from the other half for the maintenance of the maternity to be conducted in connection with the hospital.

Washington University, St. Louis, \$1,000,000, donated by the General Educational Board, to finance research in surgery, medicine and pediatrics.

St. Louis Society for the Relief and Prevention of Tuberculosis, between \$9,000 and \$10,000, the proceeds of a baseball game June 8.

St. Lukes Hospital, New York City, a bequest of \$7,500 to endow a bed in perpetuity, by the will of Anson Wales Hard.

Lake View Hospital, Chicago, Childrens Home, Lafayette, Indiana, and Home Hospital, Lafayette, Indiana, equal parts of a bequest of \$150,000, by the will of Mrs. Nicholas Box, Lafayette, Indiana, on the death of her husband.

Lakeside Hospital, Cleveland, \$1,000,000; St. Vincent's Charity Hospital, Cleveland, \$200,000; Cornell University Medical School, New York City, for its endowment fund, \$500,000; by the will of Col. Hazard Payne.

Episcopal Hospital, Philadelphia, \$5,000, by the will of Mrs. Sarah M. Lewis.

Annals of Medical History.—The *Annals of Medical History* is a new venture in journalism. The first number contains the following articles:

"The Scientific Position of Girolanto Fracas Toro 1478?-1553 with Especial Reference to the Source, Character and Influence of His Theory of Infection," by Charles and Dorothea Singer.

"The Greek Cult of the Dead and the Chthonian Deities in Ancient Medicine," Fielding H. Garrison.

"The Three Characters of a Physician," Enricus Gordus.

"Voltaire's Relation to Medicine," Pearce Bailey.

"An Unpublished Bronze Ecorché," Edward Streeter.

"Burke and Hare and the Psychology of Murder," Charles W. Burr.

"Hebrew Prayers for the Sick," C. D. Spivak.

"Laryngology and Otology in Colonial Times," Stanton A. Friedberg.

In addition there are editorials and book reviews. The book is artistically printed in large type on pages 12½ by 8½, and contains numerous illustrations, most of which are reproductions from old books. The *Annals* is to be issued quarterly and is edited by Dr. Francis R. Packard of Philadelphia, the author of "History of Medicine in U. S." The staff of Associate Editors includes some of the leaders in the study of medical history in America, as well as Sir William Osler of England. It is published by Paul B. Hoeber, New York.

FOREIGN

Eighth Pan-American Congress.—It is announced that the eighth Pan-American Medical Congress is to be held at Buenos Aires in September, 1918.

Medical Students in Switzerland.—The *British Medical Journal* states that the five universities of Switzerland have a total of 1,901 medical students enrolled, including 827 foreign students. Only 105 of the 291 women students are Swiss.

Exchange of Tuberculous War Prisoners.—The *Policlinico* relates that the Red Cross at Rome and the Red Cross at Vienna have arranged for the exchange between Austria and Italy of all war prisoners affected with tuberculosis, whatever the stage of the disease.

Mail between America and Italy.—The *Policlinico* of June 10 states that its files of American exchanges are complete to date, the only difference between war and peace times so

far in this respect being that sometimes the issues of two or three weeks are received together.

Ascoli Succeeds Baccelli at Rome.—The University of Rome has called V. Ascoli, professor of medical pathology at the University of Pavia, to the chair of clinical medicine which has been vacant since the death of Baccelli. Professor Ascoli is the editor in chief of the *Policlinico* of Rome, founded by Baccelli and Durante, and now in its twenty-fourth year.

Requirements for Professional Course in Spain.—The *Medicina Contemporanea* of Lisbon mentions that the Spanish government, by a decree issued May 4, authorizes matriculation in the Spanish university of those with diplomas from foreign universities. At the same time it is specified that this confers no right to practice in Spain or its colonies.

Physicians Appointed Life Members of Austrian House of Lords.—According to a news item republished in the *Nederlandsch Tijdschrift*, of the fifty-five new life members recently appointed to the upper house of parliament in Austria, three are members of the profession: the two great surgeons, Profs. A. von Eiselsberg and J. von Hochenegg and the pathologist, Prof. Anton Weichselbaum.

Scarcity of Glycerin in Italy.—The military authorities have notified specifically the various medical organizations of the country warning them to use their influence that physicians refrain from prescribing glycerin except when nothing else can be used as a substitute, as glycerin is needed in manufacturing munitions. A special military board has charge of the toluol-benzol-glycerin supply.

Interned Soldiers in Switzerland.—The *Riforma Medica* states that the number of war prisoners interned in Switzerland far surpasses 30,000, the figure arbitrarily agreed on at first, and that it has been decided, therefore, to return some of the interned to their home land. They are to be selected principally among those at first supposed to be tuberculous but now cured. The respective governments guarantee not to call on these soldiers for further military service. Switzerland, it is also stated, has arranged for an interchange of prisoners between the belligerent countries. Five thousand are thus to be selected for interchange from among the permanently disabled, the fathers of more than three children, and soldiers with mental disease.

Asylum for Orphans of Physicians in Spain.—The *Medicina Contemporanea* relates that a recent government decree provides for the establishment of an institution to serve as a home for needy orphans of physicians. Half orphans are also eligible and the motherless children of disabled physicians, and orphans whose grandfather was a physician. The institution is to be called the Principe Asturias para huerfanos de medicos. Part of the expense of the institution is to be defrayed by a stamp tax. Physicians are to affix a special 10 cent stamp to death certificates, and a 40 cent stamp—to be paid for by the patient—in certificates for inability from sickness, etc. The stamps are not required on certificates made out for the actually indigent.

Asphyxiating Gas Bombs from Airplanes.—The Public Health Service at Milan has issued a circular with directions of what to do when airplanes drop bombs on the city. The people are told not to seek refuge in cellars, but in the middle stories of houses, on account of the danger from asphyxiating gas bombs. The windows are to be left open, to prevent injury from breaking glass, but if an odor of gas is detected, the windows and doors should be shut tight and people should stand erect and hold the children high. Cloths wet with water should be held over mouth and nose if obliged to pass through the gas. The local Red Cross has also on sale masks something like those worn by the soldiers at the front, to protect against drift gas. The mask is of a special polyvalent type, protecting against all kinds of asphyxiating gases, including phosgen, which is the one most dreaded as it is invisible.

Deaths in the Profession Abroad.—O. O. Malm, Christiania, Norway, who turned from the practice of medicine in 1890 to organize the veterinary system of Norway, which he guided to the last. He was also member of the Christiania city council and at one time of the legislature. He was 63 years old.—Major J. M. Atkinson, chief of the British government medical department at Hong Kong until his retirement in 1912. Since the war broke out he has been organizing military hospitals in England.—J. H. Bartlet of Ipswich, England, aged 88. His father and grandfather before him had been physicians at the same place and leaders in hospital work and endowments and in municipal administration.—R. H. Brew, Chew Magna, aged 55.—A. F.

Codd, Bromley, aged 60.—Licut. L. C. Scudamore, aged 47.—Capt. J. J. Weaver, chief physician at the Curran camp, aged 54.—Lieut. R. W. Vaughan.—A. Biondi, instructor in medical pathology at the University of Naples and author of a textbook on medical symptomatology and other works, aged 71.—L. Picqué, chief surgeon of the Asile Sainte-Anne at Paris.—L. Beurnier, a surgeon of Paris, aged 56.—F. Le Dantec, the biologist-philosopher who has published twenty-five volumes on various fields of biology, "Mechanics of Life," "Heredity," "Destiny of Man," etc., besides numerous journal articles.—W. B. Thorne, London, a well known specialist in heart disease.—W. H. Calvert, Scotland, aged 57.—R. Bentham, retired, inspector-general of hospitals and fleets of the British navy, aged 70.—W. Le Page of Guernsey, aged 76.—A. H. McCracken of Falkirk, aged 52. The more recent casualty lists in Italy bear the names of G. Tamborelli of Venice, aged 29; Capt. A. Restagno da Altare; Lieut. L. Antonini; V. Machiavelli; A. Magistretti and D. Coda. In France, S. Salles, aged 22; Sarazin, chief of the casualty hospital at Bègles. In England, Major W. G. Porter; Capt. F. J. Frere; Capt. O. Hairsine; Capt. D. R. King, and Capt. W. A. Smith.

Candy Containing Cholera Germs Thrown Down from Austrian Airplanes in Italy.—The *Riforma Medica* of Naples reproduces a rush telegram sent by the commander of the army forces at Bologna to the commander at Codigoro. It states: "The candy (*confetti*) thrown down by the Austrian aviators in their raid on Codigoro the eleventh inst. has been analyzed in the laboratory of medical pathology at the University here (Bologna) and cholera bacilli have been found. The examination is not complete and possibly other germs may be discovered besides. Signed Gen. E. Escard." The Codigoro local authorities have warned the populace and ordered all such articles found to be brought to the local headquarters, and also to keep all open wells thoroughly covered. (Codigoro, on the map, is nearly 50 miles due south of Venice.)

Before accepting this story as actual fact, it should be remembered that the cholera vibrio is sensitive toward desiccation and that its resistance is small. If dried, it dies in two hours. Incidentally, the books tell us that it is not transmissible by aerial infection. If the above story is true, this scientific statement is no longer reliable.

LONDON LETTER

LONDON, June 17, 1917.

The War

THE ARMY MEDICAL SERVICE

In an interview with Mr. Edward Marshall, the American correspondent, Sir Alfred Keogh, director-general of the Army Medical Service, described the work which has been accomplished, and expressed his appreciation of the assistance which America has already rendered and will be able to render in greater quantity. "In this greatest of all wars," said Sir Alfred, "one of the greatest of all episodes is the fact that the medical service has been restricted at no time either in money or in material. Lord Kitchener gave me an absolutely free hand. Men at the head of any medical department must have a free hand if the medical work of that campaign is to be properly carried out. Before the war we had gone a bit further than America has ever gone in the way of medical preparations for a great conflict. We had organized the civil medical profession for military purposes. This was our great territorial medical organization. When the regular army surgeons left the country with the expeditionary force, all that was best in the civilian profession was already organized to take their places in the immense military work necessary at home, and continually to supply men for vacancies as they occurred abroad. One of my many responsibilities was to ascertain the absolute fitness of all to whom appointments were given. There is a tendency among young surgeons to hope that if a war comes it will give them experience in operative surgery. It has been my business to see that no man who I would not be willing to have operate on myself in case of an emergency is given an opportunity to operate on a soldier. Every soldier operated on finds ready for the work the best available surgical talent. At least every supervising surgeon is and long has been a man with a real reputation. We had to bring into the war organization a set of advisers on mental affections and neurasthenia, matters of

much greater importance than in any previous conflict. Further, a sanitary committee was devised to advise on all technical matters, and a special sanitary committee was organized for service in the East. Another step was the creation of a special committee and the invention of new appliances for the conduct of gas defense. We have investigated the carrier problem in dysentery with results which have had notable effects in prevention. Men who have had dysentery are not allowed to remain in the ranks until examined so frequently that it is certain they are not carriers. To accomplish this we have had to congregate in special camps thousands of men, keeping them constantly under observation of bacteriologists. What has been accomplished is shown by this very week's report. Notwithstanding the size of our army, there are only three typhoid cases, fifty-four cases which may be typhoid, and twenty-two cases of paratyphoid. Continually we are ready for emergencies. If bulletins show signs of typhoid at any point, everybody specially qualified to deal with it swoops immediately on that spot and the outbreak is extinguished. We have organized our specialists very carefully. One group, for example, waits in England ready for cerebrospinal meningitis among the army, while the government has a similar group equipped for work among civilians. The greatest problem of all has been furnishing quick help to the wounded. Here the motor has been of immense value. We could not conduct the medical department of this war without motors. Men hit in the trenches are in the hospital, roughly speaking, within two or three hours." Sir Alfred Keogh said that if he were asked to give advice to America it would be to trust Surgeon-General Gorgas and to urge the civilian population to work in as close harmony as possible with the army medical service. "Above all, organize slowly, and don't rush it. I would emphasize the importance of taking the brains of women very seriously. Women have done magnificent work here, and to them none owes a greater debt of gratitude than I do."

MOTOR HOSPITAL SHIPS ON THE TIGRIS

The climate and peculiar geographic conditions of Mesopotamia have rendered the problem of transport of the wounded a special one which has only recently been fully solved. The great waterway, the Tigris, is navigable up to Bagdad, a distance of 550 miles. For service on it a new type of hospital ship has been built in England. The length of this ship is no more than 160 feet, its beam about 30 feet, and so slight is the depth of the hull that the three decks, surmounted by a light sun deck, seem to rise sheer out of the water to a great height. The principal factor in the design is the light draft of the vessel, which when working, will amount to only 2 feet, 7 inches of water. The main and upper decks form two hospital wards. The main deck is fitted with tiers of hospital cots, some being specially wide and long for the treatment of serious gunshot fractures. To insure light and free ventilation with warmth in winter and coolness in summer, the sides of the lower wards are enclosed with teak framing having upper panels of splinter-proof glass arranged in the cottage window fashion and so contrived as to act as windcatchers in the summer heat and to exclude cold and rain in winter. The upper deck is intended for convalescents and is provided with a promenade and seats. The speed of the vessel is about 10 miles an hour, so that the journey to the base may take from four to eight days. Everything needed in a hospital is to be found on board. At the fore end of the upper ward is a spacious operating theater. The vessel is equipped with a refrigerating plant for supplying ice and with an aerating machine for making aerated waters.

THE MANAGEMENT OF CASES OF NEURASTHENIA AND ALLIED DISORDERS IN THE ARMY

The number of cases of neurasthenia which have occurred in the war is now considerable. Most of them are due to concussion—shell shock. Of 160,000 men now receiving pensions, a percentage of 15 suffer from functional nervous disease. A special medical board has been formed to examine all discharged soldiers suffering from neurasthenia with a view to awarding gratuities or recommending pensions. A certain number of the men have not sufficiently recovered to be able to earn a livelihood. For these, homes of recovery have been organized in different parts of the country. The methods adopted in these homes are: 1. An attempt is made to gain the confidence of the patient and to persuade him to adopt an optimistic frame of mind. 2. Remedial methods, such as massage and electricity are undertaken. 3. Outdoor work and recreation are supplied. French intensive gardening has been found to be an excellent means of treatment.

PARIS LETTER

PARIS, June 14, 1917.

The War

CONFERENCE TO STUDY THE PROBLEM OF THE REEDUCATION OF WAR CRIPPLES

This conference was organized by a Franco-Belgian commission (*THE JOURNAL*, Feb. 17, 1917, p. 559), and the inaugural meeting took place in the presence of the president of the republic. Among the papers of the first section, which was devoted to the subject of physical reeducation, were reports by Dr. A. de Marneffe on physiotherapeutic services, and by Dr. A. Imbert, professor of physiotherapeutics on the medical faculty of Montpellier, on the value of employment at a trade with respect to physical reeducation.

Dr. Marneffe emphasizes the following points: 1. It is desirable to persuade surgeons to evacuate their wounded much earlier to the institutes of physiotherapy without waiting for the so-called "irreparable" cicatrization of wounds. 2. Therapeutic gymnastics must not be practiced by other than a competent personnel with medical training (physicians, medically trained instructors and medical students). 3. Centers of university instruction in therapeutic gymnastics, similar to the one in Stockholm, should be created. 4. Therapeutic gymnastics should be taken up by the wounded as soon as possible, and thoroughly trained physical directors should be placed in the large surgical hospitals at the front where they will render better service than is accomplished with mechanotherapy. 5. In mechanotherapeutic treatment the method and the prescriptions of G. Zander should be scrupulously followed. 6. In accordance with the principles and practice of rational physical reeducation, only competent persons should be employed as aids and assistants in the rooms devoted to mechanotherapy. 7. Pedagogic gymnastics, or motorpathic reeducation, should be in charge of trained physical directors, and should be carefully supervised by a physician versed in physiotherapy. 8. In an institute of physiotherapy, reeducation with a functional basis must not be supplanted in any way by vocational reeducation. Functional reeducation should be here accorded first place. It should be entirely completed before it is replaced by the training which has a new occupation for the patient in view. In an institute of physiotherapy, reeducation solely from a vocational standpoint must take an auxiliary position. It should be regarded as an adjuvant of the physical treatment, and must remain subordinate to this. Likewise, it must be prescribed with prudence and with a full knowledge of its import, and it must be carefully supervised and controlled by the physiotherapeutic expert. It must not be given full rights except in cases in which all attempts of physiotherapy have plainly failed.

According to Imbert, employment at a trade should be regarded beyond any possible doubt as an effective agent in physical reeducation of the wounded who have not yet reached an age at which their powers of mind and body are definitely fixed. Such trade employment, however, cannot in all cases supply the place of proper mechanotherapy, if judiciously planned. As is the case with mechanotherapy, the choice of a particular trade from the standpoint of suitability belongs to the medical domain, since the work to be performed is a therapeutic agent. Again, as is true of mechanotherapy, the results will vary according to the good will displayed by the patient, and according to the manner in which the execution of the work is supervised.

In the second section Léon de Paeuw, dealing with the question of vocational reeducation, presented a report giving data on trade selection. He expressed his opinion to the effect that trade selection should lie with commissions, each composed of a physician, a close student of social pedagogy and a technical expert, all possessing a practical knowledge of matters pertaining to reeducation. Patients should be subjected to a thorough medical examination from the triple standpoint of anatomy, physiology and clinical evidence. They should be rigorously questioned in order to bring out complete information in regard to their knowledge, their previous occupation, their tastes and aptitudes, the number of their dependents, their ultimate plans for the future, and their economic condition. The principle will doubtless work out somewhat in this manner: The men, after having worked in the shops of the school for the purpose of orientation and of learning their special aptitudes, will practically choose for themselves their new trade. These men should, however, be guided by the members of the commission, and especially by the physician, whose duty it will be to decide whether or not

the practice of the trade chosen is consistent with the physical condition of the subject. The commission will endeavor to interest every wounded man in his new trade by pointing out to him in a concrete manner the possibility of establishing himself in a given place with a definite hope of success. The wounded man, having thus decided on his new trade, will be admitted to the proper workshop. If, after a short period of trial, he shows the necessary aptitude, he will be retained; if not, he will again be brought before the commission. The commissions which have for their purpose the aiding of wounded men in the choice of a trade must be actuated by the following considerations: 1. Unless it is contrary to the best interests of the mutilated men, they should be allowed to readjust themselves to their old trade or occupation, or to a related trade that would be less fatiguing. 2. As far as possible, they should be returned to the same surroundings. 3. They should become artisans rather than factory workers, and they should not be directed toward trades that are overcrowded already, but toward trades in which man-power is most needed. 4. Purely utilitarian prosthetic apparatus should not be forced on mutilated men against their will. 5. Men who have lost an arm, especially men with a dislocated shoulder, who have sufficient intellectual ability, should not be directed toward manual pursuits, but should be allowed to choose employment not requiring manual skill.

The fifth section was devoted to the question of the blind, the deaf, and patients suffering from serious disturbances of the central nervous system. De Lapersonne, professor of clinical ophthalmology at the Faculté de Médecine de Paris, presented a report on the reeducation of those blinded in war. This, as a whole, comprises three successive stages: (1) preliminary reeducation; (2) reeducation properly so called, and (3) the return home.

As regards preliminary reeducation, de Lapersonne is of the opinion that it should commence as soon as possible after the wound is inflicted, and be directed mainly by the attending physician, since the latter is in a better position than any one else to make the patient understand and accept the situation. Preliminary reeducation should be, at the outset, of a purely material nature, with a view to accustoming the patient as soon as possible to an indispensable physical and mental hygiene. The character of the assistance rendered will depend on the social class to which the patients belong. This preliminary reeducation is already in force in all small training shops for the blind which have been established in certain hospitals at Paris, and also in the provinces. Reeducation, properly so called, is worked out in France in the special schools established by the state or by private enterprise. The first and most important of these is the Maison de convalescence des soldats aveugles, rue de Reuilly. The establishment of this school in the annex of the Hospice national des Quinze-Vingts is due to the efforts of M. Brissac. This school opened with an attendance of forty, which shortly increased to 200. Soon other schools were added. At present, throughout the provinces, notably at Amiens, Bayonne, Bordeaux, Caen, Chartres, Clermont-Ferrand, Dijon, Lyons, Marseilles, Montpellier, Nantes, Saint-Brieuc, Toulouse and Tours, there exist schools for reeducation which are intended to admit blind soldiers who come originally from these respective localities. In these schools the instruction varies greatly. It may be classified as instruction in manual arts and as preparation for intellectual pursuits. Among manual arts the most common are: brush making, basket work, shoemaking, massage, cooperage, mill wrighting, molding of aeroplane wheels, polishing of crystal glass stoppers, machine knitting, weaving, pottery, etc. Among the intellectual pursuits one may mention more particularly telephony, with slightly modified standard apparatus; music and the related occupations, such as tuning and manufacturing of pianos; typewriting, etc. It goes without saying that all the blind, while they are being instructed in some trade, will be taught the Braille system and also, if occasion demands, various methods which have been devised as supplementary to this. In this connection the system recently introduced by the ophthalmologist Cantonnet deserves particular mention by reason of its simplicity, the ease of its acquisition and the important service it is capable of rendering as regards communication between the blind and the seeing. Furthermore, the problem of reeducation has not been neglected in such matters as pertain to the mutilated blind and to those still possessed of partial vision. The former, when possible, are fitted with appropriate apparatus to aid them in their work. As for the latter, it seems to be

the general opinion that the best plan will be to establish special schools for them.

It is of the highest importance that the blind be not retained too long in the school for reeducation. The time spent in this school will vary from six to eight months (it will rarely be longer) according to the instruction that they are to receive. On leaving this institution, the blind may be divided into four classes: 1. Those who can return home, which will be the largest class, constituting 70 per cent. at least. Agricultural and urban workers will return to their own firesides and found a family. 2. Those who have no family or relatives, or who cannot take up their former life, for one reason or another, but who are otherwise good workers. These will be able, by means of their pension and their earnings, to live in proximity to their old home—as far as possible in the country, where they will find more comfort under better economic conditions, and where they will be able easily to walk about without a guide, which is indispensable for laborers or urban workers going to and from work. 3. Those workers who would not be able to conduct their own affairs, but would need constant direction. They can be placed in charge of some of their comrades, or a patron worthy of such confidence. 4. A small number, scarcely 10 per cent., incapable of working, or of any continuous endeavor. Under this head come the completely incapacitated (the wofully mutilated and the mental sufferers). The necessity of separate homes and retreats for such as these is self-evident. Some of these patients will naturally be put in soldiers' homes.

Dr. F. Chavanne of Lyons read a report on the deaf. According to him, permanent total deafness, or nearly total deafness, as the result of war injuries is fortunately very rare, reaching scarcely 2 per cent. of the cases. When, however, one has to deal with one of these deaf and mutilated men one must resort to reeducation, giving the preference to the lip-reading method. This special instruction must be given by teachers in institutions for the deaf and dumb and not by teachers with insufficient training. This instruction in lip-reading should be continued after the war, as long as those rendered deaf by the last battles require it.

SPECIAL PRIVILEGES GRANTED MEDICAL STUDENTS CALLED TO THE COLORS

M. Brenier, member of the Chambre des députés, has reminded the minister of public instruction of his repeated promises to grant medical students who have been called up certain privileges as regards completion of their studies, and Brenier has asked: (1) whether it would be possible to adopt, as of this date, such measures as would permit students called up to pursue their studies in accordance with the means at their disposal; (2) whether it was feasible to issue such instructions to the medical faculties throughout the country as would permit them to count as regular intramural study to the extent of twenty-four months, as far as the winning of credits is concerned, such time as they had spent in hospitals previous to their mobilization, either while going through their "stage," so called, or while serving as interns or dressers in hospitals; (3) whether, in case it should be impossible to give credit for work done *in absentia*, it would not be in keeping to permit those who had completed their researches and written their reports, also to pass their final examinations. To these questions the minister of public instruction has thus replied:

Medical students whose studies have been interrupted by mobilization will be permitted to benefit by certain special privileges long since promised and confirmed by the circular of the minister of public instruction which appeared in the *Journal officiel*, April 17, 1917. But, in order to be equitable, these privileges must be considered all together, when once hostilities have been terminated; moreover, these privileges will necessarily vary according to the duration of the mobilization, the time which shall mark the end of hostilities and the character of the studies pursued previously. The minister of public instruction can, as of this date, give the assurance that when the proper time shall come to apply these special privileges, all due account will be taken of services rendered by medical students who have been called to the colors, whether in the capacity of interns or visiting students (dressers) in hospitals, or as assistants in the hospital units at the front. As for examinations, medical students who have been called up have never been prohibited from presenting themselves for examination, provided always that the scholarship to which the examinations are to give sanction has been acquired in a regular manner before their enlistment, and that the military authorities controlling their

actions shall allow them the necessary facilities for taking them.

MODIFICATION OF MEAL HOURS

Dr. Bergonié, professor of biologic physics at the Faculté de médecine de Bordeaux, some time ago called the attention of the Académie des sciences to the advantages which a rational modification of our meal hours would offer (*THE JOURNAL*, May 16, 1914, p. 1570). At a recent meeting of the academy he brought up the subject again. He thinks that in order to be in accord with our needs from hour to hour as regards heat and mechanical work, the storing up of energy by means of alimentation ought to take place at about 7:30 a. m., in the form of the principal meal of the day consisting of from 1,500 to 2,000 calories, and at about 6 p. m. of a secondary meal consisting of from 1,000 to 1,200 calories. Leaving out of consideration the variation in meal hours at different epochs and among different peoples, an experience of nearly ten years has convinced him that it is not only rational, but also simple and easy to accustom our system to this change of meal hours and of their relative importance, and that it results in many advantages from the standpoint of health. If one chooses the warm season for the adoption of this new time schedule and this readjustment of the alimentary ration, a season during which the energy value of this ration is minimal, and if one restrains oneself, partaking only of a light meal at 6 or 7 p. m., a few days will suffice in order to have a good appetite in the morning, one or two hours after rising, and to feel, at noon, only an aversion for food. According to Bergonié, there is no physiologic reason why the day's work of eight hours, beginning at 9 a. m. and ending at 5 p. m., for example, may not all be accomplished without any midday meal, leaving thus sixteen consecutive hours of liberty to the laborer or to the employee.

Marriages

DUDLEY ALMONTE SMITH, M.D., Oakland, Calif., to Miss Florence Carol Allen of Spokane, Wash., in New York, recently.

EDWARD AUSTIN NORTH, M.D., Newport, Ky., to Miss Pauline Masterson of Carrollton, Ky., at Covington, Ky., June 20.

LIEUT. WILLIAM ROY DILLINGHAM, M. O. R. C., U. S. Army, Sabetha, Kan., to Miss Ada Hobbie of Liberal, Kan., June 28.

THEODORE PETERS, M.D., Chambersburg, Pa., to Miss Gertrude Miriam Lenhardt of Norristown, Pa., June 26.

EDMUND ROGER SAMUEL, M.D., Mount Carmel, Pa., to Miss Emily Gemellia Snyder of Strasburg, Pa., June 30.

WILLIAM LAWRENCE BURNS, M.D., to Miss Anita Reinhard, both of Cumberland, Md., at Baltimore, June 21.

ARTHUR KING BENNETT, M.D., Marquette, Mich., to Miss Margaret Collin of Penn Yan, N. Y., June 20.

CHARLES T. REID, M.D., West Mineral, Kan., to Miss Carrie Welch of St. Paul, at Girard, Kan., June 2.

FRED. B. WELCH, M.D., Janesville, Wis., to Miss Elsie May Douglass of Covington, N. Y., June 20.

HERMON OSCAR MCPHEETERS, M.D., to Miss Ethel Anderson, both of Redwood Falls, Minn., recently.

SURG. ALLEN DONALD McLEAN, U. S. Navy, to Miss Lillian Marion Barnes of New York, June 26.

EDWARD G. SCHUSSLER, M.D., Oak Lawn, Ill., to Miss Grace E. Hart of Mount Forest, Ill., June 20.

ROBERT KENT FINLEY, M.D., Xenia, Ohio, to Miss Florence Ganiard of Jackson, Mich., June 23.

FRANK JOSEPH PARIZEK, Denton, Mont., to Miss Grace E. Thompson, at Denton, June 17.

NEAL JOSEPH CONAN, M.D., to Miss Arline Mooney, both of Syracuse, N. Y., June 26.

JOHN HARRISON FISHER, M.D., to Miss Frances Lillian Turner, both of Williamsport, Pa., June 20.

CHARLES ALLEN NEAFIE, M.D., to Miss Effie Ethel Wallace, both of Pontiac, Mich., at Detroit, June 20.

ALLAN CHURCHILL WOODS, M.D., Baltimore, to Miss Anne Powell Byrd of Gloucester, Va., June 19.

WALTER GEORGE MCGUIRE, M.D., to Miss Frances Elizabeth McCormick, both of Chicago, June 20.

Deaths

Lieut.-Col. George Durfee Deshon, M.C., U. S. Army, Boston; Bellevue Hospital Medical College, 1890; University of Pennsylvania, Philadelphia, 1893; aged 52; a Fellow of the American Medical Association; the only officer of the Medical Corps of the Army who was a graduate of the United States Military Academy; Chief Surgeon of the Northeastern Department; died in his apartment in Boston, June 24. Colonel Deshon was made second lieutenant of the Twenty-Third Infantry in 1886 and resigned in 1890. He was commissioned lieutenant and assistant surgeon in the army, May 5, 1892; five years later was made captain and assistant surgeon; on Dec. 5, 1904 he became Major M. C., and on Aug. 6, 1912, was promoted to lieutenant-colonel. He served as surgeon of the Eleventh U. S. Volunteer Cavalry from August, 1889, to March, 1900; took part in the China Relief Expedition in 1900 and was also a surgeon of U. S. Volunteers from March, 1901, to February, 1903. His most recent assignments were as lecturer and professor on hygiene in the Drake University, Des Moines, Iowa; in the surgeon-general's office, Washington, D. C., as commander of the Army and Navy General Hospital, Hot Springs, Ark., and in the Panama Canal Zone in charge of the Ancon Hospital.

Brooks Hughes Wells, M.D., New York; College of Physicians and Surgeons in the City of New York, 1884; aged 57; a Fellow of the American Medical Association; vice president of the American Gynecological Association; a member of the New York Academy of Medicine; once president of the Medical Society of the County of New York; captain, M. O. R. C., U. S. Army; editor of the *American Journal of Obstetrics and Diseases of Women and Children*; emeritus professor of gynecology in the New York Polyclinic; associate surgeon to the Woman's Hospital in the State of New York; consulting gynecologist to Beth Israel Hospital and consulting surgeon to the Brattleboro (Vt.) Memorial Hospital; died in the Norwalk (Conn.) Hospital, July 6, from injuries received in a collision while bicycling near his country home at Southport, Conn., two days before.

Ferdinand Anson Stillings, M.D., Concord, N. H.; Dartmouth Medical School, Hanover, 1871; aged 68; a Fellow of the American Medical Association; formerly president of the New Hampshire Medical Society; visiting surgeon to the Margaret Pillsbury and Woman's Memorial hospitals, Concord; chief surgeon of the Boston and Maine system for thirty years; surgeon-general on the staff of Governors Tuttle and Rollins; one of the most prominent surgeons of New England; died at his home, June 22.

William S. Hoy, M.D., Wellston, Ohio; Jefferson Medical College, 1879; aged 61; a specialist in surgery; a member of the state legislature from Jackson County; formerly president of the American Association of Railway Surgeons and the International Association of Railway Surgeons; local surgeon of the Cincinnati, Hamilton & Dayton road; for thirty years chief surgeon of the Hoy Hospital, Wellston; was stricken with apoplexy while walking in Columbus, Ohio, June 13, and died a few minutes later.

George W. Sutton, M.D., Cleveland, Okla.; Cincinnati College of Medicine and Surgery, 1867; aged 73; for several years a member of the board of regents of the Oklahoma State University, Norman; one of the founders of the Bartlesville, Okla., Hospital; for twelve years surgeon at the Osage Indian Agency, Pawhuska, Okla.; died in the Bartlesville Hospital, May 23, from uremia.

William Henry Harrison Sias, M.D., Ellisburg, N. Y.; New York University, New York, 1882; aged 76; for three years school commissioner; for twelve years coroner of Jefferson County, and for two terms president of the village of Ellisburg; and justice of the peace; acting assistant surgeon, U. H. P. H. and M. H. Service for several years; died at his home, June 16.

Joseph L. Abt, M.D., Chicago; University of Michigan, Ann Arbor, 1892; College of Physicians and Surgeons, Chicago, 1893; a Fellow of the American Medical Association; and instructor in Northwestern University Medical School and a member of the staff of the Post-Graduate hospital; died in Eagle, Wis., June 28, after a nervous breakdown.

Jacob David Wurtz, M.D., Modena, N. Y.; Geneva, N. Y., Medical College, 1867; Bellevue Hospital Medical College, 1867; aged 71; county clerk of Ulster County for twelve years and for two terms a member of the legislature from the

second district; a director of the State of New York National Bank, Kingston; died at his home, April 26, from cerebral hemorrhage.

Henry Green Preston, M.D., Brooklyn; Bellevue Hospital Medical College, 1869; aged 69; medical director of St. Martha's and Bethesda sanatoriums from 1892 to 1894; for several years surgeon to the Brooklyn Homeopathic Hospital and electrotherapist to the Cumberland Street Hospital; died at his home, June 21, from heart disease.

Henry Albert Fox, M.D., Gosport, Ind.; Starling Medical College, Columbus, Ohio, 1881; formerly a Fellow of the American Medical Association; a member of the Indiana State Medical Association; aged 54; fell from a barn-loft at his home, June 16, and died the next day from concussion of the brain.

Wesley Turner, M.D., Santa Fe, Ohio; Starling Medical College, Columbus, Ohio, 1881; aged 62; formerly a member of the Ohio State Medical Association; died at his home, June 19, from the effects of a gunshot wound of the heart, self-inflicted, it is believed, with suicidal intent, while of unsound mind.

Esther Lydia Wilhelmina Wright Nippes Marbourg, M.D., Johnstown, Pa.; Woman's Medical College of Pennsylvania, Philadelphia; 1882; aged 86; one of the incorporators of the Johnstown Memorial Hospital Association; died at the home of her grandnephew, in Johnstown, May 29, from bronchitis.

Gilbert Tennent, M.D., Atlanta, Ga.; University of Nashville, Tenn., 1885; aged 52; a surgeon in the Confederate service during the Civil War, and thereafter a practitioner of Marietta, Ga., and of McAlester, Okla.; died in the Soldiers' Home, Atlanta, May 25.

Joseph Francis Tearney, M.D., Baltimore; University of Maryland, Baltimore, 1879; aged 62; a Fellow of the American Medical Association; medical examiner for the Baltimore and Ohio system since 1884 and chief medical examiner since 1912; died at his home, June 25.

William T. Herring, M.D., Iola, Fla.; Atlanta, Ga., Medical College, 1887; aged 57; for many years a practitioner of La Grange, Ga., but since his retirement an orange grower in Florida; died at the home of his sister in La Grange, May 29, from acute gastritis.

Benjamin F. Synder, M.D., Camden, Ind.; Medical College of Indiana, Indianapolis, 1879; aged 68; a Fellow of the American Medical Association, and a charter member of the Carroll County Medical Society; died at his home, May 13, from heart disease.

Bert Leon Richardson, M.D., Gorham, N. H.; University of Vermont, Burlington, 1892; aged 38; formerly a Fellow of the American Medical Association; a member of the New Hampshire Medical Society; died at his home, May 4, from lobar pneumonia.

Albert Mortimer Wilber, M.D., West Unity, Ohio; University of Michigan, Ann Arbor, 1866; aged 80; formerly a Fellow of the American Medical Association; a veteran of the Civil War; died in the Sandusky, Ohio, Soldiers' Home, about June 17.

James Fletcher McKinstry, Jr., M.D., Gainesville, Fla.; Kentucky School of Medicine, Louisville, 1892; aged 48; a Fellow of the American Medical Association; and prominent as a surgeon of Florida; died at his home, June 13, from tuberculosis.

Anna Lukens, M.D., New York; Woman's Medical College of Pennsylvania, Philadelphia, 1870; aged 73; for several years resident physician at the New York Nursery and Child's Hospital, Staten Island, N. Y., died at her home, June 16.

Thacker V. Walker, M.D., Arlington, Tex.; Jefferson Medical College, 1854; aged 85; surgeon in the Confederate Army during the Civil War, and later postmaster of Quanah, Tex.; died in the Home for Aged Masons, Arlington, June 3.

William Herman Bell, M.D., Bellevue, Ohio; University of Michigan, Ann Arbor, 1892; aged 46; formerly a member of the Ohio State Medical Association; died in Dr. Reed's Hospital, Cincinnati, May 24, after an operation on the colon.

Felix H. Pipes, M.D., Waynesburg, Pa.; Wooster, Ohio, Medical College, 1879; for many years an employee of the government in Washington, D. C., but for two years past a resident of Kansas; died June 6, after a surgical operation.

Fred Greene Wood, M.D., Mansfield, Pa.; Jefferson Medical College, 1895, aged 49; a Fellow of the American Medical Association; died at his home, April 6, from lobar pneumonia.

Wilbur Laurin Hutchison, M.D., Hazleton, Pa.; Jefferson Medical College, 1891; aged 51; physician in charge of the State Free Tuberculosis Dispensary, and physician for the United Charities in Hazleton; died at his home, June 11.

Evan Williams, M.D., Sugar Notch, Pa.; Jefferson Medical College, 1885; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of Pennsylvania; aged 61; died recently at his home.

Charles Joseph Duffy, M.D., Long Beach, L. I., N. Y.; College of Physicians and Surgeons in the City of New York, 1883; aged 59; for several years chief surgeon of St. Michael's Hospital, Newark, N. J., died at his home, May 22.

Loren Edgar Rex, M.D., Wichita, Kan.; John A. Creighton Medical College, Omaha, 1899; aged 41; a member of the West Virginia State Medical Association; died in his office, in Wichita, June 20, from cerebral hemorrhage.

Christopher Seymour, M.D., Northampton, Mass.; University of Michigan, Ann Arbor, 1869; aged 73; a member of the Massachusetts Medical Society for forty-eight years; died at his home, May 19, from heart disease.

Oscar Houck, M.D., La Crosse, Wis.; Jefferson Medical College, 1896; aged 57; formerly a Fellow of the American Medical Association; died at his home, French Island, La Crosse, June 12, from pernicious anemia.

Frank Wilder Rastall, M.D., Chicago; Loyola University, Chicago, 1907; aged 40; a veteran police ambulance surgeon of the city; was instantly killed, July 2, in a collision between his ambulance and an automobile truck.

Orlando E. Black, M.D., Wilsonville, Ala.; University of the South, Sewanee, Tenn., 1900; aged 41; a Fellow of the American Medical Association; died in Birmingham, Ala., March 13, from encephalitis.

George William Betts, M.D., Pulaski, N. Y.; New York University, New York, 1880; aged 58; a Fellow of the American Medical Association; died at his home, April 18, from cerebral hemorrhage.

William Scott Keys, M.D., Los Angeles; Vanderbilt University, Nashville, 1909; aged 30; formerly a Fellow of the American Medical Association; died at his home, June 20, from heart disease.

Hiram K. Whitner, M.D., Chicago; Jefferson Medical College, 1859; aged 81; surgeon of United States Volunteers during the Civil War; for many years an inventor; died at his home, June 13.

George C. Brooks, M.D., Sunbury, N. C.; College of Physicians and Surgeons, Baltimore, 1884; aged 57; formerly a Fellow of the American Medical Association; died at his home, June 11.

Charles Edward Buck, M.D., Boston, Tufts College Medical School, Boston, 1903; aged 58; a Fellow of the American Medical Association; died May 11, from chronic interstitial nephritis.

John David Vaughn, M.D., St. Joseph, Mo.; National University, St. Louis, 1916; aged 25; an intern in the Ensworth Hospital, St. Joseph; died in that institution, June 23, from nephritis.

Frank Valentine Stutzke, M.D., Detroit; Michigan College of Medicine and Surgery, 1904; aged 39; city physician of Detroit from 1907 to 1909; died in Harper Hospital, Detroit, May 14.

Russell D. Adams, M.D., Monrovia, Calif.; Long Island College Hospital, Brooklyn, 1864; aged 76; for more than thirty years a resident of California; died at his home, June 11.

Charles E. Gilbert, M.D., New York; New York Homeopathic Medical College, New York, 1870; aged 68; formerly chief surgeon of the Atlantic Yacht Club; died at his home, June 18.

George Montgomery Chamberlin, M.D., Chicago; Rush Medical College, 1866; aged 73; for many years a practitioner and pharmacist of Chicago; died at his home, June 30.

Howard Robertson Stratton, M.D., Victory, N. Y.; Baltimore Medical College, 1908; aged 40; died in Cato, N. Y., June 2, from the effects of poison, accidentally self-administered.

William J. Cheany, M.D., Petersburg, Ill.; Rush Medical College, 1892; aged 47; formerly a member of the Illinois State Medical Society; died in Hot Springs, Ark., June 7.

Edmund Rufus Young, M.D., Brenham, Tex.; Tulane University, New Orleans, 1871; aged 73; died in the John Sealy Hospital, Galveston, June 17, after a surgical operation.

James G. Ward, M.D., Bloomington, Ind. (license, Indiana, 1897); aged 71; for thirty-five years a practitioner of medicine; a veteran of the Civil War; died at his home, June 17.

Pembroke M. Cowles, M.D., Chardon, Ohio; Cleveland University of Medicine and Surgery, 1874; aged 76; a veteran of the Civil War; died suddenly in Chardon, June 12.

Elizabeth Louise D'Artoise-Traver-Francis-Hilton, M.D., Brooklyn; United States Medical College, New York, 1881; aged 77; died at her home, June 14, from nephritis.

Charles Guy Reily, M.D., Los Angeles; Missouri Medical College, St. Louis, 1883; aged 58; a specialist in diseases of the eye, ear and throat; died at his home, May 26.

Sophia Meindermann Hartley, M.D., Ann Arbor, Mich.; University of Michigan, Ann Arbor, 1865; aged 84; died at the home of her daughter in Milwaukee, June 15.

Edgar W. Brown, M.D., Orange, Tex.; Tulane University, New Orleans, 1883; aged 57; twice mayor of Orange; an oil and lumber magnate; died at his home, June 16.

Albert Ashmead Bockius, M.D., Merchantville, N. J.; University of Pennsylvania, Philadelphia, 1867; aged 67; died at his home, April 14, from cerebral hemorrhage.

Thomas Andrew Dundas, M.D., Elmira, N. Y.; New York University, New York, 1878; aged 61; at one time coroner of Chemung County; died at his home, May 27.

Peter Gregory Cotter, M.D., Los Angeles; Albany Medical College, 1867; aged 60; a Fellow of the American Medical Association; died at his home, June 16.

Spencer De Forest Hinman, M.D., Grand Rapids, Mich.; New York Homeopathic Medical College, New York, 1877; aged 66; died in his apartment, May 22.

Martha Marcella Norris, M.D., Fostoria, Ohio; University of Michigan, Ann Arbor, 1876; for half a century a practitioner; died at her home, June 14.

Nelson Mowton Smith, M.D., South Danville, Pa.; University of Pennsylvania, Philadelphia, 1882; died recently at his home, from cerebral hemorrhage.

Paul Reinhardt Wohlar, M.D., Salt Lake City; Rush Medical College, 1912; aged 30; died in Washington, D. C., May 28, from a nervous breakdown.

Nathan G. Harold, M.D., Carmel, Ind.; Medical College of Indiana, Indianapolis, 1881, aged 71; died at his home, May 7, from capillary bronchitis.

Thomas J. Hoskins, M.D., Edenton, N. C.; University of Virginia, Charlottesville, 1886; aged 53; also a pharmacist; died at his home, in May.

James Augustus Page, M.D., Pittsburgh; Howard University, Washington, D. C., 1906; aged 50; died at his home, June 1, from neuritis.

Charles Ault, M.D., Montreal, Que.; McGill University, Montreal, 1855; aged 83; died at his home, March 4, from cerebral hemorrhage.

Eunice Cyrus Freeman, M.D., Pulaski, Tenn.; University of Tennessee, Nashville, 1901; died at this home, June 9, from cerebral hemorrhage.

Darius Rowe, M.D., Akron, Ohio; Medical College of Ohio, Cincinnati, 1872; aged 74; died at the home of his daughter in Akron, May 28.

Joseph Stein, M.D., New Orleans (license, Louisiana); aged 66; for forty-two years a practitioner of New Orleans; died at his home, May 28.

Samuel Jones, M.D., Neodesha, Kan.; American Medical College, Eclectic, Cincinnati, 1857; aged 92; died at his home, June 10.

W. N. Fleetwood, M.D., Cochran, Ga.; Albany (N. Y.) Medical College, 1858; aged 82; died at his home, May 4.

O. H. P. Slayton, M.D., Senatobia, Miss.; Medical College of Augusta, 1886; died in Clarksdale, Ark., May 19.

J. P. Bailey, M.D., Indianola, Miss.; Louisville Medical College, 1882; aged 57; died at his home, May 7.

Edward Baxter Sloss, M.D., Oxford, Miss. (license, Mississippi, 1906); aged 40; died at his home, about June 6.

Ferdinand F. Dawn, M.D., Knoxville, Tenn. (license, Tennessee, 1889); aged 73; died at his home, May 28.

Hercules Ogle, M.D., Wabash, Ind. (license, Indiana, 1899); aged 73; died at his home, June 10.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

TRINER'S AMERICAN ELIXIR OF BITTER WINE

Report of the Council on Pharmacy and Chemistry

Triner's American Elixir of Bitter Wine is a wine to which bitter drugs and laxatives have been added. Though evidently intended for public consumption, it is also advertised to physicians, and consequently the Council publishes this report.

Some recent advertisements read:

"It Acts Well and Is Very Palatable. These are the reasons why so many physicians recommend TRINER'S AMERICAN ELIXIR OF BITTER WINE. Free from any chemicals. Prepared from bitter herbs, roots and barks of eminent medicinal value and pure natural red wine. A safe relief in auto-intoxication, constipation, weakness, etc. Price \$1.00. At drug stores. Samples gratis upon request only to physicians."

"A Laxative Tonic. In cases of constipation and its sequelae, auto-intoxication, weakness and nervousness you should try *Triner's American Elixir of Bitter Wine*. This preparation consists of Cascara Sagrada, Dandelion, Gentian Root, with Licorice in Pure Red Wine as a base, with Aromatics."

Triner's American Elixir of Bitter Wine is put up in bottles said to hold 1 pint, 5 1/3 fluidounces. The label declares the presence of from 16 to 18 per cent. of alcohol by volume, and states that "no special tax is required by the laws of the U. S. for the sale of this medicinal preparation." The circular contains the following recommendations for its use:

"... It should be used in all cases calling for a safe evacuation of the bowels, without weakening the body or causing any pain or other discomfort; in loss of appetite, nervousness and weakness."

"Triner's American Elixir of Bitter Wine consists of two principal ingredients, viz., Red Wine and Medicinal Herbs."

"Red Wine strengthens the intestines and regulates their work. It also increases the appetite, stimulates and strengthens the body."

"Use Triner's American Elixir of Bitter Wine always when a thorough cleaning-out of the intestines is needed. Arrange the dose to suit your condition and your habits."

"In Chronic Constipation the dose of Triner's American Elixir of Bitter Wine should be increased or taken oftener."

"Many Female Troubles are caused or aggravated by constipation and ladies should always pay good attention to this fact."

In addition to Triner's Elixir of Bitter Wine, the circular—in English, Polish, Russian, Spanish and other languages—advises the use of Triner's Angelica Bitter Tonic, Triner's Red Pills, Triner's Liniment and Triner's Cough Sedative.

The composition of this "wine"—some bitter drugs, a laxative and a tannin-containing, constipating red wine—and advertising propaganda all tend to the continued use of this alcoholic stimulant and thus to the unconscious formation of a desire for alcoholic stimulation. As the medical journal advertisements may lead physicians to prescribe this secret and irrational preparation and thus unconsciously lead to alcoholism, the Council authorized publication of this report.

EDITORIAL NOTE: The following "medical journals"—we use the "quotes" advisedly—have carried advertisements of the Triner preparation in some or all of their 1917 issues:

Medical Herald (St. Joseph, Mo.)

Medical Fortnightly (St. Joseph, Mo.)

Medical Sentinel (Portland, Ore.)

Therapeutic Record (Louisville, Ky.)

Western Medical Times (Denver, Colo.)

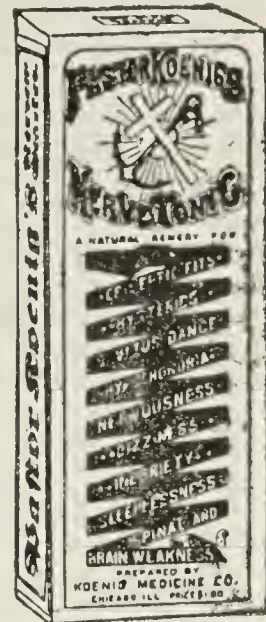
Urological and Cutaneous Review (St. Louis, Mo.)

SOME MISBRANDED NOSTRUMS*

Poland Wine Bitters.—Maryam, Walter and Casmir Struzynski of Chicago, who had traded under the firm name, Struzynski Bros., sold "Poland Wine Bitters," which, according to the federal chemists, was essentially a wine to which emodin-bearing and other unidentified drugs had been added. The stuff was labeled so as to convey the impression that

the product was made at Chenstohow, Poland, according to the discovery of the Pauline Fathers, when as a matter of fact, it was made in the United States. The false and misleading label resulted in the charge of misbranding to which the defendants pleaded guilty. They were fined \$100 and costs.—[*Notice of Judgment No. 4456.*]

Koenig's Nerve Tonic.—The Koenig Medicine Company, Chicago, Ill., made a preparation called "Pastor Koenig's Nerve Tonic." The government declared that the stuff was misbranded because the curative claims made for it were false and fraudulent and were applied knowingly for the purpose of defrauding purchasers. It was claimed that the preparation was "A Natural Remedy for Epileptic Fits . . . St. Vitus Dance . . . Dizziness, Inebriety . . . Spinal and Brain Weakness." Other equally ridiculous claims appeared on the package. The Koenig Medicine Company appeared as claimant. The court entered judgment of condemnation and forfeiture and ordered that the product should be delivered to the claimant after the cost of the proceedings had been paid and a bond of \$200 executed, one of the conditions being that the product should be relabeled under supervision of a government official.—[*Notice of Judgment No. 4531.*]



Mrs. Edwards' Infant Syrup.—This baby killer was manufactured by one William H. Raser, Reading, Pa. It contained morphin and alcohol and was sold as a remedy for dysentery, diarrhea and summer complaints in children. The claims were declared false and fraudulent and made in reckless and wanton disregard of their truth or falsity. Raser pleaded guilty and was fined \$50.—[*Notice of Judgment No. 4471.*]

Root Juice Compound.—This product was marketed by the Root Juice Medicine Co., Fort Wayne, Ind., and the label declared the presence of 20 per cent. alcohol. The govern-

FORT WAYNE DOCTORS DEFENDING SCIENTIST

Physicians of Indiana City in Discussion Over Strange New Medicine That Has Been Recently Creating a Furore in Davenport By Its Remarkable Cures of Disease.

There seems to be no end to the talk that has recently been created by the Indiana Scientist's discovery, 'Root Juice' and its strange power over certain diseases.

For the past several weeks the entire city of Davenport has been startled by dozens of remarkable cures that the new liquid has effected there and now there comes a report from Fort Wayne, Ind., concerning a controversy among leading doctors of that city over the medicine and its aura.

Physicians who first scoffed at the idea and ridiculed its discoverer, have become serious and may have made a personal investigation. Dr. J. D. Hayes, a well known physician, was asked to express his views on the subject and said "When all this talk about Root Juice started some days ago, I looked at it and openly stated to some of my friends that it was just newspaper talk. But I must admit that the persistent reports which continued to come in, interested me and I began to investigate."

many other medicines that I am already familiar with."

Dr. Dudley M. Culver, a prominent physician who has practiced medicine for more than 30 years, took the opposite view and when questioned said "Yes I have heard the talk about Root Juice and have been greatly interested in the many reports of its accomplishments. I am familiar with several of the cases in which tests were made and am convinced that the remedy possesses a truly wonderful power over certain diseases. I know that some physicians of this city do not agree with me, but I am sure any well posted and broad minded doctor who investigates the matter as I have, cannot fail to admit that the juice is a remarkable and startling discovery."

Dr. S. F. Sutton, another well known physician, said "I believe Root Juice is one of the most valuable medicines that has been given to suffering humanity in recent years. I have carefully watched the reports of many cures that have been brought about through its use. In my career as a physician, I have never seen such a rapid and complete cure of disease as that which Root Juice has effected in so many cases."

ment held that as the preparation contained less than 13 per cent. alcohol and was not a "root juice" these claims were false and misleading; further the authorities held that the claims that it was a "blood purifier" and would "strengthen and build up the system" as well as improve digestion and relieve "the strain upon the kidneys" were false and fraudulent. As no one appeared as claimant for the 72 bottles that had been seized, the court ordered that the product should be destroyed.—[*Notice of Judgment No. 4356.*]

* This material, with much additional, appears in the new edition of the pamphlet "Convictions," price fifteen cents.

Correspondence

SHEET MICA AS A PROTECTIVE

To the Editor:—Three years ago, at the meeting of the Pennsylvania Railroad Surgeons' Association, I read a paper on the employment of sheet mica (mineral isinglass) as a covering for wounds. I should like to call attention to the valuable uses to which this substance may be put, in war as well as in railway surgery.

Block mica can be readily split to any degree of thickness, from several millimeters, as sold in the hardware stores, down to a thinness equal to the the finest Cargile membrane. Placed on the surface of a wound, its glassy texture renders it nonirritant and nonadherent, while at the same time the surface beneath can be viewed as under a glass. Thus, granulation tissue, bone repair, brain, nerve, tendon, intestine or other organic structure can be daily inspected, and changes, retrograde or reparative, noted without disturbance or exposure to infection of the area. The covering is readily lifted off or broken away if removal is required, or it may remain and become encysted in regions in which motion or friction is not great, there being no injurious irritation. In a case in which I was obliged to remove a considerable portion of skull in secondary trephining after injury, I inserted an oval sheet of mica about 4 cm. in longest diameter, which is still in place, three years after operation. Like asbestos (mineral wool), also, it possesses the advantage of being readily and rapidly sterilized by being passed through a flame, being indestructible by heat. When a large surface is to be protected by a mica covering, the mica should be laid on in small pieces, varying in size in accordance with the contour of the part to be covered and the amount of exudation or discharge beneath. In the paper referred to above, I recommended that a small block of this mineral be carried in the railway emergency kit. I should like to suggest that it might be found of equal efficiency in the soldier's first aid package, or at dressing stations.

E. O'NEILL KANE, M.D., Kane, Pa.

"RAISING" THE QUANTITY OF NARCOTIC IN A PRESCRIPTION

To the Editor:—This morning a man with a nice looking face came to the Coleraine Hospital. He was using crutches, and had had one of his limbs removed, and also a portion of the pelvis, since he said that he was tuberculous. In short, he was a drug addict, and urgently begged me to give him morphin and cocain—just 2 grains of each. He hailed from Canada, and had only the day before secured enough from a physician at Hibbing to tide him over the day. He was on his way to Duluth to "take the cure."

Realizing that the person was like most of that type, I refused to give him any great amount of the drugs, and therefore wrote him a prescription for morphin and cocain, of each, gr. i. Imagine my surprise to find at the local pharmacist's where I chanced in a few hours later, to see my prescription calling for gr. iv each. Very clever. Merely a nicely added "v."

When I write my next prescription for a narcotic in behalf of a stranger, I think that I shall use our check protector.

C. R. MORSS, M.D., Coleraine, Minn.

MERCURIAL POISONING

To the Editor:—Apropos of your timely editorial on this subject (THE JOURNAL, June 30, 1917, p. 1987), it may be of interest to note that the Hygienic Laboratory is endeavoring to secure authentic information with reference to poisoning cases reported in the public press. From Jan. 1 to June 30, 1917, 707 such cases have been reported on by physicians, and hospital and police officials; of these, 449 have been

reported as suicidal, 174 accidental and 11 homicidal. Of the 707 poisoning cases, 239 were due to mercuric chlorid, and of these 61 have, *thus far*, been reported as fatal.

The purpose of this note is to call attention not only to the increasing number of such cases, but also to the urgent need of recognizing their possibly latent character and development. Some of these cases were reported originally as recoveries. Many of the patients are treated in emergency hospitals and, from the very nature of such service, are dismissed as soon as the acute symptoms are alleviated. In many cases also, the victims, for obvious reasons, are eager to escape supervision, and frequently leave against the advice of the attendants. That the possibility of a delayed, and often fatal, outcome is not yet fully appreciated, is seen in the fact that many of these patients have been dismissed as recovered when they have been under observation for but two or three days.

MURRAY GALT MOTTER, M.D.,
Library, Hygienic Laboratory, Washington, D. C.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

THE HOOKWORM LARVA

To the Editor:—A perusal of medical articles would lead one to believe that the larva of the hookworm is not to be found in a fresh stool. The presence of larval forms associated with hookworm ova has been the case in the majority of the specimens I have examined. There is some confusion in my mind in regard to what these larvae really are. To sum up, my question relates to the relative frequency of *Strongyloides intestinalis* (larva) and hookworm (larva) in the warm specimen. What other larva most closely resembles these two? Kindly omit name.

W. M. W.

ANSWER.—The eggs and the larva of *Uncinaria* may be found in the stools. In the making of a differential diagnosis the organisms to be considered are the *Ancylostoma duodenale*, the *Necator americanus*, or American hookworm, and the *Strongyloides stercoralis*. The American hookworm is differentiated from the European type in that the head is strongly bent dorsad. The eggs are more pointed at the poles than those of the *Ancylostoma duodenale*, and are larger. The eggs of *Ancylostoma duodenale* are oval with broadly rounded poles. In fresh feces they contain four granular nucleated segmentation masses of the ovum separated by a clear space from the shell. The eggs of *Strongyloides stercoralis* never appear in the feces except during purgation. They are usually strung out in chains. Following is a table of differences between the larvae of *A. duodenale* and *S. stercoralis*. See Fantham, Stevens and Theobald, "The Animal Parasites of Man," William Wood & Co., New York.

DIFFERENCES BETWEEN LARVAE OF ANCYLOSTOMA DUODENALE AND STRONGYLOIDES STERCORALIS

	A. Duodenale	S. Stercoralis
1. Vestibulum oris	1.8 microns broad	3 microns*
2. Genital rudiment.....	3 to 5 microns long	25 to 33 microns*
3. Thickness.....	Thicker	
4. Esophagus.....	One-fourth body length	Half body length†
5. Tail.....	Pointed	Two fine points†
6. Motion.....	Less active than	
7. Intestine.....	Soon fills with dark granules	

* Rhabditiform.

† Filariform.

BLIND MASSEURS: INFORMATION WANTED

To the Editor:—I am interested in the blind of this country. I am investigating massage with a view to finding whether it would be a practical vocation for blind people.

Can you give me the addresses of any schools where massage is being taught as a science? Do you know of any magazines published for masseurs? Do you know of any correspondence courses being issued on the subject?

P. T. RICHARDS, M.D., Ferris, Ill.

Medical Education and State Boards of Registration

Medical Colleges of China

The following list of medical schools of China was furnished by Dr. Edward H. Hume, chairman of the Council on Medical Education of the China Medical Missionary Association. These institutions were personally inspected by Dr. Hume during January, 1917. The list, therefore, is complete and the information furnished us reliable. The list follows:

City	Province	College
Canton	Kwangtung.	Chung-fa Medical College.
Canton	Kwangtung.	Hackett Medical College (women).
Canton	Kwangtung.	Kung Yee Medical College.
Canton	Kwangtung.	Kwangtung Provincial Medical College.
Canton	Kwangtung.	Kwang Wa Medical College.
Canton	Kwangtung.	Liang Yueh Medical College.
Changsha	Hunan.	Hunan-Yale College of Medicine.*
Chengtu	Szechuan.	West China Christian University School of Medicine.
Foochow	Fukien.	Union Medical College.
Hangchow	Chekiang.	Chekiang Provincial Medical College.
Hangchow	Chekiang.	Hangchow Medical Training College.
Hankow	Hupei.	Union Medical College.
Hongkong	Hongkong.	Hongkong University School of Medicine.
Mukden	Manchuria.	Mukden Medical College.*
Mukden	Manchuria.	South Manchuria Medical College.
Peking	Chihli.	Board of Education Medical College.
Peking	Chihli.	Union Medical College.*
Peking	Chihli.	Union Medical College for Women.
Shanghai	Kiangsu.	German School of Medicine.
Shanghai	Kiangsu.	Pennsylvania-St. John's Medical School.*
Soochow	Kiangsu.	Elizabeth Blake Medical Training College.
Soochow	Kiangsu.	Kiangsu Provincial Medical College.
Soochow	Kiangsu.	Woman's Medical College.
Tientsin	Chihli.	Army Medical College.
Tientsin	Chihli.	Navy Medical College.
Tsinanfu	Shantung.	Shantung Christian University School of Medicine.*

The five colleges indicated by an asterisk (*) are eligible to membership in the Association of Medical Colleges of China. Membership in that association is limited to such colleges as provide a four-year medical course, preceded by adequate college courses, with laboratory work, in physics, chemistry and biology, based on high school graduation.

The Union Medical College at Peking was reorganized in 1916 by the China Medical Board of the Rockefeller Foundation. It was incorporated under a provisional charter granted by the regents of the University of the State of New York. Dr. Franklin C. McLean, formerly professor of pharmacology of the University of Oregon and lately a member of the staff of the Rockefeller Institute Hospital in New York, has been appointed head of the new institution and as professor of medicine. New buildings are to be constructed and, in order to permit the reorganization to go forward without confusion, the three lower classes of students have been transferred to the Shantung Christian University at Tsinanfu. The two upper classes will be carried through the remainder of their course by the present faculty. The foreign staff now consists of six doctors giving full time and six part time, besides one pharmacist and four nurses. No permanent assignments have been made to the faculty of the reorganized school with the exception of Dr. McLean as professor of medicine, but it is the desire of the trustees that men already on the field should be utilized so far as possible, owing to their interest in the work and their knowledge of the language and local conditions. With this need in view, a number of doctors in China have been given assistance, to enable them to go abroad for special study.

At Shanghai the China Medical Board is planning to establish a second high-grade medical school, but has taken no steps aside from continuing the clinical teaching in the Red Cross Hospital, where the Harvard Medical School of China formerly conducted clinics. The latter institution has been discontinued to make way for the new school. The China Medical Board has sent seven of the most promising of the Harvard students to the United States to complete their studies, looking toward the development of the teaching staff. Pending the organization of the new school, the China Medical Board is supporting a full-time teacher at the Pennsylvania-St. John's Medical School in Shanghai, and

has appropriated \$25,000 a year for the maintenance of the Red Cross General Hospital.

The Pennsylvania-St. John's Medical School is conducted under the auspices of the American Episcopal Church, with funds contributed partly by the Christian Association of the University of Pennsylvania. The teaching is in English, and there are ten foreign physicians on the staff. This school will probably merge with the new medical school being organized by the China Medical Board, or will be discontinued in the interests of the new school. The medical school of Boone University at Wu Chang, Hupeh Province, was recently merged with the St. John's University.

At Changsha is located the Hunan-Yale College of Medicine, which is conducted jointly under Chinese and American management. It has several foreign physicians, and the teaching is in English. It has received an annual grant of \$16,200 for maintenance from the China Medical Board, which also recently made another appropriation of \$30,000 for building and equipping a new laboratory.

The University of Nanking, a year or so ago, united with St. John's University and the Harvard Medical School in inviting the China Medical Board to establish a new school at Shanghai and, in order to aid in the development of the new department, determined to discontinue its own medical school. The university hospital, however, is being continued and the China Medical Board has provided a generous sum annually for salaries and other expenses. It has also pledged \$25,000 for buildings and equipment, on condition that the university should raise an equal amount during 1917.

The Shantung Christian University School of Medicine at Tsinanfu has also been given financial aid by the China Medical Board, part of which was to provide the additional buildings and the cost of teaching the three classes transferred from the Peking Union Medical College. The board granted \$100,000 for maintenance expenses, to be spread over five years, and \$50,000 gold for buildings and equipment. The board, however, assumes no authority either to supervise the expenditure of money or to manage the institution. This school now has an enrolment of 110 students, including sixty who came from the medical school at Peking. The teaching is in the Chinese language. The staff has been strengthened so that this school is now one of the strongest in China.

The Mukden Medical College, like the medical school at Tsinanfu, is a union missionary institution. Teaching is in Chinese, and there are 106 students.

The German School of Medicine at Shanghai was closed in March, 1917, after diplomatic relations between Germany and China had been severed.

Physicians Registered in Arkansas in 1916

A request has been received from the State Medical Board of the Arkansas Medical Society asking for an explanation of the reference to Arkansas in Table 5, published in THE JOURNAL, June 9, 1917, p. 1761. That table shows that during 1916, 95 physicians were licensed in Arkansas, of whom 61 came from medical colleges of known classification. Of the 61, 15 were from Class A colleges, 22 from Class B colleges and 24 from Class C colleges. There were 34 other physicians registered, 6 from unclassified colleges and 28 who were licensed through reciprocity.

There are three separate and independent licensing boards in Arkansas, briefly referred to as the Regular, Homeopathic and Eclectic boards. The registrations by these boards of physicians from colleges of known classification were as follows:

Boards	Class			Totals
	A	B	C	
Regular.....	15	21	—	36
Homeopathic.....	—	1	7	8
Eclectic.....	—	—	17	17
Totals.....	15	22	24	61

Social Medicine, Medical Economics and Miscellany

What Is Orthopedic Surgery?

The *British Medical Journal*, June 9, comments favorably on the American Unit of Orthopedic Surgeons, and discusses what is meant by orthopedic surgery:

"The word 'orthopaedic' is an adaptation from the French *orthopédie*; the earliest authority Murray gives for this word is 1747, and for the English words 'orthopaedy' (*ὀρθός* straight; *παῖδια*, rearing of children) and orthopaedic, 1840. No doubt the primary meaning was the correction of deformities in children, but Murray notes that it has been extended to mean the correction of bodily deformities in general. That this took place at an early date is rather strikingly shown in Le Gros Clark's translation of Dupuytren's lectures on 'Injuries and Diseases of Bones' (London, Sydenham Society, 1847). In speaking of what the surgeon should do when in consequence of fracture the ends of the bone assume an altered and defective relation to each other, he asks whether the surgeon should leave this evil tendency to work its own mischief, involving as it does a disagreeable deformity and curtailing the use of the limb, or whether he ought not to make some effort to remedy the defect by reestablishing the normal direction of the limb. And he answers that 'there exists considerable analogy between the deformities resulting from fracture and those which are attributable to other causes. It is well known how much benefit is derived from orthopaedic means in this latter class of affections; and if vicious curvatures of many years' standing may be corrected without inconvenience, how much rather may we anticipate the same desirable results, by the employment of analogous means, where the deformity does not date longer than a few weeks back, and is only maintained by a newly formed structure, which does not attain to the same consistence with bone until after the lapse of a very long time.' If we add to this the lesions of joints, which no doubt Dupuytren had in mind, although his subject did not lead him specifically to mention them, it is seen how large a field there is for the application of orthopaedic principles in military surgery."

The *British Medical Journal* asked the director of the unit, Dr. J. E. Goldthwait of Boston, Major M. R. C., U. S. Army, for his definition:

"Orthopaedics with us," said Major Goldthwait, "has to do with 'the diseases or lesions of the bones, joints, and muscles, and deformities.' At one time it was expected to devote itself to the deformities, but now it is recognized that the treatment of the disease or special lesion that is causing the deformity is the most essential feature. For that reason the treatment of a rheumatic or rheumatoid condition is as essential as the treatment of the joint manifestation. The same is true of the deformities due to nerve injuries. Military orthopaedics is not different from civil orthopaedics, except in the greater prevalence of trauma as the cause of the lesion."

On this the *British Medical Journal* comments:

"Those who turn back to the remarkable article on military orthopaedic hospitals contributed to this journal by Dr. Colin Mackenzie on May 26 last will see how nearly Major Goldthwait has packed Dr. Mackenzie's doctrine into a definition."

Spray Method of Finishing and Decorating as an Occupational Hazard

New methods in industry are frequently accompanied by new dangers to the workers. The spray or compressed air method of applying varnishes, enamels, shellacs, lacquers and practically every kind of finishing and decorating material brings with it increased danger of poisoning by various hydrocarbons used for quick drying and even spreading, as well as by lead and other poisonous substances in such material. This method is now largely used as it produces a better quality of work, allows greater speed, and is efficient and economical. Unless conditions are right and proper care is used, the sprayer or nebulizer produces a cloud of poisonous fumes which envelop the operator, often causing poisoning.

Dr. R. P. Albaugh, acting director of the division of industrial hygiene, Ohio State Department of Health (*Public*

Health Reports, March, 1917), reports a fatal case in a boy of 18 who was a sprayer in a filler and varnish room. The cause of death assigned was "myocardial degeneration, probably caused by naphtha and turpentine poisoning." Six days before his death the patient had consulted a physician complaining of great weakness, periods of nausea, loss of appetite, tingling of the extremities, constipation, and hemorrhagic spots over the body. The systolic blood pressure was 85, temperature 97.2 and pulse 69. Two days later the patient was in bed, with the systolic blood pressure 75, temperature below 94, the pulse 90, and weak and irregular. The urine was cloudy, specific gravity 1.022, it was acid, and contained a trace of albumin, many hyaline and a few granular casts, and a few cylindroids. The blood count revealed 3,500,000 red cells, 12,400 leukocytes, 78.6 per cent. polymorphonuclears, 16.4 per cent. small mononuclears, 3 per cent. large mononuclears and 2 per cent. eosinophils.

Three other young men who were employed in the same department complained of symptoms similar to those of the patient, though in a milder degree. Investigation by Albaugh showed that the patient had been working in the department as a sprayer for eight months, and although the article on which he worked was covered by a large hood with a good exhaust, the spray when directed against a flat surface would envelop the operator unless he was careful of his position. It was observed that the workers paid little attention to being enveloped in the spray; no respirators were worn, nor was any adequate instruction given or enforced regarding exposure to the spray. Albaugh notes a number of faulty arrangements frequently found surrounding the employees of factories in this dangerous work.

Origin of Man

"The questions of the antiquity and origin of man," says Hrdlicka, "are naturally subjects of the greatest interest both to the scientist and to the layman, for they not only involve what is probably the most important problem in science, but touch the very foundations of human beliefs, ethics, and intellectual as well as organic progress in the future. Their detailed solution, also, is still far from us. But it may now be safely postulated that man did not appear on our planet as an entirely new and distinct being unconnected with the rest of terrestrial organic life. He is anatomically as well as physiologically but a highly specialized mammal that still carried numerous though now more or less useless vestiges or "reminiscences" of various lower stages through which he passed. Nor is there any good reason to regard him as the result of some freak of evolution, for his progress in the organic scale appears thoroughly logical. His ascent, judging from what has been already learned on the subject, though probably not uniformly accelerated, was on the whole slow. We shall seemingly come nearest the truth if we look on him as on the ultimate result or gradual modification in the upward continuity of trend of a highly specialized group of organic forms. He may be regarded as the topmost and dominating bough on an ancient mammalian tree whose roots intertwine, somewhere in the earlier Tertiary, with those of various advanced vertebrates. From this tree branches have doubtless diverged at different levels and become related species, some of these still persisting, while others have been long extinct. The stem began, so far as discernible, with lemurlike forms, from which in the course of time sprang, though scarcely in the order in which they now appear to us, the more simple and then the more highly organized primates. Among the latter then arose, it would appear, slowly or more likely rather suddenly, one or perhaps several forms characterized by more than the average physical instability; and the descendants of one or more of these strains, under the influence of changing environment, more especially food and climate, and perhaps other agencies, began to develop reduced teeth, larger brain, more erect posture, increased facility of intercommunication; and this differentiation apparently progressed until some strain of these changing beings reached that hazy dividing line below which was still the realm of the apes but above which commenced that of the true precursors of man."

Medicolegal

Validity of Statute Relative to Drugless Practitioners

(*Crane vs. Johnson (U. S.), 37 Sup. Ct. R. 176*)

The Supreme Court of the United States affirms an order denying an injunction to restrain the enforcement of the California statute of 1913, amended in 1915, empowering a board of medical examiners to prescribe a course of study and examination for those who would practice medicine, including drugless practitioners, but which statute it is provided therein shall not be construed so as to regulate, prohibit or to apply to any kind of treatment by prayer, or to interfere in any way with the practice of religion. The court says that it was alleged that the statute violates the fourteenth amendment of the Constitution of the United States, especially the equal protection clause thereof, in that it imposes greater burdens on the complainant than on others in the same calling and position, the complainant's particular grievance being set forth to be that the statute discriminates between forms of healing the sick and the use of prayer and other drugless methods. In other words, he attacked the classification of the statute as having no relation to the purpose of the legislation. Of course, he was confined to the special discrimination against him; he could not get assistance from the discrimination, if any existed, against other drugless practitioners. The case, therefore, was brought to the short point of the distinction made between his practice and certain forms of practice, or, more specifically, between his practice of drugless healing and the use of prayer. The only question was whether it was competent for the state to recognize a distinction in its legislation between drugless healing as practiced by the complainant and such healing by prayer. That there was a distinction between his practice and that of prayer, the complainant himself, it seems to the court, had charged. He had charged not only that he did not employ either medicine, drugs or surgery in his practice, but that he did employ faith, hope and the processes of mental suggestion and mental adaptation. These processes he did not describe. Presumably they were different from healing by prayer—different from treatment by Christian Science. But he alleged that for his practice he had become "particularly fitted by many years of study and practice therein." In other words, the treatment was one in which skill was to be exercised, and the skill could be enhanced by practice, and the objects of the treatment were diseased human beings whose condition was to be diagnosed. To treat a disease there must be an appreciation of it, a distinction between it and other diseases, and special knowledge is therefore required. And this was the determination of the state; but it determined otherwise as to prayer, the use of which, it decided, was a practice of religion. This court cannot say that the state's estimate of the practices and of their differences was arbitrary, and therefore beyond the power of government. And this it would have to say to sustain the contentions of the complainant, and say besides, possibly against the judgment of the state, that there was not greater opportunity for deception in the complainant's practice than in other forms of drugless healing.

City Not Liable for Injury from Materials Negligently Left at Hospital

(*Frost vs. City of Topeka (Kan.), 161 Pac. R. 936*)

The Supreme Court of Kansas affirms a judgment in favor of the city, holding it not liable in damages for the plaintiff's injury in this case, where it says that the petition disclosed that the plaintiff's parents became afflicted with smallpox and were confined in the detention hospital of the city. The plaintiff, a child of 9 years, was taken to the hospital with his parents and was allowed to play about the hospital grounds. He found a sack of dynamite caps which employees of the city had taken to the hospital grounds and had neglected to remove or render inaccessible. The plaintiff carried the caps into the hospital, accidentally exploded one of them, and injured his hand so that some of his fingers had to be

amputated. Now the court considers that while the hospital, with its equipment and grounds, was property of the city, it was property held and maintained in a public and governmental capacity, and not in a private proprietary capacity. The sole object in establishing and maintaining the hospital was to conserve the public health, a purely governmental function exercised under the police power of the state. The enterprise was public and governmental from its inception, and in doing the work of constructing the building and installing the water and sewerage systems the city acted as a mere agency of the state in promoting the general welfare. While the dynamite caps were property of the city, they were mere contributions to the enterprise, the same as building material, water pipe, sewer pipe, and other articles necessary to secure the ultimate end in view. If in performing the work of constructing and equipping the hospital and putting the grounds in condition for occupancy, materials of any kind were used or disposed of in a negligent or unsafe way, the capacity in which the city acted shielded it from pecuniary liability. When construction was completed and maintenance of the institution of a detention hospital was begun, the relation of the city to the project remained the same, and if for any reason the premises were not safe for occupancy by persons detained in the hospital, the same exemption from liability existed. It makes no difference in principle whether the building or the grounds appurtenant to the building be defective, and it makes no difference whether the dangerous agency act by penetration or by concussion. The employees of the city who caused the hospital grounds to be unsafe by negligently failing to remove the portion of the supply of dynamite caps not consumed in blasting might be personally responsible for the consequences of their conduct, but the city was not.

Notice Must Be Given to Maintain an Action for Malpractice

(*Klingbeil vs. Saucerman (Wis.), 160 N. W. R. 1051*)

The Supreme Court of Wisconsin affirms an order overruling a demurrer to the defendant's answer in this action for malpractice, based on an alleged breach of an implied contract on the part of a physician to exercise proper skill and care in treating the plaintiff's broken leg. The answer pleaded in bar the failure of the plaintiff to give the notice provided for by Subdivision 5 of Section 4222 of the Wisconsin statutes of 1913. The court says that this appeal raised the question whether the notice provided for by said Subdivision 5 must be given in order to maintain an action for malpractice based on a breach of the implied contract on the part of the physician to exercise proper skill and care in the treatment of the plaintiff. That part of the section in question reads as follows:

No action to recover damages for an injury to the person shall be maintained unless, within two years after the happening of the event causing such damages, notice in writing, signed by the party damaged, his agent or attorney, shall be served on the person or corporation by whom it is claimed such damage was caused, stating the time and place where such damage occurred, a brief description of the injuries, the manner in which they were received and the grounds upon which claim is made and that satisfaction thereof is claimed of such person or corporation.

In *Frechette v. Ravn* (145 Wis. 589, 130 N. W. R. 453), this court held that in an action for malpractice based on tort, the notice must be given, but expressly reserved the question here presented. It is to be noticed that the clause in question, though in the nature of a statute of limitations, differs therefrom in that it requires a preliminary notice to be served within a specified time, instead of fixing the time within which an action shall be begun; also that the notice must be served in every action for injuries to the person, irrespective of the form of such action. It was stated in *Frechette v. Ravn* that an action in tort for malpractice was "plainly one to recover damages for injuries to the person." Why? Because the defendant's conduct resulted in an injury to the person of the plaintiff. If it did so because of the tort, which consisted of a breach of duty created by law, it is difficult to see why it does not do so when the same identical conduct produces the same identical result, though the complaint

charges the breach of a duty created by contract between the parties instead of the breach of a duty created by law. Damages may flow from the breach of both duties, and likewise an injury to the person may result from the breach of a contract as well as from a tort. Where, as in malpractice, there is an option to sue in tort or on contract, each cause of action is grounded on the same identical acts of the defendant, namely, his failure to exercise the proper skill or care, or both. The very same conduct gives the plaintiff his option as to remedies. Hence, if the defendant's conduct when sued is tort gives rise to an action for injuries to the person, the very same conduct must give rise to the same kind of action when sued on contract. The word "action" as used in the statute has reference to the subject-matter or nature thereof, not to its form as a matter of remedial procedure. Whether it be in tort or on contract, it is an action to recover damages for injuries to the person, and comes alike under the terms of the statute, since the phrase therein, "no action to recover damages for injuries to the person," refers to bodily injuries, and not to injuries to feelings.

Society Proceedings

COMING MEETINGS

Western Roentgen Society, Kansas City, Mo., July 20-21.

AMERICAN GYNECOLOGICAL SOCIETY

Forty-Second Annual Meeting, held at Pittsburgh, May 31 and June 1, 1917

The president, DR. FRANK FARROW SIMPSON, Pittsburgh, in the Chair

Value of the Avoidance of Shock and Trauma in the Treatment of Eclampsia

DR. EDWIN B. CRAGIN, New York: In the first series of 20,000 deliveries at the Sloane Hospital, New York, with 251 cases of eclampsia, the maternal mortality was seventy-one, or 28.28 per cent. The fetal mortality was 151, or 16.15 per cent. In the last series of 15,774 deliveries, with 138 cases of eclampsia, the maternal mortality was twenty, or 14.49 per cent. The fetal mortality, including stillbirths and those dying before the mother left the hospital, was sixty-two, or 44.92 per cent. The reduction in mortality has been brought about by avoiding shock and trauma; by avoiding chloroform; by preparing the cervix before delivery; by avoiding accouchement forcé, and by treating the toxemia while preparing the cervix.

DISCUSSION

DR. J. WHITRIDGE WILLIAMS, Baltimore: I agree with Dr. Cragin about sparing the patient every possible amount of shock during the time of delivery. Unlike Dr. Cragin, in the last few years I have resorted to bleeding which has had a very good effect in a considerable number of cases of eclampsia; consequently it is almost a routine in my service now to bleed every woman with antepartum eclampsia, and when we do bleed we take away from 750 to 800 c.c. In a certain proportion of cases that ends the misery. The woman has no more convulsions; the albuminuria falls; the nitrogenous constituents of the urine rise just as though she had not been bled, and such women occasionally go on for some weeks or even months and have a baby at term without further eclampsia.

DR. REUBEN PETERSON, Ann Arbor, Mich.: I long ago gave up the use of chloroform in the treatment of eclamptic women. My investigations of both abdominal cesarean section and vaginal cesarean section have shown conclusively that if a woman can be taken early in her eclampsia, both operations are remarkably successful in saving both the mother and the child. I have seen good results from bleeding, but have not obtained satisfactory results from the use of veratrum viride.

DR. BROOKE M. ANSPACH, Philadelphia: In how many cases of eclampsia do Drs. Cragin and Williams find acetone and diacetic acid in the urine, and how do they meet the condition of acidosis? During the last year I had a woman to treat who developed serious symptoms of toxemia more than two weeks after delivery. She had three severe convulsions in one day. She showed remarkable improvement after the intravenous injection of a pint of a 2 per cent. solution of sodium bicarbonate, and she had another injection the next day and recovered.

DR. EDWARD P. DAVIS, Philadelphia: I would not deliver a woman in eclampsia and toxemia unless she showed signs of going into labor; then I would assist her with the least possible traumatism. My objection to the bag is the fact that its long continued pressure sometimes exhausts these patients and leads to the development of convulsions. Abdominal cesarean section is rarely indicated, and vaginal cesarean section still more rarely indicated. I have come to have a high regard for venesection in eclampsia, if it is followed by the use of salt solution or sodium bicarbonate in the vein.

DR. HAROLD C. BAILEY, New York: Eclampsics are particularly prone to develop shock. Accouchement forcé has been discontinued in the Bellevue Hospital Service. In 1900, when we took systolic blood readings, several eclampsics were delivered by that method and in several instances we found there was a drop of 100 mm. of mercury. We then made blood pressure readings following the use of veratrum viride, and in one instance in which the drug was pushed we found a drop of 140 mm. of mercury with the woman in profound shock. Since that time we have not used veratrum viride previous to delivery. As regards vaginal and abdominal cesarean section, my views are in accord with those of Dr. Cragin.

DR. E. GUSTAV ZINKE, Cincinnati: The principal cure for puerperal convulsions lies in prophylaxis during the pregnant state. Some of these cases will terminate fatally in spite of what we do.

DR. E. B. CRAGIN, New York: In regard to diacetic acid and acetone in these cases of eclampsia, we recognize all types of cases, one in which the liver is most involved, the other in which the kidney is more involved, and in a case in which the liver is the organ more involved, we are more apt to get acetone and diacetic acid, and there soda has proved valuable.

SYMPOSIUM ON RADIUM THERAPY

Methods and Results of Radium Treatment of Uterine Hemorrhage Due to Other Causes than Malignancy

DR. HOWARD A. KELLY, Baltimore: Radium therapy here is as simple and as safe as a dilatation of the cervix, and consists in nothing more than introducing a uterine sound with a hollow tip containing 500 millicuries of emanation and applying it successively to eight different points in the uterus, fifteen minutes at each point. This practically always cuts short the menstrual function, and so simply obviates the need for a hysterectomy. In young women, menstruation can sometimes be modified without even suspending it. In one case pregnancy and delivery of a healthy child followed the treatment. Seven of 100 patients had heart disease, two epilepsy, two insanity, and others Bright's disease and tuberculosis, manifestly bad risks for hysterectomy. No serious sequelae follow the radium treatment. Practically in all cases of fibroid tumors, radium has checked the monthly flow completely when desired. In young women it has been possible in some instances to cause the tumor to disappear without stopping menstruation permanently.

Radium in the Treatment of Uterine Hemorrhage and Fibroid Tumors

DR. C. JEFF MILLER, New Orleans: In the treatment of uterine bleeding from various causes, radium is almost a specific. Its most striking effect is its certain control of uterine bleeding due to the metropathies, or aberrant ovarian function. Aggravated cases of the menopause, usually

relieved by hysterectomy, can be controlled by a single application of radium. Similar results are obtained in bleeding complicating fibroids of the uterus, and certain types of fibroids may disappear or markedly shrink. Radium will not supersede surgery in the treatment of fibroids. Large growths giving rise to pressure symptoms, or presenting evidences of degeneration, as well as submucous tumors, should be treated surgically, if operation is not contraindicated. When desirable to preserve the function of the generative organs in young women, surgery should be considered the more conservative procedure, since it permits myomectomy. Its effect in controlling bleeding associated with chronic metritis and polypoid endometritis is equally satisfactory, and when the dosage and screening are carefully measured, it may be used as a last resort in excessive bleeding in young girls, without causing cessation of the menses. Itching associated with kraurosis of the vulva, as well as pruritus, can often be allayed by radium.

Radium Therapy in Uterine Hemorrhage of Benign Origin

DR. JOHN G. CLARK, Philadelphia: In cases of hemorrhage of the uterus of benign origin, such as that from small myomas or myopathic change, particularly in women over 38 years of age, radium in small doses is one of the most effective remedies, relieving practically all of the patients from even the slight hazard of a major surgical operation. The hemorrhages in such cases stop promptly and with rare exceptions permanently, without untoward effects incident to the use of radium. Those near the menopause respond best. Cases in former years, in which even repeated curettages failed to alleviate the hemorrhage, are promptly terminated after the application of 50 mg. of radium for twenty-four hours. In over 100 cases there has been but one failure to relieve the hemorrhagic symptoms.

Radium in Uterine Cancer

DR. HAROLD C. BAILEY, New York: The platinum applicators holding large amounts of radium emanation are placed in an iron capsule containing mercury. This mercury "bomb" offers efficient protection to the normal tissues and permits of the entire lower part of the pelvis being swept with a sufficient dose in a period of usually not more than four or five hours. In addition, heavy applications are made over the lower part of the abdomen in three areas and directed toward the upper part of the pelvis. In this manner, from the standpoint of the amount of radiation, three or four times the dose possible with the ordinary technic can be directed into the pelvis without subsequent irritation.

DISCUSSION

DR. FRANCIS CARTER WOOD, New York: I have had little personal experience with the use of radium in the treatment of uterine hemorrhage. Those cases I have seen have suggested the necessity of an accurate preliminary diagnosis of the condition of the endometrium by the thorough microscopic study of curettings removed with care so as to obtain as large fragments as possible and promptly preserved. Without such precautions in obtaining the material, a satisfactory study is often impossible. I have seen a few cases treated in which the radium did not cause a cessation of the hemorrhage until such doses had been administered as to cause atrophy of the ovaries. As to the treatment of fibroids, I feel from my pathologic experience that only a moderate percentage can be properly handled by radiation. It must be remembered that after extensive radiation, hysterectomy, should it prove necessary, may be very difficult, owing to the cartilaginous fibrosis of the parametrium.

DR. HERMAN J. BOLDT, New York: While radium has certain advantages in the treatment of hemorrhages from benign causes, I have failed to hear the final results from its use. Similar results may be obtained from the proper intra-uterine application of zinc chlorid. The advantage of radium is that fewer applications may be necessary. One may obtain a result after one or two treatments which may require a dozen treatments by zinc chlorid. Radium may cause less pain than zinc chlorid, but the proper application of a 50 per cent. solution of zinc chlorid in the form of an intra-uterine tam-

ponade will bring about a result equally as good as that by radium so far as the cessation of hemorrhage is concerned.

DR. ERNEST C. SAMUEL, New Orleans: When the hemoglobin is low, I have found that a smaller dosage of radium spread over a longer period of time produces less toxic symptoms than a large dose given for a shorter length of time. Almost 90 per cent. of patients for whom I make intra-uterine applications or applications around the cervix develop a distressing nausea and vomiting and some elevation of temperature.

DR. HENRY SCHMITZ, Chicago: I believe the radiotherapist who uses small amounts of radium obtains as good results as the man who uses larger amounts. In benign conditions we use fewer milligrams of radium, and the physical condition of the patients is much better than in malignant conditions. The malignant cases frequently show advanced cachexia and anemia. The resistance of these patients is materially lowered, and in such cases it is necessary to use larger amounts of radium rays than in nonmalignant conditions.

DR. WILLIAM P. GRAVES, Boston: One thing I have noted which has not been mentioned, that the successful reaction of the cancer cells to radium depends considerably on the histologic structure of the cancer. Cancers that are purely squamous in type, starting from the portio vaginalis, are much more favorable to treatment. Those are the cases in which I find the disease disappears like magic. But those cancers which originate in the endocervix, that is, adenocarcinoma of the cervix, do not respond in the same way.

Vulvar Carcinoma

DR. FREDERICK J. TAUSSIG, St. Louis: Eight of our fifteen patients received deep Roentgen-ray treatment, four of them with the Coolidge tube, but in none was there more than a temporary improvement. We have come to the opinion that the Roentgen ray can be considered only as an auxiliary to surgical measures in vulvar cancer. We had no radium to use, but it is difficult to see how its results would have been any better in view of the early and extensive involvement of the lymphatic system in these patients. There remained, therefore, only radical surgical removal as a therapeutic agent.

(To be continued)

AMERICAN PEDIATRIC SOCIETY

Twenty-Ninth Annual Meeting, held at White Sulphur Springs, W. Va., May 28-30, 1917

The President, DR. FRANK SPOONER CHURCHILL, Chicago,
in the Chair

Primary Carcinoma of the Liver in Childhood

DR. J. P. CROZER GRIFFITH, Philadelphia: This case occurred in a girl, aged 21 months, whose family history was negative. Below the costal margin, midway between the mid-sternal and the right mammillary line, was a visible, hard, smooth mass, apparently with a rather firm edge. It appeared to be connected with the liver. At operation a tumor mass was found in the right lobe of the liver, extending through the entire thickness of the lobe. As the case appeared to be inoperable, the wound was closed. The tumor consisted entirely of epithelial cells without a trace of liver tissue. The growth continued to increase in size, until death supervened, nine months after the patient came under observation.

Intravenous Injections in Infancy

DR. CHARLES HUNTER DUNN, Boston: At the Infants' Hospital we use the longitudinal sinus for the purpose of obtaining blood for the Wassermann test and to give intravenous injections of physiologic sodium chlorid solution, sodium bicarbonate, antitoxin, circulatory stimulant drugs and solutions of glucose. The cases in which the intravenous injection of glucose was used were approximately all cases of extreme atrophy and inanition produced by various forms of gastro-intestinal disease. The theoretical basis for the use of intravenous glucose injections in such cases is that

apparently the vicious circle produced by gastro-intestinal disorder has become so extreme that the digestion and absorption of sufficient fluid to furnish the energy requirement of the body is impossible. Glucose is the only food substance which exists outside of the body in the same form in which it circulates in the blood and is utilized by the tissues. If introduced directly into the blood it may, through a temporary supply of even a small quantity of fuel, break the vicious circle for a sufficient length of time to permit improvement of the condition to take place. In determining the quantity of glucose we rather arbitrarily adopted a 5 per cent. solution. In choosing the quantity of glucose for an individual baby, one sixtieth of the body weight was taken. In eighteen cases the records are sufficiently complete for the purposes of this report. Of these eighteen patients, thirteen died and five recovered. After the injections, seven showed no improvement, five showed a temporary slight improvement, and six showed a striking immediate improvement. There was no evidence that the improvement was due to the glucose; it was quite possible that the apparent improvement was due to giving the fluid into the circulation. However, there was sufficient evidence of the glucose being of value to warrant its further trial. In five cases, more than one injection was given, and in one case, six daily injections of 3 gm. each; in this instance the patient was apparently kept alive by the glucose, and eventually recovered.

DISCUSSION

DR. HENRY F. HELMHOLZ, Evanston, Ill.: We have been doing the same kind of work. Dr. Woodyatt has devised a pump by which sugar solution may be introduced at a uniform rate, and this rate can be varied at will. With the injection of 0.8 gm. per kilogram of body weight, no sugar was excreted in the urine. We have not tried giving the glucose to the class of patients in which Dr. Dunn has used it, so I cannot say whether or not there is a lessened sugar tolerance in such cases. In the concentration in which we have used the solution, I do not think there is any danger of overloading the circulation and placing too much strain on the heart.

DR. GODFREY R. PISEK, New York: We have been using a syringe with a double valve, so constructed that we can withdraw the fluid in the usual way and then make the injection by the gravity method. This provides an additional element of safety by eliminating the possibility of introducing the fluid too rapidly.

DR. HOWARD C. CARPENTER, Philadelphia: A word of warning should be sounded against the introduction of too powerful drugs. I know of one case in which salvarsan was administered by properly carried out technic, and the child died eleven days later. At necropsy an abscess was found on the frontal lobe of the brain.

DR. ALFRED F. HESS, New York: In a case of hemorrhagic disease in an infant, the longitudinal sinus was used for aspiration. The child died, and necropsy revealed that the blood had gone down along the side of the brain, between the skull and the brain. I feel some hesitancy in entering the sinus in hemorrhagic cases.

DR. JULIUS P. SEDGWICK, Minneapolis: We have been using the longitudinal sinus for making injections, and in a few instances of hemorrhagic disease I believe it was a life-saving procedure.

DR. HENRY F. HELMHOLZ, Evanston, Ill.: Within the last three months I have seen three cases which resulted fatally after injection, even though the injection was carefully given. At necropsy the entire cortex, as well as the base of the brain, was covered with blood, suggesting the possibility that a pathologic process was to blame.

DR. CHARLES HUNTER DUNN, Boston: Probably it would be safe to give a stronger solution of glucose than we used, but in the beginning of work of this kind it is necessary to proceed very cautiously. I think that, perhaps, in giving injections by the longitudinal sinus we may make an exception of salvarsan. We gave it a number of times, and everything went well. Then we gave it in two cases, and the patients died. Nothing could be found at necropsy that could

be attributed to the administration of the salvarsan, but since this happened we have stopped giving salvarsan in this way. We made observations in a severe case of acidosis in which intravenous injections of sodium bicarbonate had been given, and in spite of this treatment the patient was going down hill rapidly. After a large injection of glucose, this child improved and went on to recovery.

Therapeutic Use of Blood Serum in Marasmus

DR. ROWLAND G. FREEMAN, New York: The histories in our cases of marasmus seem to show that when the injections were stopped, the improvement was not so rapid and there would be a loss in weight; but as soon as the injections of horse serum were resumed, the child again began to gain in weight. After giving two injections of horse serum it is advisable to test the child for sensitization before giving a third injection. In one child in this series, the second injection was followed by the development of an urticarial rash. This child was considered sensitized, and no further horse serum was given. It seems useless to give less than 20 c.c. of serum. Under proper control this is a safe procedure, and in almost hopeless cases apparently produces marked improvement. It has a much greater sphere of usefulness than has hitherto been appreciated.

DISCUSSION

DR. CHARLES HERRMAN, New York: Last year, during an epidemic of this type of disease, we had two cases that were extremely severe. Being unable to obtain human serum, we used horse serum with very good results. Both these children would probably have died. The questions are whether it is necessary to use serum, and whether whole blood would not be as good as the serum.

DR. FRITZ B. TALBOT, Boston: It would be of interest to know what Dr. Freeman has done for the future of these babies; to what degree he has sensitized them to horse serum. I have not been as much impressed by these results as I would like to be; I have seen a number of babies show similar improvement without treatment of this kind.

DR. L. EMMETT HOLT, New York: I agree with Dr. Talbot that one sometimes sees similar results in cases not treated in this way. In one of the cases, however, the results seem very striking.

DR. ROWLAND G. FREEMAN, New York: Horse serum is not only more easily available than human serum, but one can obtain it in any quantity desired. One of these babies was given so many injections that had we been dependent on human serum we would have been compelled to stop the treatment. As to the possibility of sensitizing these babies to horse serum, it must be remembered that they were practically moribund, and the possibility of sensitization was of secondary importance. I do not think it makes any difference whether we use human serum, horse serum, or whole blood.

Twenty-Four Hour Metabolism of Two Normal Infants, with Special Reference to the Total Energy Requirements of the Infants

DR. FRITZ B. TALBOT, Boston: The purpose of this investigation was to determine how much energy was expended in the ordinary muscular activity of an infant during a twenty-four hour day. One of these infants was in the respiratory chamber twenty-two hours and thirty-one minutes, and the other twenty-three hours and ten minutes. Accurate records were kept of the time during which the infants were nursed, the time they cooed, kicked, played, smiled, were changed and cried. In the observations on the first baby it was found that the "basal" metabolism of 285 calories was increased 143 calories (67 per cent.) by muscular activity. In the second baby the basal metabolism was increased 70 per cent. The metabolism of the babies could not be measured during the periods when it was necessary to remove them from the chamber, but an estimate of what it would have been was made by taking the average maximum total metabolism and dividing it by twenty-four hours. This was added to the measured metabolism, and gave the total calories produced

in twenty-four hours. The energy lost from the body through the urine and feces was also calculated, and had to be supplied in the food. The greatest single factor to be taken into consideration was the fat lost in the feces, which with the urea in the urine should not exceed 15 per cent. of the total measured metabolism in a normal infant. By adding the calories used up in muscular activity to the basal metabolism, a rough estimate of the caloric requirements of the normal infant might be made. From these observations it is probable that infants fed on cow's milk, and particularly on formulas containing large amounts of protein, will require even more food than infants fed on human milk, because the stimulating action of the protein causes extra heat to be burned during digestion. These calculations do not apply to sick infants or those with subnormal temperature.

DISCUSSION

DR. THOMAS S. SOUTHWORTH, New York: Have you made any calculations as to how much energy is used up when certain portions of a baby's body are exposed to changes in temperature? I recently saw a child which was being dressed without shoes and stockings, and I advised the parents to cover the feet and legs of the baby so that it should not waste energy through a loss of heat that should go into growth. It has been suggested that additional nourishment must be given to provide for the loss of heat when certain portions of the body are exposed.

DR. CHARLES HUNTER DUNN, Boston: The factor of individual variation enters into these calculations to an enormous extent. In working out figures for metabolism and calories, what evidence is there that they can be applied to other children, since there may be a wide individual variation. It is a great mistake foreign investigators have made when they assume that if they take a certain number of figures and divide their sum by the number of cases, the result will be applicable to an individual. The result is never applicable to any individual baby.

DR. GODFREY R. PISEK, New York: I should like to ask Dr. Talbot whether he does not think the estimate is low for the amount of energy the child used in nursing.

DR. B. RAYMOND HOOBLER, Detroit: It would seem that Dr. Talbot has approximated very nearly the actual heat production of these babies. I think we are finding that nearly all active children require 110, 125 or even 150 calories per kilogram of body weight. All the factors in this estimation have been very accurately worked out.

DR. FRITZ B. TALBOT, Boston: In regard to the loss of heat from exposure, the surrounding temperature makes no difference in the amount of heat the baby produces, unless there is chilling, and then when he shivers he produces heat. He produces additional heat only when he performs additional exercise. The new-born baby is sometimes given a water bath immediately after birth. This is wrong, as it may result in a subnormal temperature and a lowering of metabolic activity and depression of the vital functions. If the new-born baby is strong enough to shiver and cry, it then produces heat and is able to withstand the shock. Dr. Lusk has brought out an important point in a recent investigation in a boys' school. The boys were very active, and a careful estimation of the number of calories they were consuming showed that they were eating one and one-half times as much as a laboring man.

Studies on Blood Calcium

DR. DAVID MURRAY COWIE, Ann Arbor, Mich.: The calculated amounts of calcium in the serum and corpuscles, respectively, of 100 c.c. of ox blood and of man's blood show that the serum of ox blood contains more calcium than the serum of man's blood. The corpuscles and fibrin of man's blood contain more calcium than the corpuscles and fibrin of ox blood. The whole blood of man contains more calcium than whole ox blood. The possibility of a variation in the relative proportion of corpuscles and serum under altered states of the organism must also be taken into consideration. There is more serum per volume of blood in severe anemia and in cases of hydremia.

Uric Acid Content of the Blood in the New-Born

DRS. JULIUS P. SEDGWICK and F. B. KINGSBURY, Minneapolis: We have endeavored to determine whether or not the high uric acid excretion during the first few days of life is accompanied by a simultaneous increase of this substance in the blood. All the new-born subjects that served in this investigation were normal. We found that the average values for sixteen determinations of the uric acid content of the maternal and placental blood were identical, being about 3 mg. per hundred mg. blood. In some cases the infants were given water in addition to the ordinary diet of breast milk. The uric acid content of the blood is higher the first three or four days after birth than at birth. In the period between the second and third days the value reaches a maximum. During the first three or four days this value was higher than the maternal and placental figures. From a maximum of 3.9 mg., the blood uric acid falls off slowly to 2.9 mg. on the fifth day, and then falls rapidly to 1.6 mg. by the eighth to the eleventh day. These results fit well as the connecting link in the theoretical chain of early leukocytosis, fall in leukocytosis, flood of uric acid in the blood, high uric acid excretion, and uric acid infarcts.

DISCUSSION

DR. PERCIVAL J. EATON, Pittsburgh: You said that some of these babies were getting water and others were not. Did you notice a greater concentration of uric acid in the urine of the former?

DR. J. P. SEDGWICK, Minneapolis: We did not make any examinations of the uric acid excreted in the urine, but only of the uric acid content of the blood.

Focal Lesions Produced in the Rabbit by Colon Bacilli Isolated from Pyelocystitis Patients

DR. HENRY F. HELMHOLZ and MISS CAROL BEELER, Evanston, Ill.: The mode of infection in pyelocystitis is still an open question, but in recent years prominence has been given to the hematogenous route of infection. In order to determine whether pyelocystitis could be produced by the hematogenous route, experiments were performed on rabbits. There were two series of experiments. In the first series, sixty-six animals were injected intravenously with eight different strains of colon bacilli. Of the sixty-six animals, twenty-six showed focal lesions of one kind or another. The organs were affected as follows: kidney eleven times, cecum seven times, gallbladder seven times, appendix five times, stomach four times; in addition there were single instances of hemorrhagic infarction of the descending colon, ulcerative colitis, hemorrhagic enteritis and duodenal hemorrhages. Thus, the organisms did not show any special tendency to localize in the kidneys, and focal lesions were just as likely to appear in any organs of the gastro-intestinal tract. In 90 per cent. of instances, the rabbit can excrete colon bacilli through the kidney without harm to the kidney itself.

In the second series of experiments, a mixture of colon bacilli and pneumococci were injected into eleven animals. The kidneys were infected in six of the eleven rabbits, or in about 60 per cent. This is, relatively, a much larger number than in the first series. It is possible that in human pyelocystitis there is a double infection, and the second one is overlooked. It is possible, therefore, to produce typical pyelocystitis in the rabbit by intravenous injection of colon bacilli, isolated from human cases. The relative number of kidney infections is greatly increased if a mixture of organisms is injected.

DISCUSSION

DR. CHARLES HUNTER DUNN, Boston: A baby coming under our observation was aspirated for empyema, and the pus from the chest showed a pure pneumococcus infection. A blood culture showed no pneumococcus but a pure culture of colon bacilli. Two days later the child developed a typical pyelocystitis. I was formerly not inclined to favor the hematogenous theory of infection in pyelocystitis, but I am coming more and more to believe in it.

DR. WILLIAM PALMER LUCAS, San Francisco: One of my house surgeons has repeated Dr. Helmholtz' work, and our

results have been practically identical. From our present knowledge we are warranted in thinking that there is no definite localization in the kidney, but a general infection by which any of the viscera may be infected.

DR. HENRY HEIMAN, New York: If one accepts the theory that pyelocystitis is a hematogenous infection involving other organs as well as the kidneys, and that the colon bacillus is the predominating organism, how are we going to explain the fact that of the cases in which the pelvis of the kidney is infected, 75 per cent. occur in girls, in whom infection through the urethra occurs more readily than in boys?

DR. HENRY F. HELMHOLZ, Evanston, Ill.: I have been much interested in Dr. Dunn's case which showed the colon bacilli in the blood, and pyelocystitis developed. It has been my experience that if other organisms are present that may possibly have caused the pyelocystitis, one may not find them but usually finds a member of the colon group. This is because the colon bacilli have a tendency to overgrow other organisms. It is not necessary to assume that, because in one case the infection is by the hematogenous route, all patients with pyelocystitis are infected by this route. I believe the kidney can be infected in a number of ways.

Case of Precocious Menstruation

DR. WILLIAM PALMER LUCAS, San Francisco: This case may also be reported as one of linear nevus, because the patient showed an interesting skin lesion and marked keratitis. The patient was a girl, 19 months of age, whose family and past history were entirely negative, save for the fact that she began to menstruate when 15 months of age. She had a slight flow of blood from the vagina, and was more irritable than usual at that time. She also had a linear skin lesion between the nose and lip on the right side, which was yellowish verging into brown, and resembling a keratitic condition. She had well developed mammae and a somewhat advanced development of the small bones. Her intelligence was normal. The faculty of attention was phenomenally developed; she did things systematically that it would have been difficult for a child 3 or 4 years of age to do.

DISCUSSION

DR. HOWARD C. CARPENTER, Philadelphia: Cases of polypoid sarcoma of the vagina have been reported in children in whom there has been hemorrhage. The possibility of neoplasm must be considered before making a diagnosis of precocious menstruation.

(To be continued)

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Review of Tuberculosis, Baltimore

June, I, No. 4

- 1 Tuberculosis Theses; Diagnostic, Prognostic, Therapeutic. J. Brown, Saranac Lake, N. Y.—p. 193.
- 2 *Diagnosis of Pulmonary Tuberculosis. L. Hamman, Baltimore.—p. 206.
- 3 *Parafuchsin as Stain for Tuberculosis Bacilli. P. A. Lewis and R. B. Krauss, Philadelphia.—p. 218.
- 4 *Experimental Tuberculosis in Guinea-Pigs Following Preliminary Treatment with Tuberculin by Nose. H. Sewall, C. F. Hegner and C. Powell, Denver.—p. 220.
- 5 Undergraduate Instruction in Tuberculosis. A. K. Krause, Baltimore.—p. 233.

2. **Diagnosis of Pulmonary Tuberculosis.**—Although he has practiced physical diagnosis assiduously, Hamman still regards expert pulmonary examinations as the most difficult field of internal medicine. He believes that the majority of physicians never attain unusual skill in detecting slight pulmonary abnormalities. There is little danger of the average physician finding too much in the lungs, for often lesions that are gross to the expert are to him sources of difficulty and uncertainty. Furthermore, a large number of tuberculous patients never pass through what could be called clinically an early stage, and therefore physicians have not the opportunity to detect

the disease in this favorable period. In those instances in which the disease comes on more slowly, early diagnosis will be favored by putting a careful clinical study of symptoms above the censorship of percussion and auscultation. Sputum examinations, the Roentgen ray and the tuberculin tests are valuable additional aids, but the information furnished by the Roentgen ray and by tuberculin must be interpreted cautiously. The great obstacle in the way of early diagnosis is the difficulty of separating tuberculous infection from tuberculous disease. If physicians can ever distinguish clinically that nice point where latent infection first passes into threatening activity, the problem of early diagnosis will be solved. At present this point is blankly obscure and physicians have no means of deciding definitely which doubtful cases are within safety, which have just passed without and which are hovering about the threshold. Therefore, the early diagnosis of pulmonary tuberculosis is nearly always a probability diagnosis, for when absolute evidence appears the disease is seldom in an early stage. There will always be differences of opinion among clinicians about such diagnoses and about the evidence on which they rest. The important lesson for the physician is that while he must investigate thoroughly and judge cautiously, still he must be willing to act on reasonable probability and not allow the patient's life to be thrown away as he calmly awaits the full verification of his suspicions. The important lesson for the sociologist is that he must see the insuperable difficulties in the way of early diagnosis on a large scale and abandon his efforts to make early diagnosis an essential feature of the campaign for the eradication of tuberculosis.

3. **Parafuchsin as Stain for Tubercle Bacillus.**—Lewis and Krauss are using pararosanilin as a stain for the tubercle bacillus. Pararosanilin salts have the essential staining qualities of rosanilin salts, and the tubercle bacillus when stained with them resists decolorization with acids in the same degree. Owing to difference in solubility, the solutions of pararosanilin salts must contain more alcohol in order to be effective. The method of employing pararosanilin is: 1. Make a saturated alcoholic solution. 2. Add 20 c.c. of this to 80 c.c. of a 5 per cent. solution of phenol. The result is a clear solution of about the same color intensity as the usual carbol fuchsin. When heated over the free flame the alcohol burns off and there is somewhat more rapid precipitation of the dye than there is with the old preparation. In the meantime, however, staining has taken place with the usual intensity and the resistance to decolorization by acids is the same.

4. **Experimental Tuberculosis in Guinea-Pigs.**—Three preparations of tuberculin, a Berkefeld filtered watery extract and two emulsions of ground bacilli of different concentrations were used by the authors on three groups of guinea-pigs. After a preliminary course of tuberculin instillations by the nose each group of treated pigs, together with a number of normal animals, was given a series of spaced intravenous injections with the corresponding tuberculin. At intervals of fifty-six and one hundred and twelve days after the last intravenous injection all animals were inoculated with a culture of virulent tubercle bacilli. For each form of tuberculin used in the preparatory treatment the average duration of life after inoculation with the living germs was decidedly less in animals which, in addition to the spaced intravenous injections, had undergone a course of nasal instillation than in those (controls) which had suffered intravenous injections alone. Also, the duration of life was shorter in pigs which had received the smaller quantities of tuberculin by the nose than in those which had received the larger. Compared with normal animals inoculated with tubercle bacilli without previous treatment (final controls) the resistance of the instilled pigs was unchanged or slightly lowered, while that of those which had received intravenous injections of tuberculin without previous instillation was somewhat decidedly raised. So far as these experiments go they point to the conclusions that the influence of absorption of small quantities of tuberculin by the nose, followed by a series of spaced intravenous injections either does not change or slightly lowers the normal resistance of guinea-pigs toward tuberculosis, while the

intravenous injections alone, without preliminary instillation, rather decidedly raises resistance.

Annals of Otolaryngology and Rhinology, St. Louis

March, XXVI, No. 1

- 6 Technic of Examination of Static Labyrinth. I. H. Jones and L. Fisher, Philadelphia.—p. 1.
- 7 Analytic Study of Rinne and Other Tuning Fork Tests. J. W. Downey, Jr., Baltimore.—p. 31.
- 8 Suppurative Labyrinthitis; Diagnosis and Treatment. A. B. Ducl, New York.—p. 54.
- 9 Gumma in Fossa of Rosenmueller Causing Deafness. I. M. Heller, New York.—p. 70.
- 10 Histopathology of Nose and Throat. L. K. Guggenheim, St. Louis.—p. 73.
- 11 Tonsils as Atrium of Infection in Poliomyelitis. E. M. Seydell, Wichita.—p. 98.
- 12 Tubercular Mastoiditis—Radical Operation under Cocain Anesthesia. H. Hays, New York.—p. 109.
- 13 Salivary Fistula Following Simple Mastoidectomy with Cervical Abscess. F. C. Schreiber, Washington, D. C.—p. 113.
- 14 Case of Labyrinthine Fistula with Complete Loss of Cochlear Function and Persistence of Normal Vestibular Function. J. Auerbach, New York.—p. 117.
- 15 Results in Four Cases of Modified Radical Operation for Chronic Purulent Otitis Media. H. B. Blackwell, New York.—p. 121.
- 16 Tonsil Question in Children. G. W. Boot, Chicago.—p. 129.
- 17 Clinical Problems Relating to Faucial Tonsils in Adults. G. L. Shambaugh, Chicago.—p. 135.
- 18 Surgical Treatment of Suppuration in Jugular Bulb. J. McCoy, New York.—p. 140.
- 19 Salient Facts Regarding Tonsils in Children and Adults. J. C. Beck, Chicago.—p. 149.
- 20 Diagnosis of Inflammatory Diseases of Labyrinth. J. B. Rae, New York.—p. 181.
- 21 Treatment of Labyrinthine Affections. W. C. Phillips, New York.—p. 189.

Canadian Medical Association Journal, Toronto

June, VII, No. 6

- 22 *Case of Diabetes Associated with Hemochromatosis. A. H. McCreery, Pittsburgh.—p. 481.
- 23 Modern Laboratory Investigation of Nephritis. R. W. Mann, Toronto.—p. 503.
- 24 Fractures of Skull from Neurologic Standpoint. G. D. Robins, Montreal.—p. 529.

22. **Diabetes Associated with Hemochromatosis.**—The outstanding points in the case cited by McCreery both from the clinical and pathologic side would indicate the following conditions. The patient was a man, 46 years of age; he was a plumber by occupation, and had been a heavy whisky drinker. From 1902 until his death he suffered many gastrointestinal disturbances and loss of weight. There was pain and tenderness in the epigastrium, but the liver was not obviously enlarged. The spleen was not palpable. The patient yearly suffered attacks of influenza and had numerous attacks of neuralgia, rheumatism and lumbago. On Aug. 22, 1913, there was found a trace of sugar in the urine which soon became excessive and the patient rapidly weakened. Acetone and diacetic acid were found in December, 1913, and the patient died in semicoma with a terminal decrease in percentage of sugar and almost suppression of urine on Jan. 12, 1914. At no time was the urine sugar-free. At necropsy there was found hemochromatosis of liver, heart, spleen, suprarenal, thyroid and lymph glands; portal cirrhosis of liver and fibrosis and fat necrosis of the pancreas. The pathologic findings, therefore, were typical of the so-called bronzed diabetes.

Colorado Medicine, Denver

June, XIV, No. 6

- 25 Strabismus or Squint; Its Treatment by Glasses. J. J. Pattee, Pueblo.—p. 151.
- 26 Surgical Tuberculosis of Peritoneal Cavity. O. M. Shere, Denver.—p. 154.
- 27 Application of Prognostic Lines on Roentgenograms in Treatment of Joint Fractures. E. H. Skinner, Kansas City, Mo.—p. 159.
- 28 Balance of Powder in Infection. H. G. Wetherill, Denver.—p. 168.
- 29 Diarsenol Administered by Brayton's Simplified Method of Giving Salvarsan. H. T. Low, Pueblo.—p. 170.

Florida Medical Association Journal, Jacksonville

May, III, No. 11

- 30 Bacteria in Economy of Nature. H. Byrd, Princeton.—p. 324.
- 31 Early Diagnosis and Home Treatment of Pulmonary Tuberculosis. R. H. McGinnis, Jacksonville.—p. 330.

- 32 Leading and Misleading Symptoms of Kidney Stones. E. P. Merritt, Atlanta, Ga.—p. 331.
- 33 Diagnosis and Treatment of Incipient Senile Cataract. W. H. Adams, Jacksonville.—p. 333.
- 34 Appendical Abscess; Its Treatment and Comparative Frequency in Small Towns and Rural Districts. N. A. Baltzell, Marianna.—p. 336.
- 35 Neurasthenia. J. B. White, Ormond.—p. 339.
- 36 Cancer. F. F. Ferris, Apalachicola.—p. 341.

Georgia Medical Association Journal, Augusta

June, VII, No. 2

- 37 Sins of Omission and Commission of General Practitioner of Today. C. K. Sharp, Arlington.—p. 27.
- 38 Tender Heel. T. Toepel, Atlanta.—p. 29.

Journal of Biological Chemistry, Baltimore

June, XXX, No. 2

- 39 *Peptone Hypoglycemia. H. McGuigan and E. L. Ross, Chicago.—p. 175.
- 40 Role of Yeast in Nutrition of Insect (*Drosophila*). J. H. Northrop, New York.—p. 181.
- 41 *Influence of Protein Intake on Creatin Excretion in Children. W. Denis and J. G. Kramer, Boston.—p. 189.
- 42 Enzyme and Reaction of Medium in Autolysis. M. Morse, Chicago.—p. 197.
- 43 Biologic Efficiency of Potato Nitrogen. M. S. Rose and L. F. Cooper, New York.—p. 201.
- 44 Alleged Ninhydrin Reaction with Glycerol, etc. V. J. Harding, Montreal, Canada.—p. 205.
- 45 Improved Chemical Methods for Differentiating Bacteria of Coli-Aerogenes Family. W. M. Clark and H. A. Lubs, Washington.—p. 209.
- 46 *Thermal Decomposition of Oxytocic Principle of Pituitary Solution. H. S. Adams, New Brunswick, N. J.—p. 235.
- 47 Nutrition Investigations on Cottonseed Meal. A. E. Richardson and H. S. Green, Austin, Texas.—p. 243.
- 48 Use of Van Slyke Carbon Dioxid Apparatus for Determination of Total Carbon Dioxid in Sea Water. J. F. McClendon, Minneapolis.—p. 259.
- 49 Standardization of New Colorimetric Method for Determination of Hydrogen Ion Concentration, Carbon Dioxid Tension, and Carbon Dioxid and O₂ Content of Sea Water, of Animal Heat, and of Carbon Dioxid of Air, with Summary of Similar Data on Bicarbonate Solutions in General. J. F. McClendon, Minneapolis.—p. 265.
- 50 *Studies of Acidosis. Bicarbonate Concentration of Blood Plasma; Its Significance and Its Determination as Measure of Acidosis. D. D. Van Slyke and G. E. Cullen, New York.—p. 289.
- 51 *Id. Method for Determination of Carbon Dioxid and Carbonates in Solution. D. D. Van Slyke, New York.—p. 347.
- 52 Id. Electrometric Titration of Plasma as Measure of Its Alkaline Reserve. G. E. Cullen, New York.—p. 369.
- 53 Id. Relationship Between Alkaline Reserve and Acid Excretion. R. Fitz and D. D. Van Slyke, New York.—p. 389.
- 54 Id. Alveolar Carbon Dioxid and Plasma Bicarbonate in Normal Men During Digestive Rest and Activity. D. D. Van Slyke, E. Stillman and G. E. Cullen, New York.—p. 401.
- 55 Id. Blood, Urine and Alveolar Air in Diabetic Acidosis. E. Stillman, D. D. Van Slyke, G. E. Cullen and R. Fitz, New York.—p. 405.

39. **Peptone Hypoglycemia.**—Dogs, not uniformly controlled as to diet, general condition, or time after eating, were injected intravenously with 0.3 to 0.5 gm. of Witte's peptone per kilogram of body weight. The blood sugar was determined before the injection and at intervals of two and four hours after the injection. In every case hypoglycemia developed. The average fall for thirteen dogs was 0.03 per cent. glucose or 34 to 38 per cent. of their original blood sugar.

41. **Protein Intake and Creatin Excretion.**—Experimental results are presented on four children and one infant in which it is shown that the amount of creatin found in the urine of children is directly dependent on the intake of protein, being high when large quantities of protein (creatin free) are ingested, decreasing and in some cases disappearing entirely when the child is fed a diet of an extremely low protein content. Creatinuria in normal children is therefore due to the relatively high protein intake which is the rule with practically all children; that it may also be due to the low saturation point of immature muscle is suggested by the small creatin content of the muscles of children and by the relatively low level of protein consumption at which appreciable quantities of creatin are excreted.

46. **Oxytocic Principle of Pituitary.**—Adams found that the constituent of pituitary solution which affects the isolated uterus is rapidly destroyed at 100 C. when the hydrogen-ion concentration of the solution is of the order of $N \times 10^{-5}$.

Oxygen seems not to be involved in the decomposition under the conditions of the experiment. The oxytotic principle becomes thermostable when the hydrogen-ion concentration is increased to the order of $N \times 10^{-3}$.

50. Blood Plasma Bicarbonate.—Reasons are discussed by Van Slyke and Cullen for basing both the definition of acidosis and the methods for its detection on the blood bicarbonate. Experiments are detailed showing both in vivo and in vitro the influence on the plasma bicarbonate of various factors, in particular of the shift of bases and acids between plasma and corpuscles under the influence of changing carbonic acid concentration. A simple technic has been developed by means of which the capacity of the plasma to combine with carbonic acid under definite tension is determined as a measure of the alkali in excess of acids other than carbonic. The plasma, from oxalated blood, drawn and centrifuged under definite conditions, is shaken at room temperature in a separatory funnel filled with alveolar air from the lungs of the operator, or with an artificial air mixture containing 5.5 per cent. of carbon dioxide. The carbon dioxide content of the plasma is then determined by the method described in the next paper. The results are calculated in terms of bicarbonate and are tabulated. The value determined appears to indicate not only the alkaline reserve of the blood, but also that of the entire body.

51. Determination of Carbon Dioxide.—A simple one piece apparatus is described by Van Slyke for determination of the carbon dioxide or carbonate content of water solutions. It has been designed especially for analysis of 1 c.c. samples of blood plasma, but is applicable to water solutions in general as well as to the determination of dissolved gases other than carbon dioxide. The entire analysis is performed at room temperature, requires about three minutes, and without especial precautions is capable of accuracy to within 1 per cent. of the amount determined. A micro-apparatus designed on a similar principle is described. With it the carbon dioxide content of 0.2 c.c. of plasma can be determined with an accuracy of one volume per cent.

Journal of Immunology, Baltimore

June, II, No. 4

- 56 Noninfluence of Injections of Pure Proteins on Proportions of Globulin and Albumin in Blood Serum. E. S. Schmidt and C. L. A. Schmidt, San Francisco.—p. 343.
- 57 Immunologic Studies in Typhus Exanthematicus. P. K. Olitsky, New York.—p. 363.
- 58 *Experiments with Possible Bearing on So-Called Nonspecific, Intravenous Vaccine Therapy. O. Teague and H. I. McWilliams, New York.—p. 375.
- 59 Spontaneous Agglutination in Typhoid and Paratyphoid Cultures and Its Bearing on Absorption of Agglutinins. O. Teague and H. I. McWilliams, New York.—p. 383.
- 60 Selection of Horses for Production of Diphtheria Antitoxin by Intraperitoneal Toxin Test. A. P. Hitchens and E. K. Tingley, Glenolden, Pa.—p. 395.
- 61 *Relation between Antigen and Antibody in Living Animal. R. Weil, New York.—p. 399.
- 62 Cutaneous Antibodies in Guinea-Pig. M. W. Cook and G. H. Smith, Glenolden, Pa.—p. 415.
- 63 Absorption of Antigen; Repetition of Work Reported by Doerr and Pick. G. H. Smith and M. W. Cook, Glenolden, Pa.—p. 421.
- 64 Antigenic Classification of Group IV Pneumococci. M. Olmstead, New York.—p. 425.
- 65 Vasomotor Depression in Canine Anaphylaxis. R. Weil, New York.—p. 429.

58. Nonspecific, Intravenous Vaccine Therapy.—The hypothesis has been suggested by Teague and McWilliams that the intravenous injection of vaccine brings about a transfer of bactericidal substances (complement, or bactericidal antibody, or both) from the blood to the tissue fluids or lymph and in this way increases resistance. According to this hypothesis the reaction should not be specific; *B. coli* vaccine, as well as typhoid vaccine should be able so to affect the blood capillaries as to allow the passage of these substances through their walls. Experiments recorded by the authors have demonstrated that the reaction is, in fact, nonspecific in this sense. The fact that rabbits are rendered more resistant to typhoid by a preliminary injection of *B. coli*

vaccine as well as by typhoid vaccine and that typhoid patients are cured by crisis by both kinds of vaccine makes it seem all the more likely that the same phenomenon is concerned in both reactions. The authors believe that their hypothesis offers the best explanation, not only of the new treatment of typhoid, but also of those other instances of so-called nonspecific vaccine therapy mentioned above; the bactericidal antibodies in each instance are probably transferred from the blood, where they are present in excess, to the tissue fluid where they are urgently needed. It is probable that opsonins and other antibodies, and perhaps complement, are similarly transferred and play a part in destroying the infecting organism in the diseased tissues. The cure would be brought about then, after all, by means of specific antibodies and their ideas with regard to immunity reactions would not have to undergo a radical revision as has been predicted by some writers.

61. Antigen and Antibody in Living Animal.—With the earliest appearance of reactive antibody in the cells, the same material begins to be discernible in the serum, and so, coincident with the intracellular destruction of antigen, there goes an extracellular precipitation of the circulating antigen in the blood. It is almost certain that this circulating antibody is derived from the reacting cells. Thus, gradually, the response of the cells serves to eliminate all the foreign protein from the body, both that which the cells have taken up and that remaining in circulation. But, says Weil, it is essential to keep in mind the fact that it is the anchoring of the protein which stimulates the cells to react, and which therefore constitutes the first step in the elimination. The cases in which the cells fail to anchor the foreign protein, no antitoxin is produced, and for an indefinitely long period the foreign protein remains within the body.

In one respect in particular, the cellular response is of great physiologic importance. With it goes a marked interference with normal cellular activities, which in human beings takes the form known as serum sickness. There are fever, cutaneous eruptions, joint manifestations, albuminuria and other untoward effects. In animals, death may ensue. These phenomena indicate that the symptoms of the infectious diseases may depend in no small measure on the gradual destruction of the foreign protein of the disease by the cellular antibodies. At all events, it must be admitted that the symptomatology of serum sickness, caused by an absolutely non-toxic and innocuous foreign protein, such as horse serum, can in many respects not be differentiated from that of an acute infectious disease. This remarkable fact goes far to bring home the great importance of such processes as are involved in the reaction of the cell to foreign protein, and is essential to the comprehension of some of the most common phenomena of clinical medicine, as well as of cellular physiology in a general sense.

Journal of Infectious Diseases, Chicago

July, XXI, No. 1

- 66 *Bacteriology of Acute Epidemic Respiratory Infections Commonly Called Influenza. G. Mathers, Chicago.—p. 1.
- 67 Leptothrix Associated with Chronic Bronchopneumonia. G. F. Dick, Chicago.—p. 9.
- 68 *Intravenous Injection of Typhoid Vaccine. C. S. Kibler and L. F. McBride, Chicago.—p. 13.
- 69 *Agglutination in Typhus. G. Baehr, New York.—p. 21.
- 70 *Possibility of Typhoid Infection Through Vegetables. C. O. Melick, Chicago.—p. 28.
- 71 Voges-Proskauer and Correlated Reactions of Coli-Like Bacteria. M. Levine, J. C. Weldin and B. R. Johnson, Ames, Iowa.—p. 39.
- 72 Influence of Oxygen Tension on Morphologic Variations in *B. Diphtheriae*. W. B. Wherry, Cincinnati.—p. 47.
- 73 Ninhydrin Reaction in Examination of Cerebrospinal Fluid. N. Novick, New York.—p. 52.
- 74 Nature of Plague Proteotoxins. F. Eberson, China.—p. 56.
- 75 American Mortality Statistics and Mills-Reincke Phenomenon. E. B. Fink, Chicago.—p. 62.
- 76 Effect of Injection of Nonspecific Foreign Substances on Course of Experimental Rabies. W. H. Burmeister, Chicago.—p. 95.

66. Acute Epidemic Respiratory Infection.—In a bacteriologic study of material from sixty-one cases of acute respiratory infection the influenza bacillus was found by Mathers

in only one instance and then in small numbers. On the other hand, virulent hemolytic streptococci similar in cultural characteristics and virulence to the streptococcus commonly associated with epidemic sore throat and scarlet fever were found in the nose, throat, and pharynx in forty-six and in the blood in three cases of this epidemic disease. *Streptococcus viridans* and the pneumococcus were each found in thirty instances, these organisms in virulence and biologic characters closely resembling the organisms found in the normal mouth. The predominance in the discharges from the nose, throat, and pharynx of patients suffering from the epidemic respiratory infection of a virulent hemolytic streptococcus not usually found in the normal mouth, the absence of the influenza bacillus, and the character of the associated pathologic changes suggest that this disease was caused by a virulent hemolytic streptococcus.

68. Intravenous Injection of Typhoid Vaccine.—The immediate results of the intravenous injection of typhoid vaccine, such as chill, rise and fall of temperature, leukocytosis, and changes in the concentration of agglutinin and opsonin, usually in the direction of an increase, were the same in the normal man as in the typhoid patient, and the authors' results do not support the view that the reaction is essentially specific. Except so far as they show that leukocytosis is rather constant after the injection of vaccine, they do not appear to support any particular view advanced to explain the action of intravenous injection of foreign protein in infectious diseases. The number of cases observed (six) is too small to allow any conclusions as to the therapeutic effect of typhoid vaccine in typhoid, but the results obtained would seem to correspond fairly well with the results obtained in larger series.

69. Agglutination in Typhus.—All together, 271 agglutination tests were made by Baehr on the serum of 100 persons with typhus. In forty-six of the patients, from three to eight examinations were made at intervals during the illness and early convalescence. The rest were only examined on one or two occasions. Agglutinins were demonstrable in forty-three of the forty-six cases studied systematically, or in 93 per cent. No agglutinins were found in the serum of three typhus patients, examined four, five and six times, respectively, during the course of the disease, and early convalescence.

70. Typhoid Infection Through Vegetables.—Melick concludes that vegetables grown in soil fertilized with fresh typhoid excreta shortly before planting or during the growing season are likely to be contaminated at the time they reach the consumer. Vegetables so contaminated are not made safe by the ordinary methods used in the preparation of such foods for table use, and may, therefore, be a source of typhoid infection.

Journal of Urology, Baltimore

April, 1, No. 2

- 77 *Experimental Nephropathy in Dog. Lesions Produced by Injection of Bacillus Bronchisepticus into Renal Artery. M. C. Winternitz and W. C. Quinby, Baltimore.—p. 139.
- 78 *Case of Multiple Myelomas with Chronic Nephritis Showing Bence-Jones Protein in Urine and Blood Serum. V. C. Jacobson, Boston.—p. 167.
- 79 *Injuries to Pancreas Following Operations on Right Kidney. H. H. Young and J. A. C. Colston, Baltimore.—p. 179.
- 80 *Comparative Influence of Morphin and Total Opium Alkaloids on Renal Colic. D. I. Macht, Baltimore.—p. 201.
- 81 Growth of Bacillus Coli in Urine at Varying Hydrogen Ion Concentrations. A. T. Shohl and J. H. Janney, Baltimore.—p. 211.
- 82 Verumontanum, with Special Reference to Sinus Pocularis; Its Anatomy, Histology and Physiology. A. G. Rytina, Baltimore. p. 231.

77. Experimental Nephropathy.—The experiments made by Winternitz and Quinby showed that spontaneous renal lesions, similar even in detail to those found in the human kidney in the progressive, nonsuppurative types of nephritis may be experimentally produced in dogs by the injection of the bacillus bronchisepticus into the renal artery. The results of this injection vary, but the animals tend to group themselves as follows: 1. Those in which no demonstrable general infection occurs; the kidney, however, shows immediate acute inflammatory lesions which rapidly subside and result in focal

scars associated with intermittent albuminuria and cylindruria. 2. Those that died acutely with a fulminating renal lesion and an acute general infection. 3. Those in which there was definite evidence of general infection as well as renal involvement. The first subsided while the kidney changes progressed, and led so rapidly to functional impairment that the organ was unable to maintain its efficiency after the other kidney had been removed.

78. Multiple Myelomas with Chronic Nephritis.—The case reported by Jacobson was one of multiple myelomas of the plasma cell, nongranular, nonoxydase type. It is said to be the first instance reported in which there was associated definite clinical evidence of advanced nephritis with retention of a large, measurable amount of the Bence-Jones protein in the circulating blood.

79. Injuries to Pancreas.—A few cases have been observed by Young and Colston in which extreme abdominal distention followed kidney operations. In one of them it was found necessary to perform an enterostomy for the relief of the obstruction, following which the patient made an uninterrupted recovery. The remaining cases of uncomplicated distention yielded rapidly to the usual simple methods. The two cases in which the pancreas had suffered injury are given in detail on account of their rarity and interest. In summary they are: Case 1. Renal calculus. Right nephrotomy. Bleeding from aberrant vessel, stopped by blind clamping and pressure. Postoperative intestinal obstruction. Enterostomy. Death. Necropsy: Pancreatitis, fat necrosis. Case 2. Right renal Calculus. Operation; kidney very adherent at upper pole; pyelotomy. Postoperative intestinal obstruction, requiring enterostomy. Development of glycosuria. R: Pancreatin. Slow convalescence and cure. Another case was an example of severe distention leading to intestinal obstruction which is not infrequently seen after rightsided renal operation. However, in this case there was no demonstrable injury to the pancreas either at the time of the enterostomy operation or in the subsequent postoperative course. Case 3. Nephrectomy for large hypernephroma. Difficult operation on account of hemorrhage. Postoperative nausea, vomiting and distention. Intestinal obstruction requiring enterostomy on fifth day. Recovery.

The authors point out that injury to the pancreas can best be avoided by an adequate incision for the exposure of the kidney and careful ligation of all structures divided in freeing the upper pole; and the probability of the presence of anomalous vessels must be kept in mind and care taken to ligate them securely. Injury to the pancreas should be suspected following operation on the right kidney in the presence of extreme abdominal distention and rapid prostration. Rapid enterostomy offers a chance of preserving life by relief of the intestinal obstruction but if the injury is extensive enough to cause widespread extravasation of pancreatic secretion the condition is hopeless. Traumatism to intestine by retractors, clamps or gauze packs may also cause intestinal distention or even obstruction. Care in hemostasis and good exposure without violent retraction and traumatism is of prime importance in renal surgery.

80. Influence of Morphin and Total Opium Alkaloids on Renal Colic.—Macht claims that morphin produces an increase in tonicity and in the rate of contractions of the ureter. Papaverin and narcotin produce a relaxation of the tonus of the ureter and an inhibition of its contractions. Opium and other combinations of total opium alkaloids contain enough papaverin and narcotin to overcome the spasmodic local effect of morphin, and are therefore to be preferred to morphin in case of ureteral colic.

Journal-Lancet, Minneapolis

June 15, XXXVII, No. 12

- 83 Getting Returns from Sanatorium Investments. A. T. Laird, Nopeming.—p. 404.

Journal of Abnormal Psychology, Boston

April-May, XII, No. 1

- 84 Study of Anesthesia, Convulsions, Vomiting, Visual Constriction, Erythemia and Itching. E. J. Kempf, Washington, D. C.—p. 1.

- 85 Some Analyses in Psychopathology of Everyday Life. H. W. Frink, New York.—p. 25.
- 86 Mental Imagery of Stutterers. Examination of Certain Current Theories. J. M. Fletcher, New Orleans.—p. 34.
- 87 Stuttering Boy. K. Dunlap, Baltimore.—p. 44.
- 88 Deforming Influences of Home. H. W. Brown, White Plains, N. Y.—p. 49.
- 89 Meaning of Psychoanalysis. T. Burrow, Baltimore.—p. 58.

Kansas Medical Society Journal, Topeka*June, XVII, No. 6*

- 90 Recent Progress in Surgery of Bile Passages; Plea for More Thorough Operations. D. N. Eisendrath, Chicago.—p. 149.

Laryngoscope, St. Louis*May, XXVII, No. 5*

- 91 Nonsurgical Treatment of Inflammation of Nasal Accessory Sinuses. W. A. Wells, Washington, D. C.—p. 397.
- 92 Plica Triangularis and Its Morphologic Variations. Causative Factor in Production of Foci of Infection and Irritation. F. G. Murphy, Mason City, Iowa.—p. 409.
- 93 Relation of Glands of Internal Secretion to Otolaryngology. J. C. Beck, Chicago.—p. 422.
- 94 Importance of Internal Secretions in Ear, Nose and Throat Affections with Special Reference to Hypophysis. H. L. Pollock, Chicago.—p. 430.
- 95 Campaign Voice. L. D. Alexander, Jr., New York.—p. 441.
- 96 Traumatic Deflections of Nasal Septum and Their Treatment. O. Orendorff, Canon City, Colo.—p. 445.
- 97 Frontal Sinusitis Probable Cause of Acute Nephritis. G. F. Keiper, Lafayette, Ind.—p. 449.
- 98 Case of Nasal Papilloma, Surgical Removal Followed by Roentgen Ray Treatment. C. E. Ide, Los Angeles.—p. 452.

Nebraska State Medical Journal, Norfolk*May, II, No. 5*

- 99 New Health Department of Nebraska. E. W. Rowe, Lincoln.—p. 303.
- 100 Tuberculosis; Early Recognition. G. Reeder, Fremont.—p. 309.
- 101 Acute Miliary Tuberculosis. A. J. Baker, Grand Island.—p. 315.
- 102 Relation of Food to Nervous Disturbances in Infants and Children. J. C. Moore, Omaha.—p. 317.

New York Medical Journal*June 23, CV, No. 25*

- 103 Constructive Suggestions Toward Control of Tuberculosis in Times of Peace and in Time of War. S. A. Knopf, New York.—p. 1181.
- 104 Birth Control and Physician. B. S. Talmey, New York.—p. 1185.
- 105 Duality of Voice. J. S. Greene, New York.—p. 1192.
- 106 Constructive Suggestions Toward Control of Syphilis, Gonorrhea, Pneumonia, Malaria, Typhoid and Typhus. I. S. Wile, New York.—p. 1195.
- 107 Constructive Suggestions Toward Control of Measles, Scarlet Fever, Diphtheria and Whooping Cough. S. J. Baker, New York.—p. 1198.
- 108 Sinus Thrombosis Following Fracture of Skull, with Subsequent Acute Mastoiditis and Erysipelas. W. W. Carter, New York.—p. 1201.
- 109 Nontuberculous Cases in Hospital for Advanced Consumptives. J. Kramer, New York.—p. 1202.
- 110 Fatalities in Athletic Games and Deaths of Athletes. R. E. Coughlin, New York.—p. 1204.

Ohio State Medical Journal, Columbus*July, XIV, No. 7*

- 111 Local Anesthesia for Tonsillectomy. J. A. Thompson, Cincinnati.—p. 469.
- 112 Physician in Court. D. S. Gardner, Massillon.—p. 472.
- 113 *New Method for Short Circuiting Colon. W. Griess, Cincinnati.—p. 476.
- 114 Anesthesia and Analgesia in Obstetrics. H. Heffron, Metamora.—p. 477.
- 115 Place of Individually Owned and Operated Hospital in Community. B. R. McClellan, Xenia.—p. 478.
- 116 *Treatment of Tuberculosis by Ether Anesthesia. W. E. Savage, Cincinnati.—p. 480.

113. **Method for Short Circuiting Colon.**—The technic employed by Griess is as follows: The ileum and sigmoid are divided at two given points. The ends are then anastomosed by the end-to-end or lateral method as may suit the taste of the operator. The open ends of the sidetracked intestinal tract are sutured to the abdominal wall in the line of the incision or at some convenient part. The ends stitched to the abdominal wall will atrophy into two mucous teats which will secrete a little mucus. The colon itself will atrophy and its removal, if necessary, will be found extremely easy. In fact, there is no indication for its removal except

for malignant disease, for if the object for short circuiting has been stasis, the remaining colon can be flushed out and after a short time the amount of mucus it secretes will be insignificant. The danger from this operation is said to be no greater than any other intestinal anastomosis and it fulfils a want that a pure lateral or end to side anastomosis will not fulfil, for a damming back into the sidetracked colon will occur.

116. **Treatment of Tuberculosis.**—Ether, given by the closed cone method, Savage says, is a valuable therapeutic agent in the treatment of peritoneal, pulmonary and meningeal tuberculosis. Improvement is noticeable as soon as the patient recovers from the anesthetic. Ether is of greatest benefit when used in uncomplicated tuberculous peritonitis and early pulmonary tuberculosis. One anesthetic usually suffices. In advanced cases of pulmonary tuberculosis the distressing symptoms of high fever, cough, expectoration, night sweats, loss of sleep and appetite are very noticeably benefited for a period of from fifteen days to six months. In advanced cases continued improvement has been noticed, not infrequently, with repeated anesthetics. Ether cones can be made of a towel, heavy wrapping paper, and three safety pins. In the apex of the cone a pledget of absorbent cotton is placed. A few drops of ether are at first placed in the cone to allow the patient to become accustomed to the fumes. Ether is gradually increased until the stage of excitement is reached, then a liberal supply is added and the cone kept snugly against the face, reinforced with a towel to exclude as much oxygen as possible; in this way the patient can be kept under as long as one thinks necessary.

Pennsylvania Medical Journal, Athens*June, XX, No. 9*

- 117 Workmen's Compensation Law of Pennsylvania from Physicians' Viewpoint. W. L. Estes, South Bethlehem.—p. 627.
- 118 Compensation for Industrial Diseases. F. L. Hoffman, Newark, N. J.—p. 634.
- 119 Carrel Method of Wound Sterilization. W. O. Sherman, Pittsburgh.—p. 643.
- 120 Treatment of Fractures of Long Bones from Viewpoint of Function. E. Martin, Philadelphia.—p. 658.
- 121 National Standards for First Aid. J. C. Bloodgood, Baltimore.—p. 666.

Public Health Journal, Toronto*June, VIII, No. 6*

- 122 Poliomyelitis. H. W. Hill, London, Ont.—p. 139.
- 123 Clinical Studies of Infantile Paralysis. E. J. Durocher, Windsor, Ont.—p. 141.
- 124 Public Health in Average Town; Ways and Means of Conducting. C. A. Patterson, Forest, Ont.—p. 143.
- 125 Practical Points in Enforcement of Regulations and Difficulties of Medical Officer of Health. H. Ross, Clifford, Ont.—p. 149.
- 126 How Could Rural Municipality Employ Public Health Nurse? J. F. Hanly, Almonte.—p. 153.
- 127 Overcrowding—Why Is It Tolerated? T. Watson.—p. 157.

Southern Medical Journal, Birmingham*June, X, No. 6*

- 128 Some Problems in Etiology of Poliomyelitis. W. H. Frost, Cincinnati.—p. 451.
- 129 Simplified Infant Feeding. G. K. Varden, Atlanta, Ga.—p. 457.
- 130 Phenomenon of Hypertension Reading. L. B. Newell, Charlotte, N. C.—p. 464.
- 131 Tuberculosis of Infants. M. E. Lapham, Highlands, N. C.—p. 465.
- 132 Work of U. S. Public Health Service with Reference to Malaria. R. C. Derivaux, Washington, D. C.—p. 472.
- 133 Prophylaxis in Mental Disease. W. C. Sandy, Middleton, Conn.—p. 478.
- 134 Chylous Cysts of Mesentery; Report of Case. H. R. Shands, Jackson, Miss.—p. 484.
- 135 New Growths of Clitoris. W. W. Battey, Jr., Augusta, Ga.—p. 486.
- 136 Radium Therapy. E. C. Samuel, New Orleans.—p. 490.
- 137 Gunshot Wounds of Chest Observed in Late Turko-Balkan War and in Present European War. E. L. Gilcreest, Dallas, Texas.—p. 496.
- 138 Diagnosis of Traumatic Neurosis. L. Casamajor, New York.—p. 501.
- 139 Fractures of Lower Extremity: Treatment. J. C. A. Gerster, New York.—p. 505.
- 140 End Results of One Hundred and Eleven Radical Mastoid Operations. J. A. Stucky, Lexington, Ky.—p. 511.
- 141 Technic of Tonsil Excision with Exhibition of Instruments. M. M. Cullom, Nashville, Tenn.—p. 512.
- 142 Advantageous Results of Tonsil Operation. J. G. Murphy, Wilmington, N. C.—p. 519.

- 143 Secondary and College Education in South in Relation to Medical Education. J. H. Kirkland, Nashville, Tenn.—p. 526.

Wisconsin Medical Journal, Milwaukee

June, XVI, No. 1

- 144 Physician; Past and Present. H. P. Greeley, Waukesha.—p. 1.
145 *Topographic Anatomy of Heart. C. R. Bardeen, Madison.—p. 6.
146 Regulation of Heart in Health and Disease. J. A. E. Eyster, Madison.—p. 8.
147 Some Practical Considerations in Chronic Heart Disease. A. J. Patek, Milwaukee.—p. 12.
148 Personal Hygiene for Soldiers. G. E. Scaman.—p. 22.
149 Duties of Medical Officers at Front. J. W. Frew.—p. 25.
150 Results of Examinations for Diagnosis of Gonorrhea. L. L. Gilman, Madison.—p. 27.

145. **Topographic Anatomy of Heart.**—From a study of a heart silhouette, silhouette of the heart either on a roentgenographic plate or on a fluoroscopic screen in various conditions in health and disease, Bardeen has gained new insight into what may be termed the living anatomy of the heart. He found that the heart of a person in the recumbent position is larger than that of the same person sitting up. The heart of a person in the sitting position is larger than that of one standing. The variation in the size of the silhouette from the recumbent to the standing position may be over 30 per cent. In an average of seven persons Bardeen found the increase from the recumbent to the sitting position to be 7.2 per cent., from the recumbent to the standing position 18.2 per cent. As a rule fat persons have hearts smaller in proportion to their weights than persons of normal weight, and women of a given size have hearts somewhat smaller than men of the same size. Their differences, however, are less marked than those mentioned above and are of relatively less interest to those not specialists in the diagnosis of cardiac disease. Valvular disease may produce changes in the shape of the heart which while most manifest in the Roentgen-ray silhouette may be determined by percussion. Aortic disease is marked by a bulging of the lower left side of the heart, mitral disease by a bulging of the upper left side, and, if marked, by a bulging of the lower right side. Incompetency of the tricuspid valve may cause a bulging of the upper right side.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

June 2, I, No. 2944

- 1 *British Surgery at Front. A. Bowlby and C. Wallace.—p. 705.
2 Penetrating Wounds of Chest at Casualty Clearing Stations. W. Herringham.—p. 721.
3 Administration of Anesthetics at Front. G. Marshall.—p. 722.
4 Color Changes Seen in Skin and Muscle in Gas Gangrene. C. Wallace.—p. 725.
5 *Method of Spread of Gas Gangrene into Living Muscle. J. W. McNee and J. S. Dunn.—p. 727.
6 *Successful Conservative Treatment of Early Gas Gangrene in Limbs by Resection of Infected Muscles. C. H. S. Frankau, H. Drummond and G. E. Neligan.—p. 729.

1. **British Surgery at Front.**—Bowlby and Wallace, in their summary of the present position, record the leading facts which experience has established, and describe the trend of surgical opinion and practice, more particularly in the treatment of abdominal wounds, head injuries, wounds of blood vessels, fractures and joint injuries. They point out the indispensability of the motor ambulance, around which one might safely say the whole surgical system from front to base has been organized. Motor transport of the wounded and the casualty clearing station together form the keystones of the system, and the saving of lives, limbs and suffering due to their development since the early months of the war has been immense. An important point made by the authors is that surgery at the front is a special branch of practice which all have to learn by direct experience, and a sound opinion on wound treatment comes to no one, however gifted, by the light of Nature. This seems to be specially true of the decision when and where to amputate. Among other things the war has abolished the old formal amputation dear to the teachers of operative surgery and examiners of former

days. Another development in technic has been the early routine excision of damaged tissue, and the use of moist dressings containing antiseptics, such as neutral solution of chlorinated soda, which have been devised to meet the special conditions of wound infection at the front.

In abdominal surgery it was demonstrated beyond doubt that under the conditions of this war early evacuation from the front line and immediate operation gave the only hope of success. For some time past the rule has been to operate, unless there is some special reason to the contrary; not to await special indications, but to open the abdomen and make a rapid, methodical examination of the intestine, suturing rents in the intestine, and resecting only in cases in which this is inevitable. The modern practice—aided by a special service of cars for hurrying abdominal cases to the clearing station or small advanced operating center—has resulted in a lowering of the death-rate estimated at between 15 and 20 per cent., although the mortality from these wounds is still distressingly high.

In the surgery of joints, gratifying improvement has followed modern lines of treatment. In head surgery effort has been directed toward devising the best operation and standardizing a general line of treatment adaptable to all varieties of cranial wounds. It was found that head cases travel badly after operation, although, provided the pulse is slow, they travel well, as a rule, between injury and operation. Early operation and prolonged rest after it is, therefore, the ideal, and this has been attained to some extent, by the establishment of special hospitals neither too near nor too far from the line. With regard to fractures of the limbs, the most important generalization seems to be that no amount of skilled after-care can make up for improper early treatment. Thorough, deliberate operation is needed, and, as would be expected, the operating facilities of clearing stations, combined with the Roentgen-ray plants which have sprung up in connection with them, have brought about great improvement, while the almost universal use of the Thomas splint and its progeny is an important factor. In this article are detailed also the latest views on the causation and treatment of gas gangrene.

5. **Method of Spread of Gas Gangrene.**—The rapidity of spread of gas gangrene into living voluntary muscle is so remarkable as to require explanation by a different process from that which governs ordinary septic invasion of tissues. It is suggested by the authors that the facts are accounted for by the peculiar anatomic structure of muscular tissue. The sheaths enclosing the long individual fibers are so easily detachable as to form potential spaces into which toxic material can readily pass, causing necrosis of the fibers. The early selective invasion of single muscles is consistent with the above view.

6. **Gas Gangrene in Limbs Treated by Resection of Infected Muscles.**—In no case have the authors seen gas gangrene commencing as a subcutaneous infection; injured muscle is in all cases the initial focus, the appearance of crackling in the subcutaneous tissues being a secondary phenomenon, due to extravasation of gas from the infected muscles below. In view of this, it has been their aim to model treatment on the following lines as soon as the condition is diagnosed: To explore the primary focus with a view to attempting to arrest the infection in the muscle, or group of muscles, involved by resection of the infected areas. Such resection may involve a part or the whole of single muscles, or groups of muscles. Resection should be limited to cases in which the main vessel of the limb is intact, and should be replaced by amputation where the operation must be so extensive as to be likely to give a limb which would be of less value than an artificial limb. Extensive resections, however, may be performed regardless of the ultimate utility of the limb as a life saving operation, it having been quite clear in some of the cases recorded that an amputation could not have been carried out without very grave risk to life. Resection should extend until the muscle is reached which has the following characteristics: 1. The color is unchanged. 2. The contractility is normal. 3. A good blood supply is present, as indicated by free bleeding from the cut surface. Experience

has shown that even if such muscles are, as they may be, slightly infected, free drainage and an open wound will arrest further development of the condition.

Edinburgh Medical Journal

June, XVIII, No. 6

- 7 Infectious Diseases in Relation to Child Welfare. C. B. Ker.—p. 389.
- 8 Dermatology in Relation to Child Welfare. N. Walker.—p. 396.
- 9 Id. R. C. Low.—p. 401.
- 10 Administrative Institutions Necessary for Welfare of Children under School Age. L. Mackenzie.—p. 404.
- 11 Diseases of Eye in Children of and under School Age. J. V. Paterson and H. M. Traquair.—p. 415.
- 12 Diseases of Ear, Nose and Throat in Relation to Child Welfare. J. S. Fraser.—p. 422.
- 13 Child Welfare and Prevention of Dental Disease. J. H. Gibbs.—p. 433.
- 14 Medical Inspection and Supervision of Schoolchildren in Edinburgh. J. H. Meikle.—p. 442.
- 15 Legal Powers and Administrative Regulations. W. L. Mackenzie.—p. 446.

Lancet, London

June 2, I, No. 4892

- 16 Paratyphoid Infections. C. H. Miller.—p. 827.
- 17 *Leukocytes in Cases of Irritable Heart. G. Briscoe.—p. 832.
- 18 *Influence of Maternal Oral Sepsis on Fetus and Marasmic Children. E. S. Picrepoint.—p. 837.
- 19 *Vaginal Plug in Treatment of Antepartum Hemorrhage. E. H. Tweedy.—p. 840.
- 20 Case of Placenta Praevia and Twins. W. G. Reynolds and J. O. Thomson.—p. 841.
- 21 Case of Tetanus Treated by Intramuscular Injections of Antitoxin. G. H. V. Appleby.—p. 841.

17. Leukocytes in Cases of Irritable Heart.—All the patients investigated by Briscoe were soldiers admitted to the hospital suffering from breathlessness or palpitation on slight exertion, faintness, giddiness, precordial pain and general lassitude. Ninety-three counts were carried out on thirty-four patients and thirty-two counts on nine controls. The average total count of the patients was 12,100 cells per cubic centimeters (lowest 6,800, highest 23,800). The average of the controls was 7,400 per cubic centimeters (lowest 5,000, highest 10,040). The degree of leukocytosis in these patients appeared to be directly proportional to the amount of exercise taken before the count was made, other factors, such as food, being the same. Of thirty-eight counts made while the patient was in bed or after he had been lying on his bed for an hour, the average was 10,600 per cubic centimeters (lowest 6,800, highest 16,800). Of thirty-one counts on those patients walking about in the ordinary way, the average was 12,700 per cubic centimeters (lowest 7,100, highest 18,200). Of seventeen counts made immediately after a staircase exercise, the average was 15,000 per cubic centimeters (lowest 8,700, highest 23,800). In seven controls the average count after rest was 7,100 per cubic centimeters (lowest 5,700, highest 8,400); the average after a staircase exercise was 8,200 per cubic centimeters (lowest 6,200, highest 10,040). It appears, then, that in these cases, at absolute rest, there is a slight leukocytosis or no leukocytosis. While up and about there is a decided leukocytosis. In many, and especially in cases of long standing, there may be a relative and absolute lymphocytosis. The variability of the different kinds of leukocytes is greater (more than double) than in normal individuals. The response to muscular exercise is similar to that found in healthy subjects, but is exaggerated in its degree. This exaggerated response can be used as an objective sign in diagnosis. The degree of leukocytosis and of variability in percentages after exercise is proportionate to the severity of the symptoms.

18. Influence of Maternal Oral Sepsis on Fetus and Marasmic Children.—Observations made by Picrepoint on some 500 cases show that the toxins from the maternal oral sepsis have a very strong influence in a large number of cases on the vitality of the rapidly growing fetus, so that the child is handicapped from before birth with a lowered vitality, and therefore the marasmic condition is antenatal in its inception. Prematurity of birth and miscarriages, in which no other cause can be discovered, are brought about by the toxic state of the mother, induced by the septic condition of her

mouth. The diminution in the quantity, or alteration in the quality, of the mother's milk, where no other cause can be ascertained, is due to the selective affinity of certain toxins for certain secretory cells of the mammae, and in cases in which no such diminution or alteration can be demonstrated, then, the toxins, and in some cases micro-organisms themselves, are in the milk. In the toxemias of pregnancy and the puerperium the high pressure at which the emunctory organs are working is probably adversely influenced by the toxic state produced by the mouth, and this is the deciding factor in many cases that just brings the balance down on the wrong side and results in eclampsia or the other toxemic conditions.

19. Vaginal Plug in Antepartum Hemorrhage.—To plug efficiently, Tweedy says, the left hand should be passed into the vagina, the palmar surface directed toward the hollow of the sacrum, while the finger tips lie behind the cervix. Small pieces of cottonwool, squeezed out of dilute compound solution of cresol and each the size of the thumb knuckle, are then taken and inserted by means of the right hand round the cervix. The fingers of the left hand are kept busy squeezing the pellets into a compact mass and forcing the spaces between them to permit the insertion of still another plug. This process is continued in a systematic manner from above downward till the vulva is reached and the vagina can hold no more. A T-bandage is applied to keep the plug in position, and an abdominal binder is fastened tightly from above downward to press the side walls of the uterus against the vaginal dam, and thus completes the operation. A plug so applied will cause immediate cessation of hemorrhage, and when it is removed after the lapse of hours so much blood only will be found as can be accounted for by the flow that took place during the operation.

Medical Journal of Australia, Sydney

May 12, I, No. 19

- 22 Personal Experiences and Clinical Observations with third Australian General Hospital, Lemnos and Egypt. H. J. Stewart.—p. 393.
- 23 Surgery of Ruptured Bladder. C. E. Todd.—p. 399.
- 24 Case of Cesarean Section under Rectal Anesthesia. A. E. Panting.—p. 399.

Practitioner, London

June, XCVIII, No. 6

- 25 Rubella or German Measles. C. R. Box.—p. 501.
- 26 *Surgeon and Spleen; Eight Cases of Splenectomy. G. G. Turner.—p. 511.
- 27 Recent Work on Urinary Surgery. J. W. T. Walker.—p. 528.
- 28 Recent Work on Diseases of Heart. C. W. Chapman.—p. 543.
- 29 Retrospect of Otology, 1916. M. Yearsley.—p. 557.
- 30 Surgery of Fractures. E. M. Corner.—p. 562.
- 31 Treatment of Neuralgia and Neuritis by Ionization and Diathermy. J. McGinn.—p. 565.
- 32 New Method (Forcible Passive Motion) for Treatment of Immobility or Stiff Shoulder Joints. W. J. Smyth.—p. 575.
- 33 *Case of Septic Pneumonia in Puerperium. S. Sheill.—p. 577.
- 34 *Treatment of Bronchopneumonia in Children. J. E. Measham.—p. 581.

26. Splenectomy.—In two of the cases reported by Turner splenectomy was performed for injury, and both patients died; in six cases the spleen was removed for disease and these six patients recovered and were known to be alive and well months or years afterward. The types of disease for which the operation was performed were: wandering spleen; wandering spleen with twisted pedicle; splenic anemia; splenic anemia (?) of infants; splenic anemia with recurring jaundice; Banti's disease. Turner warns that splenectomy must always be looked on with the greatest respect. A wandering spleen, with a long pedicle, allowing it to be brought out of the abdomen, is easily removed; but a spleen that has never left its secluded position, and is perhaps surrounded with vascular adhesions, is a much more difficult matter with which to deal, and one that may tax the resource of the operator very sorely. In the immediate after-history of these cases, Turner draws attention to the frequent occurrence of a little left-sided basal pleurisy. This has been present in nearly all his patients, and has come on about the fourth day. It soon clears up, and has not given rise to more than temporary inconvenience. Turner also calls attention to the fact that some condition in which the spleen is

enlarged may account for otherwise obscure hemorrhage, whether from the gastro-intestinal tract or the urinary system. The presence of some such disease may be masked, until perhaps severe postoperative hemorrhage prompts a systematic search for its cause. A routine examination of the blood ought to be made in all cases before operation.

33. Fatal Septic Pneumonia in Puerperium.—In Scheill's case there was a perineal tear requiring two sutures of silk-worm gut, and these were removed on the seventh day, good union resulting. The patient got up on the ninth day feeling very well except for a tender spot on the right breast. The same evening her temperature rose to 102 F., the first rise of temperature during her puerperium. Sheill kept her in bed and ordered antiseptic wet dressings, while the inflamed spot increased in size toward the nipple. On the eleventh day, while applying suction to the whole breast by a Bier's apparatus, 1 or 2 drops of pus were drawn from a milk duct. The next day Sheill opened the breast under nitrous oxid anesthesia, and evacuated a small amount of pus and altered milk; the incision was explored digitally to make certain that no pus pockets remained unbroken. Her temperature did not fall to normal after the operation, but instead rose in two days to 104 F., although the breast was doing very well, except that the edema did not subside. Suspicious of her lungs, Sheill made an examination of them, and found well marked patchy signs of pneumonia. A few hours later, the diagnosis of "septic pneumonia" was confirmed. Six days after the opening of the abscess, and the eighteenth day of her puerperium, she died of acute septic double pneumonia.

34. Treatment of Bronchopneumonia in Children.—The method of treatment which Measham has adopted in seventeen cases is as follows: The child's chest is enveloped in a light Gamgee jacket, and over this a pair of woolen combinations are worn. The bed is placed in a part of the room free from draughts, and not more than the usual amount of bed-clothes is used. A fire is kept constantly burning, and the window always open. The child is encouraged to take frequent sips of cold water. No medicines are given by the mouth, but a subcutaneous injection of quinin hydrochlorid is given morning and evening. A solution is prepared in which 1 grain of quinin salt is dissolved in 10 minims of water, and the dosage is as follows: For a child under 6 months, 5 minims; for a child under 1 year, 10 minims; for a child under 2 years, 15 minims; for a child under 2 years, 20 minims. In a series of seventeen cases there were two deaths, one of which was due to Bright's disease, the other to bronchopneumonia. The fatal case was not seen until the seventh day, and had had its chances of recovery lost by improper treatment.

Archives des Maladies du Cœur, etc., Paris

April, X, No. 4, pp. 145-208

- 35 Case of Aneurysm of Left Auricle as Explaining Mechanism of Pulsus Bigeminus. R. Lutembacher.—p. 145.
36 *Disturbances in the Circulation Accompanying Traumatic Reflex Paralysis or Contracture. J. Heitz.—p. 161.
37 Preparation of Strophanthus Gratus—Ouabain—in Treatment of Cardiac Insufficiency. H. Vaquez and R. Lutembacher.—p. 197.

36. Reflex Paralysis or Contracture.—Heitz refers in particular to the disturbances in the circulation accompanying the paralysis or contracture following transfixion of a limb by a projectile, or a severe contusion. The absence of the reaction of degeneration and the existence of symptoms, especially vasomotor, which cannot be reproduced by volition, thus excluding hysteria, are special features of these cases, and sustain the assumption that the paralysis or contracture is of reflex origin. Babinski and Froment have recently published a monograph on the subject, and Heitz reproduces five of their most typical illustrations and gives five tables showing the modifications in the circulation in the part involved. The local temperature is generally below normal or transiently above, and the limb is redder or bluer than normal, and there may be local hyperhidrosis. The topography of these vasomotor disturbances, their fluctuations, especially under the influence of the external temperature, their possible extension to the sound mate and their analogy with those observed with certain central lesions—all point to some reflex exci-

tation of the bulbomedullary centers and the centers in the ganglia of the sympathetic. The logical treatment is to act on the muscular trouble by way of the vasomotors, seeking to elicit and maintain intense vasodilatation. This can be realized with hot baths, superheated air or electric light baths or diathermy, supplemented by massage, local mobilization and reeducation. Psychotherapy may be needed to eliminate any associated manifestations of hysteria. Excision of hampering cicatricial tissue is useful. Periarterial sympathectomy gives good results by the vasodilatation which it induces at first. In two or three weeks as the effect begins to subside, it can be revived by keeping the part extra warm. A bath of paraffin melted at 60 C. has proved excellent for this. The paraffin in contact with the skin solidifies, forming a protecting cover, so that the heat can be tolerated. After thirty or forty minutes the member with its adherent paraffin is wrapped in cotton.

Archives des Maladies de l'Appareil Digestif, etc., Paris

May, IX, No. 4, pp. 169-228

- 38 *Palpation of Pylorus Region. A. Mathieu.—p. 169.
39 *Roentgen Diagnosis of Cancer of the Large Intestine. R. Bensaude and G. Guénaux.—p. 179. Concluded.
40 Lymphatic Leukemia with Intestinal Symptoms. A. F. Hurst (London).—p. 221.

38. Palpation of Pylorus Region.—Mathieu has been studying for years the findings when the fingers are drawn perpendicularly over the colon and over a large cord occasionally discovered in the epigastrium. Roentgenoscopy has revealed this cord to be the antrum of the pylorus. It may be tender in patients who have had symptoms suggesting an ulcer in the stomach or duodenum, or when there is much gastroptosis. The indurated pylorus is usually hidden behind the liver, but it sometimes can be palpated at the close of inspiration as the subject stands. When the stomach is very long, the pylorus may lie to the left of the median line, but when there is much dilatation it is usually to the right. In five cases in which the pylorus lay to the left of the median line a laparotomy showed an ulcer close to the pylorus. The prepyloric cord was found tender in a number of persons free from any indications of ulceration at the time or before, and they have never developed such during the years since. Is it possible that irritation of the celiac or solar plexus, augmented by gastroptosis, is sufficient alone to induce the painful prepyloric cord? The tender contracted prepyloric cord might be the first sign of cancer, but he has never encountered a case of the kind although he has long been seeking for one. Induration of the pylorus differs from the typical prepyloric cord in that it does not appear and disappear but is fixed, and is usually accompanied by signs of retention and stasis in the stomach. When the induration is due to ulcer or cancer, the pylorus may be found in the left of the epigastric region. It may be fixed and immovable or it may slide down to the right when the stomach is full, returning to its position on the left as the stomach is emptied.

39. Roentgen Diagnosis of Cancer of the Large Intestine.—The conclusions of this long analysis of thirty cases are that the Roentgen rays may locate the lesion but that they are unable to specify its nature. Gaps in the shadow merely indicate circumscribed induration of the wall of the bowel; this may be due to ileocecal tuberculosis or ulcerative colitis as well as to cancer. Bensaude and Guénaux have noticed, however, that with the latter the shadow may spread out in the shape of the flame of a candle. They have never seen this except with cancer verified by operation (transverse colon). Another typical finding with cancer is when the shadow narrows to a small bridge between two broad shadows, looking as if a chunk had been gouged out on each side. The shadows cast by overlapping loops may hide a typical gap or narrowing in the shadow; this is particularly liable with the sigmoid flexure. They comment on other difficulties with radiologic exploration of the large intestine, but add that it may give valuable information in regard to the functioning of an anastomosis, warning of recurrence and demonstrating postoperative adhesions and the advisability of further intervention. In four of the thirty cases on which the article is based, the cancer was discovered in such an

early stage that its eradication was possible. A shadow of the rectum, dotted with light spots, was obtained in a case of polyposis of the rectum.

Bulletin de l'Académie de Médecine, Paris

May 15, LXXVII, No. 20, pp. 599-653

- 41 *The Depopulation of France. C. Richet and others.—p. 604.
- 42 *Quinized Serum in Treatment of Malaria. G. Hayem.—p. 635.
- 43 Extraction of Projectiles from Posterior Aspect of the Heart. R. Le Fort.—p. 645.
- 44 *Importance of Vitality of First Teeth for Physiologic Dentition. (Resorption radiculaire des dents de lait.) Luciani.—p. 647.
- 45 Hair Ball in Stomach of Girl of Four. A. Broca.—p. 650.

41. **The Depopulation of France.**—This committee report presents the present status of the outlook for the natality of France, and urges the adoption of resolutions prohibiting birth-control propaganda, and proposes taxation of the childless to provide pensions for families with children, with stricter enforcement of the laws against induced abortion. The discussion is to be continued.

42. **Treatment of Malaria.**—Hayem gives the history of intravenous medication. It seems to have been suggested first in Scotland in 1832. It was first applied in treatment of cholera, in 1855, and popularized by Baccelli in 1890. He warns that men returning from Macedonia or elsewhere with malaria should not be sent to localities where it is known that anopheles abound. Careful selection of the places for their convalescence is important to refrain from founding new foci of infection.

44. **Absorption of the Roots of the First Teeth.**—In examining large numbers of "milk teeth," Luciani noticed that the normal absorption of the roots occurred completely only when the pulp of the tooth was in normal condition. The physiologic integrity of the tooth is indispensable, he declares, in preparation for the normal process of second dentition. All his evidence proclaims the importance of preserving the vitality of the pulp of the first teeth until they are ready to drop off from absorption of their roots.

Journal de Chirurgie, Paris

XIV, No. 1, pp. 1-112

- 46 *Treatment of Persisting Fistula with War Wounds of Bones. C. Dujarier and A. Desjardins.—p. 1.
- 47 Apparatus for Immobilization of Compound Fracture of the Leg. R. Bonneau.—p. 12.

46. **Persisting Fistulas with Osteomyelitis from War Wounds.**—Dujarier and Desjardins advocate a special center to which these interminable fistula cases can be sent for specialist treatment. Their success with such cases has practically realized a center of the kind, as they report 80 per cent. cured by their operative measures in sixty-nine cases. The interval between the war wound and their intervention was from ten to twenty-one months in most of the cases and in none was less than four months. The cure after their intervention was complete in from three weeks to six months, averaging from two to four months. In the few cases of failure some cause was discovered later in nearly every instance, a scrap of cloth, a sequester or an overlooked focus of osteitis.

The abstract department of this *Journal de Chirurgie* fills eighty-eight pages, and illustrations accompany many of the summaries. The indexing of articles interesting the surgeon in international literature fills an additional thirty-six pages.

Journal de Médecine de Bordeaux

May, LXXXVIII, No. 6, pp. 101-120

- 48 Heliotherapy at Seashore Sanatorium in Southern France. (La Fondation Wallerstein.) C. Lasserre.—p. 103.
- 49 *Differential Diagnosis of Purulent Pleurisy and Abscess in the Liver. L. Moreau.—p. 109.
- 50 Localization of Projectiles. Barozzi.—p. 113.
- 51 Zinc Dressing in Ambulant Treatment of Leg Ulcers. Charron.—p. 115.

49. **Differential Diagnosis of Pleurisy and Liver Abscess.**—Moreau describes a case in which the symptoms were ascribed to an assumed abscess in the liver, but they persisted after the operation on the liver. Necropsy revealed that the man had succumbed to a purulent pleurisy which had burrowed

downward and simulated a purulent process in the liver. The symptoms of the two are practically identical, except that the bulging of the wall is lower with the liver trouble. The area of dulness is dome shaped with the latter, and more of a parabola outline with the pleurisy, unless congestion of the lung modifies the outline. The urine may contain more urates in pleurisy while they are much reduced with inflammation of the liver. Puncture is the most reliable differentiating measure, but instructive findings have been obtained with the deviation of complement test, applied with an antigen made from pus from the liver. A positive reaction has been obtained in several cases of liver abscess while the findings were constantly negative with simple amebic dysentery. The pus with purulent pleurisy does not yield an active antigen. Roentgenoscopy is also instructive.

Journal de Radiologie et d'Electrologie, Paris

March-April, III, No. 8, pp. 497-544

- 52 Radiologic Differential Diagnosis of Lesions in Lower Duodenum. J. T. Case (Battle Creek).—p. 497.
- 53 *Radiography of the Skull and Its Interpretation. C. Villandre.—p. 507.
- 54 *Rational Treatment of Cancer. T. Nogier.—p. 515.
- 55 Intensive Reeducation in Treatment of Phenomena of Hysteria. L. Delherm.—p. 531.
- 56 Radioscopic Determination of Depth of Projectiles in the Tissues. P. Aimé.—p. 533.

53. **Radiography of the Skull.**—Villandre has been studying on prepared skulls or parts of skulls the solution of certain problems raised during interpretation of numerous radiograms of skull wounds. The brain fits exactly into the skull, and knowledge of the skeletal points throws light on the conformation of the brain and its various parts. He took radiograms of the brains with lead threads placed to outline the corpus callosum, the ventricles, etc. A composite outline picture thus obtained is placed on the radiographic plate. By this means the shadow cast by the projectile fits into the proper region of the skull.

54. **Radiotherapy plus Operation in Treatment of Cancer.**—Nogier says he has been appalled at the histologic findings of cancer cells scattered through the adjoining tissues after apparently complete excision of cancers. Particularly in the breast, improved technic has revealed cells sown through the tissue far back of the primary tumor. They are not seen nor felt, and lie latent till after the operation. This arouses them, and we have recurrence of the cancer. For this and other reasons he advocates broad and intensive radiotherapy before the operation, preoperative instead of postoperative Roentgen or radium exposures. This he insists will prove successful beyond anything yet realized to date. Working with Regaud, he has conclusively demonstrated, he reiterates, that it is possible to give enormous doses of filtered Roentgen rays, leaving the skin intact. They expose the cancer first, then the adjoining regions, and especially the lymph glands which are ordinarily invaded. The operation should be as early as possible, removing all the microscopically evident malignant tissue. The scattered cancer cells lose all power for reproduction under the exposures, and if any embolism occurs during the following operation the embolus is sterile and metastasis is not entailed. The cells in the depths having lost their power of reproduction, die off sooner or later and are absorbed. This absorption of cancer cells serves as an immunizing process. All the evidence therefore, he concludes, is overwhelmingly in favor of radiotherapy followed by excision as the logical treatment for cancer.

Paris Médical

May 19, VII, No. 20, pp. 405-420

- 57 *Treatment of Abdominal Wounds at Advanced Posts. A. Schwartz.—p. 406.
- 58 *Campaign Diarrhea. A. Hanns.—p. 408.
- 59 Dangers of Intravenous Injections by the Inexperienced. (Escarre du pli du coude par injection arsenicale concentrée.) G. Milian.—p. 412.
- 60 Apparatus to Record Excursions of the Knee. (Nouveau goniomètre médical.) L. Alquier.—p. 413.
- 61 Volumetric Dosage of Sulphates. Vansteenbergh and L. Bauzil.—p. 414.
- 62 Tuberculous Origin of Nodular Erythema. R. A. Gutmann.—p. 416.

57. **Abdominal War Wounds.**—Schwartz states that the present 30 or 40 per cent. recoveries after laparotomy for abdominal wounds is a marvellous proportion when we consider the extreme rarity of a spontaneous cure of such wounds with lesions of the viscera, especially of the gastro-intestinal canal.

58. **Campaign Diarrhea.**—When entire regiments are taken with diarrhea for a few days, without special characteristics, Hanns thinks that the food is to be incriminated. The exercise and out-of-door life keep the men hungry and they overeat. Then some chilling at night proves the last straw. The reason why the diarrhea develops in epidemic form is because the opportunities for overeating occur to all alike, ripening of fruits, etc. There were never any complications in the hundreds of cases he has encountered.

Presse Médicale, Paris

May 3, XXV, No. 25, pp. 249-264

- 63 *Significance of Uremia in Heart Disease. (L'azotémie chez les cardiaques.) O. Josué and M. Parturier.—p. 249.
64 The Question of Time in War Surgery. H. Lorin.—p. 251.
65 Radium in Treatment of Sequels of War Wounds. P. Degrais and A. Bellot.—p. 253.
66 Current Tests for Blood Coagulability. L. Binet.—p. 255.

May 10, No. 26, pp. 265-272

- 67 The Life Work of Louis Landouzy. M. Letulle.—p. 265.
68 Malaria from the Therapeutic Standpoint. R. A. Gutmann.—p. 267.

63. **Uremia in Heart Disease.**—Josué and Parturier report experiences which confirm that azotemia may be observed in heart disease when the kidneys are still intact but are secreting abnormally small amounts of urine. They insist that, with oliguria, Ambard's constant is not a reliable criterion of the functional capacity of the kidneys. Even when the kidneys are slightly pathologic, relative oliguria may falsify the findings. Oliguria without azotemia may be observed when there is asystoly with considerable reduction in the urea-producing functioning of the liver. When diuresis sets in, the urea content of the blood drops still lower. Then if the Ambard constant is normal, this denotes that the urea-excreting function of the kidneys is intact, but if the constant is above normal, this denotes that the kidneys are impaired. Reduction of the urea content of the blood shows that the liver is impaired. Uremia due to oliguria may occur in various morbid states, and persons with heart disease are peculiarly predisposed to it, the oliguria itself being the direct consequence of the weakness of the heart muscle. Hence a high urea content in the blood does not contraindicate digitalis in adequate doses. With asystoly it is imperative to secure a more copious flow of urine.

Progrès Médical, Paris

May 19, XXXII, No. 20, pp. 163-170

- 69 *Experimental Research on Food Value of Cornmeal. (A propos du pain de guerre.) E. Weill and G. Mouriquand.—p. 163.
70 War Wounds of the Eyeball and Their Treatment. M. Bourdier.—p. 166. Continuation.

69. **Cornmeal and Its Food Value.**—The recent experimental research on pigeons here described confirms the assumption that removal of hulls deprives grains of substances of vital importance. Pigeons fed on bolted cornmeal (*maïs décortiqué*) developed paraplegia of the beriberi type with profound dystrophy of the skin, the feathers dropping out in the course of a few days. The paraplegia developed in thirteen, ten or five days of feeding with fine cornmeal, such as is generally used on the table. The dystrophy of the skin was also marked in rabbits and cats fed on vegetables or meats sterilized at 120 C. (248 F.). They lost their fur, as also rabbits fed exclusively on fine white bread. The research reported, on the other hand, confirms the high and satisfactory food value of whole-grain cornmeal. Pigeons kept 240 days on this alone thrived in every way. None of the pigeons fed with other grains seemed as vigorous as those on the whole-grain cornmeal. This was proportionately true also of the pigeons and controls kept on inadequate quantities of cornmeal.

Correspondenz-Blatt für Schweizer Aerzte, Basel

May 19, XLVII, No. 20, pp. 625-656

- 71 Metal-Albumin Preparation for Diagnosis of Pregnancy. K. Kottmann.—p. 625.
72 *Index for Coagulating Property of the Blood. (Methode der Bestimmung der Gerinnungswert des Blutes.) A. Fonio and S. Schulsinger.—p. 639.

72. **Index of Coagulating Power of the Blood.**—Fonio and Schulsinger relate that when blood contains some substance which impedes its coagulation, then addition of another coagulation-impeding substance will naturally check coagulation still further. The amount of the second substance required to arrest coagulation completely can thus serve as an index of the coagulation value of the blood. They selected magnesium sulphate for the test substance. They fill a set of tubes with equal amounts of solutions of the magnesium sulphate of varying concentration, and add to each the same quantity of blood. After twenty-four hours, the tube in which complete coagulation first occurs is the index of the coagulation value. The set of tubes must be kept under sheets of moist filter paper with a glass laid over them. He calls the set of tubes for the purpose the Coagulovimeter. The tubes contain the reagent in concentrations of 0.8, 0.9, 1, 1.2, 1.4, 1.6, 1.8, 2, 2.5, 3, 3.5 and 4 per cent., and 10 drops of blood are added to each, tilting the stand until the contents of the tubes are well mixed.

Gazzetta degli Ospedali e delle Cliniche, Milan

April 19, XXXVIII, No. 31, pp. 481-496

- 75 *Mercury Oxycyanid in Abortive Treatment of Gonorrhea. S. April 22, No. 32, pp. 497-512
74 The Clinical Importance of the Organic Soil. E. Maragliano.—p. 497.
75 *Mercury Oxycyanid in Abortive Treatment of Gonorrhea. S. Colombino.—p. 499.

75. **Mercury Oxycyanid in Abortive Treatment of Gonorrhea.**—Colombino has discarded silver nitrate in abortive treatment of gonorrhea as it is irritating to the urethral mucosa. Potassium permanganate also is of little use, he thinks, in the early stages, although valuable in the second or third week. Mercury oxycyanid, on the other hand, is effectual and nonirritating, as he has demonstrated in over 100 cases. He irrigates the urethra with a tepid one per thousand solution the first day, then repeats the rinsing with a 0.5 per cent. solution morning and evening thereafter for two days, then once a day. The cure is usually complete in nine or ten days; the gonococci generally disappear by the third day. This method is indicated especially when the gonococci are restricted to the anterior urethra and not more than forty-eight hours have elapsed since the patient noted the first symptoms. Repose is good but not indispensable with this drug, but excitement, stimulants and heavy work should be avoided.

Policlinico, Rome

May 20, XXII, No. 21, pp. 669-696

- 76 *War Wounds which Predispose to Gangrene on account of Injury of Vessels. G. Baggio.—p. 669.
77 *Hygiene and Prophylaxis of Cholera, Typhoid and Typhus among the Troops. A. Capogrossi.—p. 672.
78 Treatment of Malaria in the Troops. N. Pende.—p. 679.

May 27, No. 22, pp. 697-724

- 79 *Factitious Affections. (Le autolesioni nella vita militare.) A. Ascarelli.—p. 697; (L'ittero procurato da ingestione di acido picrico.) G. Masnata.—p. 701; P. Zannelli.—p. 707; (Diagnosi urologica degli itteri da ingestione di acido picrico.) O. Paleani.—p. 711; (Diatesi emorragica e cellulodermite-autocontusiva.) M. Nissim.—p. 712; (Dermatite da causa irritante esterna.) M. Caruccio.—p. 716; P. Sabella.—p. 717.

76. **Wounds Predisposing to Gangrene.**—Baggio calls attention to the war wounds of the thigh in which the injury of vessels predisposes to septic gangrene although the vascular injuries may be so slight that they may be overlooked by the surgeon. The tissues may be able to defend themselves as long as the circulation keeps active. He has seen gas gangrene develop after a tourniquet had been applied to arrest secondary hemorrhage, a week or more after the wound. He warns that wounds of the anterior-interior aspect of the thigh are particularly liable to develop gangrene, and

that the trunk vessels should be minutely examined, even when at first they do not seem to be injured. This class of wounds in particular require thorough surgical clearing out at the earliest possible moment.

77. Prophylaxis of Camp Epidemics.—Capogrossi emphasized among other points the advantages of making vaccines from the special germs prevailing at the spot at the time. He also warns of the special dangers when an enemy trench has been taken. The dead must be buried at once and everything else burned. This is particularly imperative where cholera and typhus are liable to be found, and no soldiers should be allowed to put on any garments, etc., from the enemy corpses or from prisoners. The sick and wounded should be isolated, as there may be carriers among them. Sanarelli suggested that the cholera vibrio may enter through the tonsil, and that it induces cholera on reaching the intestines only when other germs already installed there have reduced the resisting powers. In the discussion that followed, Rivalta reported experiences showing that when latent malaria flares up under the influence of a wound, the fever curve is liable to be a continuous high remittent fever, with nothing characteristic of malaria, but suggesting local complications. He described some typical cases after skull wounds.

79. Factitious Affections.—This entire number of the *Policlínico* is devoted to communications on experiences with induced or simulated affections in soldiers and laboring men. They are discussed from various standpoints, including some experiences with control administration of picric acid, and description of tests for it in the urine, blood and stools. The responsibility of the troop physician in detecting or mistakenly denouncing a simulated affection is emphasized. Early in 1914 eight French soldiers were accused by the army surgeon of voluntary mutilation, and two were shot. The others were held under observation and enemy projectiles were found in the lesions. The causes of error in the matter of factitious affections, real or suspected, are numerous and complex.

Riforma Medica, Naples

May 12, XXXIII, No. 19, pp. 507-532

- 80 Traumatic Pseudo-Arthritis of the Knee. A. Mori.—p. 507. Continuation.
- 81 Present Status of Treatment of Infection in War Wounds. R. Mosti.—p. 513.
- 82 Severe Hysteric Contracture Cured by Bilateral Ovariectomy. N. Federici.—p. 519.
- 83 Present Status of Treatment of Cerebrospinal Meningitis. A. Montefusco.—p. 528.

Cronica Medica, Lima, Peru

May, XXXIV, No. 647, pp. 149-188

- 84 *Traumatic Nephritis. M. Castañeda.—p. 149.
- 85 High Alcoholic Content of the Peruvian Beverage, Chicha. N. E. Cavassa.—p. 157.
- 86 Liver Abscess with Vomica. E. Odriozola.—p. 160.

84. Traumatic Nephritis.—Castañeda reports two cases of traumatic nephritis, and reviews the literature on the subject. His two patients were young women who had been kicked in the abdomen by their husbands and trampled. In the first, the acute bilateral nephritis with edema by the forty-eighth hour soon subsided to a clinical cure in two months. In the second case the urine contained much blood from the first, and urination was not painful as in the first case. By the end of the month there was no blood in the urine but numbers of tube casts and much albumin were found in the urine from the right kidney. On reexamination ten months later, the urine showed unmistakable evidence of chronic nephritis. In both his cases there was nothing in the antecedents except the trauma to explain the nephritis, as also in a number of similar cases of acute or subacute traumatic nephritis on record.

Revista de la Asociacion Medica Argentina, Buenos Aires

April, XXVI, No. 149, pp. 279-418

- 87 *Medical Tuberculosis. G. A. Alfaro.—p. 279.
- 88 *Case of Pulmonary Syphilis. M. R. Castex and R. Denis.—p. 303.
- 89 *Oxid of Antimony in Treatment of American Leishmaniosis. E. Escomel.—p. 316.
- 90 Fundamental Principles of Organotherapy. B. A. Houssay.—p. 325.
- 91 *Salivary Fistulas. J. M. Jorge.—p. 338.

92 *History of Bubonic Plague. A. M. del Pont.—p. 373. Continuation.

93 *Primary Sarcoma of the Stomach. A. J. Medina and A. R. Egaña.—p. 399.

94 Soap and Petrolatum in Surgery. T. Varsi.—p. 411.

87. Medical Tuberculosis.—Alfaro refers to tuberculosis localized in the lung, pleura or mediastinum. With tuberculous glandular lesions in children there may be merely repeated attacks of croup and spasmodic coughing, or attacks suggesting asthma or a remittent or intermittent fever. After the child is a year old, the affection may be amenable to treatment by change to a mountain climate, heliotherapy, iodine, arsenic and tuberculin. The latter in particular has given him good results when there was little or no fever. Tuberculous glandular lesions are the most readily curable of all forms of tuberculosis in children over 2. In respect to pulmonary tuberculosis, he says that the present status is of less moment for the prognosis, comparatively speaking, than determination as to whether the disease is progressing or not. Hence he classifies pulmonary tuberculosis as acute, subacute and chronic, and lists under each of these headings the various types of the disease. The signs and symptoms classified by various authors as signs of incipient pulmonary tuberculosis he declares are usually signs of an old abortive form of the disease. These are the cases that "recover" under any treatment, and that have made the reputation of this or that remedy or course of treatment. The absence of fever, of cough, of tachycardia and other symptoms of tuberculous toxic impregnation show that the clinical findings are the relics of an extinct process, not the warning of an incipient new one. He would reserve tuberculin treatment to cases of nonfebrile fibrous or fibro-cheesy tuberculosis, the chronic pseudo-asthmatic bronchial forms, and the post-pleuritic cortical forms. A very slight subfebrile state does not absolutely contraindicate tuberculin treatment, but it should be given with extra caution and suspended if the febrile reaction is marked. In every attempt to give tuberculin, in his experience, when there was persisting temperature of 38 C. or rapid pulse, or low blood pressure, the condition was aggravated by the tuberculin.

88. Pulmonary Syphilis.—The young woman presented the clinical picture of chronic pulmonary tuberculosis, with occasional acute or subacute phases, high fever, cough, abundant and sometimes hemorrhagic expectoration, with great prostration. The sputum was constantly free from tubercle bacilli and the Wassermann test was negative, but on account of the absolute failure of the usual treatment for tuberculosis, mercurial treatment was tentatively given. Prompt improvement followed and the Roentgen findings gradually returned to practically normal.

89. Antimony Oxid in Treatment of Superficial Leishmaniosis.—Escomel reports experiences which apparently confirm that antimony oxid is fully as effectual in treatment of American leishmaniosis as tartar emetic, if not more effectual, while it does not induce the general reaction nor the local irritating action of the latter. It can be injected under the skin or into a muscle or vein. It does not seem to have any action on blastomycosis.

91. Salivary Fistulas.—Jorge gives an illustrated description of three cases of suppuration in the parotid gland with a fistula. The patients were girls of 7 and 8 and a young woman. No benefit was derived from silver nitrate or electric cauterization nor from injection of iodine or hot oil with phenol. But he succeeded in obliterating the fistula by injecting 5, 8 or 10 per cent. solution of formaldehyd, preceded by a subcutaneous injection of atropin. This procedure was repeated on three successive days and the cure was soon complete. It was supplemented by dieting to keep the secretion of saliva down to the minimum. Cases are on record of salivary fistulas of ten, fifteen or twenty years' duration, without complications. Once established they display no tendency to a spontaneous cure, and are often rebellious to the usual methods of treatment. Jorge describes the various surgical measures that have been applied, and reports an operative case from his own practice in which the duct of Steno had been severed by a stab wound.

92. **History of Bubonic Plague.**—Del Pont treats in this instalment the centuries from the eleventh to the sixteenth, inclusive.

93. **Gastric Sarcoma.**—There have been no signs of recurrence during the eighteen months to date in the case here reported in a man of 37. This is said to bring to 180 the operative cases of sarcoma of the stomach on record.

Prensa Medica Argentina, Buenos Aires

May 20, III, No. 35, pp. 377-388

- 95 *The Miostagmin Reaction in Rats with Malignant Tumors. A. H. Roffo.—p. 377.
96 *Diagnosis of Chronic Pulmonary Tuberculosis. P. M. Barlaro.—p. 381.
97 Activation of Hemolytic Action of Cobra Venom by Spiders' Eggs. B. A. Houssay.—p. 382.
98 Electrocoagulation Treatment of Bladder Tumors. J. Sabatini.—p. 383. Continuation.
99 Acute Abdominal Disease. R. E. Pasman.—p. 384. To be continued.

95. **Miostagmin Reaction in Rats with Sarcomas.**—There was no trace of a miostagmin reaction in twenty-two rats free from tumors, while 93.93 per cent. gave a positive reaction among the thirty-three rats with spindle-cell sarcoma and in 96 per cent. of twenty-five with alveolar carcinomas. In forty-three tests of rats inoculated with the sarcoma, the reaction veered from negative to positive in seven or eight days after the inoculation, while nine days elapsed after inoculation with carcinoma tissue. After excision of the malignant tumors, the miostagmin reaction became negative in every rat except those with recurrence of the cancer (eight out of twenty-six). The findings were constantly negative further in fifty-four rats with natural immunity to cancer, and in twenty-one with acquired immunity. These data are tabulated for ready reference. He has applied the miostagmin test to 490 human serums, and has become convinced that a positive reaction is specific for cancer. He has previously made similar series of clinical and experimental tests with the Freund and Kaminer cellular reaction, the results confirming the specific nature of these biologic reactions, and also confirming the similarity between human and rat cancers.

96. **Diagnosis of Chronic Pulmonary Tuberculosis.**—Barlaro emphasizes that pulmonary tuberculosis is secondary to tuberculous processes in and around adjoining lymph glands. When for some reason the organism as a whole or the lung itself has its resisting powers lowered, then the bacilli swarm into the lung. When they reach the apex the stage is really an advanced stage, and the assumption that the apical process is the primary one is erroneous. The aim should be to diagnose the pulmonary tuberculosis before it reaches the apex. It should be suspected whenever there is a change in the vesicular murmur, especially rough respiration, at any point in the lung, and restricted to this area, with a dry cough, sometimes spasmodic, and, when interrogated, the subjects tell that they tire or get out of breath when they walk or otherwise exert themselves. A skilfully taken radiogram may clear up the diagnosis. Anemia, tachycardia and low blood pressure are the most important signs of toxin production by the tubercle bacilli. The fact that the temperature is normal should never be interpreted as excluding pulmonary tuberculosis. The fixation of complement test may prove instructive.

Semana Medica, Buenos Aires

April 12, XXIV, No. 15, pp. 431-458

- 100 Drinking Water in the Argentine Navy. H. F. Lista.—p. 435.
April 19, No. 16, pp. 459-486
101 Gastrulation in Mammals. S. E. Parodi and V. Widakowich.—p. 459.
102 Lymphocytosis in Syphilitics. C. P. Mayer and A. C. Gourdy.—p. 465. Continuation.
103 *The Physiopathology of Chronic Nephritis. (Brightismo.) L. J. Facio.—p. 467. Concluded.
104 *Rebellious Hiccup Arrested by Compression of the Eyeballs. (Caso de hipo rebelde.) P. B. Aquino.—p. 483.

103. **Physiopathology of Chronic Nephritis.**—Facio concludes his long study of Bright's disease with the statements that nephritis may exist without symptoms but if it can be detected it is curable in this stage, when the inflammation is

restricted to the convoluted tubules. The classification of cases of nephritis by the anatomic localization of the process is an important progress. High blood pressure and an increase in the urea in the blood distinguish vascular uremia. The action of several toxic substances best explains the phenomena of uremia. The share of the internal secretions is not yet well defined, but that they participate is demonstrated beyond question by the biologic reactions, and these mirror the evolution of the nephritis. Chemical examination of the urine is of only secondary importance. He cites some typical cases to illustrate these statements, especially the quantity and the biologic value of the albumin circulating in the blood as factors in production of edema. Study of cases of mercuric chlorid poisoning has thrown much light on the anatomic localization of inflammatory processes and the symptoms induced.

Facio insists that retention of chlorids is not enough, alone, to account for edema. The blood serum has to be in a condition that permits dialysis, and this he thinks occurs when the albumin content of the serum is below normal from any cause. This permits transudation through the capillary wall into the interstices of the tissues. Other causes may cooperate, but reduction in the albumin content of the blood serum is the main factor. As the edema subsides, the albumin content will be found higher, and vice versa. The albumin, he declares, is the regulator and index of the osmotic balance, and the integrity of the liver is indispensable to keep the albumin content normal. As the lung represents the most enormous and ideal dialyzing membrane in the body, any abrupt and considerable change in the osmotic balance is liable to entail intense dialysis here, the dreaded acute edema of the lungs. He cites a few typical cases to show the fatal import of abnormally low albumin content in the blood serum. Two patients with mercuric chlorid poisoning had an albumin content of 0.64 and 0.124 per cent. in the serum and both recovered, although one had anuria for six days. One woman with fatal chronic nephritis had an albumin content always below 0.1 per cent. In conclusion, he urges others to test his assertions as to the importance of the albumin content in the production of edema and as a guide in treatment of chronic nephritis.

104. **Uncontrollable Hiccup Arrested by the Oculocardiac Reflex.**—The young man was completely exhausted by the incessant hiccup which had tormented him for over twenty-four hours. Bromids gave no relief and a dose of morphin only a brief respite. A seidlitz power caused much discomfort but did not arrest the spasms of the diaphragm as hoped. Flexing the thighs on the abdomen to force up the viscera, massage, and rhythmic traction of the tongue also proved futile. But the hiccup stopped at once when the eyeballs were compressed as for the oculocardiac reflex. The radial pulse grew slow, the hiccup stopped, and the exhausted man dropped to sleep at once. A return of the hiccup next day was aborted by the same procedure. It also proved effectual in a case of hiccup from purulent pleurisy.

Siglo Medico, Madrid

May 19, LXIV, No. 3310, pp. 345-364

- 105 Bone Graft without External Wound to Correct Saddle Nose in Young Woman. E. Botella.—p. 346.
106 *The Present Status of Antiferments in Therapeutics. O. Fernandez.—p. 358. Concluded in No. 3311, p. 376.
May 26, No. 3311, pp. 365-383
107 Hygienic Measures in Treatment of Pulmonary Tuberculosis. L. Calandre.—p. 366. To be continued.
108 Good Blood Goes with Good Muscles. J. G. Ocana.—p. 368.
109 Treatment of Intertrigo. (Las furfuraciones intertriginosas.) Sicilia.—p. 370.

106. **The Antiferments in Therapeutics.**—Fernandez concludes this postgraduate lecture with the remark that the problem of the antiferments is one of pure chemistry. This has been established among other things by the failure of antitrypsic serum as a therapeutic agent, and by the apparently established fact that the relation of the lipolytic index to the antitrypsic is the key to the variations in the tuberculous process. A high lipolytic content seems to be the most reliable expression of the resisting power of the organism in respect to tuberculosis.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam*April 28, I, No. 17, pp. 1337-1432*

- 110 *Epidemic Meningitis in Young Children. R. Korteweg.—p. 1340.
 111 White Bread or Whole-Wheat Bread. C. Eijkman.—p. 1352.
 112 Life Expectancy in South Africa. (De levensduur, in Zuid Afrika.) C. Pijper.—p. 1358.
 113 Favorable Course through Four Years to Date of Dementia Praecox under Antisyphilitic Treatment. J. G. Drossaers.—p. 1363.

110. Epidemic Meningitis in Young Children and Silent Epidemics in Adults.—Korteweg is assistant professor of children's diseases at the University of Groningen, and he here compares the percentage of epidemic meningitis at different ages as reported in various countries. The percentage in young children seems to be always higher in lands where physicians have had more experience with this disease and thus recognize it more readily. In the Oppeln epidemic of 2,916 cases in 1905, 71 per cent. were in children under 8; over 25 per cent. were under 2. In the total 225 reported cases in the Netherlands, 1916, only 26 per cent. were in children under 5. Over 31 per cent. occurred between 19 and 29, the army medical officers being skilled in its detection. He emphasizes that children with meningitis do not spread the disease themselves; school epidemics are unknown. It is probable that when a second child in a family contracts the disease, it acquired the infection from some intermediate adult host. Korteweg reported a case last year in which only one of a group of five coccus bearers had been in direct contact with a case of the disease. The coccus bearers form a chain; some of them may lose their cocci as the chain lengthens. This chain of healthy bearers may be called a silent epidemic until it reaches some susceptible person; then the disease flares up. As children are particularly susceptible, they serve as an index of the meningococcus status at the moment. Every case in a child should thus warn of a silent epidemic of bearers.

Differentiation in children is particularly difficult on account of the frequent absence in them of the pathognomonic symptoms. Labial herpes, he says, is never seen in children under 3. In children under 3, Göppert in his hundreds of cases never found stiffness of the back of the neck during the first week in 63 per cent. and even by the fourth week 21 per cent. still showed no sign of it. Progulski in his fifteen cases in infants found no signs of it in the first two weeks. Kernig's sign is scarcely more frequent. An acute onset is also rare in young children, and headache also seems rare and mild; children with epidemic meningitis may sit up in bed and play if only they are left in peace. But they scream at any attempt to take them up or move them. Symptoms of enteritis are also common. When they develop along with general hyperesthesia, meningitis should be suspected, especially if the fontanels are taut. Vomiting is rare in young infants.

Korteweg describes a case in a 7 weeks babe that took the breast well but had been whimpering for three days. There was no vomiting but some diarrhea, and the fontanels bulged. There was no Kernig sign but the child cried when touched, and the throat was slightly red. The fifth day there was a little stiffness at the back of the neck and lumbar puncture revealed meningococci in the fluid. Necropsy the tenth day showed thick pus at the base and in the fourth ventricle. In such cases the retention of consciousness is remarkable. There is little fever but the pulse is accelerated. Sometimes the course resembles fatal hydrocephalus; sometimes it is abortive but lumbar puncture gives the clue. In the Oppeln experience, 89 per cent. died of the 229 infants less than a year old. Even under serotherapy Flexner has reported a mortality of 50 per cent. in infants.

Korteweg planned to make a puncture opening in both the lateral ventricle and lumbar region in a case in which lumbar puncture evacuated only 5 c.c. of very turbid fluid, the communication being evidently interrupted. The child of 8 months had been sick for two weeks before it had been brought to the hospital. Its mother was received along with it, to keep up the breast-milk feeding. He introduced the puncture needle through the coronal suture and at a depth of 5 cm. evacuated 40 c.c. of turbid fluid and injected 10 c.c. of serum in its

place. The child opened its eyes afterward and had no further vomiting. The ventricle puncture was repeated eight days in succession. As the condition persisted grave, he then punctured both lateral ventricles and rinsed them out with Ringer's fluid, using 120 c.c. in all. Large quantities of pus were thus cleared out and improvement was manifest as also after repeating the rinsing the next day. The third day no apparent benefit followed and Korteweg refrained from further intervention, the child dying two days later. There had been little hope at any time.

In a second similar case the 6 months babe had been sick for three weeks with fever, but no vomiting or diarrhea, the head thrown backward. Meningococci were then found in the lumbar fluid, and Korteweg left the lumbar puncture needle in place and introduced 30 c.c. of blue tinted Ringer's fluid into the right lateral ventricle, gaging it to correspond to the fluid dripping from the lumbar needle. This fluid soon showed the blue tint. He then injected 10 c.c. of horse antimeningococcus serum into the ventricle. A total of 62 c.c. of fluid was evacuated and 40 c.c. introduced. Toward the end of the procedure the type of the respiration changed, possibly from irritation of the respiration center on the floor of the fourth ventricle under the influence of the phenol in the antiserum. Lumbar puncture followed the next day as the fontanels were bulging. Two days later the ventricle-spinal rinsing was applied again, but the communication was evidently interrupted so he injected 10 c.c. of serum into the spinal canal and withdrew fluid from the ventricle until the pressure was normal. The ventricle was punctured again the next day to relieve the pressure. Improvement was evident, but five days later the temperature ran up, and 35 c.c. still turbid fluid was evacuated by lumbar puncture and 10 c.c. sheep antiserum injected. The next day the ventriculolumbar rinsing was repeated for the last time, and the child was dismissed cured after a month's convalescence. In the two other cases of epidemic meningitis in young children (6 months and nearly 3 years old) the younger died and the other recovered. Three weeks and four weeks had elapsed before the meningitis had been suspected. The symptoms were vomiting, diarrhea and fever, the head bent backward, but no convulsions in one case, and high fever, vomiting and diarrhea in the other. The meningococci in this latter case had probably induced a general sepsis at first and did not localize on the meninges until the end of the month. His five meningitis infant cases were all breast fed. When bottle babies are affected they may succumb to the enteritis before the actual meningitis symptoms manifest themselves.

Ugeskrift for Læger, Copenhagen*May 17, LXXIX, No. 20, pp. 771-812*

- 114 *Roentgen Treatment of Brain Tumors. S. Nordentoft.—p. 771; O. Gulstad.—p. 775.

114. Roentgen Treatment of Brain Tumors.—Nordentoft has now a record of twelve cases of brain tumors in which Roentgen treatment has been applied and he reports complete success in three instances. The improvement was most marked in the better vision. Rapidly developing tumors are more liable to give good results than the more slowly growing. Symptoms from stasis and compression subside as the cause is removed. The loss of hair over the region was not permanent in any instance. The cure has persisted to date, the longest interval being a year and a half. Choked disk retrogressed in some of the cases, in one after it had lasted for three years. He advises a tentative course of treatment as for syphilis before beginning the Roentgen treatment, and urges that the latter should always be tried before attempting an operation. Gulstad reports the details of the twelve cases with the findings on which the diagnosis of a brain tumor was based. Two of the twelve patients proved refractory; necropsy in one showed a very old fibrous tumor. In eight the Roentgen treatment gave favorable results; in three cases earning capacity was restored. It is emphasized that these experiences seem to prove that the Roentgen rays can be applied to the skull without injury to the brain and that the tumors can be modified through the skull wall.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXIX, No. 3

CHICAGO, ILLINOIS

JULY 21, 1917

PROBLEM OF UNNECESSARY OPERATIONS AND OF INCOMPETENT SURGEONS*

ARTHUR DEAN BEVAN, M.D.
CHICAGO

I desire to present briefly an outline of a problem which I believe confronts the medical profession and which demands careful investigation and action. I refer to the problem of bad surgical therapy, of unnecessary surgical operations and of incompetent surgeons. In my work as chairman of the Council on Medical Education, and in my position as teacher of surgery and as attending surgeon in a teaching hospital, I have during the last ten years been much impressed with the fact that there does exist this definite problem which the American medical profession should face. My conception is that this problem should not be attacked by any individual, or by any local or special medical society, but should be investigated by the organized medical profession of the entire country through the council or committee best suited to do this work. This problem should be attacked without any sensationalism, certainly without any unnecessary publicity, and should be looked on as a piece of housecleaning that should be done by the American Medical Association. In order to bring this subject clearly before the profession, let me attempt to draw a picture of the conditions as I believe them to exist today.

First, let me state that within the last thirty years, by the advances made in the underlying medical sciences and in the sciences of diagnosis and therapy, clinical medicine and clinical surgery have been placed on a scientific basis, and that owing to these advances it is possible today to place the practice of medicine and the practice of surgery on a thoroughly scientific basis. It is clearly the desire of the organized medical profession of this country, the American Medical Association, to place medical education and the practice of medicine and surgery on a scientific basis, and in the last fifteen years this organization has made wonderful strides in this direction. I believe that the American Medical Association has done more in the last fifteen years to improve the standards of medical education and medical practice than has been accomplished before by any organized group of professional men in any country. It is clearly the desire and purpose of the American medical profession to secure for the people of this country all of the benefits and possibilities that the modern science

of medicine can afford. I believe not only that this is the object of the American Medical Association as an organization, but also that the great majority of the members of this organization are individually doing their best to accomplish these desired results.

In the rapid evolution of medicine into a science, certain glaring defects in medical practice became evident. Among these has stood out particularly the weakness of drug therapy of the old time practice. The American Medical Association has recognized this weakness fully and is doing more probably than any medical organization in the world through its Council on Pharmacology and Chemistry to place drug therapy on a sound, scientific basis. No such organized effort, however, has as yet been made to investigate the existing status of surgical therapy to point out its weakness, and to place it on a thoroughly acceptable basis. In the last fifteen or twenty years the practice of medicine has become more and more surgical, new surgical fields one after the other have been explored and carefully cultivated, and new operative procedures have been developed and perfected. As a result, thousands and hundreds of thousands of people have been greatly benefited by properly indicated and properly performed operations in appendicitis, peritonitis, gallstone disease, lesions of the stomach and kidneys, and in many other fields. The amount of surgical operating has increased manyfold and will continue to increase because there are thousands of people who still lack the benefits that could be given to them by modern surgical therapy.

This great increase in surgical operations and operating surgeons has brought with it this new problem of unnecessary operations and of incompetent surgeons. I should like to make perfectly clear in this presentation that I believe that the great majority of operating surgeons in this country are competent, and that the vast proportion of operations performed are necessary and desirable. On the other hand, those who are in touch actively with surgical therapy, who see a large number of surgical cases and who come in contact with a large number of men doing surgical operations cannot but be impressed with the fact that there is a certain considerable number of operations being performed in this country that are unnecessary and unwarranted, and that there is a considerable number of men operating who are not qualified to do the work.

My impression is that this condition is due to three causes, ignorance, dishonesty and bad judgment, sometimes bad judgment amounting almost to an obsession; legally when a surgeon undertakes the treatment of a case he makes a contract with the patient which, although not written, is in the eyes of the law just as binding, and in that contract he agrees to give the

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

patient the benefit of the knowledge possessed by the "professors" of the science and art of medicine and surgery in the place and at the time the services are rendered. He agrees also to give to the patient the benefit of his best judgment and due diligence, and the benefit of established and accepted methods of practice. As far as honesty is concerned, a good rule for a surgeon to follow in his practice is the golden rule. He should never do an operation on a patient which he would not want to have done on himself under the same conditions. As far as good judgment, on the one hand, and surgical tangents and obsessions, on the other, are concerned, it is necessary for us all to remember that the practice of surgery should be the practice of common sense. The three absolutely essential characteristics of the safe surgeon are honesty, good judgment and scientific training.

What shall be done by the medical profession about the unnecessary and unwarranted surgical operations done as a result of ignorance in unattached and uncontrolled hospitals by poorly trained men? What shall be done about the unnecessary operations done by dishonest men for a fee; the unnecessary appendix operations done for imaginary appendicitis, the unnecessary fixations of the kidney; the unnecessary amputations of the breast done for benign or imaginary breast tumors; the unnecessary operations on female genitals, on the tonsils, on the gallbladder, etc.? What shall be done about the operations that are due to lack of good judgment or to misguided enthusiasm; the unnecessary operations on fractures; the fantastic operations for intestinal stasis without gross pathology; operations for supposed insufficiency of the ileocecal valve based on misinterpreted Roentgen evidence, intestinal anastomosis or resections of the large intestine for the cure of epilepsy? These are problems which we should meet frankly, investigate fully and find means to correct, and this should be done by some properly qualified instrument of the American Medical Association, possibly by creating a committee or council to do with surgical therapy what the Council on Pharmacy and Chemistry has done and is doing with drug therapy. I believe that this problem should be investigated and if possible corrected by the organized medical profession, that this work should be done by and within the profession itself in the interests of the profession and in the interests of the community. This problem of unnecessary operations and incompetent surgeons is a serious matter both for the medical profession and for the public. Its existence should be frankly admitted and steps taken by and within the profession to reduce bad surgical therapy to a minimum.

Specifically, how is this to be accomplished? The answer has seemed to me in a general way to handle this problem of surgical therapy as the American Medical Association has handled and is handling the problem of medical therapy, that is, by a committee or council on surgical therapy, the business of which will be to analyze and report on these problems from time to time as they arise.

There are at least two large problems involved in this whole matter, (1) that of unnecessary and unwarranted operations, and (2) that of operations done by incompetent men.

1. In a general way it is evident that one of the best means of combating the evil of unnecessary and unwarranted operations is that of attacking surgical problems as pieces of clinical research, not from a sin-

gle point of view and not by a single man, but as pieces of joint study from the point of view of the several specialists whose fields are involved in the problem and who may be of service in finding the right solution. Let us say, as an example, the study of so-called intestinal stasis and its surgical therapy. This should be a joint study by the internist, the neurologist, the physiologist, the pathologist, the roentgenologist and the surgeon, and when this is done by a competent group of men there will be little danger of going off on a tangent, and arriving at erroneous conclusions.

2. The problem of operations done by incompetent men is largely an educational, and in a sense also a moral question. The American Medical Association could through such a council as I suggest carry on a propaganda pointing out the necessity of thorough and special training for the men who are to do general surgery or the work in any of the surgical specialties. This would mean at least the graduation from a first class medical school, the serving in a hospital as an intern, and the doing of a certain amount of post-graduate work in surgery, best as assistant to some competent surgeon, before entering independent practice.

Some may say, well, just such a propaganda is already being carried on by the American College of Surgeons. In reply to this I would say that that is not enough. Admirable as the work of the American College of Surgeons may prove to be in the future, it is limited to a comparatively small group of men. We need in solving a great problem of this kind the support of the entire profession, and that can be obtained only from the organized medical profession, which is the American Medical Association.

Because of this fact, I believe that the American Medical Association should undertake the task of establishing in some way educational requirements, including a clinical training sufficiently high to eliminate incompetent surgeons.

I give way to no man in my admiration and respect for the splendid work that is being done today by American surgeons. As a whole, no body of men in any line of human effort is more conscientious, better trained for work, more enthusiastic, more productive, more self-sacrificing or controlled by higher ideals. My paper is not a destructive criticism. It is an effort at constructive criticism. The faults which I have endeavored to point out are small, indeed, when compared with the magnificent whole which represents the accomplishment of American surgery. These faults, however, should be eliminated in the interest of the profession, in the interest of the science of medicine, and in the interest of the public.

122 South Michigan Avenue.

ABSTRACT OF DISCUSSION

DR. JAMES E. MOORE, Minneapolis: The importance of the subject we all recognize. We must admit that it is a delicate one. The moment we say we must decide on what is a required operation and a necessary one, and what is an unnecessary one, the question naturally arises, who is to be the judge? Who is to say such an operation is necessary and such another one is not necessary? Dr. Bevan very aptly suggests that this organization take the matter in hand and establish a standard that shall govern us all. It is up to us as a profession to establish this standard because if we do not, the laity will take it in hand. They already begin to realize that they have been subject to the machinations of dishonest and incompetent men, and they have been the

sufferers thereby. They are likely to legislate, and when they once begin to have laws spread on our books there will be a lot of vicious legislation enacted; we have had a number of vicious laws brought before our various states within the last year. It is up to us to direct legislation. In Minnesota we are attempting in our humble way to solve this problem through education. We have there established a graduate school. In that graduate school we have two branches; one is in Minneapolis on the campus of the university, and the other is in the far-famed Rochester. The regents of the University of Minnesota have set aside a certain amount of money that enables us to have a certain number of teaching Fellows, whom we are endeavoring to educate as specialists in various lines. The Mayo brothers have contributed \$1,500,000 to support like fellowships in Rochester, Minn. We go about it in this way: We say to the profession at large that we have these facilities. We select our candidates from all over the world. We have Fellows from all over the world. We select the best. We take each candidate and make a curriculum suited to his particular needs. We have no fixed curriculum. We find out what a man is short in; if it is anatomy, we advise him to take it up; if it is pathology, we direct him to take up pathology. So all along the line; and incidentally he is practicing surgery. Now I have forgotten the exact number we have in surgery in Minneapolis and Rochester, but it is a goodly number, and we hope to answer this question in this way: They agree to stay three years and study to the best of their advantages, and we give all the advantages there are to be had anywhere, both in Rochester and in Minneapolis. These men are paid a stipend, so that it is not a rich man's graduate school; the poorest boy in the country can go there. He is paid \$500 or \$600 the first year, on which he can live; \$750 the second year, and \$1,000 the third year. We get these young men to assist us in the teaching in the hospital and various work in the laboratory.

I think the strongest answer to this problem is an educational one. We do not pride ourselves on being any more honest in Minnesota than elsewhere; we have only the judgment given us; but in education we feel that we are particularly strong.

DR. WILLIAM M. ROBERTSON, Warren, Pa.: You cannot correct errors which are basic by any system of training. As a teacher of singing cannot make a voice, a teacher of surgery cannot make a properly balanced intellect. What we are trying to do is to educate young men beyond their capacity, which will make a "highbrow" but not a surgeon. You must select your men. Competent, honest men are born, not made. Institutions of research, like that in Minnesota, can select their men, and they can be studied in their judgment and mode of thought. What Dr. Bevan is after is judgment and honesty, and he takes for granted that one can make them, which is impossible.

DR. JOHN B. DEEVER, Philadelphia: I endorse the views of Dr. Bevan. No one is more capable of suggesting the course to pursue under these circumstances than Dr. Bevan, who has demonstrated the masterful work he is capable of accomplishing in advancing medical education; therefore, I would make a motion that a committee of ten be appointed to further Dr. Bevan's ideas relative to this vital question.

[For action on this motion, see minutes of the section.]

DR. ARTHUR DEAN BEVAN, Chicago: My idea was to do with this problem just what has been done: To refer this to a committee of say ten men of wide experience and let them analyze the facts as they are and report back to this body and to the Judicial Council. I think it is a real problem, and I think frankly facing this problem is an evidence of the strength of our position, the strength of modern surgery. I really believe that something may be done, something can be done, as has been done with drug therapy, if we handle this in an intelligent way, with the backing of the organized profession of the country.

Reformers.—Utopias are worthless, because they are founded on very limited, and probably erroneous, estimates of the possibilities of human development.—*Scientific American*.

THE AGE AND SEASONAL INCIDENCE AND COMMUNICABILITY OF ACUTE POLIOMYELITIS

AS SHOWN IN THE EPIDEMIC IN NEW YORK CITY IN 1916*

CHARLES HERRMAN, M.D.

Attending Pediatrician, Lebanon Hospital

NEW YORK

The epidemic of acute poliomyelitis which raged in New York City in 1916 was the largest on record. The statistics of the department of health are the most complete and accurate that we have. Previous epidemics were not only much smaller, but were studied by individual physicians or groups of physicians, in most cases after the epidemic had subsided. The records, therefore, were incomplete. By making the disease a reportable one from the beginning of the epidemic, the department succeeded in obtaining valuable data. It is true that a certain percentage of mild non-paralytic cases were not recognized and reported, but

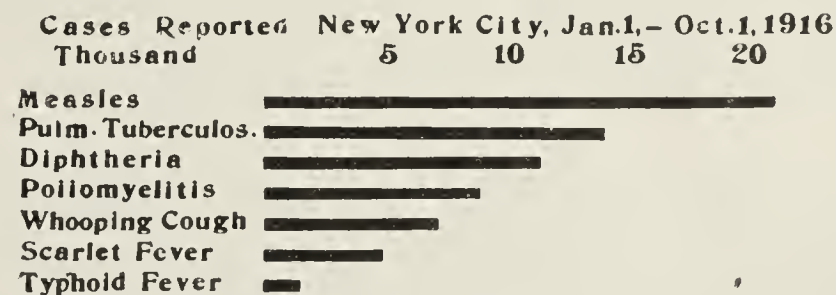
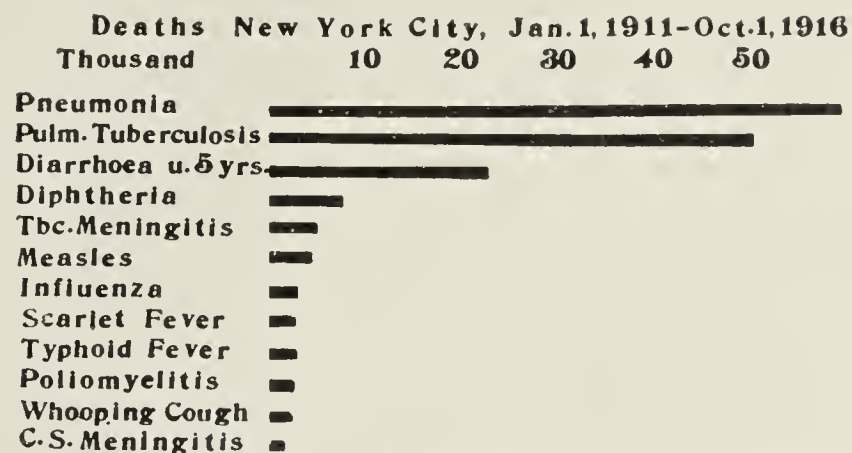


Chart 1.—Deaths, New York City, Jan. 1, 1911–Oct. 1, 1916; cases reported, Jan. 1–Oct. 1, 1916.

this percentage remained fairly constant throughout the epidemic, so that it does not interfere with the accuracy of the age and seasonal incidence of the disease, as based on the cases recognized and reported. Frost has drawn certain conclusions based on the study of three small epidemics. I shall endeavor to show how a study of the figures of the New York epidemic tend to verify some of his conclusions.

FREQUENCY OF THE DISEASE AS COMPARED WITH THE OTHER COMMUNICABLE DISEASES

In Chart 1, I have represented graphically the deaths from these diseases in New York City during the last five years. It will be seen that, as compared with pneumonia and pulmonary tuberculosis, the deaths from poliomyelitis are few; about twenty-six times as many are due to pneumonia and about twenty-two times as many to pulmonary tuberculosis. The number

* Read before the joint meeting of the Section on Diseases of Children, the Section on Nervous and Mental Diseases and the Section on Orthopedic Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

of deaths from tuberculous meningitis is important, because this disease also attacks young children almost exclusively (Chart 2), and the mortality is practically 100 per cent. As we know definitely the causative agent and the manner in which the disease is spread, it is to a great extent preventable; yet it has received no special attention. In the lower part of Chart 1, I have represented the number of cases of some of the

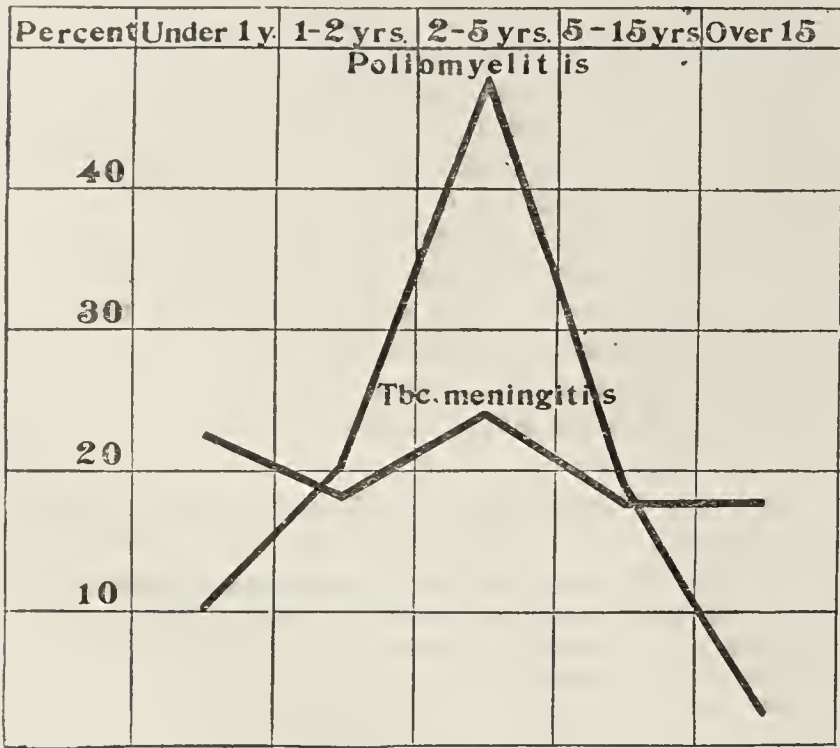


Chart 2.—Mortality from poliomyelitis and tuberculous meningitis.

other communicable diseases reported during the first nine months of 1916. Some of these diseases were less prevalent than usual, and still although the epidemic of poliomyelitis was the largest on record, the number of cases reported was less than that from measles, pulmonary tuberculosis or diphtheria.

AGE INCIDENCE

Chart 3 shows that poliomyelitis is distinctly a disease of early childhood. It seems highly probable that infants as well as young children are especially susceptible, for we have all observed cases in the first few weeks of life. The reason that the disease is comparatively uncommon in early infancy and most common between 2 and 3 years of age probably lies in the difference in the opportunity for coming in contact with the infectious material. Young infants are to a great extent isolated; after 2 years, children are able to run about and mingle freely with others. There is therefore a greater opportunity for infection. The greater susceptibility of young children is also shown by the fact that in cases of which I have notes, in 80 per cent. the patient was the youngest child in the family. This susceptibility of the central nervous system of infants and young children is also shown in the age incidence of tuberculous meningitis, Chart 2.

SEASONAL INCIDENCE

The epidemic in New York City occurred in late summer (Chart 4), as is the case in all temperate climates. In Scandinavia, however, epidemics have extended into the winter months. The high incidence in August and September is especially noteworthy, because at this time all the other communicable diseases are at their lowest point. Although meteorologic conditions may play a part in producing conditions favorable for the spread of poliomyelitis, contact infec-

tion is the controlling factor. In Chart 5, the course of the disease is shown in each borough. It will be seen that at one time the disease was on the rise in Manhattan, and Queens, while it was declining in Brooklyn, although of course the meteorologic conditions were the same in the three boroughs.

We have usually explained the increase of the communicable diseases at certain seasons by assuming that the climatic conditions were favorable for the growth of the infectious material. It is also possible, however, that we are more susceptible at certain times. It is well known that the growth of children is not uniform throughout the year. Even the increase in weight and height are not synchronous, but each has

TABLE 1.—MORBIDITY IN THE EPIDEMICS OF 1907 AND 1916 IN NEW YORK CITY *

Borough	Popula- tion, 1916	Morbidity per 10,000	Under 5 Years, per 10,000	Percent- age Over 9 Years	Morbidity per 10,000 in 1907
Manhattan....	2,634,223	9.5	6.43	7.69	1.61
Brooklyn.....	1,928,432	23.4	15.47	5.15	0.83
Bronx.....	575,877	10.9	6.78	5.39	....
Queens.....	366,426	30.6	16.64	7.62	....
Richmond.....	97,883	29.1	22.30	5.78	....

* Number of cases, 1916, 8,927; deaths, 2,343; death rate, 26.24 per cent.

its season of most marked increase. Cushing and Goetsch ascribe hibernation in certain animals to a seasonal physiologic wave of pluriglandular activity. It may be that a period of pluriglandular inactivity may likewise render the individual more susceptible to infections of a certain type.

In Chart 4 it will be seen that in the epidemic of 1916, as in other epidemics, there was a rapid increase and a rapid decrease in the number of cases; the curve shows a sudden rise and fall. Such a course is found

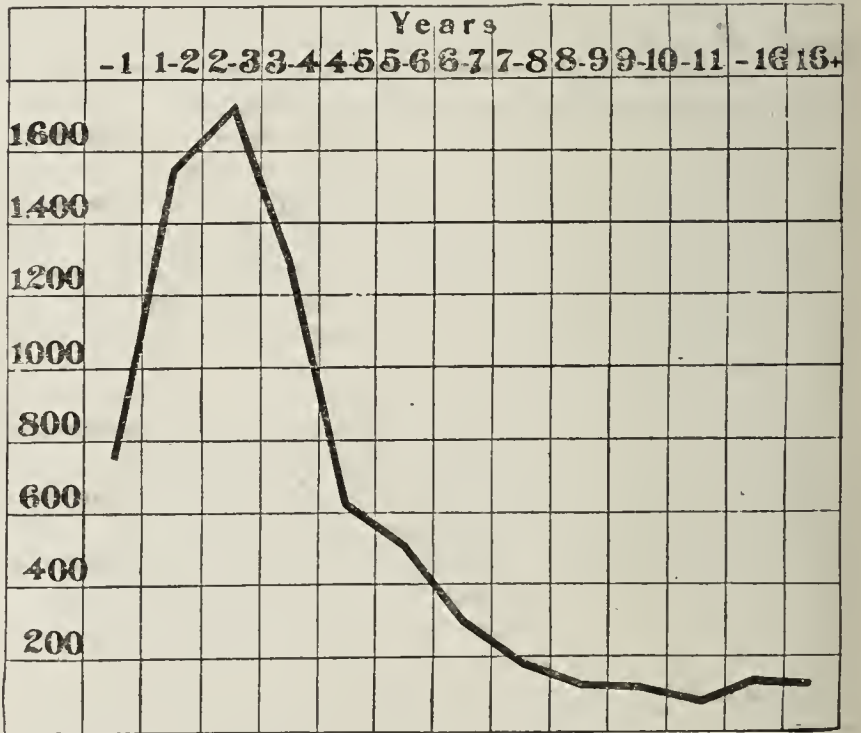


Chart 3.—Age incidence of poliomyelitis, New York City, 1916.

only in a disease which is very communicable, as measles, or in a disease in which carriers are numerous, and spread the disease rapidly. The curves of influenza (infectious epidemic catarrh) and lobar pneumonia show (Chart 6) a similar course, whereas the curve of typhoid, in which carriers are comparatively few, is fairly uniform throughout.

The epidemic furnishes no evidence that any article of food, more especially milk, was responsible. Aside

from the fact that the disease occurred in infants exclusively breast fed, only a contaminated food supply that was suddenly stopped could give such a curve; but it would not show progression from one borough to another. The evidence in favor of insects as an etiologic factor is still less convincing. One of the strongest arguments against this hypothesis is furnished by the age incidence of poliomyelitis (Chart 3). There is no reason why a disease which is spread by insects should attack only infants and young children.

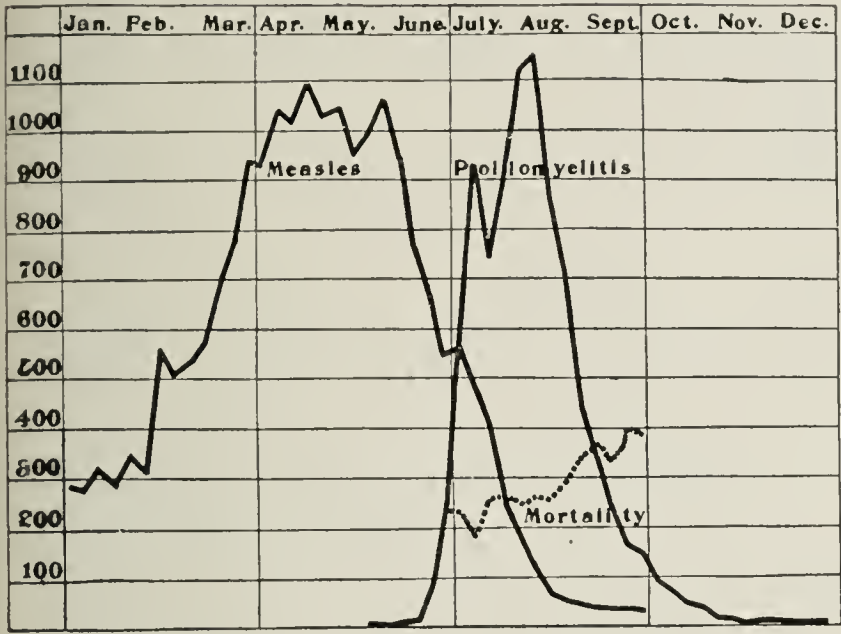


Chart 4.—Seasonal incidence of measles and poliomyelitis.

Yellow fever, typhus and malaria show no such marked predilection.

COMMUNICABILITY

The susceptibility of children to poliomyelitis is much less than to the other communicable diseases. I have investigated the conditions in 204 families which have come under my observation. Of these, 144 were being treated for various forms of paralysis, in the service of Dr. Kleinberg, in the orthopedic department of Lebanon Hospital. The remainder were seen in my hospital service and in private. In these 204 families there were 571 children under 13 years of age, an average of 2.8 children to each family, so that 367

TABLE 2.—PERCENTAGE OF AGE INCIDENCE

Ages	Percentage	
	1916	1907
Under 1 year.....	10.1	8.5
From 1 to 2 years.....	20.5	30.2
From 2 to 3 years.....	22.8	24.7
From 3 to 4 years.....	17.0	14.5
From 4 to 5 years.....	8.2	8.6
From 5 to 6 years.....	6.8	3.8
From 6 to 7 years.....	4.0	2.5
From 7 to 8 years.....	2.4	1.5
From 8 to 9 years.....	1.7	1.5
From 9 to 10 years.....	1.6	1.0
From 10 to 11 years.....	1.0	0.9
From 11 to 16 years.....	1.9	1.7
Over 16 years.....	1.7	1.0
Under 5 years.....	78.5	86.4

were directly exposed to infection. Of these, seven, or about 2 per cent., contracted the disease. The reports of the Department of Health of the City of New York, show that 7,000 cases occurred in 6,748 families; that is, there were 252 secondary cases. The total number of children in these families is not stated; but if the figures from my own series of cases are used, 2.8 children to each family, there were 12,146

children exposed, and 252 contracted the disease, making a susceptibility of a little over 2 per cent. From figures compiled from cases which have come under my own observation, I have found that of children under 13 years of age, not protected by a previous attack, 96 per cent. contract measles when exposed; 75 per cent. contract whooping cough (only undoubted cases are included); 25 per cent. contract scarlet fever, and 20 per cent. contract diphtheria.

INDIVIDUAL SUSCEPTIBILITY

There must also be an individual susceptibility. In two instances I observed poliomyelitis in one of twins, the other remaining free (in one instance, two boys of 3 years; in the other, a boy and a girl of 2 years). In both, the two children were equally well developed, previously in good health, constantly together, taking the same food, and with the same environment; the two, therefore, were equally exposed. The only difference noted was that in the younger pair of twins, one year previous when they had an attack of measles, the boy had a moderate attack, the disease running a normal course, while the girl, who later developed poliomyelitis, had several severe convulsions in the course of the disease. This might have indicated or induced an increased vulnerability of the central nervous system.

Zingher¹ states that the Schick test is positive in nearly three times as many cases of poliomyelitis as in normal children, and that susceptibility to one of the less contagious diseases, like poliomyelitis, indicates that the child is more apt to be susceptible to other contagious and infectious diseases. Since in most cases infection takes place through the nasopharyngeal mucous membrane, this hypothesis seems plausible; however, it has not been borne out by an investigation of the 150 families in which there were two or more children, which have come under my own observation. In ten families the child with poliomyelitis had had diphtheria, and one or more of the

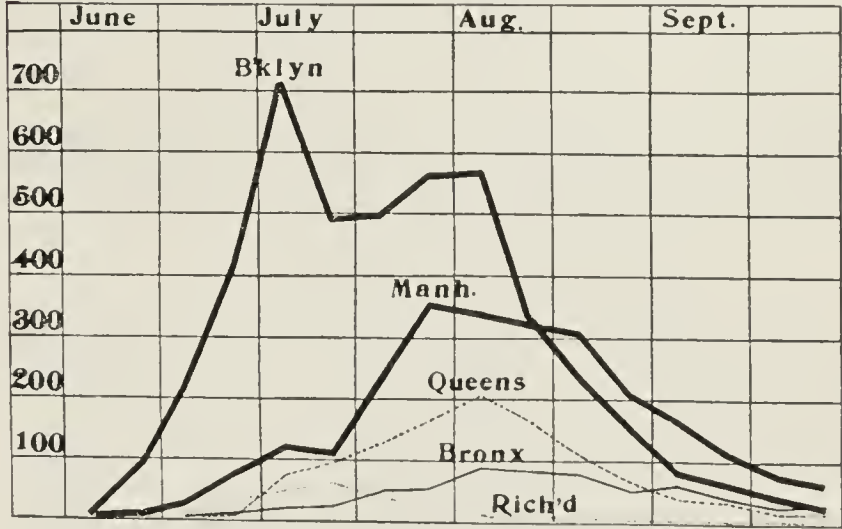


Chart 5.—Course of poliomyelitis in each borough of New York City, 1916.

other children in the family exposed had remained free, while in nine families another child in the family had had diphtheria, the child with poliomyelitis being exposed and remaining free. If the hypothesis should prove to be correct, we should have a simple and valuable means of detecting the susceptible children. I tested the Schick reaction on the two pair of twins already referred to. The boys both gave a positive

1. Zingher, Abraham: The Schick Test in Poliomyelitis, Scarlet Fever, Measles and in Normal Children, Am. Jour. Dis. Child., March, 1917, p. 247.

reaction, the poliomyelitis patient a somewhat more marked reaction. In the other pair, the girl who had had poliomyelitis gave a negative reaction, the boy a positive reaction. It seems highly probable that the infection in poliomyelitis takes place through the nasopharyngeal mucous membrane. Amoss and Taylor have shown that the secretions of these parts in most persons have the power of neutralizing or inactivating the virus of poliomyelitis. It is not unlikely that in some children this power is absent. Dr. Kleinberg, who has had large numbers of poliomyelitis patients under observation for many months has noted that they are particularly susceptible to nasopharyngeal infection.

In communities in which poliomyelitis has already occurred, the number of persons infected is usually less. This is shown in the relative number of cases in the boroughs of Manhattan and Brooklyn in 1907 and in 1916. In 1907 the incidence per 10,000 population was 1.61 in Manhattan, and 0.83 in Brooklyn. In 1916 the proportion in Brooklyn was much larger, 23.5 per 10,000, as against 9.53 in Manhattan. As we should expect, the proportion of patients over 9 years of age, and therefore not immunized by exposure in 1907, was greater in Manhattan in 1916. In the recent epidemic in Manhattan, 7.69 per cent. were over 9 years, and in Brooklyn, 5.15 per cent.

We shall probably not have a great epidemic of poliomyelitis in New York City in several years, because a large percentage of the susceptible children were attacked, or were immunized by exposure. A future epidemic will not be controlled by methods now at our disposal. It could, however, be controlled by a method of detecting the 2 per cent. of susceptible children, and immunizing these against the disease. Reasoning by analogy, the prophylactic use of convalescent serum would be more effective than its therapeutic use, and could be given in smaller quantities.

SUMMARY AND CONCLUSIONS

1. The epidemic of poliomyelitis which occurred in New York City in 1916 was the largest recorded. Nearly 9,000 cases were reported.

2. The crippling resulting from poliomyelitis is less than from the other communicable diseases and heart disease. A child with a partially paralyzed limb is less handicapped in the struggle for existence and the enjoyment of life than one with defective hearing or a diseased heart.

3. The other communicable diseases of childhood are more common and cause more deaths.

4. Infants and young children are especially susceptible. Young infants are less frequently attacked, because less exposed to infection.

5. A large proportion of patients under 5 years of age does not indicate a mild epidemic.

6. The same increased susceptibility of the central nervous system is seen in the age incidence of tuberculous meningitis.

7. In temperate climates, epidemics occur during the summer months, but sporadic cases occur throughout the year. In Scandinavia, epidemics have extended into the winter months. Meteorologic conditions do not play the most important rôle in the spread of the disease. Seasonal changes in the power of the nasopharyngeal mucous membrane to neutralize or inacti-

TABLE 3.—SUSCEPTIBILITY

Number of Families	Number of Children Exposed	Infected	
		Number	Per Cent.
Personal observation.....	204	358	7
Department of health.....	6,748	12,146	252
Measles.....	.....	.....	96
Whooping cough.....	.....	.....	75
Scarlet fever.....	.....	.....	25
Diphtheria.....	.....	.....	20

vate the virus of poliomyelitis may account for the increased susceptibility.

8. Patients who have had poliomyelitis seem to be more susceptible to the ordinary nasopharyngeal infections.

9. The susceptibility of children under 13 years of age to poliomyelitis is much less than to the other communicable diseases of childhood. It is present in only about 2 per cent. The susceptibility to measles is about fifty times as great, to whooping cough about thirty-five times, and to scarlet fever and to diphtheria about ten times.

10. Children who are susceptible to poliomyelitis are not necessarily more susceptible to the other communicable diseases.

11. There exists a distinct individual predisposition or susceptibility.

12. We shall probably not have another great epidemic in New York City for several years, because a large percentage of the susceptible children have been attacked or have been immunized by exposure to the disease.

13. A future epidemic could be controlled if we had a method of detecting the 2 per cent. of susceptible children and could immunize these against the disease with convalescent serum.

250 West Eighty-Eighth Street.

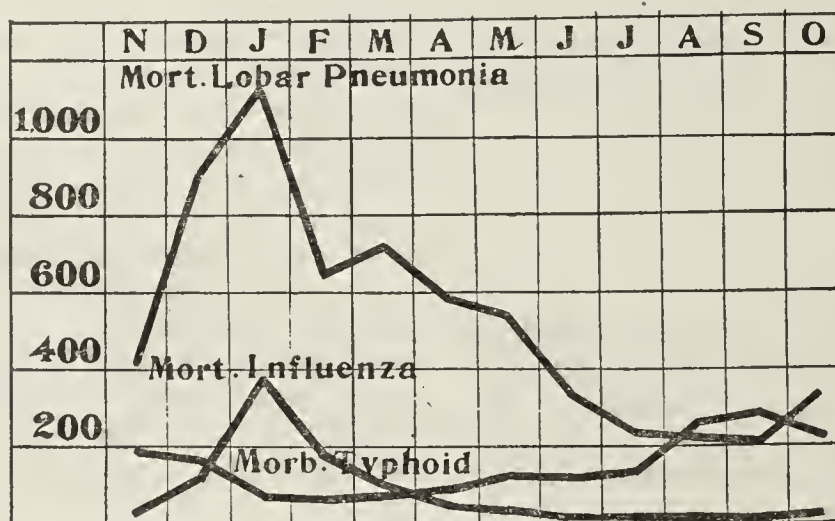


Chart 6.—Curves of lobar pneumonia, influenza and typhoid, New York City, 1916.

Application of Paraffin Film.—Joseph S. Lewis, M.D., Buffalo, writes: May I offer a suggestion to simplify the use of paraffin film for burns. I have found it useful to prepare the dressing as follows: A roller bandage 2 inches in width is sterilized and placed in a tin salve box. Enough paraffin, plain or proprietary, is placed with it, and the whole covered and put in the sterilizer or in boiling water, thereby saturating the bandage, and a little to spare, with the paraffin. For clinical use the tin is placed in boiling water until the paraffin melts. Then so much bandage is drawn out with sterile forceps and cut off with sterile scissors as is needed, whether a single piece or several strips imbricated. The dripping bandage is quickly applied to the surface to be dressed, as it cools rapidly in transit. This may be followed with cotton and the dry bandage.

RESULTS OF THE RECENT EPIDEMIC
OF POLIOMYELITIS IN NEW
YORK STATE*

HENRY L. K. SHAW, M.D.

Director of the Division of Child Hygiene, New York State Department
of Health

ALBANY, N. Y.

The wave of poliomyelitis which swept over the United States last summer helped to clear up some obscure and disputed points in its epidemiology. From the standpoint of preventive medicine, a knowledge of the mode of contact, transmission and communicability is essential in order to control the spread of disease. The material on which this paper is based was obtained from a study of 4,186 cases reported to the New York State Department of Health from June to December, 1916. This does not include the cases occurring in the city of New York.

The age incidence in the state differed somewhat from that in the city, as 55 per cent. of the cases occurred in children under 5 years of age, as compared with 90 per cent. in New York City. Poliomyelitis was almost entirely a disease of childhood in the city of New York, where there were only 1.7 per cent. of the cases among persons over 16 years of age. In the state, exclusive of New York City, 10 per cent. of the cases were of persons over 16 years of age. This difference between the age incidence in urban and rural sections of the state seems to be borne out by the experience of other states in the last epidemic. At the Cincinnati meeting of the American Public Health Association, Dr. Frost declared that "studies of statistics of such epidemics as are now available show that in rural epidemics, especially those in Iowa and Minnesota, a much larger proportion of the cases have been in the higher age groups than has been the case in epidemics occurring in large cities."

Dr. Frost suggests an explanation for this difference, when he says, "Certain other infectious diseases, notably measles, are largely limited to children, not because they are essentially children's diseases, but because the adult population has been more or less immunized." It seems not unlikely, therefore, that the limitation of poliomyelitis in urban epidemics almost entirely to children may be due to the fact that adults had developed a certain degree of immunity, through mild and perhaps unrecognized attacks in their early years; while the persons in more sparsely settled areas, who had been less exposed to the contagion of the disease in their childhood, had not acquired the degree of immunity which would render them able, as adults, to resist the infection when present in epidemic form.

The mortality among the 4,186 patients was 866, or 21.1, as compared with the mortality in the city of New York of 27.2. The age incidence in the mortality between the city and the state is similar to that in the morbidity. In New York City, 79 per cent. of the total deaths were of patients under 5 years of age, while in the up-state cities these deaths constituted 59 per cent., and in the rural sections 45 per cent. In the rural sections of the state, 19 per cent., or nearly one out of five deaths, occurred over the age of 16. The popular term "infantile paralysis" is therefore a misnomer.

The period of incubation as shown by a study of 756 cases to determine the date of paralysis after the first sign of acute symptoms was: 68.7 per cent. within three days; 79 per cent. within four days; 95.7 per cent. within seven days, and 98 per cent. within ten days. This would indicate that the period of incubation is comparatively short. It can therefore be stated with some degree of positiveness that the incubation period is from three to ten days. If a child who has been exposed to a patient with poliomyelitis does not develop symptoms of the disease within two weeks, it can be considered safe.

The most important point to determine and about which no reliable information has been published is the length of time a patient having poliomyelitis may transmit the disease and be a menace to the community. The data studied were obtained from reports sent to the department by physicians and sanitary supervisors. It was necessary to include in this study only those instances in which the date of onset of the primary case was positively established and a definite date when the secondary case was exposed. The number of cases

PARTIAL PERIOD DURING WHICH PATIENTS WITH POLIOMYELITIS WERE A SOURCE OF INFECTION

Primary		Secondary		Date of Exposure	Onset	Partial Period Poliomyelitis Communicable in Primary Cases
Case No.	Onset	Age	Case No.			
1616	Aug. 1	18 mo.	448	Aug. 4	Aug. 21	3 days
571	Aug. 2	2 yr.	475	Aug. 3	Aug. 14	1 day
P-538	Aug. 23	12 yr.	538	Aug. 22	Aug. 28	1 day
P-538	Aug. 23	12 yr.	539	Aug. 22	Aug. 29	1 day
970	Aug. 5	16 yr.	551	Aug. 11	Aug. 15	6 days
2104	Aug. 30	9 yr.	635	Aug. 30	Sept. 5	1 day
2672	Sept. 1	5 yr.	673	Sept. 3	Sept. 9	2 days
1653	Aug. 6	3 yr.	687	Aug. 10	Aug. 20	4 days
3158	Sept. 18	19 mo.	709	Sept. 19	Sept. 28	1 day
2406	Aug. 26	4 yr.	1016	Aug. 26	Sept. 4	1 day
1005	Aug. 9	6 yr.	1034	Aug. 7	Aug. 17	2 days
1238	Aug. 1	10 yr.	1060	Aug. 8	Aug. 12	7 days
3538	Sept. 18	7 yr.	2055	Sept. 18	Sept. 27	1 day
3034	Sept. 12	7 yr.	3286	Sept. 14	Sept. 19	2 days
2188	Aug. 24	2 yr.	2354	Aug. 24	Aug. 31	1 day
1078	Aug. 11	2 yr.	2414	Aug. 13	Aug. 17	2 days
942	Aug. 11	4 yr.	1612	Aug. 10	Aug. 18	1 day
Robt.E.	Aug. 26	2 yr.	Irene S.	Sept. 3	Sept. 14	8 days

in which these data were returned was necessarily small, as in most instances a strict quarantine was imposed as soon as the case was diagnosed, so that the number of exposures was limited.

From the table of thirty-six primary and secondary cases, it would seem that the longest period a primary case was actually observed to be infectious was eight days, and in most cases it was one or two days. There were a number of cases reported in which the onset of the disease was reported one or two days after an exposure. Not all of these were included, as it was felt that in many instances they probably received their infection at the same time that infection occurred in the so-called primary case. The conclusion to be drawn from this study is that for the protection of public health a period of quarantine of three weeks would render ample and sufficient protection. This is the period required in the city of Washington and in the state of Wisconsin. A longer period is unnecessary and often a distinct hardship.

That poliomyelitis is transferred by contact is becoming more generally accepted. A committee appointed by the New York City Department of Health, headed by Dr. Simon Flexner, announced a few days ago its conviction that the disease was thus

* Read before the joint meeting of the Section on Diseases of Children, the Section on Nervous and Mental Diseases and the Section on Orthopedic Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

transmitted. A commission appointed by Surgeon-General Blue of the United States Public Health Service stated that "the infectious agent was transmitted chiefly by contact with patient or carrier, but exact incidence of such contact is often difficult to determine on account of unrecognized forms of the disease." This commission further observed that "this disease was widely prevalent and was most frequently of the nonparalytic type."

No one could fail to become convinced that the infection is transmitted by contact after studying the spot maps made of the cases as they were reported in the state from week to week. The cases followed the lines of communication with such consistency as to be unmistakable. One epidemic which has been carefully studied out by Mr. Chalmers, statistician of the department of health, was proved to have resulted from exposures at a county fair

CONCLUSION

We have learned from this recent pandemic that poliomyelitis is transmitted by contact with a patient or a carrier; that the period of incubation averages seven days, and that three weeks is a sufficient period to hold a patient with poliomyelitis in quarantine.

FATIGUE AND EXERCISE IN THE TREATMENT OF INFANTILE PARALYSIS

A STUDY OF ONE THOUSAND EIGHT HUNDRED
AND THIRTY-SIX CASES *

ROBERT W. LOVETT, M.D.

BOSTON

This analysis of 1,836 cases of infantile paralysis consists of a study of the records of the first round of the poliomyelitis clinics of the New York State Department of Health, which began, Oct. 17, 1916, and finished, Jan. 20, 1917.

The paper is an abstract of a preliminary report on the scientific side of the work, presented to the New York State commissioner of health, to whom I am indebted for permission to publish these data. Extensive tabulation has been made of many points in the report to the commissioner, with whom have been deposited all the original records from which these data are drawn. The presentation here of a large number of tables would be simply confusing and defeat the purpose which I have in mind, which is merely to call attention to four salient points which I believe these figures show. The tabulations were made to cover a large number of points, most of which proved to be of no great interest or importance; but certain of the tables told a perfectly definite story, and this paper will be devoted to the study of these points. They are that:

1. A complete examination in every case gives a different picture as to the general and special distribution of the paralysis from the usual one.

2. Muscular weakening is much more frequent than total paralysis.

3. A greater severity of the degree of paralysis in the legs of old as contrasted with new cases suggests

that the weight-bearing use of the legs in walking is harmful.

4. The differing functions of the right and left arms may be utilized for the study of the effect of nonweight-bearing exercise.

These cases were studied with great care in the clinics, and in every instance an examination was made by one of the three surgeons in charge, Dr. Armitage Whitman, Dr. John T. Hodgen or myself. In every case this examination included both arms, both legs, back, neck and abdomen. It consisted in obtaining, or attempting to obtain, voluntary contraction of each different muscle or muscle group, with limbs placed under favorable conditions of leverage. The muscles were then graded as:

1. Normal.

2. Good, when the muscle was strong enough to overcome gravity and some resistance, but was not quite of normal strength.

3. Fair, when the muscle was able to overcome gravity, and could perform part of the normal movement.

4. Poor, when slight movement could be accomplished but gravity could not be overcome.

5. Trace, when no movement of the limb could be accomplished, but the muscle could be felt to contract.

6. Totally paralyzed, when attempted voluntary movement was not accompanied by any perceptible contraction of the muscle.

According to this standard, every available muscle or muscle group was classified in every case. Any such classification is subject to a certain amount of personal variation, but this proved on the whole close enough to give a general idea of the character of the muscle. For purposes of simplicity in the paper, the muscle is spoken of as if it were the only structure to be considered; but it is recognized that in this study the muscle is to be considered as the index of the condition of the neuromuscular mechanism. In the 1,836 records taken consecutively from our files for analysis, 513 were of children 3 years of age or less. Such records, although carefully made, are not sufficiently accurate for detailed analysis on account of the age of the children, and were omitted from the study except where especially stated.

TABLE 1.—DURATION OF PARALYSIS AT EXAMINATION (THREE HUNDRED AND FIFTY-THREE OLD CASES)

Duration, Years	Number of Cases	Duration, Years	Number of Cases
From 1 to 2	25	From 12 to 13	7
From 2 to 3	28	From 13 to 14	3
From 3 to 4	38	From 14 to 15	5
From 4 to 5	29	From 15 to 16	2
From 5 to 6	38	From 16 to 17	2
From 6 to 7	62	From 17 to 18	3
From 7 to 8	41	From 18 to 19	0
From 8 to 9	20	From 19 to 20	0
From 9 to 10	32	From 20 to 21	0
From 10 to 11	9	From 21 to 22	2
From 11 to 12	7		

This leaves for detailed analysis 1,323 cases in which the patients were over 3 years old. These form two groups: (1) a group of 948 cases with onset in 1916, and (2) a group of 375 cases with onset in 1915 or earlier. The recent cases were from one to six months' duration when the patients were seen at the clinics, and the group of old cases had lasted from a little over a year to twenty-two years, with an average duration of over six years (Table 1).

The groups of recent cases and old cases were studied separately on all points, and the data of

* Abstract of a preliminary report made to the state commissioner of health of New York.

* Read before the joint meeting of the Section on Diseases of Children, the Section on Nervous and Mental Diseases and the Section on Orthopedic Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

the two groups compared. In the recent cases we had patients just emerging from the acute stage with the original phenomena of the disease unmodified. In the group of old cases we had a picture of the disease years after the attack, with modifications induced by

TABLE 2.—AGES OF PATIENTS

Ages, Years	Number of Cases	
	Affected in 1916	Prior to 1916
Under 1.....	65	..
From 1 to 2.....	224	..
From 2 to 3.....	224	2
From 3 to 4.....	195	15
From 4 to 5.....	135	21
From 5 to 6.....	125	14
From 6 to 7.....	97	23
From 7 to 8.....	63	36
From 8 to 9.....	56	37
From 9 to 10.....	40	26
From 10 to 11.....	48	46
From 11 to 12.....	27	28
From 12 to 13.....	18	21
From 13 to 14.....	15	17
From 14 to 15.....	12	18
From 15 to 19.....	54	40
From 20 to 29.....	46	25
From 30 to 39.....	13	4
From 40 to 49.....	2	2
50 and over.....	2	..
Total.....	1,461	375

the conditions under which the patient had lived in the interval. Few had received continued modern treatment, all had been as active in walking as their disability had allowed, and these old cases represented what was liable to happen in the disease when treated by old methods, if treated at all, because patients under treatment by competent orthopedic surgeons were naturally not apt to appear at public state clinics. By contrasting, then, the phenomena of these two groups, it was hoped that something of the natural history of the disease might be learned.

Age.—The age tables show nothing of especial interest. Of 1,461 patients affected in 1916, 513 were under 3 years; 4.5 per cent. were over 20, two patients being over 50.

GENERAL DISTRIBUTION

The tabulation of general distribution from this group of cases examined with great care shows that the distribution is not quite what certain earlier tabu-

TABLE 3.—GENERAL DISTRIBUTION IN THE ORDER OF RELATIVE FREQUENCY

	New Cases	Old Cases
Both legs.....	338	127
One leg.....	302	85
Both legs and both arms.....	127	55
Both legs and one arm.....	101	43
One arm.....	83	19
One arm and one leg, same side.....	33	13
One arm and one leg, opposite sides.....	29	7
Both arms.....	33	4
Both arms and one leg.....	20	8
Girdle cases.....	57	1
Facial alone.....	38	1
Total.....	1,166	363

lations have shown it to be, and that certain locations of the paralysis are extremely common and practically important, as in the abdomen and neck.

In recent cases the most common involvement is of both legs, then one or the other leg, next in frequency all four extremities, then two legs and one arm, and after that one arm. Next in frequency comes a distribution of much importance—one arm and one leg—and here a hemiplegic arrangement is distinctly more

common than one arm and one leg on opposite sides in both recent and old groups (Table 3).

The group of old cases shows the same general relative frequency as the recent cases, except in the involvement of all four extremities, two arms and one leg, and both arms, all of which are much less frequent than in recent cases. This shows the tendency of these extensive original paralyses to clear up in the arms. An important and serious type of paralysis which does not affect the extremities is described as the girdle type when the affection is chiefly of the back and abdomen.

Both sides of the cord are more frequently affected than one side. Of 705 recent cases, 60.5 per cent. affected both sides of the cord, as shown by the distribution of the paralysis on both sides of the body.

The frequency of paralysis of the abdomen, the back and the neck, as shown by this table, is so important as to require separate consideration.

Abdomen.—In 948 patients over 3 years of age affected in 1916, 72 per cent. were paralyzed in the abdomen, and these unique findings are undoubtedly because examination in every case was made as to this point. In my experience at least, many cases previously have escaped observation because this especial point was not noted unless extreme. The normal child can sit up from the lying position with the arms crossed on the chest without effort when the abdominal muscles are normal and hip flexors are not seriously involved. By placing the fingers on the recti and lateral abdomi-

TABLE 4.—INVOLVEMENT OF ABDOMEN, BACK AND NECK

	1916 Cases (948)			Old Cases (375)		
	Involvements		Ratio of Total to Partial	Involvements		Ratio of Total to Partial
	Number	Per Cent.		Number	Per Cent.	
Abdomen.....	686	72.3	1: 9.6	168	44.8	1:16.3
Back.....	128	13.5	1:21.9	55	14.6	1:20.2
Neck.....	103	10.8	1:49.5	27	7	0 total

nal muscles, one can note the degree of paralysis and whether it is bilateral or unilateral. As contrasted with the 72 per cent. of affection of the abdomen in recent cases, the table of old cases shows 44.8 per cent of affection. This indicates a tendency of this paralysis to diminish in frequency and severity in the natural history of the disease; that is, the prognosis would seem fairly favorable for improvement.

Back.—The examination for paralysis of the back muscles is not as satisfactory or as accurate as most examinations, and slight degrees of weakness are apt to be overlooked. The tables show an involvement of 13.5 per cent. of the back in the patients in the recent group, and 15 per cent. in those of the old cases.

Neck.—Neck paralysis has evidently been largely overlooked, but frequently exists. In the recent cases it was present in 11 per cent., but in only 7 per cent. of the old cases. The normal patient, child or adult can lift the head against quite a little force when lying on the back. Weakness or paralysis of one or both sternomastoid muscles makes this impossible. This was the test adopted. From its relative infrequency in late cases, the prognosis is evidently favorable for improvement.

Scoliosis.—The significance of recognizing abdominal paralysis is shown, for example, in connection with lateral curvature of the spine, with which it is often associated; 179 cases of lateral curvature of the spine were recorded, sixty-nine occurring in recent cases and

110 in old cases. The proportion of scoliosis in the two classes of cases is interesting. In the recent cases scoliosis was recorded in 7 per cent., and in the old

TABLE 5.—SCOLIOSIS AND ITS ASSOCIATED PARALYSES

	Old Cases		1916 Cases	
	Number	Abdomen Involved	Number	Abdomen Involved
One leg.....	10	5	10	7
Two legs.....	17	15	14	13
One arm.....	5	1	10	7
Two arms.....	3	1	5	4
One leg and one arm.....	3	2	3	2
One leg and two arms.....	2	..	..	..
Two legs and one arm.....	8	6	6	6
Four extremities.....	12	9	14	12
Abdomen and back.....	5	..	6	..
Short leg.....	41	6	..	..
No paralysis.....	4	..	1	..

cases in 30 per cent. Scoliosis is therefore relatively four times as common in old as in recent cases, and is a late complication.

In recent cases, involvement of the abdomen occurred in connection with lateral curvature in 75 per cent. of the cases, but in only 42 per cent. of the old cases. Apparently the most frequent cause of serious scoliosis is unilateral involvement of the abdominal muscles. Any affection of the abdomen in the early stage should make one watchful for scoliosis in the late stage.

Many unusual and previously unrecorded locations of paralysis were noted which will be discussed in a subsequent report.

TOTAL PARALYSIS

The two groups of cases were then analyzed with regard to the number and distribution of total paralyzes of individual muscles occurring first, in the new, and second, in the old cases.

In the recent cases, in 948 patients there were 2,352 totally paralyzed muscles, an average of two and a half totally paralyzed muscles per individual. In 375 old cases there were 1,622 totally paralyzed muscles, an average of four and a third totally paralyzed muscles per individual. Total paralysis was therefore relatively more frequent in old than in new cases, a point the importance of which will be commented on later. As to involvement of the different muscles as to total paralysis, the following was the order of frequency in the lower extremity: Paralysis of the anterior tibial leads in both new and old groups. Next in order comes the posterior tibial, then the two extensors, the peronei, gastrocnemius, hamstrings and quadriceps, with a smaller number of total paralysis in the hip. The order of involvement does not differ materially in

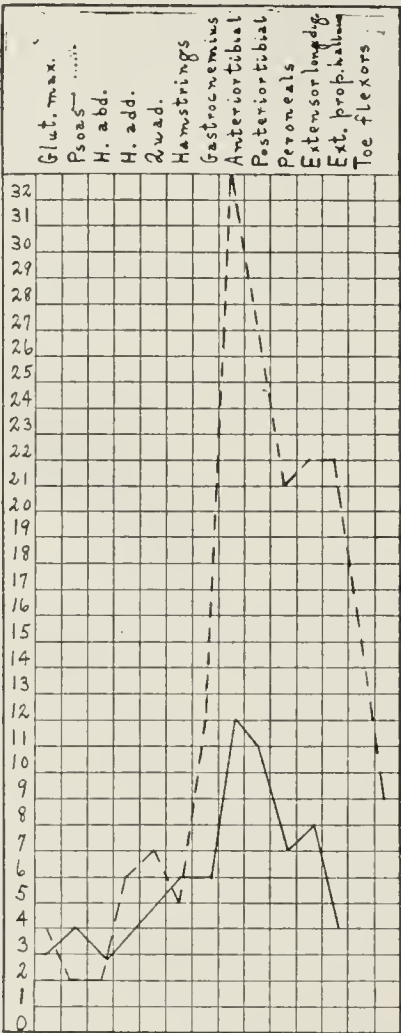


Chart 1.—Percentage of paralysis of each muscle in both recent and old cases in the lower extremity: solid line, recent cases; broken line, old cases.

the group of new and of old cases. It has just been stated that there is a much larger proportion of total paralysis in old than in new cases to the individual, and an investigation was made to see if this occurred in any especial location. Chart 1 shows that the increased prevalence of total paralysis of the lower extremity in old cases occurs below the knee, and that in the thigh and hip muscles the proportion of total paralysis remains the same in new and old cases, but rises greatly in the leg and foot in old cases.

TABLE 6.—TOTAL PARALYSES OF LOWER EXTREMITY IN ORDER OF RELATIVE FREQUENCY

	948 Recent Cases			375 Old Cases		
	Left	Right	Total	Left	Right	Total
Anterior tibial.....	123	124	247	126	120	246
Posterior tibial.....	114	119	233	104	102	206
Extensor proprius hallucis.	73	79	152	87	73	160
Extensor longus digi-						
torum pedis.....	78	71	149	86	77	163
Peroneals.....	75	72	147	78	78	156
Gastrocnemius.....	60	61	121	47	51	98
Hamstrings.....	57	59	116	20	22	42
Quadriceps.....	51	48	99	28	27	55
Hip adductors.....	47	38	85	19	27	46
Toe flexors.....	51	32	83	41	29	70
Iliopsoas.....	41	37	78	7	8	15
Hip abductors.....	37	32	69	12	8	20
Gluteus maximus.....	31	36	67	17	12	29
Totals.....	888	808	1,646	672	634	1,306

With regard to the upper extremity, the analysis of the total paralysis shows nothing of any great importance. The number of observations is relatively small, the muscular relations about the shoulder are very complex, and the study of the upper extremity from this point of view is less satisfactory than that of the lower. The paralysis of the upper extremity is most

TABLE 7.—TOTAL PARALYSES OF UPPER EXTREMITY IN ORDER OF RELATIVE FREQUENCY

	948 Recent Cases			375 Old Cases		
	Left	Right	Total	Left	Right	Total
Anterior deltoid.....	38	41	79	24	15	39
Posterior deltoid.....	36	40	76	19	14	33
Opponens pollicis.....	26	37	63	26	17	43
Outward rotators.....	19	16	35	8	8	16
Rhomboids.....	17	17	34	6	3	9
Latissimus dorsi.....	10	15	25	9	7	16
Biceps.....	10	10	20	7	2	9
Triceps.....	11	9	20	10	2	12
Lumbricales.....	8	11	19	9	6	15
Trapezius.....	8	10	18	5	5	10
Pectoralis major.....	6	12	18	13	6	19
Interossei.....	6	12	18	13	6	19
Thumb extensors.....	7	7	14	7	1	8
Serratus magnus.....	6	6	12	1	..	1
Wrist flexors.....	6	6	12	7	1	8
Thumb flexors.....	6	6	12	5	4	9
Supinators.....	4	7	11	8	2	10
Finger extensors.....	3	8	11	6	..	6
Pronators.....	4	6	10	8	1	9
Wrist extensors.....	5	5	10	5	3	8
Finger flexors.....	4	5	9	4	1	5
Totals.....	240	286	526	200	104	304

frequent in the deltoid muscle, and next follows the opponens pollicis, with the smallest number of total paralyzes in the hand. The proportion of total paralysis is practically the same in old and new cases.

RELATION OF TOTAL TO PARTIAL PARALYSIS IN NEW AND OLD CASES

In the preliminary report¹ to the State Department of Health of Vermont in 1914, it was stated that the relation of total paralysis to partial in a combined group of old and new cases was as 1:2.5. Since the

1. Lovett, R. W.: Treatment of Infantile Paralysis, THE JOURNAL A. M. A., June 26, 1915, p. 2118.

beginning of the Vermont work, the examination for muscular involvement has become more accurate and more delicate and a larger number of weakened muscles are detected, which originally probably would have been passed as normal. This change would of course make the proportion of partial paralysis higher in relation to total than in the original Vermont figures because more muscles are now recognized as involved.

TABLE 8.—MUSCULAR INVOLVEMENT

	Paralysis		Ratio of Total to Partial
	Partial	Total	
Lower extremity:			
Patients of 1916 over 3 years.....	8,574	1,746	1:4.2
Old cases.....	3,618	1,277	1:2.8
Upper extremity:			
Patients of 1916 over 3 years.....	3,628	560	1:6.4
Old cases.....	1,662	285	1:5.8

This ratio will now be discussed in the New York cases, contrasting as usual the two groups of recent and old cases.

Taking the ratio of total to partial affection in all cases without regard to the location of the paralysis, the ratio was 1 : 5 in the recent cases, and 1 : 3 in the old cases. Examining further to see if this ratio differs in different parts of the body, if the lower extremity is considered alone in the new cases it is 1 : 4.2, and in the old, 1 : 2.8. In other words, the ratio of total to partial paralysis is very much higher in the lower extremity than elsewhere. Investigating now still further the lower extremity to see in which part of it this difference occurs, we find that in the leg and foot the proportion in new cases is 1 : 2.4 and in old cases 1 : 1.5. In the thigh, that is, in the quadriceps and hamstring muscles, in new cases it is 1 : 5.7, and in old cases 1 : 7. In the hip in new cases it is 1 : 7 and in old cases 1 : 11.4.

In short, in the leg and foot the proportion of total to partial paralysis is very much higher in the old than in the new cases, but lower in the thigh and hip. The hip and thigh muscles become less affected and the foot muscles more affected as the years pass.

The proportion of total to partial paralysis in the foot and leg in old as contrasted with recent cases accentuates the observation already made as to the greatly increased proportion of total paralysis in the muscles of the leg and foot.

This seems a matter of the highest importance, and the reading of it seems clear. It may be assumed that when so large a group of cases is taken for analysis, minor differences between the characteristics of various epidemics will be eliminated and that the general behavior and type of the disease will be on the whole the same, and that therefore one may safely reason from patients paralyzed in 1916 to patients paralyzed in previous years.

This difference between the relative frequency of partial and total paralysis in the two groups may be met by one of two explanations: 1. Partial paralysis may clear up in the course of the years following the attack, leaving a larger proportion of total paralysis in these late cases. That this is not the case is shown by the fact that there is an absolute and relative increase of total paralysis in the late cases as contrasted with

the early ones. 2. The partial paralysis changes to total paralysis in the course of years. In this instance, total paralysis would become relatively and actually more common in the old cases, and the proportion of total to partial paralysis would become higher in the old than in the new cases. This is exactly what has happened here. —

The question of interest in this connection is, Why should partial change to total paralysis after the first months following the attack? Here again we obtain suggestive data from the figures. The high occurrence of total paralysis in the old cases has been shown earlier in the paper to be almost wholly due to increase in the foot and leg. In the thigh, hip and upper extremity, there is no such increase, and if we looked only at these parts of the body, we should feel that the proportion between total and partial paralysis was about the same in new as in old cases. Where so striking a difference is found as exists in the foot between old and new cases, it suggests very strongly that there is some special reason for this difference, and this reason is quite evident when one considers the function of the foot in the months following the acute attack of infantile paralysis. Of all parts of the body, the foot has the maximum weight to carry; the work thrown on the foot is continuously heavy; in walking about and in standing there is no cessation of activity in these muscles, and if, as I have believed and tried to teach for the last two years, fatigue and overuse are detrimental factors of the highest importance in the convalescent stage of infantile paralysis, it is in the foot muscles that one would look for the deleterious effect of overuse, and such deleterious effect would be the change from partial to total paralysis. In 1915 I¹ called attention to the fact that partially paralyzed muscles might lose power by overuse, and I have felt convinced that many a case of gastrocnemius weakness, for example, was converted into a total loss of the muscle by overuse and overtaking by walking.

In the entirely unexpected result of the present analysis, made by assistants not familiar with my views on this matter, is to be found a confirmation of the opinion that I have held on the effect of muscular fatigue.

TABLE 9.—COMPARISON OF OLD AND NEW CASES

Location	Old Cases: Ratio of Total to Partial	1916 Cases: Ratio of Total to Partial
Leg and foot.....	1 : 1.5	1 : 2.4
Thigh.....	1 : 7	1 : 5.7
Hip.....	1 : 11.4	1 : 7.2
Shoulder and arm.....	1 : 5.3	1 : 5.6
Hand and forearm.....	1 : 6.5	1 : 8.0

It may be permissible to call attention once more to just what these figures show: 1. Total paralysis is relatively much more frequent in patients paralyzed prior to 1916 than in patients paralyzed in that year. 2. The proportion of total to partial paralysis in the whole group of new cases is less than in the whole group of old cases. 3. When this matter is analyzed, it is found that it is due almost wholly to conditions in the muscles of the leg and foot in which the proportion

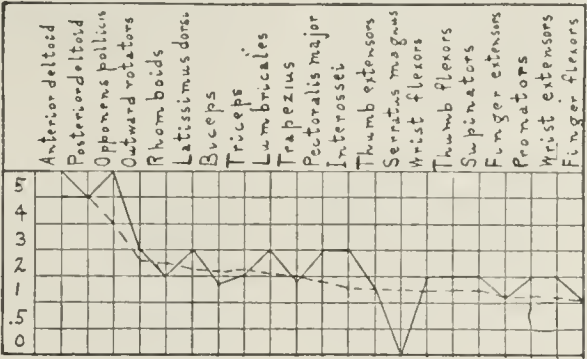


Chart 2.—Percentage of total paralysis of each muscle in both recent and old cases in the upper extremity: solid line, recent cases; broken line, old cases.

of total to partial paralysis is very much higher in old than in new cases, whereas in the hip and thigh it is relatively less in the old cases than in the new. 4. The interpretation of this that seems best to fit the fact is that in the months following the attack when walking is begun, the activity of weight bearing constitutes such gross overuse of the leg muscles that not only are they kept from improving, but also weakening is converted to total paralysis. This is only to be expected if one

TABLE 10.—AVERAGE AFFECTED OF EACH MUSCLE GROUP, FORTY-NINE CASES, IN PERCENTAGES OF NORMAL STRENGTH

Group	Per Cent.	Group	Per Cent.
Plantar flexion.....	41.5	Abduction.....	41.0
Dorsiflexion.....	32.5	Hip extension.....	51.2
Inversion.....	28.2	Hip flexion.....	54.5
Eversion.....	36.5	Knee extension.....	34.5
Adduction.....	42.5	Knee flexion.....	37.0

looks at the facts. The lowering of power in the weakened muscles of the leg is considerable, as the following will show: The records of forty-nine cases of leg paralysis were taken consecutively from the files for analysis as to the degree of involvement in the different leg muscles, as shown by the spring balance test. The power remaining in each of the groups of the lower extremity ranged from 28 to 52 per cent., with an average of 41 per cent. (Below the knee the average of all groups was 34.6 per cent., above the knee 41 per cent.)

Whatever may be said in its favor, walking on a muscle which is reduced to 30 or 40 per cent. of its normal power is a very serious tax on that muscle's endurance, and however much one may be a believer in exercise, the use of such muscles for weight bearing and walking is not desirable from what we know of the physiology of muscles. These data taken together bear out a perfectly clear conviction on my part, already definitely expressed, that walking to any extent, with or without braces, in the first year after an attack of infantile paralysis not only tends to delay the improvement of partly paralyzed muscles and is liable

TABLE 11.—NUMBER OF PARALYZED GROUPS OF MUSCLES, PARTIAL AND TOTAL (LEFT AND RIGHT)

	1916 Cases		Old Cases	
	Left	Right	Left	Right
Upper extremity				
Hand and forearm.....	853	913	505	425
Arm.....	1,121	1,301	562	455
Total.....	1,974	2,214	1,067	880
Percentage.....	47%	53%	55%	45%
Lower extremity				
Hip.....	1,450	1,346	707	737
Thigh.....	721	745	390	398
Leg and foot.....	2,087	2,071	1,343	1,320
Total.....	4,158	4,162	2,440	2,455
Percentage.....	50%	50%	50%	50%

to set a limit to their final restoration, but may also change them from the class of partly paralyzed to totally paralyzed muscles.

If weight-bearing exercise is detrimental in the first year after the paralysis, and leads to muscular deterioration, most marked where the weight is greatest, one may well inquire whether these tables give any information as to the effect of nonweight-bearing muscular exercise on the progress of paralysis.

DIFFERENCE BETWEEN RIGHT AND LEFT SIDES

From a study of the upper extremity, one may see the effect of nonweight-bearing exercise, and one may go farther and study the effect of the different activity of the right and left hands on the recovery from the paralysis. The function of the two hands is different, the right being used much more freely and continuously than the left, and for more finely coordinated movements, so that in the contrast of the two the effect of nonweight-bearing exercise may be analyzed. As a control, one may take the lower extremities, the function of which is similar. Analysis of the figures shows that the right and left legs are affected exactly alike in new and old cases. Both as to the actual number of paralyzes of all grades, and as to the number of totally paralyzed muscles, the percentage is practically 50 for right and left in both groups. In the upper extremity recent cases show a slightly greater involvement of the right arm in cases in which all grades of paralysis are noted, 54 per cent. being on the right side in new cases. In estimating total paralyzes of the upper extremity, there were found 36 per cent. on the right and 64 per cent. on the left, in old cases.

In other words, all grades of paralysis and particularly the total form, are about the same in the right

TABLE 12.—DIFFERENCE BETWEEN LEFT AND RIGHT SIDES

	Lower Extremity		Upper Extremity	
	Left, Per Cent.	Right, Per Cent.	Left, Per Cent.	Right, Per Cent.
All paralyzes, total and partial:				
1916 cases.....	50	50	47	53
Old cases.....	50	50	55	45
Total paralyzes by individual muscle groups:				
1916 cases.....	51	49	46	54
Old cases.....	52	48	64	36

and left arms in the beginning, but very much less in the later cases in the right arm, whereas, in the legs, the frequency of both right and left is the same in early and in late cases, from which one may infer that nonweight-bearing exercise is beneficial, as shown by the greater improvement of the right upper extremity.

CONCLUSION

The conclusions presented in this paper have been derived from an impartial study of a large number of figures obtained from carefully studied cases. They seem to show that weight-bearing exercise, such as walking to any extent in the first year after infantile paralysis, is apparently attended with risk and is followed in many instances by a change from partial to total paralysis in the foot muscles, whereas in other parts of the body this deterioration does not occur.

The evidence of these figures is also definitely to the effect that the right hand recovers much more effectively than the left, which may be interpreted as showing that the use of nonweight-bearing exercise is beneficial.

It is gratifying to find clinical experience indorsed by an independent statistical examination, and I should like in closing to go definitely on record to the effect that I believe that the weight-bearing use of the muscles with or without braces, in the first year following infantile paralysis involving one or both legs, is risky and detrimental if practiced to any considerable extent, and that by the use of nonweight-bearing therapeutic

muscular exercises conjoined with little or no walking, in cases affecting the leg, it is possible to secure a class of results with which I, for one, had been previously wholly unfamiliar.

ABSTRACT OF DISCUSSION

DR. HAVEN EMERSON, New York: Until the parents know enough to call a physician and the physicians are in a position to make a reasonably quick diagnosis of the disease, and until they report the cases at once to the authorities, it is unlikely that any methods of protection other than those that the individual physician directs can be employed.

I should like to indicate two matters that, as a department, I believe we have learned from this epidemic. In the first place, there is no evidence that environment plays any part in the development or spread of the disease. We have abandoned the old process of fumigation, which was done in the belief that by making a smell in the room, the persons who had the disease could be kept from spreading it to others. It was necessary to consider whether environment had a bearing on the spread of the disease. Everything, however, pointed to personal communication as the source of the infection, rather than to infection from the premises. There was nothing to point to home environment; nothing to point to the character of the diet, unclean food, unclean air, dirty streets, or anything else of that kind as having a relation to the spread of the disease.

Institutions in New York City are under the supervision of the department of health as to the manner of housekeeping of the institution. There were 28,000 children in these institutions. A quarantine was placed on them on July 1, and visitors were excluded. The children were not allowed to be at large in the community and acquire infection in that way. No children were admitted to any of these institutions without a three weeks' isolation period. The result was that only twelve cases of poliomyelitis developed among the 28,000 children in these institutions during the entire summer and fall. Of these twelve cases, only three developed after July 14. That shows that it is possible by physical separation to accomplish some sort of protection for groups of children. Dr. Herrman's suggestion that we isolate the susceptible, if we know them, would offer a chance of protection to the community.

During the past month there have been three deaths reported as due to poliomyelitis. One of these, at necropsy, proved to be cerebral abscess; another, cerebral tumor; and the other, epidemic cerebrospinal meningitis. The community has learned to expect and demand of physicians spinal puncture as a diagnostic procedure.

It is apparent, from some of the studies made in these children, that those who have normal throats are less susceptible to this disease than are those who have abnormal throats.

We have planned to treat this disease this year and in the future much as we do scarlet fever or measles, or any other communicable disease. It has been agreed by the city and state health officers independently that the period of isolation for this disease should be three weeks. If the children who have been sick and have recovered from the disease still continue, after three weeks' isolation, to have a temperature or discharges from the nose and throat, their isolation period should continue, as in the case of scarlet fever. We make one other exception in regard to isolation, in that people concerned with preparation and handling of food have an opportunity of spreading fresh nose and mouth infection through food more directly than is the case of other industries. Therefore, we expect to limit the freedom of adults engaged in the preparing and serving of foods, if they are members of a household where there is infection. It may be that food does not serve as a carrier; but it makes a poor impression on the community to have a person taking care of a sick child in the back room, and serving food to people in the front. I think it is wiser, in this city, to limit the people who are permitted to deal with the handling

and preparation of food to those who are free from any obvious contact with such infective diseases as may be carried by hand and mouth infection. We are prepared as if expecting a return of the disease in epidemic form, but so far this year there is nothing to indicate any undue increase or incidence of poliomyelitis in New York City.

DR. C. L. DANA, New York: This spring it was decided to appoint a joint committee of the Academy of Medicine, Public Health Committee and the Neurological Society to make some investigation of the poliomyelitis situation. One of our committee, Dr. Wilson, made a careful study of the relative immunity to the disease in relation to the age of children as compared with other infectious diseases. He showed definitely that the period of greatest susceptibility runs from the second to the fifth year in poliomyelitis, corresponding fairly well with that of the other infectious diseases of childhood, with the exception of whooping cough. The conclusion is that immunity to poliomyelitis is not due to a great prevalence of abortive or unrecognized attacks of the disease, but that it is a natural immunity, just like the immunity to other infections.

We found that the disease is not personally or immediately contagious, except to a small extent. The evidence of this is based on the small number of family cases, on the absence of spread of the disease among unprotected children in hospitals, schools, day nurseries and institutions; and on the small number of instances which can be really interpreted as proving personal contagion. We believe, however, in quarantine; and, in general, commend the methods lately adopted by the city board of health. We also believe in hospitalization of the patients. No epidemic developed in any of the very large number of hospitals and other institutions in New York. A child in a hospital is safe from the disease, even if other cases are brought in. If people cannot send the child to a hospital, we have drawn up a memorandum of precautions that provide for hospitalization in the home. One of the things that seemed most in favor was the frequent puncturing of the spinal canal during the early stage of the attack. We feel sure that the best methods of treatment of the paralyzed are those described as indicated in paralysis from nerve injuries. The use of the Martin spring balance in testing and treating cases is also an addition to the later therapy of the disease.

DR. HERMAN SCHWARZ, New York: I feel very strongly that in this large audience we cannot let pass the statement of the neurologists about the noncontagiousness of the disease. I am not going to quibble about the terms contagious or infectious. I might say, however, that we saw a great many cases last summer in which, in most instances, there was a history of contact with another case. If the neurologists had been doing the field work they would certainly have the impression that, if anything, it might be called "catching." If you had gone into 300 families where there had been one case, and had heard histories of other children having had sore throats, or malaise, you would also be convinced that the incidence of the disease during an epidemic is much greater than the figures show. I should say that there were many thousands more than reported, these cases being too mild to give any definite symptoms whatever.

It was one of the commonest things to find another one or more children in the family having been just slightly ill, either before or after the so-called real case of infantile paralysis was reported. I know many of these cases were poliomyelitis, for lumbar puncture was performed for the most trifling symptoms and increased number of cells found in the fluid.

At present I don't think it is fair to say anything about the degree of contagiousness, but to say that it is not contagious, I believe is going too far.

The cell count in the prognosis of the disease has not been of tremendous help to us.

DR. E. C. ROSENOW, Rochester, Minn.: All of us, after listening to this symposium, must feel how helpless we still are in the control and treatment of poliomyelitis. The serum of patients who have recovered from poliomyelitis obviously cannot be used on a large scale. From the work of Flexner

and Noguchi, Amoss and others, it appears that at least abortive attacks of poliomyelitis are necessary in order that neutralizing and protective substances may be produced in the serum. This, it is claimed, is true in the experimental disease in the monkey both from virus and from cultures of the globoid organisms. Amoss' recent work emphasizes the fact that the globoid organisms have, indeed, little antigenic powers. The hope of obtaining a satisfactory remedial agent along these lines appears to me to be small.

A restudy of the bacteriology of poliomyelitis in the recent epidemic has shown the presence of a peculiar pleomorphic streptococcus in atria of infection in the central nervous system in human poliomyelitis and in the brain and cord of monkeys paralyzed with virus. Intravenous injections of this organism soon after isolation produced flaccid paralysis with lesions in the central nervous system in animals. The apparent relation between the large aerobic form and the small anaerobic form has been discussed in a published report. It occurred to me that injections of the large form might call forth a greater production of antibodies in general, as well as antibodies protective against virus. Accordingly, we have immunized a number of horses with aerobic cultures of the pleomorphic streptococcus, and their serums have been tested from time to time as to antibodies and neutralizing and protective power against virus. One horse was injected chiefly with strains recently isolated from monkey poliomyelitis, and another with strains isolated last summer from human poliomyelitis. The serum from both has developed the power to agglutinate in high dilutions (up to 1 to 1,000,000) the strains from human and monkey poliomyelitis. Neither of these serums agglutinate in high dilutions strains of streptococci from other sources, nor do antipneumococcus and anti-streptococcus serums agglutinate the pleomorphic streptococcus. The serum from the horse which had been injected with recently isolated strains from monkeys has apparently developed the power to neutralize virus in the test tube and in the monkey. Three monkeys injected intracerebrally with active virus were protected from poliomyelitic attacks by repeated intraspinal or intravenous injections of this serum, beginning soon after injections of virus. Moreover, ten out of thirteen monkeys recovered from typical poliomyelitic attacks following injections of this serum after the symptoms had begun. Nearly all of the untreated controls, and those injected with normal horse serum, died during the attack.

These observations, while too few from which to draw sweeping conclusions, afford strong evidence that the pleomorphic streptococcus isolated so constantly from the central nervous system bears etiologic relationship to epidemic poliomyelitis, but final conclusions can not be drawn as to the exact rôle it plays until a true virus is established.

DR. REGINALD H. SAYRE, New York: The great field in poliomyelitis is, of course, prevention; and I hope that Dr. Rosenow may show us how to prevent these patients from becoming paralyzed. What Dr. Lovett has told you about the danger of overexercise in the first year cannot be too strongly emphasized; and the danger of overwork in the first few weeks and months, and also the danger of not noticing a slight paralysis of the trunk and allowing these patients to sit up in a chair. Being propped up in this way is responsible for many lateral curvatures of incurable form, for which the patients later come for treatment. These children are best lying on their backs, and not being encouraged by the nurse, and often by the physician, to do work that their muscles are incapable of performing.

How long after the acute attack is it wise to attempt to do things for these patients? Before coming to that, I should like to say that the wisdom of judiciously directed work cannot be overemphasized. The same facility that a pianist gets by constant practice, the same reeducation of his telegraph lines from his brain to his finger tips, is the thing which will give us results in those paralyzed cases in which there is some power of regeneration of function still left. When should one tell the parent that it is useless to proceed with this sort of treatment? I do not know; because years afterwards, when the patient had been abandoned and nothing was being done, the child being left to crawl on the floor

because treatment had been considered useless, I have seen cases of that sort gain a great deal of power by the intelligent application of exercise—sometimes combined with support, and sometimes not. Some of my neurologic friends have said that support is useless and should not be applied, because it has a bad effect on the child's mind; but I think it has a worse effect on its mind to have it crawling around, not being able to walk. To give it the ability to move around and exercise with its playmates by the intelligent application of apparatus, I consider a much better procedure.

I agree with Dr. Lovett that in the early stages it is better to leave the child unhampered by apparatus. It is only in the later stages that it needs support. The question of what shall be done (the application of apparatus or such operations as arthrodesis or neurotization of muscles) is one for the late stage of the disease, after several years have passed; not in the immediate condition that confronts us in the children of last year's epidemic; and the people who rush in and operate in the early stages will prevent the patients from having the chance of recovery which nature may afford them later on.

DR. HORACE GREELEY, Brooklyn: What I wish particularly to call attention to in regard to the etiology of poliomyelitis, are the conclusions of an article of mine in the July number of the *Journal of Laboratory and Clinical Medicine*. In this article it is shown that "globoid bodies," cultivated from poliomyelitis pathologic material, under the conditions mentioned by Noguchi and others, may be also grown in another form, at temperatures paralleling those prevailing during the prevalence of the disease; that is, about 70 F. At this temperature, these globules assume a bacillus form, similar in characteristics to the gram-negative bacillus sometimes spoken of as the bacillus of distemper. (These characteristics may be brought out at body temperature through the use of a special limewater containing a medium described in the article.) I believe that the organisms of poliomyelitis and of distemper are markedly affected by environment, and that they are one single organism, changing somewhat in character in passing from one group of animals to another. My conclusion in the article quoted was that the organism isolated from patients with poliomyelitis is a pleomorphic bacillus, and that the various forms—globoid bodies, cocci and bacilli—are not different organisms, but only manifestations of pleomorphism in the same organism, as affected by environment; and that this organism is the same as that found in the dog, cat, and other domestic animals when suffering from distemper.

The organism, as shown in my article, is saprophytic, and grows well at "summer heat." It grows well in milk at "summer heat" and resists the pasteurization process while contained therein. It forms spores and is a filter passer.

You all recollect that the commission that investigated the Washington, D. C., outbreak of 1910, reported that during the course of the epidemic the temperature varied between 69.7 and 77.6 F. In New York City the temperature during last year's epidemic was evidently an important factor as the following table shows:

POLIOMYELITIS IN NEW YORK CITY IN 1916

Month	Mean Temperature, F.	Cases
May	59.3	29
June	64.2	756
July	73.8	3,863
August	73.6	3,306
September	66.0	780
October	57.2	193

All other epidemics have also been associated with "summer heat" temperatures, and the reasons of such associations are, I think, explained by the findings of the article in question.

DR. WILLIAM C. HAGER, Brooklyn: There are three essential points that the medical profession at large—that is, the general practitioner and the pediatricists—are interested in, and the public also: first, how the disease is transmitted; second, how the diagnosis may be made early; and third, how

the disease may be treated. You have heard this morning that this is not a contagious disease. That is a matter of terms merely. It is surely communicable. Let me cite one or two cases that I saw myself last year.

A child died in Brooklyn, after thirty-four hours' illness, without a diagnosis. An old woman of 52 years took care of the child almost constantly. She came down, one week later, with a disease of which no diagnosis was made; but after two weeks of inability to walk she was transferred to a hospital, where she remained two weeks and the diagnosis of meningitis was made. A spinal puncture was made, but no definite results were obtained from it. After another two weeks she was discharged, able to walk; but when I examined her she had definite weakness of one leg and inability to raise her left arm. When she was discharged from the hospital she went to her son's house in Queens. There had been no cases of poliomyelitis in that neighborhood previous to this time. Six days later a child in that family came down with poliomyelitis and was taken to the hospital. A day or two later, another child, a nephew of her son, but living in another house, who had visited at his uncle's but one day after she arrived, came down with poliomyelitis and went to the hospital. She then went to a house five blocks away to look for rooms, and took the upper floor of the house. While there, she sat on the porch with the four children of the family, and they all drank water and grapejuice together. One week later one of the children in that house came down with the disease. Perhaps she did not have it.

The diagnosis in the typical cases, which constitute the large percentage of these cases, is possible before paralysis occurs. It should be made as surely as that of any other infectious disease in the typical cases, and most of them are typical. It can be made, first, by the fact that we are dealing with an acute infection of some kind; and secondly, by the fact that we get, as the second stage, involvement of the central nervous system definitely. It may be something else, but the symptoms of the typical cases are very suspicious. Then the spinal puncture will determine the diagnosis absolutely, and that can be made, if the cases are seen early, before paralysis has occurred. That is most important, from the public health point of view; but it is also of the utmost importance, if the children are to receive proper care and a proper line of treatment. Let us all combine on early diagnosis.

The third essential point is treatment. I was, and still am, as hopeful as any one that we can find a serum treatment. I think that will come. The theory of immune serum was excellent; but, on the face of it, it is not useful, because the antibodies produced by nature are sufficient to give sure protection to the individual actively immunized; but when you take a small amount of serum and dilute it, the dilution brings it, in most cases, below the stage of very active power. If we can produce active immunity, that may be another possibility.

DR. HENRY KELLER, New York: One thing struck me as very peculiar, namely, that so few of the patients suffering from tuberculosis of joints have been attacked by infantile paralysis. I have seen none. I have also asked Dr. Lovett about it and he could not recall a single case of his own. I have brought up that same question before the Orthopedic Section of the New York Academy of Medicine, and only one of the men could recall a case. I cannot account for it, and am anxious to hear from some one who can.

Dr. Lovett emphasized, and very properly so, that it is essential to keep the patient at rest for a long time, because, by giving the muscles a chance to rest, especially the weight-bearing muscles, the nerves may regenerate. The difficulty, however, is to keep the patient quiet if only few muscles of a group are involved. If the children are paralyzed so extensively that they cannot walk, they will not resist being kept at rest. It is different, however, when only few muscles are involved. I have tried time and again and did not succeed. The parents come back and say that they can not keep the child quiet. Hence, after the quarantine period is over, one is compelled to apply some kind of apparatus, or a plaster-

of-Paris bandage, in order to have the child walk properly—for it will walk whether you want it to or not.

One point which has a practical bearing on treatment, especially in paralysis of the leg muscles, is that muscle groups helped by gravity are usually the weaker muscles, while muscles working against gravity are the stronger group. In the muscles of the foot the same rule holds good. The everters are the weaker muscles while the inverters are the stronger group. Now, if the peroneal group is attacked by paralysis, the inverters being very strong, will produce a marked varus deformity in time, unless restrained early in the disease by proper bracing. On the other hand, paralysis of the inverters will not be followed by any marked deformity provided ordinary care is taken to keep the foot within the weight line; that is, building up the shoe one-sixth to one-third inch on the inner border is often sufficient.

Lastly, it is well to bear in mind that a joint is only incapacitated in virtue of the paralysis of the muscles surrounding it, and hence, in the application of a brace, one must see to it that the muscles, as well as the joint, are supported. In quadriceps extensor paralysis, for instance, with a resultant hyperextension of the knee, a short brace reaching to the middle of the thigh does more harm than good, because it cuts the very muscle which it should support. A long brace with a pelvic band to support the muscle from its origin to its insertion is the only efficient brace, and no other.

DR. GEORGE DRAPER, New York: It is impossible for me not to take this opportunity to add my strongest and most emphatic approval to the remarks of Drs. Shaw and Schwarz on the subject of contact distribution of this disease. It was most surprising to hear the report from the committee of the New York Neurological Society and the New York Academy of Medicine that poliomyelitis is not spread by contact. This judgment, apparently, was based on secondary reports. It is impossible to know an epidemic disease unless you see it in its whole course in the field. It is necessary to go where the disease is and see it, feel it, and smell it—for there is a peculiar and distinct smell to these cases in the acute stage. The neurologist who takes the stand that it is not transmitted through contact, and minimizes the value of quarantine, surely cannot have been in the field with the acute cases, and assumes by his position a grave responsibility before the community.

The so-called prodromal stage, as mentioned by Dr. Tilney, is not prodromal, it is the disease itself; and the abortive type, which Wickman described, is analogous to the first or systemic phase of the disease. The paralyzes are incidents in the course of an acute general infection.

I cannot help reiterating that poliomyelitis is an acute contagious disease, and a serious menace to the community. The only hold we have on it at present is to treat it as being spread by contact. Unless we try to check immediately the nonparalyzed cases, and healthy contacts who may be carriers of infection from the sick cases, so that secretions and excreta cannot be transferred, we shall again, in some localities, have the trouble that we had last year. This is no time to take the position that it is not a contact disease.

DR. CHARLES HERRMAN, New York: I am a pediatrician, but I think the neurologists may have been misunderstood. The figures are perfectly true: 252 secondary cases occurred in the families that were attacked in New York City. That, in itself, is sufficient to show, beyond all doubt, that the disease is communicable. If I understood correctly, the neurologists make a distinction between contagious and communicable, and think that people are not infected by the patient, but by a person who carries the disease. I do not think they mean that the disease is not communicable, but that the vast majority of cases are caused by carriers.

With regard to the percentage of other children exposed in the families in which a case occurred, I would say that I mentioned that 5 per cent. of the other children in the families exposed had some symptoms. We cannot say definitely that they had a mild attack of poliomyelitis, but they had some symptoms, fever, vomiting, tonsillitis, that might have been due to such an infection. We must assume that a large percentage of these children are practically immune.

With regard to adenoids and tonsils, my investigations show that they were not more common in the children with poliomyelitis than in the others. Twenty-five per cent. of all the children in New York have adenoid vegetations and enlarged tonsils, and in the poliomyelitis cases, the percentage was not perceptibly larger. So I do not think that it is so much a question of their presence as of some lack of normal power to neutralize and inactivate the virus of poliomyelitis in certain individuals. Why, I do not believe anyone knows; but certain individuals lack that power, which is normal in a large percentage.

I believe it should be emphasized that we are not likely to have another large epidemic of the disease within a few years in New York City. The figures show that pretty well. There were seven thousand undoubted cases in children under 5 years, with distinct paralysis. That represents 1 per cent. of the children under 5 years in New York City. If we assume that an equal number who were exposed had a mild attack, were thus immunized, we would have 2 per cent. That is a large percentage of the total number of children under 5 years who are susceptible, and I do not think that it is likely that we shall have another large epidemic here, for some years, at least.

DR. LA SALLE ARCHAMBAULT, Albany, N. Y.: I quite understand the attitude that is taken by Dr. Draper. The views that I have expressed concerning the pathogenesis of poliomyelitis are so directly opposed to the doctrine prevailing at present that I can see how difficult it must be to accept them without further evidence. I did not have an opportunity to go into all the facts that I had hoped to present. A point that, in my opinion, cannot be contested, however, is that I have found in the bloodvessels of the Rolandic area, the pons, the medulla, the cervicodorsal cord and the spinal pia, unusual numbers of white cells. There were some polymorphonuclears, but most of the cells were lymphocytes and polyblasts, analogous to the infiltrating cells of the central gray matter. These sections were seen by other men, and I want to add that my preparations are at the disposal of those interested.

There is one point in this connection that I believe has considerable practical bearing. If it is true that the virus of poliomyelitis is carried into the cerebrospinal axis through the bloodstream, we should follow up treatment in the same way. Reading the very careful reports of the serum treatment of poliomyelitis in New York last summer, I cannot say that I was favorably impressed with the reactions obtained. A number of cases did remarkably well, but I do not believe that it was possible to say that the amelioration or recovery was due to the serum in these cases. In a large number of instances the patients were made decidedly worse and must have caused considerable anxiety to the attending physician. It seems to me that if the hematogenous route represents the path by which the cerebrospinal axis is involved, and I believe that it does, we should give the serum intravenously. In that way, much larger quantities can be employed. We must remember that the meninges and their bloodvessels are sufficiently disturbed already, and that the introduction of the serum into the subarachnoid space acts much as an irritant, simply aggravating the condition and perhaps, in some instances, making the case hopeless. A better result might be obtained by the intravenous route. I would suggest, however, that lumbar puncture be performed before the administration of the serum.

Cold Storage.—Nothing has been found to indicate that cold storage, under proper operation, has any injurious effect on perishable foods. On the contrary, where the best methods of treating respective classes of foods have been determined, as is the case with a large part of the perishables, cold storage has proved its greatest usefulness to mankind. Perishable food placed in cold storage in good condition will, when kept under proper conditions, be perfectly sound and wholesome when removed after long periods of time.—Fifth Report of Committee on Cold Storage, American Public Health Association, *Am. Jour. Pub. Health*, March, 1917.

TREATMENT OF IMPETIGO CONTAGIOSA *

HOWARD MORROW, M.D.

SAN FRANCISCO

After reading the different articles on impetigo in the standard works on dermatology, one cannot help but being impressed with the general belief on the part of the various authors in the specific action of some form of ammoniated mercury. Other parasitocides receive less consideration, and the reader is given to understand that the condition can usually be cured in two or three weeks by the application of the stated therapeutic measure. While it is true that the mild forms of the infection are frequently cured in a short period of time, it must not be forgotten that in its severe manifestations, impetigo may persist for weeks before its eradication is effected. We should also remember that impetigo of the new-born sometimes terminates fatally, no matter how rational and thorough the treatment might have been. So a short summary of the accepted methods of dealing with this by no means harmless disease, and a brief outline of some other procedure not commonly exploited, seem enough to form the subject-matter of a timely paper.

As has usually been recommended, the affected parts are frequently anointed with a dilute ammoniated mercury ointment, and when possible these parts should be bandaged. However, when the eruption is on the face it is next to impossible to keep the involved areas under cloth dressings, and in order to continue one's vocation it is obviously objectionable to apply grease to the lesions during working hours, especially if these occur during the daytime. Unfortunately such drawbacks suffice not only to its partial control, but serve in a very efficient manner to favor the spread of the disease.

Schoolchildren with impetigo often attend their classes and mingle with their fellows at play, without their condition being recognized. It is only natural that they should thus disseminate their infection among their associates. Again adults with impetigo seldom remain away from their work, and many of the male victims continue to be shaved by a barber. It is unnecessary to go into details how, under these unfortunate conditions, a widespread transference of the disease not uncommonly occurs. As a matter of fact, it may be asserted that in a great majority of cases of impetigo among men the infection has been contracted in barber shops. It is therefore no wonder that the laity looks on the disease as "barber's itch," a term which, as is generally conceded by dermatologists, should be restricted to ringworm infection of the beard. It should be mentioned, of course, that there are hygienic school rules governing children, as well as health regulations for the barber shops; but the mild or chronic cases frequently escape detection, and they are just as capable of transmitting the infection as the more acute and severe forms of the disease. For these reasons it is of great importance to make an early diagnosis and to abort the lesions with all possible speed.

For many years aurists have asserted that the best method of treating "pyogenic eczemas" of the ear canal is by the use of some preparation of silver. As many of these "pyogenic eczemas" are in reality strep-

* Read before the Section on Dermatology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

teccoccic infections, treatment of similar infections on the glabrous and hairy skin by silver preparations should give equally satisfactory results, and this is actually true.

Over a considerable number of years it has been our custom to treat impetigo patients by this method, and it has proved to be a very efficient therapy. By its employment individual lesions in most instances are rapidly aborted, and the general course of the disease appreciably shortened. The method is as follows: The vesicles or pustules are ruptured with gauze, the sodden epithelium which comprised part of the wall is removed, and the base of the lesion is thoroughly covered with a silver solution, the application of the remedy being made with a swab. Where crusts have formed it is usually an indication that the disease is still spreading at the base. The crusts should likewise be removed by rough friction with gauze, and the underlying areas treated with a silver solution applied in the same way as to the vesicular and pustular bases.

I have experimented with different strengths of silver nitrate solution, but now confine myself as a routine practice to a 20 per cent. preparation. When other drugs were added to the silver nitrate solution, in order to avoid staining of the skin, the value of the remedy was lost. And when the colloidal and complex silver salts were employed, the results were just as disappointing.

There are two disadvantages to the silver nitrate method of treating impetigo, one being the temporary pain which follows its application and the other the formation of a black crust which appears quickly and remains for three or four days. These objections, however, should receive little attention, especially when one has learned by actual experience of the reliable efficacy of silver nitrate in the treatment of impetigo, and its almost unfailing qualities as an abortive agent in the control of the disease.

New lesions can usually be prevented by washing with boric acid solution, or with a weak solution of mercuric chlorid. Still, the patient should always be examined carefully and often, in order that new lesions may be recognized in their first stages and promptly aborted.

It is advisable to apply a dusting powder, preferably one containing ammoniated mercury in the strength of from 6 to 10 per cent., and boric acid powder up to from 15 to 20 per cent. When the impetigo is on the uncovered part, even without the silver the powder form of treatment should be selected in preference to a grease. Customarily I have applied such a powder after swabbing with silver solution, and order its use by the patient several times daily. The most satisfying manner of applying the powder is by means of an insufflator. Adults who have the infection on the face should not shave until all active signs of it have disappeared and they should not subject themselves to the irritation of the wind, such as results from motoring in open cars. Needless to say, children suffering from impetigo should be restrained from attending school until they are entirely well, and, furthermore, all prophylactic measures should be enforced to prevent others who occupy the same living quarters from acquiring the disease. New-born infants should be removed as soon and as completely as possible from victims of impetigo, for they seem not alone very susceptible to the infection but are often gravely affected by it. Since that form of impetigo which attacks the new-born differs as a rule

widely from the variety of the malady encountered in early youth and in adults, it should receive its own special medical attention. Although small vesicles and small pustules, along with slight crust formation, may be observed in an impetigo eruption of the new-born, the disease usually tends toward the formation of bullae, which appear with great suddenness, and increase in dimension with almost incredible swiftness, occasionally reaching the size of an adult palm in a few days' time. In these cases ammoniated mercury ointment seldom checks the advancing borders, and instead of a cure being achieved, we frequently see the lesions progressing to the formation of enormous flaccid bullae. It is the rule for these bullae to rupture, their thin covering of epidermis sloughing away, leaving large denuded areas resembling superficial burns. The accumulation of sodden epithelium on the diseased skin surface, and of pus, crusts and of greasy detritus, leads to a general pathologic condition which all too often has a fatal ending. If these cases are recognized in the beginning, and the lesions aborted with silver, further dire results of the infection can usually be avoided. It is not infrequently necessary to apply the silver daily to certain portions of the border where the disease has not been stopped in its advance. Clothing produces heat and friction with infants, so it is advisable to keep those who have impetigo in a suitably warm room and with as few garments on as possible. With only a limited amount of material for forming this statement, exposure of these infants to the direct rays of the sun has seemed to be a distinct help in securing a cure. However, it must be emphasized that this form of heliotherapy should not go to the extent of producing an erythema of the unaffected areas of the body.

ABSTRACT OF DISCUSSION

DR. JOHN E. LANE, New Haven, Conn.: Dr. Morrow's paper expresses my own views in regard to the treatment of impetigo. As it is frequently used, on oozing and crusted surfaces of dirty children with impetigo, an ointment is about the worst application that can be made. After the surface has been cleaned and nearly dry, it works well. In cases covered with crusts and ointments, I soften with boric acid solution or petrolatum and then remove the crusts, wipe the surface and apply a solution of silver nitrate. The surface thus becomes nearly dry, and then a powder is applied. In my experience the method is much more rapid and cleanly than that usually employed.

In impetigo of the bearded face I have never had good results with ointments. In such cases I usually use a weak alcoholic solution of iodine, as the stain is less lasting than that from silver nitrate. These cases are a little more stubborn, but they usually yield fairly promptly under such treatment.

DR. W. C. BROWNSON, Asheville, N. C.: I have never used the powder, but I shall try it. It seems to me anything in the shape of a powder would be apt to substitute one crust for another. In my opinion there is little need for treating the ordinary cases of impetigo so actively. I have used a modified form of *l'eau d'Alibour*, the favorite treatment of Saboraud. A modification of his remedy, which does very well, is made up of 1½ grains copper sulphate and 3 grains zinc sulphate to the ounce of camphor water. I often start by removing the crusts by a boric acid-starch poultice, and when removed, sop on the solution named several times a day, and its results are usually prompt. It is cleanly, and I can hardly see how it could be improved on. I think the results are fully as good as when stronger applications are used. In regard to the use of ammoniated mercury, it is advised by Walker and others to use not more than 5 grains

to the ounce. This may be used at night, and in the morning it is washed off with soap and water, and then during the day the lotion I spoke of is used.

DR. R. A. McDONNELL, New Haven, Conn.: My opinion is that ammoniated mercury ointment is a specific if rightly applied. It should be thoroughly rubbed in with a toothbrush, and some of it left on until the time for the next application. This should be done three times a day. I think that there is a distinct advantage in using greasy applications in exudative diseases of the skin, because serum will not mix with grease, and, if the epithelial layers are thoroughly impregnated with salve, then serum has little chance to collect in them. Impetigo is a very superficial disease, and these remarks apply pertinently to this disease. The type of impetigo represented by pemphigus neonatorum is an entirely different proposition. We recently had a little epidemic of this disease in the New Haven Hospital and five patients out of eight died. Nothing seemed to check the advance of the infection.

DR. SAMUEL E. SWEITZER, Minneapolis: I have always thought there were certain definite principles for treating impetigo. The crusts and the tops of the little pustules must be removed. One can do that by an ointment of ammoniated mercury, and the next time by wiping the lesions they will come away easily. These patients are mostly children, and to get them off painlessly is an advantage.

I do not believe boric acid is strong enough to stop the transfer of these lesions. I use a 10 per cent. ammoniated mercury ointment. I do not believe they look so bad as when painted black with something like silver. The average case gets well in from five to seven days; in some cases it is a little longer.

If we have a circinate lesion, it is a mistake to suppose that ammoniated mercury will do good. So I cut off the loose part next to the skin and apply the ointment to the whole surface. In the cases in the new-born I have been using a little vaccine and I find it is a big help. There is one case in the University Hospital at present. The baby was born with the skin off the fingers and numerous bulla soon formed. That patient is getting on with staphylococcus vaccine and a little ammoniated mercury.

DR. EVERETT S. LAIN, Oklahoma: Most dermatologists and practitioners have their own methods of treating impetigo, and all are successful, largely because of nature's immunizing bodies which come to their rescue.

I was glad to hear of Dr. Morrow's method, inasmuch as it differed from most others, and also to hear of his work in testing the silver salts. I believe he reports that the colloidal groups did not give as good results as straight silver nitrate. I have often found the colloidal salts of value in secondary infections of carcinomas. We have all objected to staining and the pain following applications of silver nitrate. My treatment of impetigo, whenever crusts have formed before I see the case, is to apply the usual routine of washing with soap and gauze. I do not resort to the brush as that seemed too severe. Then I apply ammoniated mercury ointment. After the secretions and the scabs are removed, if the patient is deemed able to stand the treatment, I use a 50 per cent. alcoholic solution of salicylic acid. This does not stain unless it is repeated. This has been of special value in preventing spreading.

DR. HAROLD N. COLE, Cleveland: As Dr. Heimann suggests, impetigo is due to streptococci, but if we take cultures in pemphigoid of the new-born we will find it staphylococcic in origin. This is often serious if the disease spreads over the body and down to the umbilicus, where it sets up a blood infection.

Ointments seem to me to make the cases worse. I have not used silver nitrate solution, but I will try it. How strong does Dr. Morrow use it in infants? I have been using 1 per cent. iodine in alcohol, and then a dry dusting powder. I always use vaccines, autogenous if possible; otherwise a stock vaccine.

DR. WALTER J. HEIMANN, New York: Impetigo contagiosa is not obstinate. It is not dependent on the general principles of susceptibility, in the proper significance

of the word. There is a local susceptibility in the epidermis, but it is not of a kind that need be controlled by vaccine. In the impetigo of Bockhardt the opposite is the case. An ordinary case of impetigo contagiosa is much easier to cure, particularly if one uses soap and water followed by the application of a lotion. Because of the fact that we are dealing with an acute exudative inflammation of the skin, however, it does not stand grease well. The damming-back process indicated by Dr. McDonnell's discussion I have not found. Consequently I do not use salves in that stage. If it is secondary to pediculosis, I find it best to use a shampoo and get off all the crusts by mechanical and other means and paint with a 20 per cent. silver nitrate solution (I do not use the 50 per cent. solution), and then use mild white precipitate ointment or a 10 per cent. balsam of Peru ointment.

There are two other groups of cases which deserve special consideration. These are the bullous types, in which it is necessary to cause a rupture of the lesions to get antiseptics on the battlefield, so to speak. There are two or three ways of opening a bulla: One is with a sterile toothpick, or gauze, or even with a toothbrush. Then paint the surface of the open bulla with nitrate of silver, and that will produce a cure. When the beard is involved, the disease is likely to become follicular; and then I use soap and water and a solution of resorcin in alcohol. Instruct the patient to moisten the surface several times a day and to put on at night an ammoniated mercury ointment to keep the skin from getting too dry. I find if the patient is not instructed to shave, and he lets the hair grow, the crust mats with the hair, so I tell the patients to shave once a day after softening down the crusts.

DR. HOWARD MORROW, San Francisco: I had not mentioned the treatment by boric-starch poultice. That is of value occasionally, especially where we have thick crusted lesions.

Some one suggested that it would not be advisable to treat with a powder impetigo which was weeping. Sometimes there is a slight amount of weeping after the silver is applied, but it is only a few minutes before it is stopped, and then it is advisable to use the powder. I think it was Dr. Sweitzer who objected to lotions. I also dislike lotions, but after the powder is used through the insufflator a few times, it cakes on the skin, and I use a boric acid compress or solution to wash the powder off the parts.

In answer to Dr. Heimann, I have yet to see a bullous impetigo, either of the adult or of the new-born, in which the bullae could not easily be ruptured by gauze.

In answer to Dr. Cole, I use 20 per cent. solution of silver nitrate with infants as on adults.

Clinical Examination of Painters.—The December, 1916, *Bulletin* of the New York City Department of Health publishes the results of an examination of 289 painters undertaken in the occupational disease clinic. In this series there were forty-seven patients, in all of whom both the clinical evidence and the laboratory findings gave positive evidence of lead poisoning. Fifty patients gave marked physical signs of plumbism without laboratory confirmation; twenty-four patients who were apparently free from symptoms were reported from the laboratory as showing either lead in the urine, or stippling of red cells. There were twenty-two patients in whom the symptoms alone or in combination with the laboratory findings created doubt as to the existence of lead poisoning. One hundred and forty-six cases were negative as to lead poisoning. The heaviest incidence of plumbism was found in those who had been in the trade ten years or more. A comparatively small number survive as members of the trade after reaching the age of 50. In this series there were eighty-nine abstainers from alcoholic beverages, a surprisingly large number considering the conditions under which painters work, it being often difficult to obtain drinking water. A study of the symptoms of lead poisoning was made, which shows that in only ten cases was the lead line observed. The hemoglobin estimation and blood pressure findings were of little significance. Lead poisoning appeared to have no influence on the Wassermann test.

AN ANALYSIS OF FORTY-THREE
CASES OF SKIN CANCER *

SAMUEL E. SWEITZER, M.D.

Associate Professor and Head of Division of Dermatology and Syphilis,
University of Minnesota Medical School

MINNEAPOLIS

Much has been said and written on the subject of skin cancer. Hazen,¹ in a recent book, has given an ample presentation of the subject. My reason for presenting this analysis of forty-three cases is that I have found that a lamentable lack of knowledge of the dangers of skin cancer still exists as regards both the general public and the average physician.

I have had patients tell me that their family physician told them to leave these lesions alone and, in other instances, I have seen cancer near the eye burned off with caustics and recurrences take place and destroy the eye and endanger life itself.

At the present time, both the medical journals and the newspapers have done good work in the dissemination of knowledge on this subject. It is only by endless repetition, however, that any medical facts are generally made known to the public, and so the endeavor must go on, even at the risk of being tiresome to some of us who have ample information on the subject.

The problem of prevention of skin cancer is, to my mind, more important than the treatment of the disease after it starts, and I will endeavor to show from the analysis of these few cases that a great many could have been easily prevented. This is something that needs to be emphasized in the medical schools, as I have found patients often very anxious to have skin blemishes removed from fear of cancer, and I have often found that they came of their own volition as their physician had told them that the lesion was of no consequence.

Progress has been made, however, and the outlook for the future is brighter and we all can help by insisting on the eradication of any lesion that we know from our experience to be a precancerous condition.

In an analysis of these forty-three cases, we find that there were twenty-eight males and fifteen females. This is nearly twice as many in the male as in the female. The ages varied from 27 to 86 years; there were two cases under 30, seven cases under 35, eleven under 50, and thirty-two cases above 50 years. The duration of the disease varied all the way from eight weeks to twenty-five years.

They were all located on the face, neck or ear. The extremities were not involved in this series. Most of the cases were around the nose or on the cheeks, the lower eyelid was involved twice, the temple twice, the lower lip four times. Of the lower lip cases, two were due to smoking, one to a cold-sore and one to seborrheic keratosis. We all know the malignancy of cancer of the lower lip, but I have found that cases involving the inner canthus of the eye are very hard to cure, and if they involve the orbit, the difficulties of treatment are greatly increased.

ETIOLOGY

From the frequency of the occurrence of skin cancer on the exposed surfaces of the body, one is led to believe that the rays of the sun may have something

to do with its production, or it may be only on account of the better opportunity for irritation to occur.

Fourteen of these forty-three cases were due to seborrheic keratoses. This is about 30 per cent. and is the most frequent cause in this series.

Acute injury, such as a razor cut, or a scratch, or being hit with a stick, was responsible for seven cases, and three cases were directly due to pinching out a blackhead with the fingers. This gives ten cases due to one acute injury and is about 25 per cent. of the total. Most writers mention trauma as a cause, the occurrence of repeated slight injuries, but do not emphasize the single injury. I was greatly surprised to find this large percentage on analyzing these cases.

Other causes were warts in three cases, pimples five cases, smoking two cases, both on the lower lip, cold-sore two cases, scaly spot three cases, irritation of nose-glasses one case, irritation of alkali dust one case on lower eyelid, angioma one case, red spot one case. Every one of these cases then was due to either one acute injury or to a precancerous dermatosis or to chronic irritation.

I am certain that in many cases we must have the added factor of chronic irritation. Chronic irritation alone can also cause skin cancer. This has long been known and is shown in this series by the two cases involving the lower lip due to smoking, and by the eyelid involvement due to chronic irritation of alkali dust and rubbing.

The high percentage of cases due to an acute injury would lead one to suspect either an infectious origin or a displacement of cells at the time of injury.

In patients with seborrheic keratoses, I think that the formation of skin cancer is possibly aided by the irritation of sunlight, scratching the lesions and picking off the crusts. This might explain the cause of the occurrence of skin cancer in these patients only on the exposed surfaces. We often see seborrheic keratoses on the body, but I never have seen a skin cancer on the body caused by it. However, on examining a very small beginning epithelioma due to this cause, I often have been led to believe that the pressure of the heaped-up scales gradually caused enough chronic irritation in the underlying cells to make them undergo cancerous degeneration and form a little ulcer with the characteristic hard edges.

There were seven patients with multiple lesions, and of these six were due to seborrheic keratoses and the other was due to a scaly spot.

The treatment given in these cases was radium. Thirty-four patients are cured to date; four are still under observation and should result in cures; two were benefited but are not well yet; two had recurrences and one patient was directly stimulated. Of the two that recurred, one involved the neck and was previously treated with the Roentgen ray but not entirely healed. This patient has done well under radium, but is not completely cured and, at present, I am trying desiccation on him.

The second patient also had received Roentgen treatment, in this instance extending over a period of nearly three years. After one course of radium treatment the patient disappeared for six months, and the disease, which previously was on the bridge of the nose, had spread so that it involved the frontal sinus. This patient had in previous years been operated on twice and the lesion had recurred both times.

The case that was directly stimulated involved the malar bone and the amount of radium used was too

* Read before the Section on Dermatology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Hazen, H. H.: Skin Cancer, St. Louis, C. V. Mosby, 1916.

small to be effective. It was necessary to resort to surgery and do a wide operation, and Roentgen rays were used afterward. This patient writes me that he is now apparently well. This was a prickle cell tumor.

CONCLUSIONS

The most important part of the cancer problem is prevention. From this analysis, all but the ten cases

due to an acute injury could have been prevented, as thirty-three were due to a precancerous dermatosis or to a chronic irritation. Too much emphasis cannot, therefore, be laid on the early removal of all lesions on the face and hands, especially such as seborrheic keratoses, warts, moles, pimples, angiomas, etc. I assume that the term "pimple," as given by the patients, must have meant some small fibrous tumor. This

SYNOPSIS OF FORTY-THREE CASES OF SKIN CANCER

Case	Sex*	Age	Location	Duration	Etiology	Treatment	Results	Recurrences
1	♂	81	Neck under chin	10-12 yrs.	Started as pimple; was cut and irritated....	Radium	Good	Yes
2	♀	53	Side of nose	12 yrs.	Seborrheic keratosis	Radium	Cured	No
3	♂	62	Side of nose	4 yrs.	Seborrheic keratosis and had been twice cauterized with silver nitrate stick	Radium	Cured	No
4	♀	69	Upper lip	15 mos.	Started like a cold-sore and did not heal....	Radium	Cured	No
5	♂	77	Ala of nose and 1 cheek	1 yr.	Pimple came on nose after auto accident. Lesion did not heal but grew rapidly and destroyed ala of nose	Radium	Cured	No
6	♀	78	Large area on 1 cheek	18 yrs.	Seborrheic keratosis	Radium	Cured	No
7	♂	41	Right cheek	18 mos.	Razor cut. Did not heal.....	Radium	Cured	No
8	♂	85	Left malar eminence	Several years	Seborrheic keratosis	Radium	Cured	No
9	♀	84	Bridge of nose	25 yrs.	Began as pimple. Operated on twice and recurred. Roentgen-rayed off and on for three years	Radium	Poor	Yes
10	♂	59	Side of nose	1 yr.	Seborrheic keratosis	Radium	Cured	No
11	♂	65	Side of nose	2½ yrs.	Began from squeezing a blackhead....	Radium	Cured	No
12	♂	27	Lower right eyelid	4 yrs.	Alkali dust irritated eyes and produced conjunctivitis. Rubbed and irritated nose, finally began to ulcerate	Radium	Cured	No
13	♂	71	Left cheek	Several years	Seborrheic keratosis	Radium	Cured	No
14	♀	53	Left cheek	2 yrs.	Seborrheic keratosis	Radium	Cured	No
15	♂	30	Lower lip	2 yrs.	Smoked pipe. Had a white spot which later turned into a sore and did not heal	Radium	Cured	No
16	♂	57	Left cheek	18 mos.	Began as red spot like dilated blood vessel. Was treated with electric needle, after which it started to grow and formed an ulcer	Radium	Cured	No
17	♂	75	Left malar area	2 yrs.	Seborrheic keratosis	Radium	Stimulated lesion	
18	♂	35	Median line of nose	15 yrs.	Started from injury. Sore resulted and was irritated by patient. Has been frozen with CO ₂ , curetted and Roentgen-rayed. Biopsy. Prickle celled	Radium	Good	Not absolutely well yet
19	♀	32	Right temple	8 yrs.	Started as red spot; then grew and ulcer formed. Was cut out and skin grafted. Recurred. Roentgen-rayed for a long time	Radium	Good	Not absolutely well yet
20	♀	56	Nose	20 yrs.	Began as red sealy spot; after five years began to ulcerate	Radium	Cured	No
21	♂	58	Nose	5 yrs.	Began as red pimple; later ulcerated. Was burned off a couple of times. Nose glasses irritated it	Radium	Cured	No
22	♂	66	Left side of cheek	1 yr.	Seborrheic keratosis	Radium	Cured	No
23	♂	47	On cheek in front of r. ear	3 mos.	Cut while shaving. Did not heal and ulcer formed	Radium	Cured	No
24	♀	66	End of nose	4 yrs.	Began with a scratch.....	Radium	Cured	No
25	♀	35	Left naso-labial fold	3 yrs.	Began with a scratch.....	Radium	Cured	No
26	♂	56	Upper part of left eyelid	10 yrs.	Started from slight injury. Skin cracked and ulcer formed	Radium	Cured	No
27	♂	66	Lower lip	8 wks.	Smoked pipe. Had a hyperkeratosis and leukoplakia. Ulcer formed	Radium	Cured	No
28	♀	56	Nose near left ear	2 yrs.	Irritation of nose glasses caused sore which failed to heal	Radium	Cured	No
29	♀	55	Right lower eyelid and r. cheek	10 yrs.	Started from injury. Stick hit patient and ulcer formed	Radium	Cured	No
30	♂	41	Right cheek near eye	2 yrs.	Started from small pimple.....	Radium	Cured	No
31	♂	45	Right side of nose	3½ yrs.	Started from wart. Burnt off twice.....	Radium	Cured	No
32	♂	32	Left side of nose	2 yrs.	Started from smooth wart or fibroma. Burnt with silver nitrate twice and recurred	Radium	Cured	No
33	♂	29	Lower lip	1½ yrs.	Started from cold-sore. Ulcer did not heal..	Radium	Cured	No
34	♂	63	Right temple	5 yrs.	Started as small ulcer. May have been seborrheic keratosis	Radium	Cured	No
35	♀	74	Left cheek near nose	3 yrs.	Started from squeezing a blackhead. A small tumor formed which grew slowly	Radium	Cured	No
36	♂	57	Left side of nose and front of left ear	6 yrs.	Seborrheic keratosis	Radium	Under treatment	
37	♂	74	Near canthus of right eye	10 mos.	Started from sealy spot; probably seborrheic keratosis	Radium	Under treatment	
38	♀	53	Right cheek and right lower eyelid	20 yrs.	Started from scratching a sealy spot which itched. Small ulcer formed which gradually spread, growing rapidly last few mos.	Radium	Cured	No
39	♂	86	Left naso-labial fold	6 yrs.	Seborrheic keratosis	Radium	Cured	No
40	♂	58	Upper part right eyelid	10 yrs.	Started from a wart.....	Radium	Cured	No
41	♂	57	Lower side of nose	10-15 yrs.	Started with squeezing a blackhead; grew slowly; was burned off with silver several times	Radium	Cured	No
42	♀	66	Left side of end of nose	4 yrs.	Began as sealy spot. Patient has seborrheic keratosis	Radium	Under treatment	
43	♀	72	Right cheek near nose	12 yrs.	Began as sealy spot. Patient has seborrheic keratosis	Radium	Under treatment	

* In this column. ♂ denotes male, and ♀ female.
In Cases 1, 13, 17, 20, 22, 36 and 39, more than one lesion were present.

removal is particularly important for people over 50 years of age, as that is when the majority of these cases begin.

The cases due to injury could not have been prevented, and present a puzzling problem. Skin cancer should be suspected in any ulcer of the face or extremities which does not heal readily under ordinary treatment. If skin cancer exists, it should be treated most energetically either by excision, intensive Roentgen ray or radium. Treatment should be instituted early while the lesions are small and before extensive destruction has resulted.

ABSTRACT OF DISCUSSION

DR. FRED WISE, New York: In the concluding remarks of his paper, Dr. Sweitzer laid especial stress on the question of prophylaxis in cutaneous cancer. This is a point which is invariably emphasized by all who are interested in the subject, and the physician is ever cautioned to regard with suspicion any stubborn growth of the integument, especially in adults and elderly people. Cautioning physicians is very good as far as it goes, but I think that very little is done in the way of educating the lay public. The magazine sections of the Sunday papers, instead of dealing with some of the popular minor ailments, such as freckles, superfluous hair, etc., would do well to devote some space to teaching the lay public the danger of neglecting persistent pigmented and warty growths of the skin, which show signs of degeneration or proliferation. In the larger cities, the children of high school age should be taught all about the subject of skin cancer. Children between 16 and 20 years are at an age when these lessons would be deeply impressed on their minds, and information of this character would eventually prove to be an exceedingly valuable aid in the prophylaxis of cancer.

DR. EVERETT S. LAIN, Oklahoma City: Dr. Sweitzer has given a good classification; and as he said, he has repeated that oft-given warning relative to early treatment of skin cancer, and of precancerous conditions. I do not think, however, that this can be emphasized too much; nor does any one realize the effect of removal of early lesions more than do dermatologists.

I was interested in the classification, and while there were but forty-one cases, yet that gives a fair degree of knowledge of the usual run of skin cancers.

Dr. Sweitzer's experience corresponds closely with my own in the summary which I made in 1915 of about 250 cases, which perhaps some of you may remember having read in reprints, or in our *Oklahoma State Medical Journal*. This summary of the forty-one cases corresponds with the larger number I gave in 1915, except that I never found epithelioma of the inner canthus of the eye any more stubborn than when located externally. The inner canthus condition is doubtless caused by our attempts to remove dust and other foreign particles from the eye. I find that in this location the lesion yields to the Roentgen ray and radium equally with those located externally.

As regards the age of the patient, we formerly thought it was almost impossible for anyone under 40 years of age to have the epithelial type of cancer. I have a record of three patients under 30, one 22, and another 23, and all typical cases of epithelioma, one near the lower eyelid on one side, and the other on the lower lip. They have yielded to treatment.

One thing most of us have observed (which is rather contradictory to the usual course of other diseases) is that after 65 or 70, all epithelial cancers, in my experience, yield more readily than the same types in persons of middle age.

As regards race, we expect in the Irish, who have fair, red, tender skins, epithelioma to be more common than in others. That is also true of fair Germans; a large percentage of my cases have been of the Irish or fair German type. The reverse is also true; dark-skinned people, as pointed out by Hazen in the negro, and the full-blooded Indians, to whom I called attention in my paper in 1913 before this section, are

not subject to skin cancers. I have yet to see my first case in an Indian. I have seen but few cancers in the negro.

Dr. Wise thought it would be a good thing to have lectures in the public schools in regard to prevention of skin lesions. This progress, I am pleased to say, has been made in the high school of Oklahoma City. For two years we have had medical lectures before the domestic science part of the graduating class. Instruction is given on the prevention of skin lesions and the nursing and care which may be given by ordinary measures.

DR. WALTER J. HEIMANN, New York: What evidence is there that cancer may be caused by acute conditions known to us by the name of "cold sores"?

DR. CHARLES J. SHEPARD, Columbus, Ohio: Dr. Sweitzer mentioned epithelioma following smoking. I wish to report a case I saw on the lip of a carpenter, which apparently followed the holding in his mouth of a lead pencil which he used in his work. It was probably covered with dirt, and doing that day in and day out, had apparently produced that result.

DR. J. C. BATESON, Scranton, Pa.: The essayist has brought out his ideas in a very simple way. I should like to call attention to the cause, as being attributed to traumatism, or some condition such as a wart or mole. I do not believe that these are primary causes, but furnish suitable locations for development.

It is evident that some steps should be taken to inform the public that all malformations should be looked after carefully by the physician to prevent the development of skin cancer. Not all warts or moles produce cancers, but if they are causing any disturbance I think it advisable to remove them at once. We also know that the public fears the knife and think that warts should be left alone.

Now, as to the quack who uses pastes and local escharotics. I know many of their patients, even after the use of the knife, have been cured; and I, too, have treated like cases with simple escharotics, such as acetic acid, zinc chlorid or some combination, and have brought about beautiful results. If we know how to use escharotics with tact and skill, we need not relegate them to the quack.

DR. FREDERICK HARRIS, Chicago: The best way to destroy cancer that I know of is by means of a red hot soldering iron. This will do away with the cancer; so will arsenic, zinc chlorid and trichloroacetic acid; but as dermatologists we have better methods than these of treating cancer of the skin.

DR. HAROLD N. COLE, Cleveland: I concur in the suggestions, but I think the Association should be very careful about recommending anything of that sort.

DR. JOHN E. LANE, New Haven, Conn.: The treatments recommended by the speaker, excision, Roentgen ray and radium, are all that are to be recommended in the treatment of cancer, and for ordinary use excision should have the preference. In selected cases in proper hands, radium and the Roentgen ray are most valuable, but as used by a great many operators—I agree with a well known dermatologist that "there are more crimes committed in the name of the Roentgen ray than ever were committed in the name of liberty." One of the most frequent reasons given for using the Roentgen ray for the removal of a cancer is that the cancer is small. To my mind that is no indication for not using the knife. At the age at which most skin cancers appear, a small one can be cut out, leaving a scar that in a few weeks can hardly be distinguished from a wrinkle. It is done more quickly, more surely and with less expense to the patient than in any other way, and if properly done the cosmetic results are as good. In some locations the Roentgen ray or radium is the method of choice. As far as escharotics, acids and other methods of that sort are concerned, I believe that the time has long since gone by to mention them even for condemnation. Certainly it is past my comprehension how any physician can mention them for any other reason than total condemnation. They have no place at all in medicine of the present day.

DR. LOUIS B. MOUNT, Albany, N. Y.: One case I recall, that of a prickle-cell epithelioma of the lower lip in a man 26 years old. Six years previously, that is, at the age of 20,

he was in a fight and was struck on the lower lip. From that time on he had a small bluish discoloration there, which was exactly the spot on which the epithelioma developed. I disagree with the last speaker's statement that the cosmetic results of surgery are better than those obtained with radium or the Roentgen ray.

DR. JAMES M. KING, Nashville, Tenn.: I had one patient who began to develop an epithelioma in the right ear at the age of 16, confirmed with the microscope. When I saw the patient he was 19 years of age, and the growth covered nearly the entire ear. Later he developed a lesion of the nose and one on the chin; that was at the age of 21 or 22.

In reference to the point of cancer resulting from a traumatism, I had one case resulting from a wasp's sting in a mole. When I saw the patient the lesion was about the size of a quarter. It was evidently a cancer. I treated the patient with the Roentgen ray and it gave as good a result as I could wish. Another case was in a patient who cut his lip while eating an apple; death followed from cancer starting in the wound after two or three years' treatment.

In reference to treatment of cancer, I think the main point to keep in mind is the pathology of the case and the size of the lesion. In the case of a small lesion I would treat with the Roentgen ray. I would be sure of getting a better cosmetic result with that, and as permanent a result as by any other means. If it were a larger growth, I would use my judgment as to whether excision and Roentgen ray or Roentgen ray alone was better treatment. I do not advocate pastes. Excision with the electrocautery is a means which I prefer above all others, followed by the Roentgen ray in massive doses.

DR. FRANKLIN W. CREGOR, Indianapolis: It seems to me that when we find an explanation for disturbed metabolism, which the colloidal chemists are studying, we will know more about how best to attack cancer. We know some cancers metastasize while others do not.

As to treatment of cancer, the means that will remove all of the pathologic tissues most completely with the least amount of trauma and with the best cosmetic effects is the treatment to be employed. I have had some splendid results from surgery and some good results from pastes, and have had some splendid results from the Roentgen ray; and I am going to continue using all of them.

DR. HENRY H. HAZEN, Washington, D. C.: I want to touch a few high spots concerning cancer. First, we must differentiate between prickle-cell and basal-cell cancer. Prickle-cell cancer usually invades the neighboring lymph nodes, and the problem is the same as in cancer of the breast. Now, if one gets a patient early, before a clinical diagnosis is possible, and uses the Roentgen ray or caustic, one cannot tell whether one is dealing with prickle-cell or basal-cell cancer. It is always necessary to know, for that gives the clew to treatment. Diagnosis in the case of prickle-cell cancer must be made early. In dealing with cancer of the lip, if the glands are definitely involved at the time of operation we know that the patient does not have the chance for life that he has before they are clinically involved. The glands should be cleaned out before they show any change.

As to treatment, let me give a few statistics: Last winter I studied about 150 of Dr. Bloodgood's cases of basal-cell cancer. Of the cases which could be traced up for the requisite number of years, 86 or 87 per cent. of patients who could be operated on, were definitely cured. Dr. McKee, in an excellent paper read in Cincinnati last month, found that the Roentgen ray cured nearly the same percentage of cases in a series of about the same size; so we have some justification for the claim that the Roentgen ray is good. Of course we must remember that the Roentgen-ray work was done by an extremely skilful radiologist, and also that the surgery was done by very competent surgeons. I personally believe, as Dr. Lane said, that there are many crimes committed in the name of Roentgen ray. I think many people use radium who do not know anything about it. I have had cases in which the growth was simply stimulated by it, instead of destroyed; and I fear lest some men, using radium in too small quantities, do more harm than good.

As far as caustics are concerned, I do not see how any man with regard for the feelings of his patients will use caustics in preference to the Roentgen ray. No patient will ever elect the second use of a caustic paste unless he be a candidate for martyrdom. Of all caustics the use of the actual cautery, with either a local or general anesthetic, is the only one really fit for use. It gives many cures, and the cosmetic results are not as bad as many think.

DR. C. AUGUSTUS SIMPSON, Washington, D. C.: I agree with the other speakers that the use of small amounts of radium may not destroy, but simply stimulate, the growth of skin cancers. I also would like to apply the same statement to many of the Roentgen-ray equipments used by dermatologists. I am sorry to say that I find many well known dermatologists treating skin cancers with the cheap, little Roentgen-ray machines that do just as much harm and just as little good as an insufficient amount of radium. It is just as unreasonable and harmful to attempt to cure these lesions with a weak and inferior outfit as it is to attempt the same end with \$300 or \$400 worth of radium. In both instances the growth is more often stimulated than destroyed.

In regard to prickle-cell carcinoma, I will repeat what we have known for some years. Dr. Pusey's statistics relating to this lesion when located on the upper lip show that they are as amenable to Roentgen-ray therapy as basal-cell carcinoma. Naturally, if the glands are involved it is a case for surgery, to be followed by the Roentgen ray.

I do not think it is necessary to do a biopsy on every case of skin cancer by any means. If a microscopic examination seems necessary, remove the entire growth and then section it. We must remember it is a cure the patient seeks and pays for, and not statistics and a diagnosis. A biopsy and Roentgen-ray treatment on the same lesion seem to me to be inconsistent.

DR. SAMUEL E. SWEITZER, Minneapolis: I do not know the etiology of skin cancer—I should have said, the etiologic factors. Concerning the question of acute injury, I should say that of these patients, one gave the history of having been chopping wood, when a stick flew up and hit her, an ulcer formed and an epithelioma on the upper lid resulted. The sister of another woman gave her a little scratch; there was no defect there previously. I saw her within two months and she had an epithelioma on the side of the nose. In the case of a man with an eruption on the lower lip, he said it was a cold sore. After the cold sore had disappeared the lip did not heal and he had an epithelioma. I simply brought that out in the history taking. The only one I saw was in the case of a business man who, while shaving himself, made one single cut near the ear. He came to me in a few weeks with a tiny epithelioma with hard edges. Precancerous dermatosis is something which I think should be removed before the lesion starts, if possible.

In giving my treatment I said: First excision, then Roentgen ray, and then radium. I use the radium but I do not insist on others doing it. These lesions were all on the face and ears, in places which would show the results of the therapy. I am sure excision would leave more scar than I got by the means I used. I have had a number of patients who have had recurrences after excision. I agree with Dr. Hazen that it is preferable to excise in the prickle-cell cases and treat with radium afterwards. It must be borne in mind that the treatment varies in different hands.

Scarcity of Medicinal Plants.—The *Paris Médical* remarks that it does not at present advocate cultivating medicinal plants as this takes time and skill. But it does advocate collecting in the woods and fields the medicinal herbs now growing wild, or in gardens. It gives a list of plants that could be thus collected, describing their characteristics and habitat, the methods for drying and otherwise preparing them and the seasons when each should be collected. The necessity for extreme care, not to allow the herbs to get mixed, is emphasized, as many of the available plants are highly poisonous. Among these are mentioned aconite, belladonna, digitalis, datura, hyoscyamus and Solanum nigrum.

SANITATION IN THE TRENCHES

CHAMPE CARTER McCULLOCH, M.D.

Lieutenant-Colonel, United States Army; Professor of Military Hygiene,
Army Medical School

WASHINGTON, D. C.

(Concluded from page 87)

V. THE PREVENTION OF SPECIAL DISEASES

We have in the army, in addition to the practice of the general sanitation of the troops in regard to food and water, conservancy, personal habits, etc., often to concern ourselves with efforts toward the prevention of certain diseases common in military life, some of them especially likely to occur under particular conditions of environment. Each camp, each war and each climate has had its own individual situation in this respect to be studied and handled by the military sanitarian. The European war, like the others, has developed its own characteristic liability to particular diseases.

Let us look for a moment at the development of the war in regard to a few of the most important and interesting of these diseases. They are no doubt familiar to most physicians, through the reading of the current medical journals, but for the sake of completeness I shall consider them briefly here.

In the consideration of the prevention of diseases in war, two points, always important in the study of disease, but especially so in military life, ought to be emphasized at the start. These are:

1. *Accurate Diagnosis.*—This statement at first glance would seem to be a sort of medical truism and unnecessary to repeat. However, when one recalls that in 1898, in our Spanish war, the doctors mistook a large proportion of the typhoid fever for malaria, with the result of great sanitary disaster, it seems just as well to bring it up again in this connection. No doubt we shall have better facilities for diagnosis in this war. The British have developed the field laboratory idea in a practical way. Before billeting troops in new areas or occupying ground recently captured from the enemy, they send out traveling motor laboratories in advance of the troops. These have been found necessary, especially on account of the German practice of poisoning wells. Metallic poisons are tested for and the water examined chemically and bacteriologically for gross pollution.

2. *Correct Statistics.*—For good preventive work, the army sanitarian must have reliable information as to the incidence of the various infectious diseases, the numbers of sick, and the geographic distribution in camps, regiments, etc. Statistics, indeed, are the necessary foundation for all effective sanitary work. However, the importance of this feature of the work is not always realized by the neophyte in practical sanitation. It affords a good example of the necessity of having experienced medicomilitary administrators in control of medical department affairs, and of the need of special training along these lines for recently appointed medical officers. Paper work and "red tape" are a great nuisance in the army, especially to new men, and ought to be cut down as far as possible. A certain amount of bookkeeping, however, is absolutely essential here, as in all well conducted business affairs in civil life. As another important example of this necessity, it should be realized that the enormous matter of the pensions that succeed a big war, or any large enrolment of men in the military service, even without fighting, has its foundation stone

in the medical records of the period in question. Justice, both to the individual soldier and to his family on the one hand, and to succeeding generations of our tax-paying descendants on the other, absolutely requires the most intelligent and painstaking care in the preparation of medical records. As good sanitary work may, by prevention and elimination of epidemics, forestall the necessity for tens of thousands of pension claims, so also good medical administration may by prompt removal of wounded from the battle front, and quick return of well handled soldiers to the firing line, aid the military commander, as much as any other factor, in winning his country's battles. Our military men have not always recognized this fact, but I believe that at least in the regular army they are fast coming to appreciate the immense value to their work of the competent medical staff officer. Lord Northcliffe⁵ has written in a most complimentary way of the administrative work of the Royal Army Medical Corps in this war. We learn from Colonel Goodwin that the British line officers now follow implicitly the sanitary advice of their medical staff, a consummation devoutly to be wished for in the new American army.

IMPORTANT DISEASE PROBLEMS

Among the more important disease problems of the present war are those afforded by:

1. *Typhoid and Paratyphoid Fevers.*—The practice of compulsory antityphoid vaccination has doubtless solved successfully for us the formerly serious question of typhoid fever in our army camps. The British have had some trouble in the present war owing to the fact that vaccination is voluntary in their army. Fortunately, however, owing to careful sanitation, the disease did not make great inroads on their fighting strength.

The place of typhoid as a military problem has now been taken for us by paratyphoid fever. Many of the milder cases diagnosed as typhoid fever in 1898 were no doubt paratyphoid infections, differentiation between the two diseases not having been made at that early date by the practicing physician. In fact, paratyphoid as a distinct disease entity was not known at all until 1896, when it was announced by Achard and Bensaude.⁶ Glimmerings of the truth had, indeed, been seen earlier. Osler's statement of his belief that there were undifferentiated continued fevers in the South was no doubt a stimulus to the army surgeons, who, especially in Texas, made observations in this connection. Col. William B. Davis noted at Fort Clark, Texas, in 1892, "a hybrid between typhoid and malaria," and in 1894 I⁷ described the symptomatology of a continued fever noted at various border posts, which I tried to differentiate from typhoid. We called this "Texas fever" in default of a better name, and I was inclined at that time, following Guiteras, to regard it as of thermic etiology. I was mistaken in this, and Davis made a better guess. I have no doubt, at present, that the disease observed in Texas was what we now call paratyphoid fever, though, doubtless from imperfect observation, I missed the "rose spots," which it seems should be found in at least 50 per cent. of cases of paratyphoid.

Reverting to present conditions, it seems that inoculation with a mixed vaccine of paratyphoid, types A

5. Saturday Evening Post, Philadelphia, April 28, 1917.

6. Achard, C., and Bensaude, R.: Bull. et mém. Soc. méd. d. hôp. de Paris, 1896, pp. 821-833.

7. McCulloch, C. C.: Rep. Surg.-Gen., U. S. Army, Washington, D. C., 1894, pp. 52-58.

and B, has prophylactic value against the disease. In fact, this measure has been used successfully both in Europe and in our camps on the Mexican border, where paratyphoid has recently been found to exist bacteriologically as well as clinically. Our troops in this war will therefore doubtless be vaccinated against paratyphoid fever as well as against typhoid. There is a rather severe reaction after inoculation with the paratyphoid B strain, but the British experience is that this is not serious enough to counteract its great value as a prophylactic.

The other intestinal infections, besides the continued fevers, are at present handled in a preventive way only by the ordinary methods of camp hygiene. Possibly something practical in a specific way may result in the future from the prophylactic administration of emetin in amebic dysentery and the development of the Japanese idea of vaccine or serum prophylaxis of the bacillary form, though it has not up to the present. It seems to me that this question of bacillary dysentery offers the best and most to be desired field for future research and experiment in preventive medicine, in connection with the needs of the army. If intestinal diseases could be excluded, army sanitation would be, to speak in the vernacular, almost "a cinch." It is worthy of note in this connection that raw vegetables seemed in the Philippines a potent means of the conveyance of dysentery and other intestinal diseases.

2. *Tetanus*.—This clinically hopeless and distressing affection gave rise to much trouble and mortality among the wounded in the early period of the war. It was found to be much more extensively present in the thickly settled areas, such as the Champagne district in France, than in more sparsely inhabited places—a question of soil pollution. It will suffice to say in this connection that a completely adequate solution of the tetanus problem has now been found: All victims of wounds of whatever character, simple scratches included, are given at the earliest possible moment after the receipt of the wound a prophylactic subcutaneous injection of 500 U. S. Army units of tetanus antitoxin contained in about 3 c.c. of horse serum; in the case of severe wounds, a second dose of the same strength is given on arrival at the base hospital. The first injection is given preferably at a dressing station or field ambulance, as soon as possible after removal of the wounded man from the firing line. When given in the small doses of serum stated above, the danger of anaphylaxis from the second or succeeding injections is negligible. This measure has entirely controlled the former troublesome situation, and tetanus is no longer feared by the surgeon.

3. *Infection with Gas-Forming Bacilli*.—This unpleasant and often dangerous complication of wounds, also owing to soil infection in the thickly populated and agriculturally worked-over sections of the battlefields of Belgium and France, has given rise to most serious trouble. Most of these infections are due to the *Bacillus acrogenes-capsulatus* of Welch, usually called, by the British, *B. perfringens*. About the only means available to us in prophylaxis is the attempt to minimize the influence of the predisposing causes of gas cellulitis or gas gangrene. These causes are the too tight bandaging of the limb, the too infrequent changing of dressings, and the lack of adequate drainage of wounds. I understand that an antitoxin has just been prepared for this bacillus. Let us hope that it will prove to have prophylactic as well as curative value. This is a surgical rather than a medical

or hygienic matter, but it seems worthy of note in this place.

4. "*Trench Foot*" and *Frostbite*.—This particular effect of prolonged exposure to the cold and wet on dependent limbs had not been observed before the present war—certainly not on a large scale. The symptoms, speaking generally, rather closely resemble those of a preliminary peripheral neuritis, succeeded in severe or improperly treated cases by pressure gangrene, the successive pathologic stages being in the latter case, first, stasis, second, exudation, and third, gangrene. Rational measures of prophylaxis have been found to be:

(a) Drainage of the trenches by the military engineers, or, this being impracticable, the raising of the foot level in the trenches by fascines of brushwood.

(b) The thorough rubbing into the feet and legs of whale oil or antifrostbite grease.

(c) The wearing of long rubber boots. In any case the avoidance of pressure by tight shoes or puttees. The socks should be kept dry (by greasing the shoes) and changed daily.

(d) Keeping the legs elevated while resting, and the avoidance of the sitting posture in sleeping.

(e) Keeping up the physical condition of the soldiers by proper nourishment and warmth (as far as possible) and the avoidance of fatigue. Basil Hughes recommends the frequent use of hot soup and also the rum ration* in selected cases.

Dampness in gun emplacements is a fertile cause of bronchitic and rheumatic affections, and should be obviated by care in construction. Water should be drained to the outside of the "cave," rather than under the floor, or it should be periodically pumped out. Walls are made double and filled with sand or brushwood and iron sheathing is incorporated in the earth covering of the emplacement.

5. *Trench Fever*.—This disease is another of the developments of the peculiar environmental conditions of the war in Europe. Briefly, the symptoms are those of a relapsing pyrexia extending over a time varying from a few days to several weeks, usually coming on suddenly with headache and pain in the back and legs, and having no specially characteristic features beyond these and painful, tender shins. It thus resembles the European relapsing fever, though as yet no spirochetes have been found in the blood. Suspicion points to its conveyance by the body louse, and rational prophylaxis would therefore point, as in typhus fever, to measures chiefly directed against these vermin—to isolation of patients, the disinfection of clothing and the protection against lice of the attendants on the sick. The internal administration of quinin has been recently suggested as a prophylactic in typhus fever.

6. *Gas Poisoning*.—This remarkable German contribution to warfare was a great surprise to the Allies when first sprung on them, and a great many men were "gassed" in the early stages of its employment with distressing and often fatal results, generally due to asphyxia in those not killed at once by the poison. Prevention was quickly stimulated, however, and gas masks and gas helmets were devised which, saturated with certain chemicals, served to neutralize or nullify the bad effects both of the "shell" and "drift" gases used by the enemy. It is hardly worth while to speculate on the chemical composition of the various gases and their antidotes, as the different armies have vied with each other in their production, and keep them as strict military secrets. It suffices for our present

purposes to know that all soldiers in the trenches are furnished with the proper masks and taught how and when to use them, and that at present it has resulted that the gas attacks are no longer feared and seldom do any really serious damage.

7. *Cerebrospinal Fever*.—Outbreaks of this rather mysterious affection are quite common in army camps. Infectibility, though it appears to be slight, is not negligible, and it seems probable from later experience that, owing to defective knowledge of its means of spreading, we have not perhaps, in the past, been quite so strenuous in our prophylactic measures as we should have been. Today, whether rightly or wrongly it is difficult to say, we think it advisable to act on the "carrier" theory of the propagation of the disease. Adequate ventilation appears to be essential. We now isolate patients, and contacts, as far as possible, examining the latter bacteriologically to try to determine whether or not they may be possible carriers; we disinfect bedding and other formites; we destroy food and waste matter in infected premises. The throats of carriers are swabbed with 3 per cent. iodine in glycerin or some equivalent solution, or spray is used as an alternative. As it is thought possible that flies may act as vectors, they and their breeding places are attacked *secundum artem*. Munson⁸ has written convincingly in regard to the prevention of the spread of diseases conveyed by means of the secretions of the nose and throat, taking measles as a text. He emphasizes the importance of ventilation, of fresh air and of sunshine. I am also inclined to follow Wells of Chicago, who says that pneumonia (and other respiratory infectious diseases) could be largely controlled by the popularization of the use of the pocket handkerchief, that is, holding it over the nose and mouth whenever sneezing or coughing. This plan does not seem impossible of realization when we consider the success of the educational campaign of recent years against promiscuous expectoration.

8. *Malaria*.—Owing to the ubiquitous nature of the *Anopheles* mosquito, troops in the field are in most countries exposed at times to malarial infection. This, while not usually dangerous to life in temperate climates, can nevertheless by its effect on the sick reports often become quite troublesome to armies in campaign. It behooves us, therefore, to be awake to the possibility, and in malarious locations, to employ the accepted methods of prophylaxis. The temporary nature of army occupation makes it generally impossible to carry out all the painstaking methods that were employed, for instance, at Panama; still, a great deal can often be done by simple and easily employed means of prevention. The use of the mosquito bar and head net at night (with at least eighteen meshes to the inch) should be employed in camps liable to malarial infection; small pools should be filled in and larger collections of water carefully oiled weekly by spraying (1 ounce of kerosene to each 16 square feet of surface), or treated continuously by a drip can; water tanks should be screened, and old tins, bottles, etc., looked after. The application, on exposed parts of the body, of the essential oils gives some help, though not reliable alone, and something may be done by "swatting" adults locally. The administration of 6 grains of quinin daily proved to be a prophylactic of value in the antimalarial work on the Panama Canal.

Owing to our adequate modern methods of quarantine, *cholera* and *plague*, formerly so much dreaded in camps and wars, are not at all likely to be introduced on the western battle front. If they should by any chance get a foothold, the resulting conditions would most likely prove to be serious. The crowding, on the one hand, and on the other the enormous numbers of rats that are present in the trenches and billets, would make the proper prophylactic efforts very difficult of execution. In the event of the introduction of either of these diseases, I am inclined to believe that the sanitary authorities would promptly try the effect of prophylactic vaccination, for the reason that while the efficacy of this procedure is not fully proved on a large scale, still it has given promise of good results. In addition, the already well established preventive methods of control would, of course, be employed, as they have been so often and so successfully in both hemispheres by the officers of our distinguished Public Health Service.

CONCLUSION

I wish to repeat that this sketch is not by any means intended to cover all the ground of military medicine, and all the diseases of camps and armies; this could not be done, indeed, in the space of any journal article, however concise. I have, however, tried to outline briefly the essential points in the prophylaxis of the most frequent and important diseases that we are likely to encounter on the western front in Europe, particularly those that seem to be in some respects newer developments of the peculiar environmental conditions of the present war.

Even this "indication" has, I am too keenly aware, been imperfectly handled. I shall be amply satisfied, however, if I am successful in arousing the interest of some of our prospective young medical officers in the sanitary aspects of the war and in stimulating them to further study of the literature (cited above) of this so important and timely subject.

THE ABORTIVE TREATMENT OF WOUND INFECTION

CARREL'S METHOD—DAKIN'S SOLUTION *

WILLIAM O'NEILL SHERMAN, M.D.

PITTSBURGH

Nearly all of the truly great discoveries in medicine and surgery have had to combat skepticism, worn out dogmatism and even the open hostility of a large part of the profession before their general acceptance has been obtained. Imagine, for a moment, the trials of those surgeons who, in their broadness of mind, first dared to brave the anger of their brethren in the hippocratic creed when they "cut for stone"; now, all unite in honoring that specialty whose field is so important and beneficent. The great military surgeon of Charles IX, Ambroise Paré, was ostracized and nearly lost his life because he dared to substitute healing balms for boiling oils in the treatment of wounds of war. His use of the hemostatic ligature called forth a storm of protest and was not generally accepted for

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

* By "Dakin's solution," wherever it occurs in this article, I mean neutral solution of chlorinated soda as described in New and Nonofficial Remedies, 1917, p. 141, and in THE JOURNAL A. M. A., Dec. 9, 1919, p. 1777.

years. Still later, Larry, chief surgeon to the great Napoleon, was constantly under suspicion of his colleagues for presuming to overturn their long established tenets. The practice of vaccination and the use of diphtheria and other antitoxins have been, and still are, subject to adversity even after their efficacy has been undeniably established. The first ovariectomy was performed with a hostile and howling crowd outside the house awaiting its outcome.

The contention over antiseptics, and still later, the subject of asepsis, is still within the memory of many today. Such examples might be indefinitely multiplied. These tests, however, which we at first may regard as unfortunate, may quite likely be blessings in disguise, as they serve to separate the wheat from the chaff. Once their sterling worth has been proved, those who offered the greatest resistance to their use are often the first to honor and approve.

The status of the latest treatment for the prevention or abortion of infection, as devised by Dr. Alexis Carrel, is no exception to the rule. Skepticism, jealousy and doubt have been directed against it, to our credit let it be said, largely by others than American members of the profession. Those who have had the best opportunity to study Carrel's method thoroughly and observe its results believe that it ranks as a life-saving, limb-saving and time-saving procedure, almost equal in importance with the advent of antiseptics. It is humiliating but nevertheless true, that sanitation and preventive medicine have far outstripped the advance in the surgical handling of industrial and military wounds, so far as prevention of infection is concerned. During the Spanish-American War, the deaths from sickness outnumbered those from wounds in the proportion of 6:1, bearing out the old tradition that disease is more deadly than bullets. That a startling change has taken place, however, is borne out by the statistics gathered among the Canadian troops in the present war, in which the proportion of deaths due to disease to those from wounds, instead of being 6:1, is but 1:20. These figures include not only those actually engaged but also the entire Canadian contingent from the time of its enlistment during the nearly three years in camp and trench, and represent less than 1.5 per cent. of the total casualties. Out of 5,242 officers and men who have not been killed outright but wounded, of those dying after the first twenty-four hours, 80 per cent. of the deaths have been directly traceable to infection. Furthermore, according to Tuffier, consulting surgeon of the French, 80 per cent. of all amputations have to be performed because of infection, and from 95 to 98 per cent. of all secondary hemorrhages are due to the same cause. While in our own civil and industrial surgery, owing to better facilities for early treatment, these figures may not be so high, still it is true that a large proportion of deaths, amputations and of prolonged disability can be directly traced to infection. The part played by infection and the prime importance of its control

were early recognized by Carrel, who for over two years has bent every effort toward its solution, with the result that now, for the first time in history, we have a method which, if resorted to sufficiently early, will not only positively prevent and abort infection of any sort but will eliminate it in from one to three weeks after it has become fully established.

Carrel, in conjunction with Dakin, who had charge of his chemical laboratory, carried on his work first at Tuffier's laboratory at the Beaujon Hospital, Paris, and later at Military Hospital 21, Compiègne, under the direction of the Rockefeller Institute. The Carrel-Dakin treatment comprehends the direct sterilization of wounds with their subsequent secondary closure by suturing or strapping. The procedure to be successful requires:

1. The proper initial and early care of the wound; clearing and cleansing.
2. The specific antiseptic hypochlorite solution (Dakin's solution) prepared after the formula of Daufresne.
3. The standardized armamentarium of Carrel.
4. An exact application of the principles of a simple but all important technic.
5. Absolute aseptic redressings.

6. Bacteriologic control of the time of closure.

7. Approximation of the margins and closure of the sterile wounds by suturing, lacing or strapping.

The success or failure of the treatment largely depends on the mode of procedure at the first dressing. This is preparatory in character. If necessary, a general anesthetic is employed. Under aseptic precautions, all areas surrounding the wound are shaved and

cleansed with benzin or ether, followed by painting with tincture of iodine. With scalpel or scissors, the bruised or devitalized skin margins are carefully cleared away. Now, with fresh sterile instruments, the entire wound and all its ramifications are laid freely open, permitting of no pockets or secluded recesses. Under careful and delicate exploration, foreign matter, clothing, shell fragments, bullets, unattached bone fragments, infected or likely to become infected tissues, and the tissues which appear to be devitalized are carefully excised. All bleeding points are carefully controlled and blood clots removed. This is necessary because the solution of sodium hypochlorite possesses the property of dissolving blood clots, and hence, if proper precautions are not taken, may cause severe secondary hemorrhages. This constitutes the wide "débridement" spoken of by Carrel as necessary in prompt clearance and cleansing of the wound and subsequent successful application of the treatment.

Chlorinated lime is probably one of the oldest antiseptic chemicals known to science, and from this standpoint, the solution of hypochlorite constitutes no new discovery. The discovery of the combination of this chemical, however, which will permit of its safe use in the living tissues without destroying them, con-



Fig. 1.—Crush of leg, with loss of skin and soft parts; wounds sterilized, and closed by rubber ligature suture and silkworm-gut sutures; excellent functional result.

stitutes the great advance in its use. The antiseptics used heretofore by surgeons have been either too strong, causing destruction and necrosis of the tissues with which they come in contact, or so weak that their effect on the infecting organisms was negligible, thus resulting only in injury to the cells of the tissues without killing the microbes.

After experimenting with some 200 antiseptic solutions, of various kinds and strengths, Dakin at last succeeded in compounding a solution of sodium hypochlorite which was later modified by Daufresne but still known by the name of Dakin. The formula for preparing this solution should now be too well known to demand its rehearsal. Caution should be given, however, that Daufresne's modified formula be not confused with Dakin's original formula. Unfortunately, the latter is in use in various parts of the country, and owing to its greater causticity and lower bactericidal properties, will not give the results claimed for the true Daufresne-Dakin solution (neutral solution of chlorinate soda).

Great care should be exercised in the making of the latter solution, which must contain to be effective, from 0.45 to 0.5 per cent. sodium hypochlorite, the causticity of which has been thoroughly neutralized by adding the proper proportions of sodium bicarbonate and sodium carbonate; the antiseptic thus obtained is absolutely non-toxic, noncaustic and non-irritant to the tissues, and possesses a high bactericidal power. It is from fourteen to twenty-two times as bactericidal as phenol (carbolic acid). Its low cost, together with the possibilities of its use in practically unlimited quantities, makes it an ideal antiseptic. The solution is not difficult to

make. Too much emphasis cannot be made on the necessity of titrating and testing for free caustic every time the solution is newly made. The unstableness of bleaching lime makes this imperative. Certain critics have stated that Dakin's solution is similar to Javel water and Lebarraque's solution. There is nothing in common in the clinical and bacteriologic appearance of wounds treated with Dakin's solution and other hypochlorite solutions. Close examination of the formula will readily disclose the difference. On my return from Europe, I found that few druggists or chemists in the United States were making Dakin's solution properly. In many of the largest cities and hospitals, the solution was faulty, no attempt being made either to titrate or to free the solution from alkali. In many cases, these solutions had been in use for from nine to twelve months. While the end-results were generally better than under other methods, they were far from ideal. Daufresne has been working on a new process of making Dakin's solution electrically. To this potassium permanganate is added to insure greater stability; the details of this work will be forthcoming at an early date.

Sodium para-toluenesulphochloramin, sold in this country as Chlorazene (Abbott) and under different names abroad, is a coal tar derivative, and while it is stable and a very efficient antiseptic, it does not have

the same properties as Dakin's hypochlorite solution. Where Dakin's solution cannot be made, sodium para-toluenesulphochloramin can be used as a substitute, though it should be borne in mind that the hypochlorite solution of Dakin is much to be preferred and is also less expensive.

THE STABILITY OF DAKIN'S SOLUTION

The Coleman laboratories have prepared several hundred gallons of Carrel-Dakin solution (Dakin's solution made according to the technic of Daufresne) and have been frequently asked, "How long will the solution hold up?" In order to answer this question intelligently, they made a series of experiments with solutions kept under various conditions, and tested them at frequent intervals to note the rate of decomposition. The formula used in the preparation of the solution has been published,¹ and is known as the Daufresne technic, as used by Carrel. The concentration of sodium hypochlorite in the solution must be exactly between 0.45 and 0.50 per cent. Below 0.45 per cent. the solution is not sufficiently active; above 0.50 per cent. it becomes irritating.

A series of six half-pint bottles were filled with a solution containing 0.52 per cent. sodium hypochlorite and kept as indicated in Table 1.

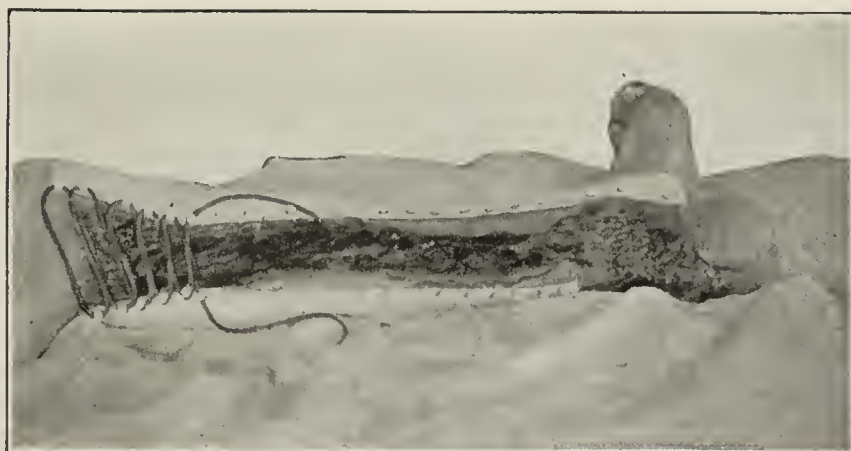


Fig. 2.—Manner of closing with ligature.

Ten c.c. were taken from each bottle, and 20 c.c. of 10 per cent. potassium iodid solution, and 20 c.c. of acetic acid (36 per cent.) were added and titrated with tenth-normal sodium thiosulphate solution, after first being standardized against tenth-normal iodine solution. The results are given in Table 2.

The figures show that:

1. A solution kept in a clear glass bottle exposed several hours a day to direct sunlight decomposes quite rapidly and is useless after several days.

2. The same solution kept in an amber bottle under the same conditions decomposed much more slowly and was satisfactory until thirty-one days after the first exposure.

3. The solution in a flint bottle, exposed only to diffused daylight, remained satisfactory for thirty-five days.

TABLE 1.—CONDITIONS UNDER WHICH SOLUTIONS WERE KEPT

No. of Solution	Kind of Bottle	Conditions
1	Amber	Kept in closet on shelf near floor
2	Flint	Same as No. 1
3	Amber	Shelf in laboratory, getting diffused daylight, but no direct sunlight
4	Flint	Same as No. 3
5	Amber	By window, getting afternoon sunlight
6	Flint	Same as No. 5

4. The same solution in an amber bottle, exposed under the same conditions, shows a much slower decomposition, and is still satisfactory at the end of forty days.

5. The two solutions kept in a closet on a shelf near the floor, in flint and amber bottles, respectively, have shown no difference in the rate of decomposition as

1. Carrel-Dakin Solution, Queries and Minor Notes, THE JOURNAL A. M. A., Dec. 9, 1916, p. 1777.

far as the bottles are concerned. Both solutions are going down slowly, and both contain 0.506 per cent. sodium hypochlorite at the end of forty days' trial.

CARREL TECHNIC

The mode of action of the hypochlorites is not as yet definitely known. Dakin has been unable to find any evidence in support of the theory that their anti-septic action is due to the liberation of oxygen in the presence of organic matter. The application of hypo-

TABLE 2.—RESULTS OF TESTS

Days	1	5	7	14	19	21	26	31	35	40
Sample 1	.522	.522	.514	.510	.510	.510	.510	.510	.506	.506
Sample 2	.522	.522	.514	.510	.510	.510	.510	.510	.506	.506
Sample 3	.522	.522	.514	.510	.510	.510	.510	.510	.506	.502
Sample 4	.522	.516	.502	.487	.480	.476	.469	.461	.450	.413
Sample 5	.522	.510	.495	.480	.476	.473	.465	.458	.435	

chlorite solutions to animal tissues is productive of the evolution of chlorin rather than oxygen. It appears, therefore, that this liberation of chlorin occurs when Dakin's solution is instilled into the wound, and that this chlorin acts on the organic matter present with the conversation of some of the $>NH$ groups of the proteins into $>NCl$ groups, producing new substances which are chemically known as chloramins. These chloramins are known to possess the same bactericidal properties as the hypochlorites do themselves, and it seems probable that it is through their action rather than through the liberation of oxygen that their direct bactericidal effect is obtained. In addition to this direct bactericidal action, Dakin's solution possesses a hyperisotonic effect which results in the flow of lymph from the surface of the wound, thus preventing the usual rapid absorption of toxic products through the lymph channels. This partial reversal of the lymph flow may, at least to a certain extent, account for the well known absence of evidence of lymphatic involvement in infected wounds treated by the Carrel method.

Time will not permit of a detailed description of the Carrel apparatus; nor, indeed, should this be necessary, since there have previously appeared several communications thoroughly describing the apparatus and emphasizing the importance of the equipment as worked out by Carrel. Many of the failures which have been recorded have been due either to the incompleteness of the equipment used or to unwarranted efforts at its modification. Carrel's apparatus was devised solely and entirely for the purpose of enabling one thoroughly to saturate and bathe repeatedly every part of the wound with the solution without the necessity of frequent redressings. For this reason, what may seem an overabundance of the number of tubes should be used in dressing the wound in order that there shall be no part of the wound surface which will not be readily reached by the solution when it is injected. Two, four, eight, ten, twelve and even twenty tubes are necessary in a single wound.

The fluff gauze which is lightly laid between and about the tubes serves only to retain the solution in contact with the tissues during the interim between

the installations, which are carried out every two hours. The gauze also fixes or holds the tubes in position. This time interval between injections has been found by experience to be the most efficient in keeping the wound saturated or bathed with the anti-septic continuously. At no time should so much solution be permitted to enter the wound as will more than fill it and saturate the bedding, but just enough to permit of complete saturation of the gauze dressing. One might look on the method as one of a continuous bath confined solely to the infected tissues. One can readily judge from experience the exact amount of solution necessary completely to lake or puddle the wound. *The method is not one of continuous drip (Murphy), and if this is attempted, failure is sure to follow.* The method is one of instillation under pressure every two hours. The solution should spray from the small holes staggered in the tubes made by a special punch, as water sprays from a rose spray. Certain pharmaceutical firms have placed on the market an apparatus which, if used, would spell certain defeat. The expense of the apparatus, together with the many complications, prohibits its use. Carrel's *standardized apparatus* should be used. *The method is not one of drainage. It is directly the opposite;* the Carrel tubes carry Dakin's solution into

the wound and do not carry anything away. Most surgeons find it extremely difficult to give up their ideas of drainage. They persist in attempting to drain by making numerous counterincisions, and as a result, much of the solution runs away. Dependent drainage is not used unless for special indications. Too many rather than not enough tubes will be found to be beneficial.

As Dakin's solution is somewhat irritating to some skins, it is necessary to surround the margins of the wound for a distance of 3 or 4 inches with bandage gauze impregnated with sterile petrolatum. Bandage gauze No. 4 mesh, from $2\frac{1}{2}$ to 3 inches wide, is cut into suitable lengths; this gauze is placed in trays (catheter trays preferred) and covered with melted liquid petrolatum. It is then placed in an autoclave and sterilized, after which the excess of petrolatum is poured off and allowed to cool. The strips of bandage which are enmeshed with petrolatum can then be readily peeled out of the tray and placed on the skin. This sufficiently protects the skin from any possible ill effects.

The vessel containing the solution should be attached to the head or the foot of the bed, never more than 3 feet above the level of the wound, and should pain be experienced when the solution is permitted to run into the wound, the reservoir should be lowered in order to diminish the force of the stream.

Greatest care should be exercised in the redressing of these Carrel-treated wounds in order that we shall not daily be reinfesting the tissues which we are attempting to sterilize. This is quite possible if any of the instruments or dressings which come in contact with the skin about the wound are used in the wound itself. The dressing should be entirely instrumental.



Fig. 3.—Result, Feb. 7, 1917.

When the dressings are removed, the tubes are taken from the wound and the petrolatum gauze from the surrounding skin. Cotton sponges moistened with commercial ether are then used to remove the excess of petrolatum and to cleanse somewhat the skin areas. This is followed by thorough and careful cleansing with a neutral 8 per cent. solution of sodium oleate followed again by saline and ether to dry the surface of the skin. The petrolatum protectors are then reapplied. The dressing forceps which have been used up to this stage are laid aside and a fresh sterile set employed in reinserting the tubes and fluff gauze. Before this is done, however, the surface of the wound should be lightly cleansed with sodium oleate and salt solution.

The granulation tissues of wounds treated with Carrel's method have an entirely different gross appearance from granulations treated with any other method. They are bright red, resembling much the gross appearance of a cross-section of beef muscle. After the infection subsides, the granulations can be rubbed with gauze sponges, free from pain and bleeding. They are firm and well organized, never becoming superabundant. If the dressings or granulations are painful, infection is present. After the granulations are sterile, reinfection can easily be caused by carelessness in technic. The skin must be scrupulously cleansed at every dressing to prevent infection of the wound. If Dakin's solution is stopped, the wound will rapidly become reinfected. This question is frequently asked: "Can the same results be secured with solutions other than Dakin's hypochlorite?" Emphatically, no. Depage and Carrel in exhaustive experiments tried out a great many solutions (salines, phenol [carbolic acid], mercuric chlorid, etc.), and found that a wound could not be kept sterile with these solutions and that they could not be sutured with any degree of safety.

Ordinarily, dressings are repeated every twenty-four hours, but when necessary, it is perfectly safe to permit them to remain for two or three days. This should not be done, however, if circumstances will permit of daily dressings.

The Carrel tubes are boiled daily before they are used. The linen or silk which ties off the end of the tube is removed, and the interior of the tube is cleansed. If this is not done, collections of débris will be found in the interior of the tube which tends to clog up the tube. The interior of the glass container should be cleaned every day, as a precipitate tends to form on the bottom of the container which rapidly becomes caustic, and if allowed to remain will cause burning and much discomfort to the patient. If the patients complain of pain or discomfort, one can be sure that the solution is either caustic or there is some error in the method of introducing the solution. The Turkish towel covered tubes are used *only* for the superficial wounds. They remain more firmly fixed than the plain rubber tubes.

Every aseptic and antiseptic precaution must be carefully carried out from the beginning to the end if success is to be obtained. While the method is very exacting, it is not difficult if the principles are thoroughly mastered. A dressing carriage should be so arranged as to permit of its being used in the surgical wards. This table or carriage contains: trays for plain Carrel tubes (assorted sizes); for Turkish towel covered tubes; two trays for petrolatum gauze (various sizes); sterile forceps and hemostats, scissors and scalpels, for soiled instruments and for soiled Carrel tubes that are removed at dressing; one ether bottle; jar for cotton sponges, for small gauze sponges, for large gauze fluffed sponges, for flat gauze sponges, and for Turkish towels; three half gallon bottles containing sodium oleate solution, Dakin's solution and physiologic sodium chlorid solution; jars for bandages; one irrigation bottle, and three small basins for Dakin's solution, saline and sodium oleate. If the dressing carriage is conveniently arranged with this equipment, sponges, instruments, gauze, etc., the great majority of the dressings can be done in the general ward. This work can be so organized that while more time and detail are required, little or no difficulty is encountered in the thoroughness with which the dressings are being made. The time consumed in making

the dressings is more than compensated for by the great saving of time in the convalescence.

In order thoroughly to master the method, one should spend at least three weeks observing the treatments. Special instruction should be given physicians and nurses in all the detail; one cannot follow the method or secure the remarkable results of Carrel unless one is thoroughly familiar with the method. Those who decry the method are

not familiar with the technic, which represents 80 per cent. of the cure. We have had no difficulty in instructing interns and nurses so that in a short time they all become proficient. I have trained a nurse to make the smears, stain counts and keep the bacterial charts so that this feature of the method is now being done very well. The method is not difficult, but it is exact, and one must master the details, or failure is certain to result.

TREATMENT OF INFECTIONS OTHER THAN THOSE OF WAR

The Carrel technic with Dakin's solution is undoubtedly a specific so far as infection of wounds is concerned. It not only aborts infection if used early, but cures it when once established, provided the focus is within reach of a Carrel tube. It is being used successfully in the treatment of suppurations following radical operations on the frontal and the mastoid sinus, and infections about the mouth and teeth (if a technic can be devised in the treatment of pyorrhea, one can hope for success; the present technic is to follow the mechanical cleansing of the teeth by packing around the gums loose pledgets of cotton, this cotton to be kept saturated with Dakin's solution by applying the



Fig. 4.—Crush of leg, Jan. 16, 1917; all tissues severed except posterior tibial artery, and soleus and gastrocnemius muscles; extremity saved from amputation with regeneration of bone, soft parts and skin; granulating wound healed with skin graft.

solution with cotton applicators for five minutes every hour; the peridental membrane is also injected with a platinum syringe); suppurating glands and abscesses of the neck, empyema, fecal fistula, walled off abdominal abscesses, suppurating tuberculous lesions, osteomyelitis, suppurating joints, chanroidal infections, ischio-rectal abscesses, cystitis, uterine infection (technic of author), and infection in wounds following operations, etc.

The introduction of a tube into a sinus leading to necrotic tissue will not sterilize the infected area; all infections must be freely opened and the necrotic tissue must be removed. If this is followed by Carrel's method, suppuration is held in abeyance. If a rubber perforated tube is introduced into a sinus, the walls of the tube come in close contact with the walls of the sinus, plugging up the holes in the tube and preventing the solution from bathing the infected areas.

In order definitely to know the progress in treatment, it is absolutely necessary to make frequent bacteriologic examinations. This is done every second or third day. The technic is simple. A smear with a platinum loop from the surface of the wound is made on a glass slide and stained with one of the simple stains. It is then examined under a one-twelfth or one-sixth oil immersion lens, and the number of bacteria per field noted on the bacterial chart. When this number fails for three successive counts to an average of one microbe to five fields, twenty fields being examined to secure this average, the wound may then be considered surgically sterile and capable of being closed without danger of subsequent suppuration.

If possible, closure should be made by suture. The granulation tissue over the surface of the wound is removed, the edges of the skin freshened, and raised over the underlying tissues to permit sliding the skin margins together. If the tension is too great, lateral incisions may be made to permit of easy approximation of the skin margins. If suture is impossible because of loss of tissue, the wound may be laced or strapped together with adhesive plaster. The lacing is accomplished by gluing strips of flannel along the edges of the wound by means of a special glue. Attached to the edges of the flannel strips are numbers of ordinary shoe hooks about one half inch apart. The laces are of rubber similar to the old McGraw ligature.

Under bacterial control, from 90 to 99 per cent. of wounds may be closed and union obtained by first intention.

The appearance of these wounds when healed is extraordinary and very typical. They resemble nothing so much as postmortem wounds (C. L. Gibson) in that there is no redness either about the stitches or along the line of incision, and neither drainage nor swelling.

COMPARATIVE RESULTS OF THE CARREL AND OTHER METHODS

I had excellent opportunities to study the various methods of wound treatment used in the English, French, Belgian, American and Canadian base hospitals. *Practically every wound seen except those treated by Carrel's method was infected.* The mortality from infection being high, amputations unnecessarily common, with secondary hemorrhage a frequent occurrence, thousands of the wounded were crippled for life beyond the possibilities of surgical repair. Many of the wounded were returned to Canada and sent to their homes uncured, the latent effect of infection in bones, joints and cicatrices being present.

There were few surgeons who believed that wounds could be sterilized and sutured, because it had never been done before. They refused to accept the technic of Carrel, and persisted in maintaining that there was nothing new in the method. This attitude on the part of those who strenuously opposed and fought the Carrel method has greatly retarded the general acceptance of the method. In France, Tuffier, Gosse, Lyle and Carrel were the only ones using the method cor-

rectly. Depage at La Panne, Belgium, was an enthusiastic supporter. Not one hospital in England was using the method at the time of my visit there in July and November, 1916. Pedro Chutro at the Hospital Buffon, Paris, was daily demonstrating the fact that suppuration when well established could be cured, and that these infected wounds could be sutured or closed with adhesive plaster, with union by first intention. The contrast between the patients of Chutro and those treated by other methods was striking. Sepsis, anemia, pallor,



Fig. 5.—Appearance, January 30, of injury shown in Figure 4; arrow points to hole through leg; shin bone appears just below this hole.

emaciation, high temperature or pain was not seen in the cases of Chutro, Depage, Carrel and Lyle, because infection was under control. The frightful complications, chronic sepsis, anemias, etc., were to be seen in all hospitals in which Carrel's method was not used. Tourniquets were to be found in every ward and frequently seen attached to the bed in anticipation of secondary hemorrhage—the result of infection.

From information given me by Tuffier, Sir Alfred Keogh (surgeon general of the British army), Pedro Chutro (professor of surgery at the University of Buenos Aires, Argentina) and Dr. Carrel, it would be conservative to say that at least 150,000 lives and 75,000 amputations, with hundreds of thousands of cripples could have been prevented had Carrel's method been made obligatory in the Allied armies. If vaccination against typhoid and smallpox is obligatory, why should the wounded be allowed to die from infection? Carrel's method is a proved specific, and all military and civil surgeons and nurses should receive three or four weeks' instruction in the use of the method if America is to profit from the mistakes of

the Allied army surgeons. The wonderful bravery and self-sacrifice of the wounded entitle them to everything that science has to offer. If the medical profession fails to accept and put into practice this epoch making advance, it is sure to be indicted for negligence and will be held responsible for many deaths, amputations and hopeless cripples that could have been prevented.

ABSTRACT OF DISCUSSION

DR. CHARLES L. GIBSON, New York: History repeats itself. If any of you have read the beautiful life of Lord Lister you will see that Lister failed to receive recognition in his own country for nearly twenty years. On visiting Carrel last year I was able to confirm his statement that he was able to eliminate suppuration. I also had the opportunity of seeing this work done to perfection at the clinic of Dr. Depage of Belgium. He is doing like Carrel, because he took the trouble to learn how. The average idea of Carrel's method is slopping on a solution of hypochlorite, which may not be Dakin's solution. I found many people in Paris condemning the Carrel method, but not one of them had taken the trouble to see Carrel's own results. Depage used the method right, because he not only sent assistants and nurses, but studied it with Carrel at Cambridge. The usual principles of good surgery are as much of a necessity to success with the Carrel method as they always have been. Depage had in one ward eighty fractures treated by the Carrel method. I saw every dressing, and I did not see one drop of pus in these eighty patients! It is said that similar results can be obtained by other methods, but I have got to see such results. These cases of Depage's are treated early. These are ideal conditions and of course are seldom at hand and must be given due credit for some of the good results. If we have to deal with a well established suppuration, we have a different problem; but even in the late cases the method has considerable influence on the suppuration. It has been said that various other methods and substances will give similar results, and Depage carried out a series of control cases. In none did he find anything that would make him wish to give up the Carrel method. Carrel and Dehelly have just written a book, which is published by Balliere, Tyndall and Cox of London, and I recommend a faithful study of it.

In the practical application of the method the particular pitfalls which I have observed are: (1) the improper preparation of wounds and failure to remove foreign bodies, necrotic material, etc.; (2) failure to make free incisions and suitably placed incisions in which every portion of the Dakin fluid can come into direct contact with all portions of the wound; (3) failure to utilize tubes of proper caliber, with suitable perforations as regards size, number and situation; failure to place them so that every portion of the wound is properly moistened by the solution; (4) failure to introduce the fluid under proper pressure so that all of it runs out as a spray and does not trickle out of the first hole; (5) introducing the fluid under too much pressure. Excess of pressure is produced (Carrel and Dehelly) either by too great an elevation of the container, or with small-sized incisions, which prevent the easy outflow of the fluid between the wall of the wound and the tube. This excess pressure is manifested by pain. If the introduction of the fluid at any time causes the patient pain, it must be discontinued and the technical fault corrected. In addition to pain, too great a pressure may result in absorption of the fluid, with resulting hemolysis and possibly death in a short time. It is possible that in certain wounds, as, for instance, an appendiceal abscess in

which a loop of gut presents, absorption may take place, with disagreeable and perhaps fatal results if the condition is not recognized. On one occasion there was quickly produced a change in the patient's condition and transitory jaundice. As soon as these manifestations appeared treatment was discontinued and the patient recovered; (6) failure to place the tubes so that the fluid runs down hill and not up hill, a very frequent source of error, as I have found; (7) failure to locate the perforations in the tubes so that they are all contained within the wound, not allowing the fluid to run out on the skin; (8) the use of too much fluid so that the wounds are drowned out and the fluid runs out on the skin, with disastrous results; (9) the use of packing and tampons in the wound, which prevents free access of the fluid to the bacteria; (10) failure to realize the evanescent character of the hypochlorite and its dilution by wound secretions, in that the wounds are not moistened regularly every two hours as prescribed; (11) failure to protect thoroughly the skin with yellow vaselin smeared on gauze; (12) failure to use the correct solution, which is usually lacking in strength, there being only 0.05 margin between efficiency and danger. In addition to the difficulty of getting perfectly correct proportions of the active chlorin, there is very grave danger of over alkalinity, giving rise to burning and caustic action in the wound. The proper solution should *never* cause any pain. The appearance of pain should be a signal for the immediate discontinuance of the solution and an investigation of its composition.

DR. GEORGE W. HAWLEY, Bridgeport, Conn.: [Dr. Hawley

presented a number of moving pictures of a case being dressed according to the technique as perfected by Carrel after two years' work in his experimental hospital. Each step in detail was demonstrated and explained by legends, followed by a series of cases in different stages of progressive sterilization.]

DR. J. W. LONG, Greensboro, N. C.: The Carrel-Dakin method is one of the very few good things that have come to us from the European war. I arose to say, first, that

one cannot speak too enthusiastically of this method, and, second, it is as applicable in civilian practice as it is in military practice.

Some months ago I sent my first assistant, Dr. H. H. Ogburn, to study the method with Dr. Lloyd Noland, who had spent a number of months in the French army and who had studied it with Carrel himself at Compiègne. As a result we have since been using the method and with the greatest satisfaction.

Recently, just before adopting the Carrel-Dakin method, we had three cases of gas-bacillus infection occurring in patients with compound comminuted gunshot fracture of the thigh. We amputated in each instance. Two of the patients died. The third case, which occurred just as Dr. Ogburn returned, was treated by applying the Dakin solution to the stump after the Carrel method, and was saved.

A woman, ten days after confinement, was brought in with a temperature of 105 F., pulse 140, delirious. The uterus was scraped out gently with a dull curet, the remnants of membrane removed; Carrel tubes were placed in the uterus and stitched into the cervix. The cervix was so rotten that it could not be held with a tenaculum. In forty-eight hours the temperature was normal and in a few days more the woman was practically well.

In a case of acute infectious gangrene of the genitalia in a man we slashed the parts freely (it was like cutting up a banana), then put him in a bath tub, my old plan of treating such cases by continuous bath. Unfortunately, the fever continued, while the sepsis was manifestly increasing. The patient was taken out of the bath, put into bed and Dakin



Fig. 6.—Appearance, April 27, of injury shown in Figures 4 and 5.

solution applied. He was on safe ground within forty-eight hours and made a good recovery.

In every case of acute appendicitis or peritonitis that we operate on we use this method. We put in ordinary drainage tubes also, because as yet I have not the courage to do without them and probably should not in all cases; also two to five or even eight Carrel tubes are introduced. About the second day the Dakin solution is begun.

We are more than pleased with the method, and I am glad to call the attention of the surgical section to the fact that it is just as applicable in civilian practice as in military surgery.

DR. R. W. CORWIN, Pueblo, Colo.: I wish to corroborate the statements made by Dr. Sherman. I was with Dr. Carrel at Compiegne for about four months last year, and what has been stated here today agrees with the work I saw in France. Since returning home we have used Dakin's solution and Carrel's method at Minniqua Hospital with splendid success and great satisfaction. The treatment is painless and the process of healing remarkably rapid.

DR. E. S. VAN DUYN, Syracuse, N. Y.: The greatest emphasis and insistence should be put on the importance and necessity of following exactly and implicitly each and every step of Dr. Carrel's technic. No man has a right to criticize the Carrel method from his own results unless they have been so obtained. The importance of each step in the Carrel method has been fully brought out. In this discussion I will use only the first step to illustrate my point, the necessity of exactly following his method, of understanding the underlying intent and of long practice in the technic. After studying Dr. Carrel's own work in his hospital at Compiegne and adopting his method in our hospital, we obtained with each new train of wounded quicker and better results as our ability and accuracy in the use of the method increased.

The first step in the method is the proper preparation of the wound. Heretofore we have been accustomed to follow two principles in the primary care of wounds: (1) to conserve all tissue possible; (2) to insure free drainage; the latter by dependent drains and counter openings. Both of these principles are diametrically opposed to those underlying the first step in the Carrel method. He prepares the wound (1) so as to hold the Dakin solution in constant contact with its entire surface, and (2) removes all tissue so traumatized that its vital resistance to bacterial invasion is lowered. For the first the incision should be above, so that the wound will act as a well, not below, and there should be no counter-opening, as this would defeat the purpose of retaining the Dakin solution, which must flush upward and overflow at the top. For the second, loosened pieces of tissue and torn muscle and skin tags, devitalized by bruising and lessened blood supply offer, if attempt is made to save them, as is so often done in an expectant method, little resistance to bacterial invasion and must be cut away broadly. The older the wound the more important is this. Such wounds fill quickly with new growths. Hard, binding and contracting cicatrices never result when Carrel's method is properly followed.

DR. WILLIAM O'NEILL SHERMAN, Pittsburgh: I do not wish to convey the idea that Dakin's solution is a panacea. Not at all. The success of the method is dependent on the thorough, open, wide dissection of the shell track and removal of all of the foreign material and devitalized tissue. It is necessary to spend two or three weeks in study and observation to master it. The criticisms and objections come from the people who have never seen it and know practically nothing about it. It is just as useful in civil practice. In every one of thirty cases of septic abortion the infection subsided. In twelve puerperal infections we have been able to reduce the bacterial count from 60 to 1 or below 1 to the microscopic field. There may be something much better in six months or a year, but to date it has saved life and ought to be adopted in the United States army and navy. I hope some action will be taken to train surgeons in this method.

As to the technic: The skin is cleansed with ether, following that with neutral sodium oleate soap; after that the skin is dried, then bandage gauze enmeshed with liquid petrolatum

is placed along the edge of the wound so that the solution does not injure the skin. The debris is removed from the wound and the tubes inserted into the different parts of the wound and injected every two hours; the dressing is repeated every twenty-four hours. These wounds may be sponged and the sponge will not be blood-stained. The granulations are entirely different in gross appearance from any other granulations. As to the use of the solution in the free peritoneum, I am not prepared to give an opinion. My experience is a limited one in diffuse peritonitis and there is not enough information at hand to make any definite statements at this time. Empyemas and localized abscesses clean up very rapidly. If the infection can be reached with a Carrel tube, it is certain to subside. There are only a certain number of patients who have an idiosyncrasy to burning from Dakin's solution, and those who are burned complain more of the burn than of the wounds.

PERLECHE *

J. E. LANE, M.D.

NEW HAVEN, CONN.

My attention was attracted to perleche about two years ago, when I chanced to see a few cases in New Haven. In looking for literature of the disease I found brief descriptions of it in the larger textbooks of dermatology and of pediatrics, and the translation of a French article in a periodical,¹ but I was unable to find any first hand description of it in the English language. One American dermatologist, Cole² of Cleveland, published notes on a few cases in an article on eczema and pyodermitis. These cases were seen at Jadassohn's clinic in Berne. So, in the literature that has come to my notice, there is no indication that the disease is found in this country. Most of the textbooks say that it is seen chiefly in France (Stellwag, Pusey, Sutton).

I do not know whether the disease is a rare one here, whether it is rarely seen because it causes little inconvenience and physicians are not consulted for it, or whether no one has thought it worth while to describe it because it is of so little consequence.

In New Haven it is quite common, but this fact was discovered by looking for cases with the assistance of visiting nurses and nurses detailed for school inspection. In this way I saw forty or fifty cases in a year and a half. In this paper I shall attempt to give the main features of the disease as gathered from the literature and from my own observations, leaving the less important points for a more detailed paper.

Perleche first appeared in medical literature in 1885, when Lemaistre of Limoges published a careful clinical and bacteriologic study of some 300 cases. Although this was the first appearance of the disease in the literature, it is certain that it had then been known for a long time in some districts of France, for it had acquired several names in the Limousine patois. The same is true of Germany, as was shown by Epstein, who collected a considerable number of popular names for the disease. In Italy, according to Solaro, the disease was also well known, but had remained nameless up to the time of Lemaistre's study.

DESCRIPTION OF THE DISEASE

Although perleche is occasionally found in adults, it is preeminently a disease of infancy and childhood.

* Read before the Section on Dermatology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Buffalo Med. and Surg. Jour., 1886-1887.

2. Cole: Arch. f. Dermat. u. Syph., 1913.

It is an affection of the labial commissures, almost always bilateral, and usually rather closely limited to the commissures. As it progresses, the process extends for a varying distance toward the center of the lips, and usually extends a little on to the skin surface and on to the true mucous membrane of the inner side of the lips. At the beginning of the disease the epithelium is smooth and whitish, with a mother of pearl tinge. As it progresses the epithelium becomes macerated, a little thickened, and loses most of the mother of pearl color. Small transverse fissures appear, which show a red base, if the lips are stretched, but which do not reach the lower layers of the epidermis, and which do not bleed readily even if rubbed. In some cases there is slight erosion, but the surface is ordinarily not denuded. One well known textbook on the diseases of children describes perleche as a "form of ulceration" and adds that "the ulcer is of a grayish color, is quite painful, and is associated with considerable swelling of the lip." According to other authors and to my own observations, this is exactly what perleche is *not*. It is never an *ulceration* and there is no swelling of the lips connected with it. There is little or no inflammatory area around the lesions. Occasionally a little of the pellicle can be detached and more infrequently there is some hypertrophy. As the lesions begin to heal their appearance approaches that of the early lesions and after the roughness has disappeared there remains only a slight discoloration which persists for a month or so. No scars are left. If treated the disease is usually cured in two or three weeks. If left to itself there is usually spontaneous cure in a month or so unless there is reinfection, but in some cases it is of indefinite duration. In one case which I left untreated the whitish color was still visible at the end of a year.

In the mild cases of perleche there are no symptoms at all. In the fully developed cases there is a slight feeling of irritation which causes the child to continually run the tongue over the lesions. It is from this sign that the disease derives its name. There is never enough discomfort to cause the child to rub or pick the lesions. There are no other symptoms or physical signs. There is never more than the slightest local inflammatory reaction and the lymphatic glands are never enlarged. Impetigo, desquamation of the tongue and impetigenous stomatitis are sometimes associated with the disease, but in my cases there was no such association.

Lemaistre considered perleche to be caused by a streptococcus which he called the *Streptococcus plicatilis*. Several investigators following him considered the staphylococcus the causal agent. At present all agree with the most recent writers, Cole and Jadassohn, that the streptococcus is probably the causal agent, but that it can not be considered absolutely proved to be such, until we have succeeded in reproducing the disease in animals or human beings. Bartlett of Yale University kindly made cultures from twenty of my cases. Two or more varieties of bacteria were found in practically every case, but the streptococcus was the only one present in all cultures. This streptococcus in liquid mediums grew in long chains. On blood agar it produced a slightly greenish color, with little or no hemolysis. A few unsuccessful attempts were made to reproduce the disease in guinea-pigs with this organism.

Considering perleche a streptococcus infection, many observers classify it as a variety of impetigo.

Clinically this appears to me to be hardly justified, because the two diseases are not more frequently associated than may be accounted for by coincidence. None of my own patients had impetigo though they were all in the class of patients in which that disease flourishes. In my cases of perleche that extended on to the skin surface, there was not the slightest resemblance to impetigo, and the cases of impetigo that I have seen at the angles of the mouth bear no resemblance to perleche. In fact, in my experience, impetigo usually stops at the edge of the skin, and does not extend on to the vermilion border of the lip. It would seem that if the diseases were identical, they would be frequently associated at the corners of the mouth, and that their appearance in this location would not be so entirely different. It may be, that while the streptococcus is an essential element in the causation of the disease, the association with it of some other bacteria is also essential, a condition of affairs somewhat similar to that found in Vincent's angina.

Auché studied the histopathology of one case of perleche and found cellular infiltration of the connective tissue of the papillae, dilatation of the blood and lymphatic vessels, thickening of the interpapillary plugs, enlarged intercellular spaces in the prickle cell layer with leukocytic infiltration, and, in the upper part of this layer, serofibrinous infiltration and some intercellular cavities filled with polymorphonuclear leukocytes. Some of the prickle cells were degenerated, opaque and without nuclei.

Perleche is highly contagious. Lemaistre found 312 of the 5,500 children in the primary schools of Limoges affected, a little over 5 per cent. Raymond describes two epidemics; in one, forty-two of the 155 children of one school were affected; in the other, twenty-five of the 245 children. I have seen five cases in one family, and two or three cases in several different families.

Common drinking utensils are the most frequent vehicles of transmission. Other ways in which it is spread are kissing and the use of common pencils, handkerchiefs and towels.

DIAGNOSIS, PROPHYLAXIS AND TREATMENT

The diseases mentioned as likely to be confused with perleche are herpes labialis, eczema, stomatitis and syphilis. No careful observer would confuse perleche with any of these diseases except syphilis. Perleche so greatly resembles the mucous patch or split papule that Fournier said that every practitioner who sees perleche for the first time never fails to take it for a mucous patch, and both he and Raymond asserted that the resemblance is so great that perleche is not to be differentiated objectively from the corresponding types of syphilis. However, this difficulty largely disappears if the mouth and the surface of the body are carefully examined, because secondary syphilis does not betray itself simply by mucous patches at the commissures.

My own observations are in accord with these statements. Nothing except syphilis could seriously be considered in making a differential diagnosis. A person acquainted with the disease would run little danger of confusing the mild cases with syphilis. In the more advanced cases it would have been impossible to make the diagnosis from the lesions alone, but in no case was there any doubt after a complete examination of the patient. In a larger series of cases it is likely that there would be some which could not be

settled in this way, but at the present time a doubtful case should be easily cleared up by the dark field or by the Wassermann reaction. If any doubt remained, brief treatment would settle the question.

What has already been said sufficiently indicates the prophylactic measures needed to stop the spread of the disease. The treatment is most simple. Prompt cure is effected by painting the lesions daily or every other day with a 10 per cent. solution of silver nitrate, a diluted tincture of iodine, and the copper sulphate of the alum pencil. Sabouraud recommends in addition an antiseptic mouth wash, but this is hardly needed in most cases. Auché found a 5 per cent. solution of chromic acid efficient in the few cases that resisted the milder treatments mentioned.

NOTE.—This paper was written some weeks ago, and the work on which the paper is based was finished before the beginning of this year. A few days ago, I saw in THE JOURNAL an abstract of a paper on perleche by A. L. Smith,³ of Lincoln, Neb. I saw this abstract too late to consult the original paper, but the title indicates that 223 cases were studied, and I should judge from the abstract that my conclusions substantially agree with those drawn by Smith

ABSTRACT OF DISCUSSION

DR. HAROLD N. COLE, Cleveland: I believe that Dr. Montgomery of San Francisco has written something on perleche, and also the late Dr. Edward Cushing of Cleveland.

DR. WILLIAM A. PUSEY, Chicago: I think Dr. Lane has performed a service in calling our attention to perleche in the way he has. The name is an attractive, short and distinctive word to describe a condition which we have all seen for a long time. When I first read the accounts of perleche I was a good deal confused as to what the condition was. Later I saw a statement, by Sabouraud I think, that perleche is an impetigo at the corners of the mouth. Since then my conception of it has cleared, and I have thought of it as a pus infection at the corners of the mouth due to maceration and lack of care in dirty children, and that impression is confirmed by what we have heard from Dr. Lane. I think the name perleche is a good one to add to our dermatologic nomenclature to describe a distinct clinical picture.

DR. PHILIP KILROY, Springfield, Mass.: While it is true that perleche is only a localization of a streptococcus infection, or of impetigo contagiosa, it is an important one for the reason that it is mistaken frequently for secondary syphilis. Perleche is common. It is found in children as a complication of ordinary impetigo; and like retro-auricular intertrigo, or intertrigo under the breasts in women, is merely a localization of streptococcic infection. I believe the real cure to be copper sulphate. In the country districts, where we have to cure quickly, we cure impetigo in twenty-four hours. The lesions are thoroughly washed, and then, according to the age of the patient, from 0.5 to 1 per cent. solution of copper sulphate is applied; sometimes 1 to 2 per cent. of zinc sulphate is combined with the copper, but I doubt if the zinc helps any. The patient is told to apply the copper solution the first time thoroughly around the edges, between the epidermis and dermis, with a wooden toothpick or similar instrument, as Dr. Marrow applies his silver nitrate, and then to touch the lesions with the solution every hour or half hour for twenty-four hours. The only resulting unsightliness is a greenish crust; when this is washed off there remains a slight redness, but the impetigo is cured.

DR. GEORGE MANGHILL OLSON, Minneapolis: I have seen a number of cases of perleche in Minneapolis in nervous young girls who lick one corner of the mouth and then the other. Perleche is impetigo contagiosa brought on by this trauma in many of the cases.

DR. W. C. BROWNSON, Asheville, N. C.: I think Dr. Lane has given an admirable description of perleche, which will

now be recognized as an American disease and not something exclusively French. It is not limited by any means to children, as we have been led to suppose. I have frequently seen it in adults. I saw a social worker on my way up who has had the trouble for two years. I attended him and thought he had been cured; his wife has not shown any signs of the trouble. Whether they indulge in the reprehensible habit of kissing on the mouth, I do not know. I have promised to cure him after he gets back home, but it is an unusually persistent case, evidently.

DR. JOHN E. LANE, New Haven, Conn.: Sabouraud calls perleche "impetigo commissural," and when I publish the subsequent paper I shall give a large number of other names that have been used. One of them is "angulus infectiousus oris." I do not wish to be understood as asserting that perleche and impetigo are different affections, as I think that question is not settled but that it will soon be settled. My reasons for not classing it as an impetigo at present are entirely clinical. Lemaistre, who had more experience with the disease than any other observer, never saw impetigo and perleche in the same person, and in hospital wards and schools he never saw perleche give rise to anything but perleche, and never saw impetigo cause perleche.

I am very much interested in Dr. Brownson's statement that perleche is common in the South, and in his statement that he sees it in adults. It has been described as occasionally seen in adults, but I have never seen a case.

As to treatment, the mouth wash recommended by Dr. Kilroy is perhaps wisely prescribed in all cases. Sabouraud also recommends it. Miller reports a number of cases in which he was compelled to use atropin to stop excessive salivation in order to effect a cure. In my own cases, cure has been prompt with the simple measures I described.

INVESTIGATIONS AS TO FREQUENCY OF METASTATIC EYE INFECTIONS FROM PRIMARY DENTAL FOCI

PRELIMINARY REPORT *

JOSEPH M. LEVY, D.D.S.

NEW YORK

ASSISTED BY

WILLIAM F. C. STEINBUGLER, M.D.

BROOKLYN

AND

MARSHALL CARLETON PEASE, JR., M.D.

NEW YORK

It must be realized that ideal research conditions cannot be obtained in investigations such as we are reporting on, for the reason that the ailments for which the patients are presenting themselves are of such a nature that we did not feel justified in eliminating all routine treatment, owing to the danger of possible irreparable damage due to delay, should the dental foci not be the etiologic factor.

In the course of the past year, fifty-seven patients with various eye conditions were sent to the dental department of the Herman Knapp Memorial Eye Hospital for dental treatment. The diagnosis in these cases and the results obtained were as shown in the accompanying table.

The general impression which has hitherto obtained is that these metastases occur through the blood stream, but our observations have led us to the conclusion that this belief is not substantiated by the clinical evidence. With one exception, all the patients

3. Smith, A. L.: *Perleche: Its Bacteriology, Symptoms and Treatment in Two Hundred and Twenty-Three Cases*, Arch. Pediat., 1917, 34, 274; abstr., THE JOURNAL A. M. A., May 26, 1917, p. 1581.

* Read before the Section on Stomatology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

cured or materially benefited presented dental infection on the same side as the affected eye. If the belief that these metastases occurred through the blood stream was correct, we feel we should have observed more cases in which cure or material improvement occurred, when the dental infection was on the opposite side from the affected eye. Failing to have seen such cases, we have been led to the conclusion that these eye metastases, occurring from primary dental foci, travel through lymphatic channels. We have recently endeavored to demonstrate the correctness or fallacy of this belief by means of animal experimentation, but unfortunately, the number of experiments carried out so far are too few to arrive at any conclusion. Animals injected intravenously or through lymphatic channels have all died without presenting any eye lesion whatsoever. We have been using rabbits for this work, but as they are particularly susceptible to streptococcus infections and succumb very readily

1917, a roentgenogram of the upper left maxilla showed an apical infection about the roots of the upper left first molar. On the following day this tooth was extracted and a culture made. The culture showed a pure growth of staphylococci from which the vaccine was obtained. The extraction of this tooth was followed by a slight reaction, the eye becoming somewhat redder. On March 14, 1917, the eye was almost white. On the 21st, the fundus examination showed a diminution of the venous congestion. He received two doses of the autogenous vaccine before he left our care, March 26, at which time the eye was white and only slight venous engorgement remained.

CASE 3.—W. R., man, aged 51, Dispensary No. 21026, presented himself Oct. 27, 1916, with a history of redness of the upper lid of the left eye of one week's duration. Examination showed vesicles of forehead and upper lid. The eye was normal. The patient was given aluminum acetate to apply locally in the form of a wet dressing. On November 20, he again presented himself with a history of failing vision of the left eye for two weeks previously. Vision L. $\frac{20}{40}$; the cornea shows an opacity nasally and below and is anesthetic. B. P. 160. The Wassermann reaction was negative, the streptococcus fixation weakly positive. Examination of the teeth revealed a severe pyorrheal condition of the six lower incisors, the only teeth remaining. The extraction of these teeth was advised, but this the patient refused to have done. On November 24, his vision had fallen to $\frac{20}{100}$. On December 4, all the teeth were extracted; at this time the vision was $\frac{20}{200}$, and the cornea was hypesthetic. From now on, his condition gradually improved until on December 27 the cornea was no longer anesthetic and the eye was almost white. On January 12, the eye was white, the vision was $\frac{20}{40}$, and showed only a faint macula as the remnant of the inflammation.

CASE 4.—M. S., woman, aged 27, Dispensary No. 15743, previously presented herself Feb. 26, 1916, with a history of having had the grip two months prior to coming to the dispensary, following which the left eye became painful. She is married, has three children, has never aborted and is otherwise normal. Examination: Vision R. $\frac{20}{20}$, L. $\frac{20}{70}$. The right eye shows four nodules of episcleral and possibly scleral infiltration. They are situated above and temporally, over which areas there is slight congestion. In addition to these nodules there is a vertical band of superficial opacity about $2\frac{1}{2}$ –3 mm. wide, extending from the pupillary margin temporally almost to the center of the cornea, with a smaller band temporally. A roentgenographic examination of her teeth showed apical infection about the roots of the upper centrals and about the root of the lower right second bicuspid. The roots of the upper centrals were filled and the ends amputated and the lower right second bicuspid was extracted. Cultures were made in both instances. The culture from the root ends of the centrals showed the staphylococcus to be the predominating organism. *Streptococcus viridans* and the pneumococcus were present. The culture from the bicuspid socket gave *Streptococcus viridans* as the predominating organism. From this culture a vaccine was prepared. Patient received in all fifteen injections of the autogenous vaccine at intervals of seven to ten days. Following some of the injections there was a slight reaction in the form of backache, headache and an increase in the local redness. When this occurred the dose was diminished. In June, four months after her first visit to the clinic, her vision had increased to $\frac{20}{20}$ and the nodules were very much smaller. The nodules subsequently disappeared and the opacity became fainter.

CASE 5.—F. A., woman, aged 44, Hospital No. 19183, presented herself September, 1915, with a deep keratitis of the right eye for which the etiology could not be found. She gave a positive reaction with tuberculin but treatment with tuberculin did not improve her condition. Thyroid tablets were also given without result. She was treated in this manner until Dec. 12, 1915, when a roentgenographic examination of her teeth showed apical infection about the roots of the lower first molars, the upper left first and second bicuspid and the upper right cuspid and second bicuspid. On the following day the lower left first molar was extracted and on the fifth day following, the root of the upper right cuspid was filled

DIAGNOSIS AND RESULTS IN FIFTY-SEVEN CASES

Diagnosis	Cases	Cured	Materially Improved	No Result
Chronic iridocyclitis	9	2	1	6
Acute iritis	7	1	4	2
Detachment of retina	5	..	..	5
Episcleritis	2	..	1	1
Choroiditis	10	1	2	7
Iridochoroiditis	2	..	..	2
Acute iridocyclitis	5	..	5	..
Vesicular keratitis	1	1	..	..
Keratoiditis	2	..	1	1
Postoperative iritis	3	1	1	1
Cyclitis	1	..	1	..
Corneal ulcer	2	..	1	1
Retrolbulbar neuritis	1	..	1	..
Retinal hemorrhage	1	..	..	1
Chorioretinitis	1	..	1	..
Interstitial keratitis (nonspecific)	1	..	1	..
Neuroparalytic keratitis	1	..	..	1
Dendritic keratitis	2	1	1	..
Sclerosing keratitis	1	1	..	..
	57	8*	21†	28‡

* 14 per cent.; † 36.85 per cent.; ‡ 49 per cent.

thereto, we feel we shall have to secure animals less susceptible in order to carry on further investigation.

Believing it may be of interest, we will briefly outline a few typical cases:

CASE 1.—C. B., man, aged 34 years, Dispensary No. 15267, presented himself Feb. 2, 1916, with the history of blurred vision of the left eye for the past four days. He had had a similar condition a year previously and was treated at that time for choroiditis and glaucoma. On examination vision in right eye was $\frac{20}{20}$, left. $\frac{20}{30}$. Vitreous opacities and choroidal patch in lower temporal region of the left eye. Diagnosis, choroiditis. Urinalysis was negative, as was also the streptococcus complement fixation. An examination of the nose and sinuses excluded them as possible etiologic factors. Feb. 14, 1916, the upper right cuspid and second bicuspid were roentgenographed, disclosing an apical infection about the root of the cuspid. This tooth was extracted and a culture made from the root end and the curettings from the socket. Culture gave *Streptococcus viridans* as the predominating organism. Feb. 19, 1916, five days after the extraction of the cuspid, vision was $\frac{20}{20}$ and the eye was much clearer. It cleared up entirely in a short time and has remained so since.

CASE 2.—J. K., male, aged 24, Dispensary No. 23416, presented himself March 2, 1916, with a history of pain and inflammation in the left eye for one week. The patient gives the history of having had syphilis and gonorrhea recently. Has had considerable disturbance from one of the teeth in the upper left maxilla. Examination: Vision R. $\frac{20}{20}$, L. $\frac{20}{30}$; conjunctival and ciliary congestion. The left pupil reacts sluggishly and the iris is greenish in color. Internally, the eye shows congestion of the retinal veins. The Wassermann and gonococcus complement fixation were negative; the streptococcus complement fixation, weakly positive. On March 7,

and the end amputated. A vaccine was prepared from a culture taken at the time of the root amputation. She was given this autogenous vaccine and her condition gradually improved. Two weeks following the root amputation, the eye was clear and the pain had completely subsided. When last seen in October, 1916, her vision was normal and there were only a few deposits remaining marking the site of the old infiltration.

CASE 6.—W. J., man, aged 71, Hospital No. 19898, was operated on for a mature cataract of the left eye June 20, 1916. The second week the eye became inflamed. Patient had recurring attacks of iridocyclitis, sometimes with the development of hypopyon. The Wassermann and the streptococcus complement fixation were negative. On July 6, 1917, the upper left bicuspid (first) and upper left first molar were removed. This was followed by considerable local improvement. The patient subsequently had two more attacks of iridocyclitis. On August 21, a roentgenographic examination showed abscesses about the upper left second bicuspid, lower left first molar, upper right first and second bicuspid and upper right lateral. Later the lower left first molar was removed and a culture made from the socket gave a pure growth of *Streptococcus viridans*. Following the clearing up of these dental foci, the eye improved and no further iritis occurred.

CASE 7.—J. S., man, aged 42, Hospital No. 20251, presented himself Nov. 3, 1916, with the history of having taken "cold" two to three weeks previously, following which the right eye became red and discharged pus. He continued at his work and did not consult a physician until the day before admission to the hospital. An examination of the secretion from the conjunctival sac was negative. A grayish infiltrate, irregular in outline, ran across the lower half of the cornea, somewhat dendritic in shape. The cornea was hypesthetic. The streptococcus complement fixation was negative. On Nov. 13, 1916, roentgenographic examination showed abscesses about the roots of the right central, lateral, cuspid, first bicuspid, first and third molars, also the upper left central. All these teeth were removed. Following the extraction, the patient made a rapid improvement and was discharged cured.

CASE 8.—E. O'R., man, aged 22, Dispensary No. 22729, presented himself Jan. 29, 1917, with the history of an acute inflammation of the left eye of three days' duration. The history was negative, with the exception that the patient had had a severe cold just before applying for treatment. The patient admits having poor teeth. Examination gave vision R. $\frac{20}{100}$, L. $\frac{1}{200}$. Pupil narrow, anterior chamber filled with exudate. Urinalysis negative; Wassermann and gonococcus complement fixation negative; streptococcus complement fixation +. Patient did not improve under the usual treatment for acute iritis. A roentgenographic examination of his teeth revealed abscesses of upper left first bicuspid, first molar, lower left third molar, upper right first bicuspid and first molar. These teeth were extracted and there was an immediate improvement in the condition of the eye, the vitreous, however, still remaining hazy. At the time of discharge the patient's vision had increased to L. $\frac{20}{100}$ and the vitreous had cleared up considerably.

CASE 9.—W. O'C., woman, aged 27, Dispensary No. 22024, presented herself Dec. 21, 1916, with the history of having had an attack similar to the present one, in both eyes, at the age of 13. For the last five months the left eye has been bothering her. She complains of poor vision, redness and photophobia. The family and the personal history are negative. Examination: Vision R. $\frac{20}{40}$, L. $\frac{20}{100}$. The left eye shows numerous opacities, eight or nine in all, of irregular size and shape in the substance of the cornea. Some of the patches are white, others grayish. The Wassermann reaction, urinalysis and examination of the nose proved to be negative. Patient was given 1 mg. of tuberculin T. O. but did not react. A roentgenographic examination of her teeth showed abscesses over the upper left lateral and first bicuspid, also about the lower left first molar, right first bicuspid and upper right third molar. On December 23 the roots of the lower left first molar were extracted and on the 26th the upper left lateral and first bicuspid, upper right second bicuspid and third molar were extracted. Patient's condition did not improve until some time later. Six weeks after extraction of the

teeth the vision of the left eye was $\frac{20}{40}$ plus, and the cornea was decidedly clearer.

CASE 10.—M. J., woman, aged 30, Dispensary No. 19480, presented herself Aug. 12, 1916, with the history of having had pain in the right eye for two weeks. Patient says she had a previous similar attack in 1903, at which time she was treated for eleven weeks. The Wassermann reaction was + + + +. Later the left eye became involved, and she was admitted to the hospital on Nov. 10, 1916. She did not improve under the routine treatment for cases of specific iridocyclitis, which treatment included mercurial inunctions and injections. On November 19, a roentgenographic examination of the teeth showed apical infections about the roots of the upper right lateral, second bicuspid, lower right third molar, upper left central, lateral first bicuspid, upper and lower left third molars. All these teeth were extracted, giving almost immediate relief from pain. The patient from then on made a rapid and uneventful recovery.

It will be noted that a fraction over 50 per cent. of the cases were either cured or benefited by dental treatment. It is not meant that the conclusion should be drawn that 50 per cent. of infectious eye conditions will be benefited or cured by dental treatment, but that when dental infection is present, coincidentally with an infectious eye condition, there is a strong probability that the dental foci may be a material etiologic factor.

We would again call attention to the fact that in all but one of the cases enumerated, dental infection has been on the same side with the affected eye.

Owing to the fact that the usual dental examination is of a very perfunctory nature, it is perhaps not out of place for us to warn the ophthalmologist to satisfy himself that a careful roentgenographic examination has been made of all suspected teeth before excluding them as a possible etiologic factor in infectious eye conditions.

28 West Eighty-Ninth Street, New York—94 Lenox Road, Brooklyn—155 East Sixty-Second Street, New York.

ABSTRACT OF DISCUSSION

DR. MEYER L. RHEIN, NEW YORK: I do not agree with Dr. Levy in regard to the deduction he makes from the complement fixation test. He says he places very little reliance on a small positive result. This is not at all in conformity with my own clinical experience with this test.

As mentioned elsewhere, up-to-date there have been over 150 strains isolated, and we do not know at present how much further these strains may go. Consequently a negative streptococcus fixation test does not necessarily prove that there is not a streptococcus infection by a strain that has not been used for comparison. I have been using the test extensively for a year and a half, and my own clinical deductions are that even a small positive test is of great diagnostic value. There is a great deal of uncertainty about it, but I do not think that it is fair to the test to draw the conclusions the essayist draws in his remarks. The one case he cites in which there was a negative test and in which staphylococci instead of streptococci were found, calls to our attention how frequently we may have this source of infection instead of the streptococcus, and of course if there is any great proportion of this form of infection, it presents an entirely different point of view relative to the complement fixation test and everything pertaining to it.

There is a strong possibility that both of these microorganisms may be found; that is, in certain cases either one may be the attacking organism. I think this is a valuable form that investigations should take, and while it is of value, I feel that the investigator attached too much importance to the negative result of the fixation test.

DR. MORRIS I. SCHAMBERG, NEW YORK: I am not connected with any eye institution and have not observed as many cases as Dr. Levy. I have had probably five cases in the last two

years, among which a most refractory recurrent iritis on the right side was directly attributable clinically to an infection on an upper left molar tooth, which might have escaped attention even with the help of the Roentgen ray if I had not used common sense in conjunction with it. There was nothing to suggest rarefaction at the apex, or any evidence of infection. A shadow in the picture showed a large filling which appeared to project into the pulp chamber, and I assumed it was pulpless. After applying the termal test I decided to remove the tooth to make a culture from it. After the removal of the tooth the eye cleared up, though it did not occur for some time.

Eye cases respond almost as rapidly without vaccine treatment as with it. In one recurring case vaccines were administered with very gratifying results. Another case of iritis in a woman aged 86 defied treatment by the ophthalmologists and did not respond in any sense until I looked into the mouth. Nothing in the roentgenogram indicated infection or deep seated pyorrhea. I noticed, however, that there was an offensive breath, and that the fold at the gingival border was rather deep. I used tincture of iodine and alcohol in equal parts, having the part sprayed three times a day, and had a nurse make applications to the eye, spraying forcibly into pockets a bland antiseptic, every half hour, and with that treatment the eye improved, though it had not responded until the mouth treatment was instituted.

I would sound a note of caution against the conclusion that the lymph channels are the means of transmission of infection to the eye. I believe the complement fixation tests and the blood cultures are just as uncertain as our findings in Wassermann examinations; in fact, I think more so. I feel that there is a great deal to be learned about these various tests, and I know that it is almost impossible, even though there are organisms circulating in the blood, for the average pathologist to recover them and grow them.

The same thing applies in connection with the test Dr. Levy proposed, the injection into the lymphatics. I am convinced that if autogenous vaccines are used in the blood stream, these antibodies formed will eventually reach the lymph channels, and if injected into the lymph channels they will reach the blood stream. I offer that as a suggestion.

DR. THOMAS L. GILMER, CHICAGO: I should like to ask a question. As a preface to this question I would say that those of us who have made a study of the bacteriology of alveolar abscesses and made animal inoculations, have used the vein of the ear to introduce the organisms. As a result we have found ulcers in some organs and hemorrhages in many parts. In our work at St. Luke's Hospital we found as a result of such inoculations 20 per cent. of hemorrhages in the periosteum of the jaw, and about the same in the joints. Does this not seem to indicate that the organisms go directly through the blood stream?

DR. JAMES H. KELSEY, ERIE, PA.: I should like to make just a few remarks in corroboration of Dr. Levy's paper, and to mention one or two personal experiences that I have had in connection with teeth and eye conditions. Dr. David N. Dennis, a well known oculist in Erie, and I have cooperated to some extent in the last year and a half, and I have been able to compile records on some fifteen to twenty cases of eye conditions that have been benefited by dental treatment. I have in mind a few patients who have definitely assured me of the connection between eye conditions and teeth conditions; in one case particularly, that of a young man about 18 years of age, who had a neuroretinitis, a rather bad case, a Wassermann test was found negative, the spinal fluid was taken, nose examined, the Roentgen ray showed the sinuses normal, and so on; everything possible had been done until he was referred for dental examination and diagnosis. We found an upper right first bicuspid showing a small granuloma. To hasten results, on account of the severity of the eye condition, this tooth was extracted. The eye cleared within a few days. The rest of his teeth were examined, and found apparently in good condition, but about three months afterward there was a recurrence of his eye trouble. Another thorough examination of his teeth disclosed a hidden cavity in the bicuspid on the opposite side from the one mentioned.

The pulp was partially dead, and answered tests for both a vital and a nonvital condition. I extracted that tooth and the eye condition cleared up again within two or three days. Since then, as I understand, there has been no recurrence.

In my experience eye conditions have had more to do, perhaps, with the ten upper anterior teeth than with any of the other teeth in the mouth. Another case was of a right central incisor with an apical infection that held a gold crown. The crown was removed and the tooth drained; within a few days, the eye condition cleared. I left the tooth open, and later closed it up, thinking perhaps it was all right. I sealed it hermetically with cement, and within a day or two the same eye condition presented itself again. I removed that filling, drained it again and treated the tooth further, and in the last eighteen months there has been no recurrence.

In one case of eye trouble we found a pyorrhea pocket around an upper third molar and nothing else wrong. We made a vaccine from this pocket, extracted the tooth, curetted the socket and used this vaccine for some time, and with local eye treatment the condition cleared, but prior to that for some months the patient had considerable trouble, everything else possible having been done.

DR. G. V. I. BROWN, MILWAUKEE, WIS.: In this discussion it seems to me we are assuming that because there is iritis and an abscessed tooth, that *ipso facto*, the eye trouble must be the result of the infection. That does not follow at all. It may still come from the tooth, but it seems to me that the newer study of nerve conditions in that region supplies a very much more simple reason why my friend got a more direct result in the relief of his case than he could have expected from an infection, because he had a direct nerve relief. Later investigations show that there is a much more direct connection than has been thought between the ciliary ganglion and the fifth nerve, so that the tooth which was extracted might easily have supplied the cause and the correction; whereas no amount of investigation and no test, complement fixation or anything else, could have demonstrated that the iritis was the result of infection. I am not saying it was not, of course, but I do not think in this discussion we ought to ignore this newer study of nerve conditions and look fixedly on the side of infection all the time.

DR. JOSEPH M. LEVY, NEW YORK: I believe the last speaker might be justified if we were only discussing iritis, but I wish him to recall that we have other cases and other eye conditions which have responded to dental treatment. One thing I will say in substantiation of the statement made by the last speaker. No one, I believe, among all those investigating these metastatic eye infections has ever been able to produce a bacteriologic culture from tissue taken from one of these eyes, and only once has anybody ever claimed to have produced an experimental iritis by animal inoculation.

Whenever I have drawn the conclusion that the eye condition may have been due to a primary dental infection and that there had been an infectious process in the eye, it was because I have had the authority of Dr. Knapp and his staff at the hospital that such was the case. I am not drawing conclusions as to whether an eye condition is or is not due to either nerve irritation or infection, because I believe it is just as foolish for me to make a diagnosis about the eyes as for the ophthalmologist to make a diagnosis about the teeth. If the ophthalmologist turns a case over to me as an infectious eye condition, I have to accept his diagnosis. Whether or not this answers Dr. Brown I do not know.

In reply to Dr. Rhein's statement about the species of streptococci, I want to say that some of these streptococcus complement fixations were performed, using as antigens streptococci obtained from cultures made from the teeth and sockets at the time of extraction. We cannot, presumably, get closer to the original organism we want for an antigen than using the one from the culture made at the time of extraction. Of course the conditions under which the cultures are produced are entirely different from those in the body, and there may be some difference in the organism itself when grown in culture than when grown in the body. If we take a culture from a tooth which we believe is producing an infectious condition elsewhere in the body and use it as an

antigen for complement fixation, and the fixation result is negative, and we get a positive cure or material improvement from the elimination of this tooth, I think we are justified in concluding that the primary focus was where we believed, and the complement fixation showed there was no demonstrable toxin in the blood due to this organism.

Now as to Dr. Schamberg's statement about a recurring case of iritis in which he used a vaccine. If he made a careful roentgenographic examination and eliminated the dental focus, where did he get his vaccine for this case? Did he use a stock vaccine?

DR. MORRIS I. SCHAMBERG, NEW YORK: I refer to the fact that a roentgenographic examination proved negative until I used common sense in conjunction with it and decided to remove a pulpless tooth from which we took a culture.

DR. JOSEPH M. LEVY, NEW YORK: As to animal inoculations, most of the men doing animal experimentation seldom use less than 3 to 5 c.c. of a twenty-four hour culture. Their bacteria will probably run up to 100 million to the cubic centimeter. Rosenow uses colossal quantities, 15 to 30 c.c. We do not get anything like this in the human being. What we get, or what we have been led to believe we get, is a slow, gradual but constant inoculation with the active virus from the original focus. What we are trying to produce in our animals is a similar condition. If we give massive inoculations our rabbits promptly go to postmortem. We are trying to produce these slow but constant injections, simulating the conditions we find in the human subject, and see what results will be obtained. We have had the usual results obtained by other experimentors as to cardiac, arthritic and other involvements, but to date we have been unable to produce an experimental infectious eye condition.

THE CRUCIAL TEST OF THERAPEUTIC EVIDENCE*

TORALD SOLLMANN, M.D.
CLEVELAND

According to the good old truism, the last and crucial proof of the pudding is in the eating thereof; and so, the last and crucial test of a therapeutic agent is its consumption by a patient. There is, however, one essential difference: When the pudding is eaten, with a sense of satisfaction, we know that it was a good, or at least an eatable pudding.

If the patient improves after taking a remedy, we do not yet know that he improved on account of the remedy. The *post hoc* type of reasoning or logic is not respectable; but it is all too apt to creep in unawares, unless one takes great precautions indeed.

Clinical evidence needs especially to be on its guard against this pitfall, for the conditions of disease never remain constant; nor is it possible to foresee with certainty the direction which they are going to take. It is just this point which makes the clinical evidence so much more difficult to interpret than laboratory evidence, in which the conditions can be more or less exactly controlled, and any changes foreseen. It is on this account, also, that clinical experiments must be surrounded with extra painstaking precautions.

In brief, while the "proof" of a remedy is on the patient, that is not the whole story, but merely an introduction. The real problem is to establish the causative connection between the remedy and the events. The imperfect realization of this has blocked therapeutic advance, has disgusted critical men to the point of therapeutic nihilism, and has fertilized the ground for the commercial exploitation of drugs that are of doubtful value or worse.

This has been impressed on me particularly by my service on the Council on Pharmacy and Chemistry. In the course of its work of passing on the claims advanced for commercial remedies, this council is forced to inquire critically into the basis of the claims of manufacturers.

It is interesting to note the qualitative differences in the evidence for the various kinds of claims: The chemical data are usually presented in such a form that it is possible to tell at a glance whether or not they are based on demonstrated facts, which could usually be verified or refuted without special difficulty. The deductions are usually such as can be legitimately drawn from the data, or else they are obviously absurd. All this agrees with the relatively exact status of chemical science.

In passing to data and deductions from animal experiments, a distinct change is noticeable: Not only are the data less reliable, and less worthy of confidence, but they are more often stated in a less straightforward manner. The presentation of the data often shows evidence of manipulations of the results, so as to make them most favorable to a preconceived conclusion that would recommend the drug. This is not always intentional, but is partly due to the less exact nature of animal experimentation, which leaves a wider play to the arbitrary interpretation of the reporter. A certain amount of this is unavoidable. No serious objection can be raised, provided the experimenter presents all the essential data, and discusses fairly all of the interpretations that would apply to them.

On the whole, it is usually possible to form a fairly definite estimate of the value of experimental data.

When one comes to the clinical evidence, an entirely different atmosphere obtains. When the Council demands evidence of the usefulness of a remedy, the manufacturers generally respond with every sign of enthusiasm. They may have ready a series of articles already published, or they instruct their agents to bring in letters from physicians. The last method seems to meet the most cordial response, judging from the deluge of letters and opinions that floods the Council.

The quality of the published papers is a fair reflection of the deficiencies of what is still the common type of clinical evidence. A little thought suffices to show that the greater part cannot be taken as serious evidence at all. Some of the data are merely impressions—usually the latest impressions of an impressionable enthusiast—the type of man who does not consider it necessary to present evidence for his own opinions; the type of man who does not even realize that scientific conclusions must be based on objective phenomena.

Some of the papers masquerade as "clinical reports," sometimes with a splendid disregard for all details that could enable one to judge of their value and bearing, sometimes with the most tedious presentation of all sorts of routine observations that have no relation to the problem.

The majority of reports obtained by the agents belong to these classes, notwithstanding the fact that they are often written for the special use of the Council, and therefore with the realization that they are likely to be subjected to a thorough examination, and therefore presumably representing the best type of work of which the reporter is capable. So, at least, one would suppose.

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

It is also possible, however, that some of these reports are written merely out of thoughtlessness, or perhaps often to get rid of an importunate agent. This is illustrated by the following correspondence, taken literally from the files of the Council.

A letter from a prominent physician "A," endorsing a certain preparation "D," having been submitted to the Council, the secretary was directed to write to Dr. A as follows:

Dear Dr. A:—The B Company of C has requested the Council on Pharmacy and Chemistry to admit its preparation D to New and Nonofficial Remedies. As part evidence for the value of the preparation, the company submitted a letter from you which contains the following:

So far as my experience has thus far gone, they are certainly superior to a number of other iodine compounds now on the market, and I should judge that they ought to take a superior place in therapy involving the use of iodine.

The referee of the Council in charge of D writes that he was interested by your letter and asks that I inquire: As compared with sodium or potassium iodid, what would you say are the differences between, and real advantages of, D and the alkaline iodids? Did you make any comparative experiments and keep a record of them? If so, the referee would like to receive an account of your trials. In what direction could D be expected to occupy a superior place in iodine therapy?

I hope that you can give the information asked by the referee and thus aid the Council in arriving at a correct estimate regarding the value of D.

The following reply was received from the physician in response to the foregoing:

Dear Professor Puckner:—In reply to yours of January 19, I did not proceed far enough in the investigation of D to draw conclusions of any particular value for the purpose of the Council on Pharmacy and Chemistry; and I so stated in my letter to the proprietors of that remedy.

Answers to the questions you put in your letter require an amount of investigation of the remedy far beyond anything I undertook. As a matter of fact, I returned about five sixths of the capsules sent me, because of lack of time and opportunity to carry out the extensive clinical experiments that I plainly saw would be required to give an opinion at all worth while. I believe you had better not consider me in the matter at all.

The report was furnished by a physician for whom I have a high personal regard. I introduce it here, not so much in a spirit of criticism, but as a justification of the opinion that I have formed of clinical evidence obtained by manufacturers through their clinical adjutors.

When commercial firms claim to base their conclusions on clinical reports, the profession has a right to expect that these reports should be submitted to competent and independent review. When such reports are kept secret, it is impossible for any one to decide what proportion of them are trustworthy, and what proportion thoughtless, incompetent or accommodating. However, if this were done it is quite possible that such firms would find much more difficulty in obtaining the reports. Those who collaborate should realize frankly that under present conditions they are collaborating, not so much in determining the scientific value, but rather in establishing the commercial value of the article.

Often the best type of clinical reports—those in which the observations are directed to the significant events and not to mere side lines, and in which the significant events are correctly and adequately reported—generally lack one important essential, namely, an adequate control of the natural course of the disease.

Since this cannot be controlled directly, it must be compensated indirectly. For this purpose, there are available two methods:

The first is the statistical method in which alternate patients receive or do not receive the treatment. This method can usually only be of value when a very large series of patients is available. Even then, its value is limited or doubtful, because it cannot take sufficient account of the individuality of cases.

The second method consists in the attempt to distinguish unknown preparations by their effects—the method that might be called the "comparative method" or the "blind test."

In this, the patient, or a series of patients, is given the preparation which is to be tested, and another preparation which is inactive, and the observer aims to distinguish the two preparations from their effects on the patient. Surely if the drug has any actions at all, it will be possible to select correctly in a decided majority of the administrations.

The same principle can be applied in distinguishing the superiority of one preparation over another. In this case, the two preparations would be given alternately to different patients, and the observer would try to distinguish them by their effects. Here again, if one drug is really superior or otherwise different from another, to a practically important extent, the observer will surely be able to make the distinction.

This method is really the only one that avoids the pitfalls of clinical observation; it is the only method that makes the results purely objective, really independent of the bias of the observer and the patient. It is the only method, therefore, which determines whether it was really the pudding that was eaten and not some other dessert.

In principle this method does not usually offer any very great difficulties. It is, of course, necessary that the two preparations to be compared shall resemble each other so closely or shall be flavored, etc., so that they cannot be distinguished by their physical properties. This is usually not a very difficult matter. The method does not jeopardize the interests of the patient, for it is understood that no drug would be tested in this way unless there is some reason to believe that it has a value. When the patient's condition is such as to demand treatment, then he would be receiving either the standard drug or the drug which the experimenter believes may be superior to the standard.

CONCLUSIONS

The final and crucial test of a remedy is on the patient; but the test must be framed so as to make it really crucial. Most clinical therapeutic evidence falls far short of this. The "blind test" is urged to meet the deficiencies.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, SECRETARY.

ACETYLSALICYLIC ACID (See N. N. R., 1917, p. 265).

Acetylsalicylic Acid, M. C. W.—A non-proprietary brand complying with the standards for acetylsalicylic acid.

Mallinckrodt Chemical Works, St. Louis, Mo.

THE JOURNAL OF THE
AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address "Medic, Chicago"

Subscription price Five dollars per annum in advance

Contributors, subscribers and readers will find important information
on the second advertising page following the reading matter

SATURDAY, JULY 21, 1917

THE PHYSIOLOGIC VALUE OF THE
NITROGENOUS COMPONENTS
OF THE POTATO

There is a widely persistent belief that protein ingested in the form of vegetable products is far less readily utilized by the human organism than are the albuminous substances of animal origin, such as are commonly consumed in flesh, fish, fowl, milk and eggs. The claim of comparatively low digestibility made against the protein of vegetable products has, indeed, furnished one of the arguments used to combat the vegetarian propaganda. In part, the statements regarding the poorer utilization of the nitrogen consumed in the form of some of the foods derived from plants are justified. Numerous experiments have demonstrated that the figures for the availability of the nitrogenous components of most common legumes and many of the coarser cereals are conspicuously lower than those for the usual mixed diet of man in which food products of animal origin enter quite largely. Atwater and Bryant¹ gathered the following data:

Character of Diet	Protein Utilized, Per Cent.
Animal foods	97
Cereals	85
Legumes, dried	78
Vegetables	83
Fruits	85
Vegetable foods	84
Total foods	92

There are numerous factors which might account for a poorer utilization of nutrients from certain vegetable foods. The low nitrogen content of most vegetable foods necessitates the ingestion of a relatively large volume. This generally increased bulk of vegetable food may of itself lead to more rapid evacuation and lessen the possibilities of digestion and absorption. Again, in comparison with products of animal origin, the vegetable foods may present an unfavorable texture. In older plants, the cell walls may be quite tough and even supplemented with lignin. There is evidence that cellulose is not digested to any considerable extent by the higher animals, and the vegetable membranes are not always easily per-

meable to the digestive juices. It is of primary importance for digestion that the plant cells should be thoroughly disintegrated. Mechanical factors also may influence the rate of passage through the alimentary canal. This applies to coarse particles, such as are derived from seed coats in bran.

It cannot be argued from the foregoing that the vegetable proteins by themselves necessarily exhibit any inherent resistance to digestion and utilization in man. Several years ago, Mendel and Fine² showed that the two characteristic proteins of wheat, gliadin and glutenin, are as thoroughly digested and as completely absorbed as the nitrogenous components of fresh meat. The same is probably true of the barley proteins, and in somewhat lesser degree of corn proteins. No such favorable report is available for the isolated proteins of the white bean and the common pea.

What has just been said necessarily leads to the conclusion that each food product ought to be tested on its own merits before any final pronouncement as to its availability is made. This is further emphasized from a different standpoint by the newer knowledge of the physiology of the amino-acids. A protein may be highly digestible and its digestion products readily absorbed into the blood stream; yet such a protein may be of inferior biologic value because of its failure to yield all of the amino-acids requisite for the nutritive functions in tissue growth or repair. The test must be furnished by a physiologic experiment rather than a mere chemical analysis.

An answer is now at hand with respect to the value of the potato from this standpoint. Its richness in starch has long been recognized, and has led to the inclusion of the potato primarily in the group of carbohydrate foods. Hindhede³ of Copenhagen called attention not long ago to the apparently excellent digestibility and physiologic value of the nitrogenous components as well. His trials on men were of sufficiently long duration—weeks rather than days—to give unusual significance to the data. Even when potatoes and margarin furnished the sole ingredients of the ration, a satisfactory nitrogen balance could be maintained.

This is astonishing in view of the low nitrogenous content of potatoes. The general result has just been corroborated, however, by Rose and Cooper⁴ at the Department of Nutrition in the Teachers College, Columbia University. On a diet adequate in total

1. Atwater and Bryant: Report, Storrs Agricultural Experiment Station, 1899, p. 86.

2. Mendel, L. B., and Fine, M. S.: Studies in Nutrition, I, The Utilization of the Proteins of Wheat, Jour. Biol. Chem., 1911, 10, 303; II, The Utilization of the Proteins of Barley, *ibid.*, p. 339; III, The Utilization of the Proteins of Corn, *ibid.*, p. 345; IV, The Utilization of the Proteins of the Legumes, *ibid.*, p. 433; V, The Utilization of the Proteins of Cotton Seed, *ibid.*, 1912, 11, 1; VI, The Utilization of the Proteins of Extractive-Free Meat Powder; and the Origin of Fecal Nitrogen, *ibid.*, p. 5.
3. Hindhede, M.: Untersuchungen über die Verdaulichkeit der Kartoffeln, Ztschr. f. physikal. u. diätet. Therap., 1912, 16.
4. Rose, Mary S., and Cooper, Lenna F.: The Biological Efficiency of Potato Nitrogen, Jour. Biol. Chem., 1917, 30, 201.

fuel, consisting of potatoes and clarified butter, in which the potatoes supplied all but 0.1 per cent. of the total nitrogen, nitrogen balance was maintained for seven days on a total nitrogen intake of 0.096 gm. per kilogram, equivalent to a net intake of 0.068 gm. per kilogram. This is in harmony with other experiments in which nitrogen equilibrium has been maintained on potato nitrogen when the net available supply was from 0.04 to 0.08 gm. per kilogram, and demonstrates that the potato is a source of nitrogen compounds of high nutritive efficiency in spite of the fact that only 63 per cent. of the potato nitrogen is reported to be in the form of protein.

During the war-time shortage of food, the potato has achieved unusual prominence both in Europe and America. It has been lauded as a valuable source of carbohydrate in palatable abundance. Its base-yielding inorganic components have been pointed out as having a useful function in maintaining the acid base equilibrium of the body,⁵ and now the climax may be capped by a most favorable report on the high biologic value of the nitrogenous components of a food that has rarely been regarded as having any significance whatever from this standpoint. The promised bumper crop of potatoes for this autumn may thus be thrice welcome.

DANGERS FROM THE EXPLOSION OF CARBONACEOUS DUSTS

Although it is now widely recognized that coal dust is explosive, the fact that other carbonaceous dusts also are easily ignited and capable of explosion is not so well known. An expert of the Bureau of Chemistry⁶ in Washington has noted that while most of the dust explosions reported in surface plants occur in mills and elevators handling wheat, oats, corn and their products, it appears that no mill handling carbonaceous material is immune from the possibility of an explosion. The list of known explosions in other kinds of mills includes those handling dextrin, sugar, starch, malt, wood, linseed meal, cottonseed meal, paper, cork, fertilizer, sulphur, cocoa, and spice dusts.

There is a pronounced similarity between the explosion caused by gas and that caused by dust. A flame attains a high velocity in certain gas mixtures in which the oxygen is intimately mixed with the gas molecules. In the case of dusts, the heat of combustion of one particle cannot be transmitted so readily to the next particle as it can in a mixture of gases in the molecular condition. The velocity attained in dust explosions depends on the size of the particles concerned. In addition to the fineness of the dust, its inflammability and the amount in suspension are determining factors.

The importance of obtaining a more thorough knowledge of the genesis and prevention of dust explosions is brought forcibly to our attention by the fact that in a single explosion in an American feed grinding plant, thirty-three men lost their lives, and over seventy were injured. This explosion, which occurred during the ordinary process of operation, completely destroyed the milling plant and considerably damaged surrounding property. The government laboratories which have recently initiated a study of the problems of the inflammability of carbonaceous dusts found that among more than fifty tested varieties that may have a commercial or industrial significance, all had a high degree of inflammability. A dangerous condition apparently exists when a cloud of any of them is in suspension, or in a position in which it can be easily thrown into suspension in the air.

Brown and Clement⁷ have summarized the problem by saying that if dust could be entirely confined within the machinery of a mill in which combustible dust is produced, and a method could be found for preventing explosions in these machines, a long step would be taken in the prevention of dust explosions in mills. To keep a dust cloud from forming in the machines appears to be almost, if not utterly, impossible. It is possible, however, by proper cleaning to remove foreign material from the grain and thus lessen the possibility of a spark which might ignite the dust being formed in the machine.

Sources of heat, nevertheless, cannot be entirely guarded against, especially when both mechanical imperfection and human negligence come into play. It seems desirable, therefore, to circumvent this ever present danger by some device which will prevent the possibility of an explosion even when the heat factor is present. This has led to the consideration of the use of inert gases. Carbon dioxid at once suggests itself. The government chemists state that the most likely source of such inert gases around a mill is flue gases. These contain 79 per cent. of nitrogen, the other 21 per cent. being composed of varying amounts of oxygen and carbon dioxid. Under normally working conditions, the oxygen content is about 11 per cent. Small amounts of carbon monoxid, usually under 1 per cent., are often present, especially when the oxygen content is low. For use in enclosed machines, the carbon dioxid content would not necessarily have to be as low as in a mine or as in an atmosphere in which men are working, and hence it would not have to be removed from flue gases before they could be used in the grinding systems of mills.⁷

Laboratory tests recently reported by Brown and Clement⁷ indicate that an explosion of grain dust cannot be initiated in a gas mixture containing 12 per cent. or less of oxygen, the remainder being inert

5. Compare Blatherwick, N. R.: The Specific Role of Foods in Relation to the Composition of the Urine, *Arch. Int. Med.*, September, 1914, p. 409.

6. Brown, H. H.: Inflammability of Carbonaceous Dusts, *Jour. Indust. and Engin. Chem.*, 1917, **9**, 269.

7. Brown, H. H., and Clement, J. K.: Inflammability of Carbonaceous Dusts in Atmospheres of Low Oxygen Content, *Jour. Indust. and Engin. Chem.*, 1917, **9**, 347.

gases. This limit could be extended to 14 or 14.5 per cent. of oxygen if elevator dusts alone are considered. These studies need to be extended on a large scale where the actual preventive efficiency of inert gas mixtures containing 12 per cent. or lower of oxygen in preventing a dust explosion from starting or propagating can be tested under the conditions of industrial practice. From the standpoint of vocational hygiene, the tentative conclusions of the government investigators are highly significant. The new researches suggest, they say, that the maintaining of an atmosphere of inert gases in all systems of grinding or handling carbonaceous materials which form dangerous dusts would be an effective means of preventing many dust explosions; for even though an ordinarily dangerous amount of dust may be present and a spark or other source of heat may be formed, the dust would not be ignited or an explosion propagated because the oxygen content of the atmosphere would be too low to support combustion. Here is a promise, at least, of an ultimately successful plan in combating a recognized menace to human life.

FUNCTIONAL CARDIAC DISORDERS IN SOLDIERS

The report of Dr. Thomas Lewis and his associates of the Hampstead Military Hospital¹ should be read by every American physician who expects to take part in the care of our own troops. The report deals with a syndrome which was first described during the Civil War by Da Costa as the "irritable heart of soldiers." The symptoms are not unknown in civil life, and patients suffering with similar disorders are familiar to every physician. Under the stress of war, however, these disorders become so much more numerous as to constitute a medical problem of real importance. It is altogether probable that the majority of the patients carry into their military careers the underlying factors for the development of the symptoms, and that the rôle of war is a provocative, rather than an actually causative, one; in other words, if these men had continued to live their normal lives, free from unusual physical and mental strain, and less subject to infections, they would probably never have developed the affection. From the standpoint of throwing light on the etiology and pathology of the syndrome, Dr. Lewis' report is disappointing. Its conclusions are for the most part negative, yet some of these negative results are of great importance.

Foremost of all is the proof that these patients are not suffering from dilatation of the heart. The term "cardiac strain" is therefore not properly applicable to them. No proof has been obtained that structural disease of the myocardium exists in these patients. Infection has been shown to play an important rôle in

the production of the symptoms. From this an important practical conclusion has been drawn. Soldiers suffering from even mild infections should not be returned to the front until their cardiovascular efficiency has been proved to be normal. In many cases this would require a short period of retraining. The adoption of such a measure would probably prevent many cases. Infection is the only etiologic factor which occupies at all a prominent place, and in the treatment of the condition, the removal of foci of infection has sometimes been followed by very rapid improvement. The bulk of the patients have been recruited from the sedentary classes. This gives the report an especial significance for the United States at this time, when the operation of the selective draft will call to military duty many men unaccustomed to strenuous physical effort, and of a type unfamiliar in the past to the officers of our army. It is highly important for their efficiency as soldiers, as well as for their individual safety and comfort, that their training should be carried on more cautiously and slowly than has been necessary with the usually vigorous voluntary recruit of our present army. The fundamental importance of the report, however, is its demonstration of what may be accomplished by proper treatment.

The British experience has shown conclusively that the ordinary treatment of such patients along the lines familiar for cardiac disease leads to inevitable failure. Rest in bed and digitalis are not only useless, but even harmful, by confirming the patient in his belief that he has permanent heart disease. Treatment by exercise, graduated to the patient's ability and increased week by week, is of great efficacy. At the Hampstead Hospital it has succeeded in removing symptoms, and returning to some military service, almost 50 per cent. of the men who did not have chronic cardiac defects, and one-half of these returned to full duty. That graduated exercise is useful in such patients has been known to physicians in the past. The Oertel treatment was based on the retraining of a damaged myocardium. The men who have been successful in the treatment of neurasthenics with cardiac symptoms have found exercise invaluable. Dr. Lewis' demonstration, however, coupled as it is with the most rigorous objective study of the cases, affords proof on a scale hitherto unknown. Furthermore, he has contributed to the efficiency of the army by reducing the average stay in hospital of these patients from five and a half months under the former methods to two months under exercise.

It is to be hoped that the medical department of the United States Army will be able to achieve equally satisfactory results in this type of military disability, the first description of which is to be found in the great medical and surgical history of our own Civil War.

¹ See abstract, this issue, page 231.

LAUNDRY SANITATION

The hygienic problems of the modern laundry have at least a twofold aspect: one concerns the health of the employees engaged in the work; the other relates to the part which the methods and materials of the business may play in the transmission of disease among its patrons. It has been stated that in a number of instances typhoid fever and cholera were conveyed to washerwomen, apparently through infected bed and body linen.¹ Nowadays even the markers and listers who handle the dirty clothes consider their work fairly free from the risk of infectious diseases. The one thing which the workers fear and guard against is body lice.

A sanitary study, including bacteriologic tests, of laundries and the public health was recently undertaken in the Bureau of Laboratories of the New York City Department of Health.² It was demonstrated that the methods now employed in large cities in laundering clothes have varying degrees of efficacy in destroying pathogenic bacteria and thus preventing the spread of disease. As a rule, clothing washed in homes receives a good deal of care, so that the danger from infected linen under ordinary conditions is negligible. When the laundry is cared for in the homes of laundresses, the standards set by the individual vary. Owing to the close quarters in which the laundresses live, there is a possibility of a reinfection of the clean linen, if communicable diseases are present among the members of the family of the laundress.

The sanitary conditions existing in what is now familiarly known as the "hand laundry" were in general of low grade. In fact, the expression "hand laundry," as understood by the general public, is a misnomer, since practically the only work done by hand is the receiving, marking, some ironing, and distributing. The New York investigators point out that little washing is done in the average hand laundry. The practice now prevails of tightly packing a heterogeneous collection of soiled clothes into large bags or nets. These nets are then sent to the steam laundries, where they are washed as units and returned to the hand laundries wet. The drying facilities employed in the hand laundries are limited and of primitive type. The process is not such as would secure the death of all the pathogenic germs which may have survived the washing process.

In principle, the steam laundry contains all the facilities for a satisfactory sanitary treatment of dirty textiles. Wet clothes infected with bacteria and subjected to the action of the usual degree of heat found in drying houses, tumblers, mangles and hot presses are freed from living organisms. It is stated, however, that the practice of "net washing" as now done in

steam laundries is insanitary. The miscellaneous character of the contents of the nets prevents the proper application of disinfectants, soap, water and heat, and thus permits the survival of vermin and pathogenic organisms. The size of the nets and the methods of tight packing employed prevent the penetration of water and heat in the allotted time.

Added defects are also reported with respect to the distribution of laundry articles in the current procedures. The methods employed by steam laundries in the collection and delivery of clothes are found to be defective in a considerable proportion of the laundries. Soiled and clean clothes are carried on the same wagon and come into direct contact. They are also frequently sorted in close proximity, as comparatively few establishments maintain separate receiving rooms in which the clothes may be properly handled. The absence of proper sorting rooms for the clean linen in the average steam laundry and the consequent contact with soiled linen may result in a possible reinfection of the clean clothes.

The New York report states that in the majority of steam laundries the clothes are washed under conditions prejudicial to the health of the employees, the "washers" being usually located in basements poorly lighted and ventilated, with defective floors, and without adequate provisions for the disposal of waste water and steam. Labor-saving machinery, slatted floors, exhaust fans for the removal of steam, and reasonable working hours are some of the measures which will improve the vocational aspects of the industry.

Current Comment

SUGGESTION FOR TREATMENT OF
SURGICAL SHOCK

Cannon¹ describes surgical shock as a syndrome with rapid, thready pulse; subnormal temperature; shallow, rapid respiration with an occasional long drawn sigh; pallor; thirst; cold clammy skin; dilated pupils reacting slowly to light; diminished response to sensory stimuli; muscular weakness; diminished reflexes, and apathy. In this complex what phenomena are fundamental and what incidental? These phenomena, he points out, may be classified into four main groups, namely, disturbances of sensation, of motion, of respiration and of circulation, and all or nearly all may be explained by diminution of the volume of blood in circulation. In support of this statement, Cannon cites the parallel between shock and the condition resulting from severe hemorrhage, and also a number of physiologic considerations, notably that low blood pressure causes an increase in sympathetic resistance so that stronger stimuli are required to evoke motor response, and that the activity of contracting muscle is diminished under low systolic pressure, whence results a tendency to lower

1. Kober and Hanson: Diseases of Occupational and Vocational Hygiene, p. 664.

2. Schroeder, M. C., and Southerland, S. G.: Laundries and Public Health, Pub. Health Rep., 1917, 32, 225.

1. Cannon, W. B.: The Physiological Factors Concerned in Surgical Shock, Boston Med. and Surg. Jour., 1917, 176, 859.

bodily temperature. Respiratory disturbances may be secondary also to such derangement of circulation as hyperirritability of the medullary center develops from increase of acid metabolic products and diminished oxygen supply. Clearly pallor, small thready pulse, and cold clammy skin are explainable on the basis of circulatory disturbances. We see, then, that viewed in this light, three factors must be considered in any effort to get closer to the nature of shock, namely, the heart, the vasomotor mechanism, and the volume of blood. As the nervous control of the heart is not impaired, Cannon ascribes the relaxation of the heart to low blood pressure and increased hydrogen ion concentration in the blood. He emphasizes that the vasomotor mechanism, contrary to common belief, is not depressed in shock, as the vessels in reality are in a state of tonic contraction. The changes in the nerve cells often given as a cause of shock are results which are found also after severe hemorrhages. These statements will serve to indicate how Cannon reaches the conclusion that the keystone in the problem of shock is the diminished volume of blood in circulation due to stagnation in the portal area. Accumulation of a large amount of blood in the splanchnic area is favored, on the one hand, by relaxation of its capillary vessels due to increased acidity of the stagnant blood and, on the other, by resistance to the outflow through the portal branches in the liver by the activity of the vasomotor centers. The splanchnic blood lies trapped, so to speak, between the contracted portal venules of the liver and the arterioles of the stomach, intestine, pancreas and spleen, necessitating a high general pressure to overcome the resistance. The vasomotor center, when deprived of blood, causes constriction of the vessels in an attempt to raise blood pressure; but in so doing the vessels of the liver naturally share in the general constriction, and there is developed a vicious circle which results in continued accumulation of blood in the portal area and reduction of blood in the general circulation. The point of attack in the treatment of shock, if one adopts this conception, must be relief of the splanchnic condition. For this purpose Cannon suggests the use of pituitary solution intra-abdominally because of its action on smooth muscle. Introduced into the abdominal cavity, it would cause contraction of the smooth muscle of the intestine, thus exerting pressure on the smaller mesenteric veins at the same time as the muscle of the larger veins would be acted on directly. The usual treatment does not restore the splanchnic blood to the circulation; salt solution soon passes into the tissue spaces, epinephrin constricts the splanchnic arterioles, thus defeating the object, and pressure on the abdomen causes equal pressure on the portal vessels. Whether or not pituitary solution will act as indicated remains to be seen, and the results of the practical tests Cannon proposes to make will be awaited with much interest. To repeat, the problem as he sees it is to return the stagnant blood to the circulation, in order to give the heart and blood their proper nourishment; and to accomplish this, he suggests a treatment that is calculated to drive the idle blood back into the general current.

ANOTHER NOSTRUM FALLACY

One of the stock arguments of the "patent medicine" makers—and their stock is large—is the claim that any preparation that has been on the market for a number of years must, by that very token, be of value. No one knows better the falsity of this claim than the nostrum maker, unless it is the advertising man. If, without any advertising, a medicinal preparation continued in public favor for many years, there might be some justification for assuming that the product either had merit, or contained certain drugs that might explain its continued popularity. Yet even this would not be indisputable evidence, because the nostrum always gets credit for that large proportion of recoveries that are wholly the result of *vis medicatrix naturæ*. The most worthless and fraudulent proprietary medicines will, and do flourish just so long as they are advertised. Some of the biggest medical swindles known have brought to their exploiters increasingly large fortunes until Nemesis arrived and put them out of business or until the advertising ceased. The "Sargol" fraud was, during the last year of its existence, bringing in more money to the men exploiting it than it had ever done and, if widely advertised, would unquestionably have continued to do so had not the federal authorities put it out of business. The "Oxydonor" swindle was a goldmine to Moses up until the time he was sent to the federal penitentiary for selling it. The same can be said of Samuel's outrageous piece of imposture whereby he made a fortune selling a weak solution of sugar and salt in hydrant water as a cure for all the ills of the flesh. If the proprietary medicine business proves anything it proves beyond cavil the fact that you can fool some of the people—and some of the doctors—all the time, if you advertise!

TUMORS OF THE BLADDER IN ANILIN WORKERS

Long exposure to anilin appears to result sometimes in the development of tumors of the bladder, with or without the symptoms of chronic anilinism. With the growth of the anilin dye industry and the manufacture in this country of rubber and high explosives, in the process of which anilin and its homologues are used, the symptoms of acute anilinism have become more or less generally known to the medical profession. But these industries are, after all, so new in this country that reports of anilin tumors have not yet appeared in the literature. In Germany, however, the occurrence of these tumors has been recognized for some time. Rehn, in 1895, reported three cases. Lehmann, in his book on industrial diseases, says that in sixty-three cases of anilinism observed by Bachfeld, sixteen patients had bladder affections. In 1904, the Höchst on-the-Main dye works collected from eighteen anilin factories records of thirty-eight cases of tumors of the bladder, eighteen of which ended fatally. Seyberth, in 1907, described in detail five cases in men, all of whom had worked for a year or more in rooms in which they were exposed to anilin. These tumors, he says, may be preceded by mild symp-

toms of chronic poisoning, that is, slight strangury, rather dark urine, and somewhat blue lips and pale face, though the appetite and capacity for work may still be normal (blood examinations were not made). On the other hand, none of these symptoms may be present, and the first sign of trouble may be bloody urine, and on cystoscopy the tumor is discovered. In all of Seyberth's cases the tumors were situated at the base of the bladder near the opening of the ureter, where the urine drops from the ureter, carrying the supposed irritant substances, perhaps paramidolsulphuric acid, in which form the anilin is partly excreted. The tumors may be benign and papillomatous, but probably over half are malignant. In view of the great danger of malignancy, he advises as radical an operation as possible. It is well for those interested to remember that at the first sign of trouble with urine or bladder in anilin workers the advisability of careful cystoscopy should be considered.

"PATENT MEDICINES" THREATENED BY THE FIGHT FOR NATION-WIDE PROHIBITION

"Patent medicines" may become the national beverage of the United States if a nation-wide "bone dry" prohibition law is enacted; or at least one might so infer if one accepted at face value a speech on "Some By-Products of Prohibition," delivered in the United States House of Representatives, June 29, by Hon. Jacob E. Meeker, who represents a St. Louis district. Mr. Meeker himself is not a prohibitionist; but his exposé of the "patent medicine" business has prompted the prohibitionists, it is said, to consider seriously the need for laws for the further regulation of the manufacture and sale of "patent medicines" containing alcohol, with the possibility that necessary legislation may be proposed in the near future as an amendment to some available bill. According to Mr. Meeker, 747 "patent medicines," with alcoholic contents ranging from 0.8 per cent. to 93.5 per cent. are listed by the United States commissioner of internal revenue, and all escape under existing prohibition laws. The Department of Commerce is quoted as stating the total capitalization of "patent" and proprietary medicine concerns as \$71,437,000, while the distilling business is said to be capitalized at only \$91,000,000. "Patent" and proprietary medicines, according to Mr. Meeker, are tax-free and bring to the United States government not one cent of tax except that paid on the alcohol used in the process of manufacture. A nation-wide "bone dry" prohibition law, without special provisions for the regulation of the manufacture and sale of alcoholic "patent medicines," would, it was asserted, make the \$71,437,000 capitalization of the concerns now engaged in their manufacture worth \$700,000,000 inside of two years. Referring to the liberty, or the license, now allowed venders of "patent medicines," Mr. Meeker said:

You would no more permit a brewer to send a circular into your home advising you to use a bottle of beer a day and give another bottle to your baby than you would let him send poison. But you will put one of these bottles up on the shelf

with full instructions as to how much to give the baby, how much an adult is to take, and if mother is not watching you can get a good jag on before she can get you. In the name of reform, in the name of common sense, in the name of common decency, I say to the men of this house this afternoon, if you let your prohibition amendment go on with the federal exemption to "patent medicines," you have made a free gift to all men who shall go into the conversion of alcohol into "medicine" instead of beer, wine and whisky, and they escape without tax. . . . The thing that shocks me is that men will not see that when they exempt these "medicine" men from taxation they permit them in the name of "medicine" to put that amount of alcohol into what they sell which, if put into any other drink, would drive the producer out of the country under the whip of public scorn. You would buy that by the bottle to put into your home, and you would say to yourselves, we are fighting the "demon rum." Listen: If the principle of prohibition is right, we should enact it into law, and we should enforce that law if it takes a standing army to do it. If the principle of prohibition is wrong, we should oppose it on the ground of principle and not as a matter of dollars and cents, not as a matter of saving any man's commodity.

END THE MONOPOLY ON SALVARSAN

The Adamson Bill, known as the "trading with the enemy act," has recently been passed by the House of Representatives, is now before the Senate, and will doubtless be enacted into a law. One of its clauses confers authority on the Federal Trade Commission to grant licenses to citizens of this country to operate patents owned by enemy aliens. Physicians are interested in the bill primarily because it includes the salvarsan situation. The manner in which salvarsan has been supplied in this country has been so arbitrary and the prices charged so tremendously above the actual cost, that we should not be satisfied unless the monopoly is ended so that the drug can be supplied at least at a fairly moderate figure, and the old methods eliminated. It is to be hoped, therefore, that the Federal Trade Commission will not grant exclusive control—that is, exclusive license—to any one person or firm. To do so would simply perpetuate the old monopoly and the old conditions. England has adopted a law which, in principle, is similar to the Adamson Bill, and there several concerns have been licensed to manufacture the product. The same should be done here. The Dermatological Research Laboratories of Philadelphia announce that they can supply Arsenobenzol at \$1.50 a tube, and that there is immediately available a supply sufficient for any demand that may be made. The same laboratories have announced also that in a few months they will be able to supply hospitals for \$1.00 a tube. Considerable responsibility rests on the Federal Trade Commission in this matter, for it is not only a question of monopoly, but also a question of scientific qualifications and ability to make the product on the part of some who may make application. Undoubtedly the commission will secure the cooperation of the United States Public Health Service, under whose supervision these drugs should be manufactured no matter who shall be licensed to make the product.

Medical Mobilization and the War

New Office for Col. Jefferson R. Kean

Col. Jefferson R. Kean has been recalled from service in the Red Cross and is to be placed in charge of the 160 U. S. Army ambulance sections in France. He will be succeeded in his position as director-general of military relief by Mr. John D. Ryan, president of the Anaconda Copper Company. Mr. Henry P. Davison, chairman of the Red Cross war council, says: "It is due to Colonel Kean's magnificent work in organizing base hospital units in this country that the Red Cross organization was the first to carry the American flag to France after our entrance into the war. Colonel Kean is peculiarly qualified for the great work he is to do abroad." Mr. Ryan will take over the supervision of the base hospitals, remaining in this country. He will also have charge of all Red Cross efforts to supply medical needs, including the Red Cross service in connection with the sixteen army cantonments. Before war was declared twenty-six base hospital units had been formed, and the number has since been increased to forty-three, with five navy base hospitals, eighteen hospital units and fifty ambulance companies. According to Mr. Davison, "through the Red Cross and private donations these base hospitals have purchased equipment, including beds, blankets, operating tables, tents, etc., at an expense of at least \$2,400,000."

Red Cross to Erect Houses for Convalescent Soldiers

The Red Cross war council will build houses for convalescent soldiers who are able to leave the hospital but are unfit for duty, in the camps at Fort McPherson and Fort Oglethorpe, Ga. At the latter place the organization, at the suggestion of Mrs. Leonard Wood, wife of Major-Gen. Wood, commander of the southeastern military district, has also taken over a stone quarry which it will convert into a bathing pool large enough to accommodate 600. The pool is to be ready for use August 27, when the second officers' training camp opens, and will be constructed under the direction of Col. Herbert Slocum. The convalescent buildings, which will supplement the recreation rooms of the Y. M. C. A., will contain large lounging rooms, writing rooms and wide porches, and amusement and recreation will be provided for the convalescents.

Base Hospital No. 27 (Pittsburgh) Organized for Active Duty

Arrangements are being made to organize for active duty Base Hospital No. 27 of the University of Pittsburgh. The following is the complete medical personnel of the hospital: Majors Robert T. Miller, director; James D. Heard, H. G. Schleiter; Capts. Edward W. ZurHorst, William G. Ray, Stanley Smith, E. W. Fisk, John R. Simpson, Paul R. Sieber, Edward J. McCague, James W. Robinson, Howard H. Permar; First Lieuts. John H. Wagner, Alexander H. Colwell, Andrew P. D. Zumura, Charles B. Maits, Frederick Z. Cassman, Roy R. Snowden, R. C. Clark, Raymond J. Frodey, Ross H. Booth, Frederick Jacobs, Henry T. Metz, Max Neil. The organization will be effected at Allentown, Pa., where the unit will assemble for the training and equipment of the enlisted men.

Medical Reserve Officers from Training Camps Muster in National Guard

During the past week many of the medical reserve officers in the training camps have been sent to various states in order to muster in the National Guard. On Saturday, July 14, ninety-two officers went from Fort Benjamin Harrison to Pennsylvania for this purpose; others were assigned to New York. The reserve officers from Fort Riley, aided by the remaining officers from Fort Harrison, will muster in the National Guard for the Central Department.

Commissions in the Reserve Corps

During the week ending June 30, 1917, six majors, 144 captains and 951 lieutenants were recommended to the adjutant-general of the army for commission in the Medical Reserve Corps. During the week ending July 7, 1917, six majors, 105 captains and 706 lieutenants were recommended for commission in this corps.

Notes on Base Hospital No. 4, U. S. Army, on Active Service*

The following report on the itinerary of the Cleveland base hospital is forwarded by Dr. George W. Crile, director:

On April 28, the director of Base Hospital No. 4 (the Lakeside, Cleveland, unit), received a telegram from the Surgeon-General ordering the immediate mobilization of this unit for service abroad, and asking if the unit could be ready to leave within ten days. An affirmative answer was at once returned, and the work of mobilization was promptly inaugurated.

On May 3, Major H. L. Gilchrist, M. C., U. S. Army, was appointed the commanding officer of the unit, with Capt. A. D. Tuttle, M. C., U. S. Army, and Capt. Titus E. Sturgeon, Q. M. O. R. M. C., U. S. Army, as adjutant and quartermaster, respectively. The mobilization and muster-in was completed on May 6, on the afternoon of which day the unit with its full personnel entrained for New York, sailing on May 8. Aboard the ship the unit was honored by an official visit from the Surgeon-General and Major Noble, M. C., U. S. Army. As this unit was not only the first contingent of the United States Army to be mobilized for service in this war, but also the first unit of the American Army that has ever been ordered to Europe for active duty, the Secretary of War detailed these officers to visit the unit as his representatives on the day of its departure. The Surgeon-General addressed the officers, the nurses and the enlisted men, pointing out the great political significance of this first military expedition, since it represented the inauguration of a departure from the tradition of the United States and opened a new page in our history.

On arrival in Liverpool, May 18, the unit was welcomed by a general officer and administrative medical officer of the British Army, and Colonel Bradley, U. S. Army, from the American embassy. These officers inspected the unit, which was drawn up in parade formation on the saloon deck. General Edwards and Colonel Bradley then made brief addresses from an improvised rostrum, this being flanked on one side by the stars and stripes, on the other by the union jack. Immediately on arrival at Liverpool, Major Crile, director of the professional staff, was temporarily detached from the unit to attend the Inter-Allied Surgical Conference at Paris.

Under the command of Captain Tuttle, the enlisted men went at once to the army post at ——— to gain a brief insight into R. A. M. C. methods. Here they received a royal public and official welcome. The whole town was bedecked with American and British flags and the line of march to the town hall was flanked by R. A. M. C. troops. Here the official welcome was extended by the mayor, clad in his official robes. He closed with the words:

"In the name of the citizens of ———, I may, I think, say, in the name of the whole British Empire, we accord to you the heartiest welcome it is possible to give manhood. I bow to you and I ask for three cheers for the American citizens who have come to us."

The officers not detailed to duty with the men at ——— were entertained at dinner on the evening of the day of arrival by the Brigadier-General and his staff, and on the following day with the nurses and the civilian personnel went to London, where the former were received by a company of the R. A. M. C., and the nurses officially welcomed by the Countess of Airlie, representing Queen Alexandra, Miss Beecher, matron-in-chief of the Army Nursing Board, and others. At the War Department, Lieut.-Gen. Sir Alfred Keogh, the director-general of the Army Medical Service, and Surg.-Gen. Sir W. Babbie, like General Gorgas, expressed their delight and pride in the fact that the medical departments of the United States and of Great Britain were the first to effect an alliance, not only in the present war, but in history. On Sunday, May 21, Colonel and Mrs. Bradley entertained the officers at luncheon. On Monday, May 21, the officers were received by the adjutant general and the commander-in-chief of the home forces, and commander of the troops in London. On the following day the members of the unit were entertained at tea by Mrs. Page at the American embassy and in the evening of May 23 the Rt. Hon. E. G. V., Earl of Derby, the secretary of state for war, and president of the Army Council, entertained the officers at dinner. The officers were made honorary members of the Overseas Club, and the privileges of

*The official censorship that this article has received makes it less interesting than would otherwise be the case.

the American Women's Club and of various nurses' clubs were extended to the nurses. In short, under the direction and personal attention of the members of a committee consisting of representatives of the British Medical Corps, every possible courtesy and aid was extended to the members of the unit. A lieutenant-colonel of the Royal Army Medical Corps was detailed for duty with the unit during its London stay, and was indefatigable in his attentions, entertaining the senior officers at luncheon at the Senior Army and Navy Club. By special invitation, the nurses visited one of the great military hospitals of London and St. Thomas Hospital, now in part a military hospital.

On the afternoon of the last day before the departure of the unit for its post in France, its members were officially welcomed by the king and queen at Buckingham Palace. The king made the following address:

"It is with the utmost pleasure and satisfaction that the Queen and I welcome you here today. We greet you as the first detachment of the American Army which has landed on our shores since your great Republic resolved to join the world struggle for the ideals of civilization. We deeply appreciate this prompt and generous response to our needs. It is characteristic of the humanity and chivalry which have ever been evinced by the American nation that the first assistance rendered to the Allies is in connection with the profession of healing and the work of mercy."

A personal greeting was then extended by both the king and queen to each member of the party individually, the Prince of Wales and the Princess Mary adding their greeting to the officers.

On May 24, the party left London for its post in France, being joined en route by the enlisted men from ———, and on May 25 arrived at ———, where a cordial and enthusiastic welcome was extended by the populace. From the point of arrival the unit marched to its post of duty. The official welcome to ——— was extended by the base commandant and the commandant of the port, and the British and American consuls. No. 9 General Hospital of the British Expeditionary Force has been assigned to the American unit, and at this writing the members of the unit are being rapidly initiated into their new duties. The commanding officer of this hospital had joined the detachment of Base Hospital No. 4 at ——— and escorted the unit to its post here.

Everywhere, from the moment of its arrival in England, from the man on the street to the king, the unit was most cordially greeted.

PERSONNEL OF BASE HOSPITAL NO. 4, U. S. ARMY (THE LAKESIDE, CLEVELAND, OHIO, UNIT)

ADMINISTRATIVE STAFF

Major Harry L. Gilchrist, Med. Corps, U. S. A., Commanding Hospital
Capt. Arnold D. Tuttle, Med. Corps, U. S. A., Adjutant
Capt. Titus E. Sturgeon, Quartermaster, O. R. C., U. S. A., Quartermaster—3

PROFESSIONAL STAFF

MEDICAL OFFICERS RESERVE CORPS, U. S. ARMY

Major George W. Crile, Director
Major Charles F. Hoover, Assistant Director, Medical Section
Major William E. Lower, Assistant Director, Surgical Section
Capt. Howard T. Karsner, Assistant Director, Laboratory Section
Capt. Henry L. Sanford, Staff Surgeon
Captain Allen Graham, Staff Surgeon
First Lieut. Harold K. Shawan, Staff Surgeon
First Lieut. Thomas P. Shupe, Staff Surgeon
First Lieut. Walter B. Rogers, Staff Surgeon
First Lieut. Benjamin I. Harrison, Staff Surgeon
First Lieut. Drury Hinton, Staff Surgeon
First Lieut. Sam Brock, Staff Surgeon
First Lieut. Richard Dexter, Staff Physician
First Lieut. Chester D. Christie, Staff Physician
First Lieut. Herbert V. Weihrauch, Staff Physician
First Lieut. Harry V. Paryzek, Staff Physician
First Lieut. Marion A. Blankenhorn, Staff Physician
First Lieut. Gordon N. Morrill, Orthopedist
First Lieut. Walter C. Hill, Roentgenologist
First Lieut. Arthur B. Eisenbrey, Bacteriologist
First Lieut. William R. Barney, Registrar—21

DENTAL OFFICERS RESERVE CORPS, U. S. ARMY

First Lieut. Bertram S. Rothwell, Dentist
First Lieut. Alan MacLachlan, Dentist

First Lieut. William S. Sykes, Anesthetist—3

RESERVE NURSES, ACTIVE, U. S. ARMY NURSE CORPS—64

CIVILIAN STAFF—4

MEDICAL DEPARTMENT, U. S. ARMY (ATTACHED)—7

PRIVATE—149

TOTAL PERSONNEL—251

Public Health Service Experts to Protect Training Camps

The Public Health Service plans to place outside of each training camp a sanitary unit with medical specialists to make surveys of health conditions around these camps such as have already been made in the districts immediately surrounding the camps at Little Rock, Ark.; Memphis, Tenn.; Petersburg, Va.; Quantico, S. C., and Louisville, Ky. The work to be accomplished varies for each camp, but generally includes such measures as water supply, drainage, extermination of flies and mosquitoes, and the general health of the neighborhood. The Public Health Service is cooperating with state and local health boards in this work. The passage of a bill now pending in the House of Representatives will provide additional men and funds required to carry on this work.

Height Requirement for the Medical Department of the Army

A physician of Worcester, Mass., inquires whether a physician can obtain a waiver of one-fourth inch in height from the required 64 inches for admission in the regular Medical Corps of the Army or in the Reserve Corps.

ANSWER.—Under the new ruling in connection with the selective draft, men will be admitted who are only 61 inches in height, if otherwise physically capable.

Exemption of Medical Reserve Officers from the Draft

Several physicians ask whether they will be exempt from the draft if they have filed application for the Medical Reserve Corps, but have not received their commissions.

ANSWER.—No.

Mental Tests for Soldiers

Plans have been taken up with the government for the establishment of an outpatient department at Camp Admiral by the officers of the Maryland Psychiatric Base Hospital Unit, of which Dr. A. P. Herring is chairman, and Dr. W. R. Dunton, secretary. The chief object of this department will be to examine soldiers for mental and nervous disorders and to arrange for their treatment, but specialists of various sorts of physical disease will also volunteer their services. The purpose is to have volunteers go to the cantonment at stated intervals and with army surgeons conduct thorough mental tests and physical examinations. The new psychopathic building at the Spring Grove State Hospital, designed for acute cases of mental disease, has been offered to the government, and if it is accepted, patients from Camp Admiral will be treated there. The psychopathic building will also be useful in treating soldiers returned from the front, 18 to 20 per cent. of whom, it has been found in England, are suffering from mental breakdown, temporary or permanent.

New England Contingent to Fort Oglethorpe

The 128 officers and men from the medical and sanitary units of the National Guard of New England have gone to Fort Oglethorpe, Ga., to undergo intensive training in camp. Of these, Maine furnished 2 officers and 4 men; New Hampshire, 5 officers and 13 men; Massachusetts, 15 officers and 46 men; Rhode Island, 3 officers and 13 men, and Connecticut, 6 officers and 21 men. All were mustered into federal service, June 24.

Ordered to Service with Navy

The following medical officers of the United States Public Health Service have been ordered to report to the surgeon-general of the navy for duty: Senior Surgs. Fairfax Irwin, Philadelphia; Louis L. Williams, New York, and William J. Pettus, Charleston, S. C.; Surgs. Gregorio M. Guiteras, Key West, Fla.; George B. Young, Norfolk, Va.; Mark J. White, St. Louis; Bolivar J. Lloyd, Seattle, and Arthur M. Stimson, Washington, D. C.; P. Asst. Surg. William M. Bryan, Boston, and Asst. Surg. R. R. Spencer, Chicago.

Hospital Donated for War Cripples

Mr. and Mrs. Charles D. Freeman have given their 660 acre estate at Iselin, N. J., to be used as a reconstruction hospital. It is expected that the house will accommodate 250 patients when it is opened under the auspices of the American Red Cross in August. Bungalow wards are to be built which will bring the capacity of the place up to 2,000. Dr. Fred H. Albee is to have charge of the undertaking.

Orders to Officers of the Medical Corps

Major Albert G. Love, M. C., from Fort Gibbon, Alaska, to New York, N. Y., medical supply depot.

The sick leave granted Major William A. Duncan, M. C., is extended four months.

Capt. Howard Clarke, M. C., to permanent duty with 8th Reserve Engineers.

So much of Par. 130, S. O. 143, June 21, War D., as relates to Capt. W. T. Cade, Jr., M. C., is revoked.

Lieut. Col. William H. Wilson, M. C., to report in person to commanding general, Panama Canal Dept., for duty as surgeon of department.

Lieut. Col. Jere B. Clayton, M. C., to Fort Sam Houston for duty as sanitary inspector of S. D.

Lieut. Col. Clarence J. Manly, M. C., to Fort Sam Houston as assistant to department surgeon and sanitary inspector of S. D.

Major Harold W. Jones, M. C., in addition to other duties, is detailed as professor of medical department administration at the Army Medical School, Washington, vice Col. James D. Glennan, relieved.

Major Clarence H. Connor, M. C., to report to board at Washington for examination for promotion.

Major Henry F. Pipes, M. C., from further station at Fort Slocum, N. Y., for duty at Jefferson Barracks, Mo.

Sergt. 1st Class Davidson M. Fleming, Med. Dept., to Little Rock, Ark., and take station.

Major L. P. Williamson, M. C., to Pittsburgh, Pa.; Baltimore, Md., and New Haven, Conn., for inspecting the work being done in the production of gas masks.

Maj. Edward B. Vedder, M. C., is detailed as a member of the board of medical officers appointed July 3, 1915, to determine the result of the preliminary examination of applicants and the final examination of candidates for admission to the Medical Corps, vice Col. James D. Glennan, Medical Corps, hereby relieved.

Maj. Harold W. Jones, M. C., will proceed to Watertown, N. Y., for the purpose of inspecting ambulance bodies at the H. H. Babcock Co., Watertown, N. Y., and upon the completion of this duty will return to his proper station.

Capt. W. Cole Davis, M. C., is relieved from further duty at the United States Military Academy, West Point, N. Y., and will proceed to Wrightstown, N. Y., take station, and act as camp sanitary officer during the period of construction of cantonment.

Col. George E. Bushnell, M. C., now on temporary duty in this city, is relieved from further duty at Fort Bayard, N. Mex., and will report in person to the Surgeon General of the Army for duty in his office.

Capt. Charles W. Haverkamp, M. C., is relieved from duty at the United States Military Academy, West Point, N. Y., and will proceed to Fort Oglethorpe, Ga., and report in person to the commanding officer of that post for duty as surgeon and also to take charge of the general hospital.

Capt. William T. Cade, Jr., M. C., will proceed to Atlanta, Ga., and report for duty as camp sanitary officer during the period of construction of cantonments.

Orders to Officers of Medical Reserve Corps**ALASKA**

To Allentown, Pa., Lieut. R. V. Ellis, Douglas.

CALIFORNIA

To Ft. Gibson, Alaska, Lieut. Walter E. Leonard, Los Angeles.

To Los Angeles for opening a school for instruction of officers in Roentgenology, Capt. William B. Bowman, Los Angeles.

To report in person to commanding general Western Dept., for assignment to duty, Lieuts. J. M. Relifisch, Berkeley; J. P. Frizell, Ione; A. E. Boland, Needles; A. C. Magee, San Diego; H. Abraham, L. H. Young, San Francisco and G. W. Burgess, Saratoga.

The resignation of Major Wallace I. Terry, San Francisco, is accepted.

DISTRICT OF COLUMBIA

To Allentown, Pa., Lieut. W. F. O'Donnell, Washington.

To Army Medical School, Washington, D. C., for instruction, Lieut. E. B. Macon, Washington.

To Walter Reed Hospital, Takoma Park, Lieut. W. H. Huntington, Washington.

FLORIDA

To Allentown, Pa., Lieuts. T. G. Croft, C. L. Jennings, Jacksonville, O. F. Green, Mayo; E. E. Strickland, Miccosukee; P. L. Goss, Mulberry; W. J. Vinson, Tarpon Springs and J. O. Phillips, Worthington Springs.

To Ft. Oglethorpe for instruction, Lieut. Arthur L. Izlar, Ocala.

GEORGIA

To Allentown, Pa., Lieuts. J. A. McAllister, Atlanta; G. Burns, Douglas; J. R. Turner, Hickory Level; M. E. Perkins, Millen; H. L. Akridge, Sasser; J. M. Bryant, Savannah, and H. J. Morton, Waynesboro.

To Ft. McPherson, Lieut. Herbert J. Rosenberg, Atlanta.

To Ft. Oglethorpe, for instruction, Capt. George T. Horne, Augusta.

IDAHO

To report by telegraph to commanding general, Western Dept. San Francisco for duty, Lieut. C. S. Moody, Hope.

ILLINOIS

To Allentown, Pa., Lieuts. C. L. Weber, Cairo; V. Hays, Canton; J. L. Foley, V. D. Greer, E. H. M. Griffiths, P. E. Hopkins, E. K. Langford, R. H. Lowry, Chicago; T. Van Bôyd, East St. Louis; C. L.

Garris, El-lorado; J. F. Wharton, Homewood; J. C. Kimball, Joliet, and H. A. Felts, Marion.

To Ft. Benjamin Harrison, Lieut. T. A. Kreuser, Chicago, and Capt. H. L. Thompson, Harrisburg.

To his home and from further active duty, Capt. Frank E. Pierce, Chicago.

To Ft. Adams, for temporary duty, Lieut. W. H. Evans, Murphysboro.

To Army Medical School, Washington, D. C., for instruction, Lieut. W. L. Smith, Toledo.

INDIANA

To Allentown, Pa., Lieuts. L. A. Elliott, Elkhart; F. A. Brayton, K. L. Craft, H. A. Shimp, W. M. Stout, Indianapolis; E. M. Shores, North Terre Haute; J. G. Kidd, Roann, and C. R. Hoy, Syracuse.

To Ft. Benjamin Harrison for instruction, Lieuts. J. H. Willis, Evansville, and O. A. Newhouse, Montezuma.

To Fort Benjamin Harrison, Lieut. C. K. Jones, Indianapolis.

IOWA

To Ft. Benjamin Harrison for instruction, Lieut. J. S. McAtee, Council Bluffs.

Honorably discharged, Lieut. Frederick Binder, Corning.

KANSAS

To Ft. Riley for instruction, Lieut. E. King, Ft. Leavenworth.

To Fort Riley, Capt. John W. Turner, Fort Riley.

MAINE

To Army Medical School, Washington, D. C., for instruction, Lieuts. D. E. Dolloff, Biddeford, and William C. Whitmore, Portland.

MARYLAND

To Allentown, Pa., Lieuts. E. A. Looper and G. P. Ross, Baltimore.

To Army Medical School, Washington, D. C., for instruction, Lieut. H. P. Makel, Baltimore.

To Ft. Oglethorpe, board of examiners for tuberculosis at the civilian training camp, Capt. Joseph A. Chatard, Clement A. Penrose, and Lieut. John T. King, Jr., Baltimore. For instruction, Capt. T. K. Conrad, Chevy Chase.

MASSACHUSETTS

To Allentown, Pa., Lieut. M. R. Kendall, Boston.

To Ft. Banks, Mass., Lieut. George H. Burke, Springfield.

To Ft. Terry, N. Y., Capt. Isaac S. F. Dodd, Pittsfield, and Lieut. Homer Gage, Worcester.

To Ft. Warren, Mass., Lieut. W. M. Crandall, Lawrence.

Honorably discharged, Lieut. Augustus Riley, Boston.

To Fort Terry, N. Y., Lieut. Frank A. Davis, Boston.

Honorably discharged, Lieut. Henry L. Davis, Lynn.

MICHIGAN

To Allentown, Pa., Lieut. R. G. Edgar, Clarkston.

With Red Cross Ambulance Co. No. 11, Capt. James T. Case, and Lieut. Asa C. McCurdy, Battle Creek.

To Army Medical School, Washington, D. C., for instruction, Lieut. Curtis D. Pillsbury, Ann Arbor.

Honorably discharged, Capt. Hugo A. Freund, Detroit.

MINNESOTA

To Allentown, Pa., Lieut. L. G. Smith, Montevideo.

To Ft. Riley, Lieut. David M. Berkman, Rochester.

To Sparta, Wis., Lieuts. J. J. Catlin, Buffalo, and G. D. Rice, St. Cloud.

MISSISSIPPI

To Atlanta, Ga., for duty in connection with the organization of American Red Cross Ambulance Co. No. 20, Lieut. W. C. Brewer, Columbia.

MISSOURI

To Allentown, Pa., Lieuts. L. J. Ferguson, Brookfield; G. R. Dagg, North Kansas City; W. A. Fair, Pleasant Hill; E. K. Dixon, St. Louis, and J. A. Powers, Warrensburg.

To Ft. Benjamin Harrison, Capt. Paul R. Fletcher, St. Louis.

To Ft. Riley, for instruction, Lieut. G. A. Tull, Kansas City.

To report to 20th Field Art., Camp Wilson, Ft. Sam Houston for duty, Lieut. William A. Delzell, Springfield.

MONTANA

To report by telegraph to commanding general, Western Dept., San Francisco for duty, Lieut. W. N. King, Victor.

NEBRASKA

To home, Lieut. J. M. Shramek, Omaha.

NEVADA

To report by telegraph to commanding general, Western Dept., San Francisco for duty, Lieut. H. Ostroff, Reno.

NEW HAMPSHIRE

To Boston Base Hospital No. 6 (Massachusetts General Hospital), Capt. Robert W. Holmes, Keene.

To West Point, N. Y., Lieut. S. Miller, Manchester.

NEW JERSEY

To Allentown, Pa., Lieuts. T. Reed, Atlantic City; N. B. Leggett, Morristown, and H. G. Walker, Wycoff.

To Allentown, Pa., Lieut. C. W. Thomas, Woodstown.

To Richmond, Va., for instruction in military roentgenology, Lieut. James B. Edwards, Leonia.

Par. 50, S. O. 145, June 23, 1917, War D., as related to Lieut. Harry Stein, Paterson, is revoked.

NEW YORK

To Allentown, Pa., Lieuts. M. C. Wilson, Bronxville; D. O. Lyon, Mt. Vernon; A. H. Williamson, New York City; Capt. E. Dowdle, Oswego; Lieuts. L. F. Allen, Rochester, and C. B. Witter, Schenectady.
To Army Medical School, Washington, D. C., for instruction, Lieuts. J. O. Parramore, Mt. McGregor; Alan DeF. Smith, and E. R. Easton, New York, N. Y.
To Balboa Heights, C. Z., for duty, Capt. Robt. L. Loughran, New York, N. Y.
To Ft. Oglethorpe, for instruction, Major Richard Derby, New York, N. Y.
To Ft. Strong, Mass., Lieut. Warren Wooden, Rochester.
To Ft. Terry, N. Y., Lieuts. Abraham Ginsburg, and Ruel B. Kariobe, New York, N. Y.
To Rockefeller Institute for Medical Research, New York, N. Y., Major Simon Flexner, New York, N. Y.
To active duty as instructor in Roentgenology in New York City, Major Lewis G. Cole, New York, N. Y.
To report to Surgeon General of Army for duty, Major H. D. Corbusier, New York, N. Y.
To Washington, D. C., for instruction, Lieut. Edmund B. Spaeth, Elmira.
So much of Par. 105, S. O. 134, June 11, War D., as relates to Lieuts. G. K. Rhodes and L. E. Deyoe, New York, N. Y., is revoked.
To home, Major T. W. Hastings, New York, N. Y.
To home and honorably discharged, Lieut. Stanley W. Pallister, Brooklyn.
Honorably discharged, Lieut. F. S. Child, Jefferson.
To Army Medical School, Washington, D. C., for instruction, Capt. J. E. Donnelly, New York.

NORTH CAROLINA

To Ft. Oglethorpe for instruction, Lieut. J. Thames, Wilmington.
To Richmond, Va., for instruction in military roentgenology, Lieut. F. R. Wrenn, Silver City.
The resignation of Lieut. Rigdon O. Dees, Greensboro, is accepted.

OKLAHOMA

To Washington, D. C., for instruction, Lieut. David D. Paulus, Oklahoma City.

OHIO

To Allentown, Pa., Lieuts. W. S. Chamberlain, E. D. Dowds, T. R. Kennerdell, Cleveland, and G. P. Whitwham, Toledo.
To Army Medical School, Washington, D. C., for instruction, Lieut. E. A. Fennell, Cincinnati.
To Cleveland, Ohio, for duty with Ambulance Co. No. 4, Lieuts. R. P. Forbes, J. E. McClelland, and H. O. Ruh, Cleveland.
To Washington, D. C., for instruction, Lieut. Harold O. Brown, Cincinnati.
To home, Lieut. Orville T. Manley, Cleveland.
To home, Lieut. Townsend H. Dickinson, Germantown.
Honorably discharged, Capt. Charles W. Stone, Camp Perry.

OREGON

To report by telegraph to commanding general, Western Dept., San Francisco for duty, Capt. A. A. Finch, Astoria.

PENNSYLVANIA

To Allentown, Pa., Lieuts. H. O. Jones, Altoona; A. G. Beckley, J. W. Dennin, C. L. Fulmer, T. G. Schnabel, Philadelphia, and H. H. Thompson, Philipsburg.
To Ft. Niagara, N. Y., board of examiners for tuberculosis at the civilian training camp, Capt. Milton H. Fussell, Lieuts. Augustus A. Eshner, and David Riesman, Philadelphia.
To Ft. Oglethorpe, Lieuts. L. E. Bernd; Theodore LeBoutillier, Philadelphia, and O. A. Jones, Sharon.
To Allentown, Pa., Lieuts. A. D. Ferguson, Philadelphia, and C. W. Page, Pittsburgh.
To Army Medical School, Washington, D. C., for instruction, Lieut. F. H. Wells, Chester Springs.
To Fort Ontario, N. Y., Lieut. J. P. Burns, Philadelphia.

TEXAS

To Cornell Medical College, New York, N. Y., for instruction in military roentgenology, Lieut. E. V. Powell, Ft. Worth.
To Sparta, Wis., Capt. R. K. Cole, Dallas.

SOUTH DAKOTA

To Allentown, Pa., Lieut. L. M. Field, Aberdeen.

UTAH

To Allentown, Pa., Lieut. J. M. Graham, Fruita.

VIRGINIA

To Gettysburg, Pa., Capt. Robert S. Spilman, Norfolk.

WASHINGTON

To Ft. Riley, for instruction, Capt. S. E. Lambert, Spokane.
To report by telegraph to commanding general, Western Dept. San Francisco for duty, Capt. C. T. Dublin, No. Yakima, and Lieut. F. L. Horsfall, Seattle.
To report by telegraph to commanding general, Western Department, San Francisco, for duty, Lieut. H. C. Burson, Seattle.

WEST VIRGINIA

To home, Lieut. William C. Moser, Morgantown.

WISCONSIN

To Sparta, Wis., Lieuts. C. O. Decker, Crandon; G. R. Randall, Milwaukee; J. W. Monsted, New London; C. H. Nims, Oshkosh; E. G. Festerling, Reedsville, and E. W. Hanson, Three Lakes.
To report for duty by telegraph to commanding general, Western Dept., San Francisco, Lieut. F. Rose, Coleman.

AT FORT BENJAMIN HARRISON

Fort Benjamin Harrison, some 14 miles out of Indianapolis, includes one of the training camps for medical reserve officers. There were at this post, July 14, between 13,000 and 15,000 soldiers, representing practically every branch of army service. The camp is the scene of continuous activity. The days are full of active work and the nights are full of study, recreation and sleep—mostly sleep, and sound sleep. The whole camp qualifies easily as one of the wonders of modern army construction.

POST HOSPITAL

The post hospital is well fitted with modern equipment and the arrangements are well-nigh perfect. Outside the hospital special buildings have been constructed for contagious cases, and for the housing of enlisted personnel. Opposite the post hospital is a quarantine camp in which troops arriving from other posts where infectious disease exists, are detained.

THE TRAINING CAMP FOR MEDICAL OFFICERS

But we are especially concerned with the training camp for medical officers. At the time of this writing—July 13—there are in the camp about 700 medical officers, of whom over four fifths are in the training camp. There are in all 2,500 men in the medical department, including the medical officers, field hospitals, and ambulance companies.

THE BARRACKS

The medical officers' barracks house some fifty to fifty-five men each. The barracks were constructed originally with a view to housing 600 men, but were found inadequate for this purpose so that between the barracks are tents occupied by medical officers of the National Guard. Each two barracks has a separate mess hall, and a building containing shower baths with hot and cold water, urinals and latrines. Everything is flyproof—screened in—and conspicuously new and clean. The men sleep on their folding cots, which are in two rows the length of the barracks, and about 2 feet apart. An aisle about 4 feet wide runs down the center. There is excellent through and through ventilation. The barracks are lighted by electricity but at first the light was hardly adequate to permit intensive night study without some inconvenience. Later the lights were replaced by bulbs of a higher candle power, and this condition, which was perhaps the only source of complaint, is now fully corrected. In one barracks the men invested in special incandescent bulbs of their own selection.

THE MESS

The mess is excellent. The men get what *they* want and what they pay for, the cost being 75 cents to \$1 a day per man. When the men arrived the only mess equipment was that issued, the ordinary soldiers mess kit. Most companies bought their own table service—usually granite ware cups and plates. One affluent company spent \$150 on china and so-called "silver" mess equipment which they will either donate, bequeath or sell to their successors in camp. The cost and quality of whatever is served meets with flattering treatment in that it is usually wholly consumed.

STUDY AND LECTURE

The men are organized in four companies, some serving for short periods as officers. The days are full of study and drill and lectures and as one man expressed it—"something is doing all the time." In one afternoon there may be French lesson, drill, a lecture on map-making accompanied by the opportunity to go over the surrounding country and indulge in practical work; a lecture on the physics, economics and other intricacies of the horse and the army mule with practical examples, book quizzes, "paper work," more drill, first aid, tent pitching, customs of the service, and what not.

One custom of the camp which has met with approval is that of wearing only the U. S. R. and the caduceus, insignia of rank not being worn except when visiting the city. As one officer said, "Here, for the present, we are all cadets."

RECREATION

The evenings are spent in study, in walks through the camp and the surrounding country-side, in auto rides on the excellent boulevard roads and in an occasional trip to the city. The permanent barracks are the center of camp life. Here at night are lectures, concerts, motion pictures and vaudeville entertainments. The medical officers are conspicuous in the streets of the city by their absence; rarely does one see the caduceus on the shirt of any of the numerous uniformed men

on the streets of the city. One medical officer remarked: "No, we don't go into town much. I haven't been in but once since we've been here. There's so much to learn and to do, so much to see right here in camp, that a trip to the city is more of a bother than a pleasure."

THE SPIRIT OF THE MEN

One of the instructing officers requested that particular attention be called to the wonderful spirit among the medical officers, and particularly among the enlisted men. There has been no serious breach of discipline among the 2,500 men in the medical department during the entire time that the camp has been in operation. It is this spirit of earnest cooperation and realization of the serious nature of the business ahead which has encouraged the superior officers to enjoy their work and which has made the camp the wonderful achievement that it is.

The following men were in the training camp for medical reserve officers at Fort Benjamin Harrison on July 13:

ARIZONA

Evans, Roy K., Douglas

CALIFORNIA

Oliver, Jean R., San Francisco

COLORADO

McDonald, Wm. J., Fowler
Blackmore, Richard, Farmington

CONNECTICUT

Irwin, Vincent J., Jr., Granby
Griswold, Matthew H., Kensington
Harvey, Carl C., Middletown
Goodridge, F. G., Pomfret Center

INDIANA

Collins, Albert W., Anderson
Hunt, Lee F., Anderson
Beckett, Clinton G., Attica
Hines, Dorsey M., Auburn
Reese, Forest L., Ellettsville
Samples, John T., Boonville
Line, Homer E., Chili
Redman, L. H., Elizabethtown
Ehrich, Wm. S., Evansville
Willis, Joseph H., Evansville
Clay, L. R., Ft. Benj. Harrison
Edwards, T., Ft. Benj. Harrison
Hanna, Carl, Ft. Benj. Harrison
Kersten, P., Ft. Benj. Harrison

Jewett, L. E., Wabash
Whisler, Fredk. M., Wabash
Hoffman, Robert Lee, Wichita
Moser, Elmer B., Windfall
Lee, Geo. W., Yates Center

MAINE

Bliss, Raymond V. N., Blue Hill
Webster, Harrison B., Castine
Flint, Edgar T., Foxcroft
Cummings, Edson S., Lewiston
Haskell, Alfred W., Portland
Millikin, John S., Readfield

MASSACHUSETTS

Bowen, James F., Amherst
Boardman, Wm. P., Boston
Cochrane, Robert C., Boston
Fraser, Somers, Boston
Brothingham, C., Boston
Goulding, Timothy F., Boston
Janney, James C., Boston
Mahoney, Daniel F., Boston
Mahoney, John L., Boston
Medalia, Leon S., Boston
Ohler, William R., Boston
Reese, John A., Boston
Carr, Arthur W., Bridgewater
Cady, F. B. M., Cambridge
Lanpher, Howard A., Chester
Gallagher, J. H. C., Chicopee
Mannix, Louis, Chicopee Falls
Emmons, Arthur B., Dover
Simmons, R. H., Fall River
Kearney, John H., Fitchburg
Peters, J. D., Great Barrington
Whelan, Chas., Hingham
Beckley, C. C., Lancaster
Pfeiffer, Albert, Lexington
Pulsifer, Nathan, Lowell
Breed, Nathaniel P., Lynn

Du Bois, Wm. J., Grand Rapids
Martin, Alex. Morrison, G. Rapids
Adams, DeWitt C., Highland Park
Foden, Geo. S., Highland Park
Kitson, Verner H., Ionia
Burt, Clarence Edward, Ithaca
Cooley, Randal M., Jackson
Leland, Roscoe G., Kalamazoo
Willey, Gordon F., Kalamazoo
Holm, M. L., Lansing
Shaw, Milton, Lansing
Waters, Geo., Memphis
Mackenzie, Alex. J., Port Huron
Silshy, Don H., St. Johns
Winslow, R. C., Sault Ste. Marie
Woodlock, Lawrence, Stockbridge
Crane, Chas. V., Tawas City
Martin, Jas. R., Traverse City

MISSOURI

Chandeysson, Pierre L., St. Louis
Fletcher, Paul R., St. Louis

NEW YORK

Cochrane, Harold D., Albany
Douglas, Malcolm, Albany
Papen, Geo. W., Jr., Albany
Tebbutt, Harry K., Albany
Vanderveer, James N., Albany
Van Campen, Benj., Olean
Preston, Willard De Forest, Attica
Cooper nail, Geo. P., Bedford
Allerton, S. M., Binghamton
Hooks, Don M., Binghamton
Ackerman, Stephen H., Brooklyn
Erown, Francis X., Brooklyn
Byrne, John B., Jr., Brooklyn
Coogan, Wm. J., Brooklyn
Dexter, Thurston T., Brooklyn
Feinblatt, Henry M., Brooklyn
Gill, Chas. R., Brooklyn



A BIRD'S-EYE VIEW OF THE TRAINING CAMP FOR MEDICAL OFFICERS AT FORT BENJAMIN HARRISON. 1. AN AMBULANCE COMPANY. 2. HEADQUARTERS BUILDING. 3. TENTS USED FOR MEDICAL OFFICERS OF NATIONAL GUARD. 4. MESS HALL. 5. BARRACKS FOR MEDICAL RESERVE OFFICERS.

McGaughey, J. D., Wallingford
Dye, John Sinclair, Waterbury

GEORGIA

Cranston, William J., Augusta

ILLINOIS

Hastings, James B., Alton
Dahlenbach, John C., Champaign
Burnart, Wm. F., Chicago
Bremerman, Lewis W., Chicago
Britton, James A., Chicago
Clark, Wm. A., Chicago
Cox, Roy H., Chicago
Deacon, Frank, Chicago
Fisher, Erle P., Chicago
Foley, Thomas P., Chicago
Geiger, Arthur H., Chicago
Irons, Ernest E., Chicago
Kreuser, Theo. A., Chicago
Kuhns, Ralph H., Chicago
Larkin, Wm. R., Chicago
Mayers, Lawrence H., Chicago
Miller, Edwin M., Chicago
Miller, George W., Chicago
Moss, Eli B., Chicago
Musselman, George H., Chicago
Robison, William T., Chicago
Tarnowsky, Geo. de, Chicago
Wilder, Russell M., Chicago
David, Vernon C., Evanston
Lerman, G. E., Griggsville
Butner, Andrew J., Harrisburg
Thompson, H. L., Harrisburg
Kreml, Otto A., Joliet
Cook, Charles E., Mendota
Fendall, Wm. E., New Holland
Coen, Walter W., Springfield

Meador, F. M., Ft. Benj. Harrison
Equivitch, B. M., Fort Wayne
Fauve, Adrian E., Fort Wayne
Johnson, Robert C., Frankfort
Titus, John M., Hebron
Krebs, Maurice H., Huntington
Daggy, B. T., Indianapolis
Doepfers, Wm. A., Indianapolis
Ducworth, J. W., Indianapolis
Guthrie, George L., Indianapolis
Hickson, Fred E., Indianapolis
Hypes, Francis E., Indianapolis
Pettijohn, B. B., Indianapolis
Shipp, Floyd M., Indianapolis
Thixton, E. DeB., Indianapolis
Titus, Elton M., Indianapolis
Wales, Ernest Dew, Indianapolis
Warpel, Fredk. C., Indianapolis
Wayman, Cecil L., Indianapolis
Storms, Roy B., Kempton
Thompson, B. A., Kokomo
Troutman, R. E., Logansport
McQuown, Otis W., Marion
Magenheimer, V. A., Mooresville
Cox, Harold B., Morristown
Thompson, H. H., Noblesville
Tucker, Fredk., Noblesville
Beaman, Z. M., North Manchester
Lynch, Otho Rees, Peru
Van Mater, Geo. C., Peru
Tucker, Carroll J., Rushville
Jewett, Earl D., Saint Paul
Myers, Edgar H., South Bend
Higbee, Paul, Sullivan
Scott, Garland D., Sullivan
Alexander, O. O., Terre Haute
Carpenter, G. C., Terre Haute
Stout, E. T., Upland

Merrill, Charles H., Lynn
Sanborn, Frederick R., Lynn
Latham, Benoni M., Mansfield
Pease, Charles W., Needham
Collins, J. D., Northampton
Collins, Wm. J., Northampton
Byrnes, Harry F., Springfield
Cort, Parker M., Springfield
Maloney, John M., Springfield
Rumrill, Samuel D., Springfield
Smith, Endix T., Jr., Springfield
Dennen, Ralph W., Waltham
Hollings, Chas. B., Waverly
Chisholm, Miles D., Westfield
Howard, Fred H., Williamstown
Hollis, Fredk., Williamstown
Simmons, E. B., Worcester

MICHIGAN

Chase, Artemus W., Adrian
Lochner, George M., Adrian
Krafs, Rollo W., Ann Arbor
Larajan, Harry M., Ann Arbor
Wile, Udo J., Ann Arbor
Van Camp, Eliah, Athens
Peuker, Bernard J., Atwood
Murphy, Norman D., Bancor
Morrill, W. P., Benton Harbor
Slattery, Matthew R., Bay City
Fisher, Francis G., Campionsburg
Pabcock, Warren L., Detroit
Eaelsack, Fredk. W., Detroit
Buck, John D., Detroit
Drever, Adolph E., Detroit
McCord, Carey P., Detroit
Newberry, Frederick H., Detroit
Stapleton, Wm. J., Jr., Detroit
Suggs, Frank, Detroit

Harding, Read B., Brooklyn
Harris, Harry C., Brooklyn
Hauff, John J., Brooklyn
Helprin, Benjamin E., Brooklyn
Kane, Arthur M., Brooklyn
Laing, Wm. W., Brooklyn
McGraw, Russell J., Brooklyn
McQuillin, John P., Brooklyn
Moore, F. W., Brooklyn
Norton, H. L., Brooklyn
Reynolds, Robert J., Brooklyn
Robertson, R. S., Brooklyn
Rosenfeld, Joseph, Brooklyn
Grabau, John C., Buffalo
Sparck, Joseph, Castleton Corners
Allen, George S., Clyde
Beattie, Joseph H., Dobbs Ferry
Hicks, Wm. M., Durham
Hovey, Walton, Fairport
Tepper, Abram S., Far Rockaway
MacNeal, Ward J., Forest Hills
Allen, Jas. S., Geneva
Sloat, Harrison G., Glen Cove
Byrne, David C., Jr., Great Neck
Parsons, Alfred H., Great Neck
Tilden, Walter C., Hartsdale
Hayes, Floyd W., Jamestown
Holcombe, Frank M., Keeseville
Steckel, Harry A., Kings Park
Snyder, Fredk., Kingston
Roettger, Carl, Long Island
Kilcourse, J. J., Long Island City
Mencken, H. P., Long Island City
Ashley, Harmon H., Machias
Clark, Edw. M., Mamaroneck
Ballantyne, Reg. M., Manlius
Donovan, Jas. C., Middletown
Shelley, Hilton J., Middletown

Coghlan, Jasper W., Newark
Daehr, Geo., New York
Beer, Edwin, New York City
Belden, L. de K., New York City
Bereus, C., Jr., New York City
Bles, Chas. B. D., New York City
Bolling, R. W., New York City
Bradner, J. C., New York City
Braun, Alfred, New York City
Brewster, H. D., New York City
Brinsmade, D. B., New York City
Busby, A. H., New York City
Caecini, A. M., New York City
Cairns, D. W., New York City
Celler, Herbert, New York City
Clark, Abram S., New York City
Cohn, Sidney, New York City
Colie, E. N., Jr., New York City
Connely, E. McC., New York City
Cornwall, L. H., New York City
Dalton, Wm. A., New York City
De Yoe, Leon E., New York City
Dugdale, A. H., New York City
Eckert, M. M., New York City
Eliasberg, B. H., New York City
Everingham, S., New York City
Framb, Robert T., New York City
Geist, S. H., New York City
Gere, J. B., New York City
Gerster, J. C. A., New York City
Girsdanský, New York City
Gottlieb, Chas., New York City
Gray, C. P., New York City
Hartshorne, W. M., New York City
Held, B. J., New York City
Hetrick, L. E., New York City
Holt, R. R., New York City
Hooker, R. S., New York City
Horowicz, B. S., New York City
Imperator, C. J., New York City
Jaches, L., New York City
Jameson, J. W., New York City
Jones, Lewis P., New York City
Kaplan, D. M., New York City
Kent, James M., New York City

Phillips, B. G., New York City
Poll, Daniel, New York City
Pool, E. H., New York City
Rhodes G. K., New York City
Riley, Hugh A., New York City
Ruddy, W. P. J., New York City
Satterlee, H. S., New York City
Selinger, C. H. S., New York City
Strowger, C. W., New York City
Turner, Reeve, New York City
Van Ingen, P., New York City
Varner, H. H., New York City
Wallace, K., New York City
Warner, J. W., New York City
Weil, R., New York City
Miller, G. L., Niagara Falls
Meeker, J. E., Ogdensburg
Albertson, H. S., Oswego
Rawlson, Ira A., Plattsburg
Cromwell, C. D., Poughkeepsie

Murbach, Clarence F., Arehbold
Conard, Robert, Manchester
Poyle, Frank V., Lowling Green
Caton, Russell J., Lucyus
Lane, Fred W., Cambridge
Shipley, Ralph T., Carrollton
Applegate, Mat. M., Cincinnati
Deneen, De Enna D., Cincinnati
Metz, Charles W., Cincinnati
Paden, Russell H., Cincinnati
Knodes, Goodrich B., Cincinnati
Ware, H. J., Cincinnati
Jackson, Harry D., Circleville
Boutwell, Joseph H., Cleveland
Burstein, Theodore, Cleveland
MacFarland, Chas. H., Cleveland
Marine, David, Cleveland
Wagner, Harold F., Cleveland
Albanese, Nicholas A., Columbus
Boucher, Howard E., Columbus

Klein, Elmer A., Norwood
Neal, Charles A., Norwood
Kennedy, Edwin J., Peebles
Haley, Michail R., Piqua
Teeter, Judson, Pleasanthill
Caldwell, John R., Rayland
Biddle, Victor, Steubenville
Dryer, Charles, Toledo
Eyestone, Fred L., Toledo
Harrison, Jay M., Toledo
Church, Charles G., Van Wert
Ailes, Melville D., Warren
Waller, Chester C., Warren
Hartmann, Carl E., Wauseon
McCurdy, Sidney M., Youngstown
Meyer, Nathan N., Youngstown
Painter, Albin M., Youngstown

OREGON

Osborn, C. C., Portland



SHOWER BATHS



EXTERIOR OF BARRACKS USED FOR MEDICAL RESERVE OFFICERS

King, Jos. E. J., New York City
Kopetsky, Sam. J., New York City
Larson, H. M., New York City
Loeb, Max. L., New York City
Lyle, H. H. N., New York City
Lytle, John D., New York City
MacGuire, C., New York City
McBurney, M., New York City
McHenry, J. H., New York City
McMillin, M. B., New York City
Mead, T. F., New York City
Myer, L. B., New York City
Morgan, W. A., New York City
Morison, R. A., New York City
Morrow, A. S., New York City
Murphy, J. J., New York City
Nicolson, Wm. P., New York City
Oppenheimer, B. S., New York City
Palmer, S. D., New York City
Pease, M. C., New York City

Child, Frank S., Port Jefferson
Boddy, Edm. C., Rochester
Bowen, Albert, Rochester
Gage, Geo. H., Rochester
Nacey, Lawrence J., Rochester
Heffer, John C., Salamanca
Phillips, E. W., Savannah
Mullens, C. E., Slingerlands
Selover, Charles W., Stanley
Rapuzzi, Jos., Staten Island
Wiggin, Dayton C., Staten Island
Ballantyne, L. W., Syracuse
Schwartz, Seymour C., Syracuse
Farmer, Harlow G., Watertown
Lord, Lester W., West Ossipee
Benedict, Albert N., Yonkers

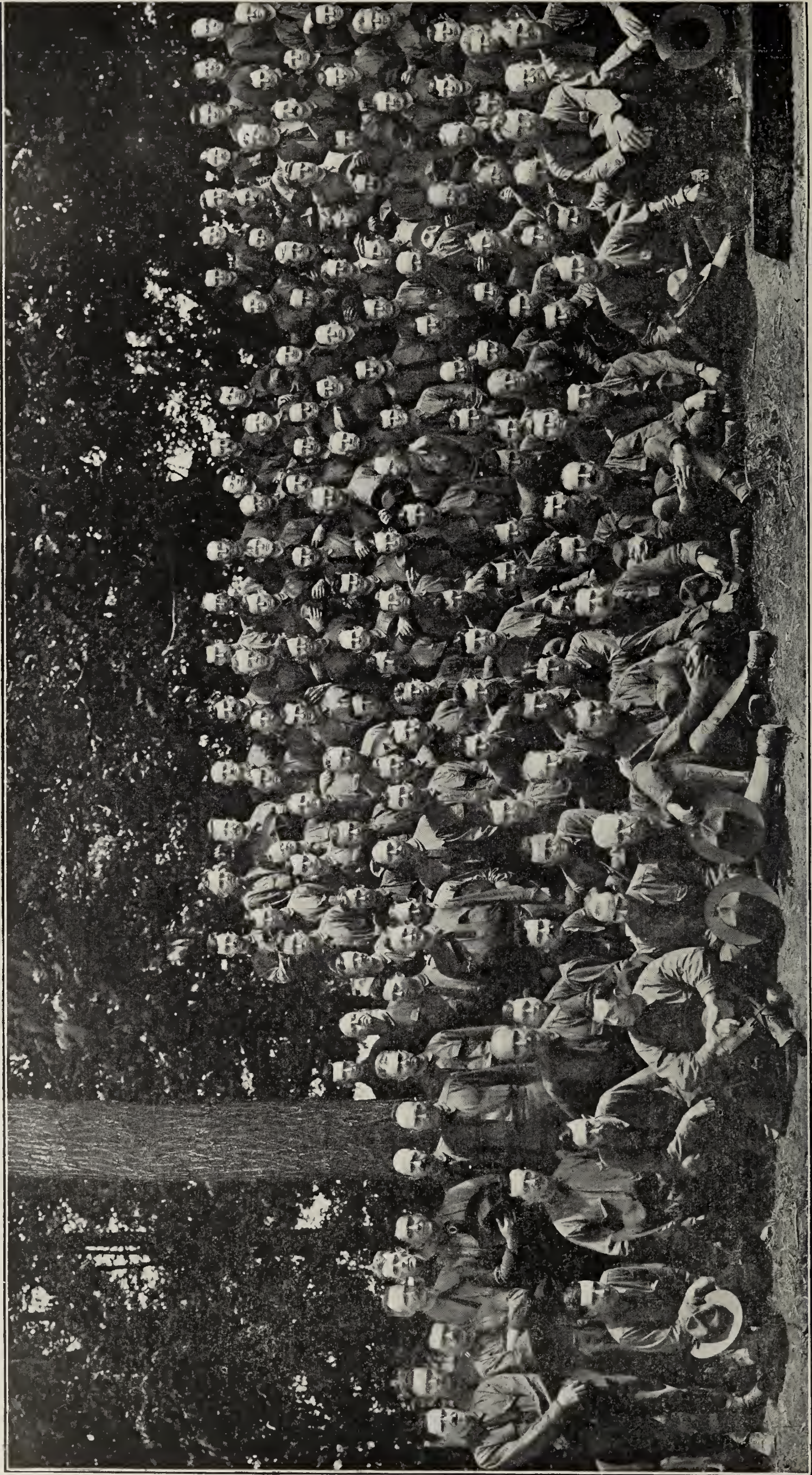
OHIO

Parnard, Peni. C., Alliance
Ramsey, P. M., Alliance

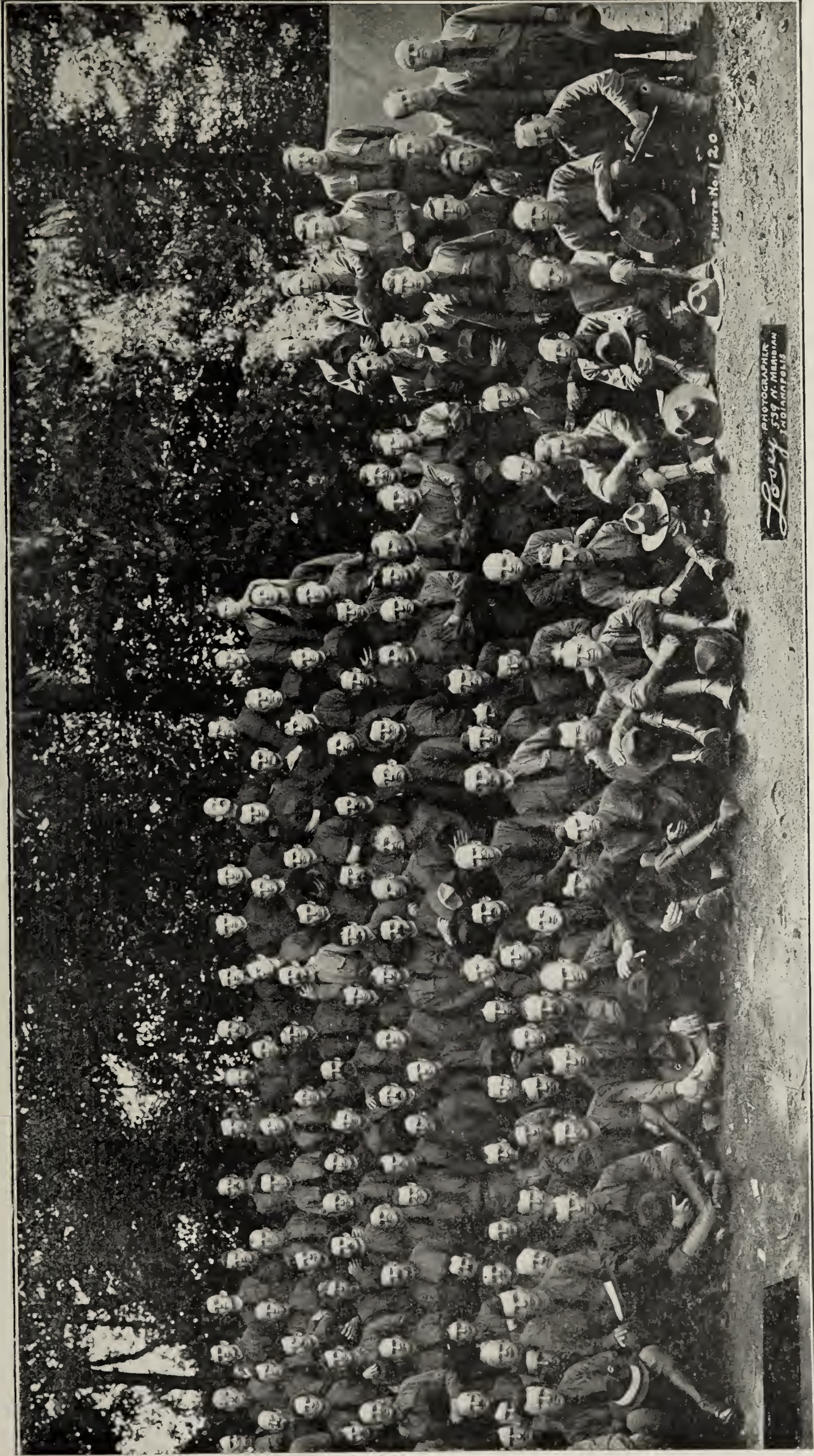
McClelland, Chas. E., Columbus
McDowell, John R., Columbus
Osborn, Morse F., Columbus
Smith, Edward E., Columbus
Hewitt, Archie E., Dayton
Kislie, Fred K., Dayton
Mansur, Wm. B., Dayton
Wilson, Roy A., Dennison
McEelf, Henry M., Elyria
Smith, Arthur B., Elyria
Cass, James W., Farmer
Dickinson, T. H., Cementown
Lantz, James M., Lancaster
Farr, George M., Lilly Chapel
Haw, Virgil H., Lima
Hibbard, Burt, Lima
Penrett, Herbert W., Lisbon
Christopher, Harry V., London
Shawacker, K. E., N. Philadelphia
Gill, Robert C., Norwalk

PENNSYLVANIA

Hendricks, Chas. S., Bolivar
Bulgar, Alvine, Braddock
McKibbin, Jas. M., Buck Valley
Little, Theodore Alvin, Corry
Hemphill, David E., Curtisville
Good, John L., Harrisburg
Sharpe, John S., Haverford
Buckley, R. Emerson, Hazleton
Shafer, Charles L., Kingston
Boger, John D., Lancaster
Davis, Henry B., Lancaster
Thomas, Lauren, Datrobe
Lamb, Harold, Mercer
Linn, Charles F., Monongahela
Workman, Wm. M., Mt. Joy
Harper, Howard C., New Castle
Burg, S. S., Northumberland
Schwartz, Grover C., Perkasio
Barron, Charles A., Philadelphia
Bertollet, John A., Philadelphia
Bohn, Zera E., Philadelphia
Cole, Albert N., Philadelphia
Conrad, G. W. H., Philadelphia
Cornell, Walter S., Philadelphia
Crampton, George S., Philadelphia
Devereux, Robt. T., Philadelphia
Elliott, John D., Philadelphia
Felterman, W. B., Philadelphia
Franklin, Melvin M., Philadelphia
Guilfoyle, Wm. F., Philadelphia
Hilsman, Henry H., Philadelphia
Kieffer, Geo. C., Philadelphia
Leopold, Samuel, Philadelphia
Lermann, Wm. W., Philadelphia
Lawrence, J. S., Philadelphia
Lewis, Clarence J., Philadelphia
Lucke, B. H. E. W., Philadelphia
Lynch, John J., Philadelphia
Lynch, Wm. L., Philadelphia
Massey, Bradford, Philadelphia
McCloskey, E. W., Philadelphia
Medley, John E., Philadelphia
Merscher, W., Philadelphia
Ross, Thos. C., Philadelphia



A GROUP OF MEDICAL OFFICERS IN THE TRAINING CAMP FOR MEDICAL RESERVE OFFICERS AT FORT BENJAMIN HARRISON. AT THE EXTREME RIGHT IN THE LOWER ROW IS MAJOR PERCY M. ASHBURN, CHIEF OFFICER; TO HIS LEFT IS MAJOR GEORGE H. SCOTT.



A GROUP OF MEDICAL OFFICERS IN THE TRAINING CAMP FOR MEDICAL RESERVE OFFICERS AT FORT BENJAMIN HARRISON. AT THE EXTREME LEFT OF THE LOWER ROW IS MAJOR JAY R. SHOOK; TO HIS RIGHT IS CAPT. TAYLOR EUGENE DARBY; BACK OF MAJOR SHOOK IS CAPT. HOWARD M. SNYDER.

(This illustration and the one above were in one group which was separated into two sections for reproduction.)

Ryan, Wm. C., Philadelphia
Sheaff, Phillip A., Philadelphia
Stimson, C. M., Philadelphia
Tassman, Isaac, Philadelphia
Winter, Karl D., Philadelphia
Zulick, Jay D., Philadelphia
Ferner, Jos. J., Pittsburgh
Frank, Austin C., Pittsburgh
Hamilton, Sam., Jr., Pittsburgh
Jackson, Daniel F., Pittsburgh
Jackson, Elmer C., Pittsburgh
Lindsay, J. A., Pittsburgh
Proescher, Frederick, Pittsburgh
Van Kirk, Vite E., Pittsburgh
Vaux, Carey J., Pittsburgh
Toland, William A., Pottstown
Longwell, Benj. J., Seminole

Shaffer, Fred. B., Somerset
Mackey, Robert B., Waverly
Pleasants, H., Jr., West Chester
Peichard, Simon W., Wilkes-Barre
Hill, Ralph L., Woodville
Gordon, Edward J., Wyncote

RHODE ISLAND

Holt, Chas. H., Pawtucket
Gardner, George W., Providence
Jordan, H. P. B., Providence
Noyes, Ira H., Providence
Christie, Chas. S., River Point
Donnell, C. E., Tulia.

VERMONT

White, Wm. H., North Troy
Pond, Arlington, Rutland

VIRGINIA

Elanton, Wyndham B., Richmond

WASHINGTON

Van Kirk, Asher W., Elberton
Booth, John R., Seattle

WEST VIRGINIA

Rusmissett, J. A., Buckhannon
Pettry, Benjamin L., Dorothy
James, Maurice C., Hinton
Kearns, Frank M., Hundred
Keatley, Harry W., Hnutington
Lyons, Joseph W., Huntington
Price, Norman R., Marlinton
Eanes, Richard H., Widen

WISCONSIN

Vogel, Carl C., Elroy
Longley, Jonas R., Fond du Lac
Mix, Harry C., Green Bay
Sinn, George, Green Bay
Shimek, Adolf J., Manitowoc
Vander Veer, Jas. N., Martell
Darling, F. E., Milwaukee
Wilkinson, M. R., Aconomowac
Scantleton, John M., Sparta
Bellis, Glenford L., Wanwastosa
Huges, C. W., Winneconne

CANAL ZONE

Evans, Forrest M., Balboa



INTERIOR OF BARRACKS USED FOR MEDICAL RESERVE OFFICERS. NOTE PARTICULARLY REGULATION ARMY FOLDING COT; REGULATION ARMY TRUNK AT FOOT OF BED; BEDDING ROLL; SCREENING AND VENTILATION. THIS PICTURE WAS TAKEN AFTER SOME 200 MEN WERE ORDERED AWAY FOR TEMPORARY DUTY ELSEWHERE.

The following men were at Fort Benjamin Harrison but were ordered elsewhere. Most of them probably have gone for service abroad, some to other stations; a few have been ordered home and honorably discharged:

CALIFORNIA

Chapin, W. A. R., Pasadena

ILLINOIS

Pierce, Frank E., Chicago
Ullman, H. J., Highland Park
Richman, S. H., Oak Forest
Pettit, Roswell T., Ottawa
Griswold, R. W., Pitchfield

INDIANA

Campbell, C. C., Indianapolis
Clevenger, W. F., Indianapolis
Coble, Paul B., Indianapolis
Dubois, Edward J., Indianapolis
McElroy, Jesse L., Indianapolis
Chenoweth, E. B. C., Nineveh

MAINE

Hill, Paul S., Biddeford
Hayden, L. B., Livermore Falls
Anderson, W. D., Portland

MASSACHUSETTS

Riley, Augustus, Boston
Watt, Charles H., Fall River
Tucker, W. M., Hinsdale
Rochford, R. A., Springfield
Kelly, Harvey A., Winthrop

MICHIGAN

Hammel, Harry H., Ann Arbor
Washburne, C. L., Ann Arbor
Clark, Harold E., Detroit
Freund, Hugo A., Detroit
Honor, W. H., Wyandotte

NEW HAMPSHIRE

Bergeron, Pierre, Manchester
Miller, Samuel, Manchester
Straw, Amos G., Manchester
Huse, Earnest L., Meriden

NEW MEXICO

Smith, Fredk. C., Fort Stanton

NEW YORK

Van Winkle, H. L., Albany
Palister, S. W., Brooklyn
Rankin, John F., Brooklyn
Brooks, N. P., New Lebanon
Baughman, W. H., New York
Cobb, James L., New York
Davis, Thomas K., New York
Gable, Malone L., New York
Osincup, G. S., New York
Hastings, T. W., New York
Worcester, J. N., New York
Almy, Max A., Rochester
Duffy, Francis T., Troy
Silliman, G. S., Westbury

OHIO

Wright, Fred S., Bellaire
Brown, H. A., Cincinnati

Gillespie, William, Cincinnati
Sherry, Leroy B., Cleveland
Spruncy, Anton B., Cleveland
Wahl, Harry R., Cleveland
Fenker, William T., Columbus
Dickinson, T. H., Germantown
Maxon, C. W., Steubenville
West, James H., Tiffin
Manley, Orville T., Warren

PENNSYLVANIA

Crouse, Charles C., Derry
O'Reilly, Charles A., Philadelphia
Keely, Henry E., Philadelphia
Redmond, M. S., Pittsburgh
Robinson, G. H., Uniontown

WEST VIRGINIA

Moser, W. C., Morgantown
Lack, Esly T., Muss

**PHYSICAL EXAMINATION OF MEN DRAFTED
UNDER THE SELECTIVE SERVICE ACT****Methods to Be Followed, and Official Instructions to
Medical Examiners**

The initial physical examinations of the 687,000 men registered and to be drafted under the Selective Service Law are to be made under direction of the local exemption boards, by the medical members of such boards or by experienced licensed physicians in good standing appointed for that purpose. In the latter case the examining physicians are to be designated by the governors of the state and are to be appointed by the local boards which they are to serve. In addition to the

drafted are liable to be called for military service, it will in the order of such liability send notices to such men, each notice containing a direction to appear for physical examination at a time and place stated in the notice. Normally such examinations will be made within the exemption district within which the man to be examined was registered. A man absent from his normal exemption district and unable to present himself for examination there on or before the tenth day after the mailing of the notice directing him to appear, may, however, on or before that day, file with his proper local board an application for an order directing his examination by another board, and his local board may if it deems proper certify him to that board for examination.



INTERIOR OF MESS HALL AT FORT BENJAMIN HARRISON

medical member of the local board and in addition to the examining physician, if any, appointed for that board, a physician is to be appointed to make a second examination of every man who is found by the first examiner to be unfit for military service. Additional examining physicians may be appointed if the work of the local board requires—one additional if the men to be examined in any one day exceed eighty, two if more than 120 are to be examined, three if the number to be examined exceeds 160, and others in like ratio. Men accepted by local boards for service will be examined later by army surgeons for physical disability, but not until they arrive at the rendezvous camps.

ROUTINE OF NOTIFICATION

As soon as practicable after a local board has determined, in accordance with the regulations governing the matter, the order in which the men within its jurisdiction who have been

If any man notified by a local board to appear for physical examination shall because of sickness be unable to do so, it will be necessary for him, on or before the tenth day after the mailing of the notice, to prove such inability to the satisfaction of the board, such proof to be made by affidavits, at least one of which shall be made by a licensed physician. If satisfied of his inability to appear, the board may enter an order requiring its examining physician to examine the sick man wherever he may be, within the board's jurisdiction.

Men who do not present themselves for examination before their normal local boards on or before the tenth day after notice, and who within that time make no applications for orders directing their examination elsewhere and no proof of absence on account of illness, are to be regarded as physically fit for military service and are to be recorded accordingly. On just cause shown, however, local boards may authorize the physical examinations of such men later.

ORDER OF PHYSICAL EXAMINATIONS

In making physical examinations and in basing conclusions on the results of such examinations, examining physicians and local boards are to be governed by the regulations which follow, which have been prescribed by the President for that purpose. If an examining physician or a local board is in doubt as to whether or not any man examined is physically unfit for military service, the doubt is to be resolved in favor of his physical fitness and he is to be held qualified. If in any case the examining physician finds the man examined physically unfit for military service, the board must cause him to be examined by another examining physician, designated and appointed for that purpose, who shall make his examination "without reference to or regard for the report of the first examiner."

QUALIFICATIONS

On the completion of the physical examination by one or two physicians as the case may require, the local board conducting the examination shall pass on the physical qualifications of the man examined in accordance with the following rules: If the examining physician making the original physical examination has found the man examined physically qualified for military service, the board shall hold that man to be so qualified. If the first examining physician found the man disqualified and the second examining physician has found him qualified, he shall be held to be physically qualified. If both examining physicians have found the man examined physically disqualified for military service and the board does not concur in such findings, he shall be held to be physically qualified. If both physicians have found the man examined not physically qualified for military service and the board concurs in such findings, he shall be discharged from the draft and a certificate setting forth the conditions of such discharge shall be issued to him in accordance with these regulations.

No discharge shall continue when the cause therefor no longer exists. Whenever a local board determines that such is the case, that board shall at once revoke its certificate of discharge and restore the name of the man to whom it was issued to the list of those called for service. Certificates of discharge shall require by their terms any man discharged conditionally or for a limited time to report to the local board issuing the certificate, immediately on the expiration of the time specified or whenever the conditions entitling him to a certificate of discharge cease to exist.

No man is to be physically examined unless at least one member of the local exemption board other than the medical member is present. No physician shall participate in the physical examination of any man who is related to him "by blood or marriage nearer than a second cousin"; nor shall any member of a local exemption board participate in the physical examination or pass on the physical qualifications for military service who is related to him "by blood or marriage nearer than a second cousin."

Regulations Governing Physical Examinations Under the Selective Service Act of May 18, 1917

Under authority vested in him by the act of May 18, 1917, the President of the United States has prescribed the following regulations governing physical examinations under the act. These regulations prepared by the Surgeon-General of the Army have been published by the War Department. THE JOURNAL reproduces them for the information of physicians.

1. It is important, to begin with, that the examining physician should realize that there will be a certain proportion of men among those presenting themselves for examination who will endeavor to obtain exemption by dissimulation, varying from exaggeration of an existing condition not disqualifying to downright malingering, and he should be prepared to protect the government and himself against such attempts at deception.
2. The physical examination should take place in a large, well-lighted room. The person examined is to be stripped. The examining physician should proceed in substantially the following order, viz:
- (a) Observe the general condition of the skin, scalp, and cranium, ears, eyes, nose, mouth, face, neck, and chest. Take

weight, height, and chest measurements. Accepted measurements are as follows, all chest measurements to be taken on a level just above the nipple:

Height		Weight (Pounds)	Chest Measurement	
Feet	Inches		At Expiration (Inches)	Mobility (Inches)
51½	61	118	31	2
52½	62	120	31	2
53½	63	124	31	2
54½	64	128	32	2
55½	65	130	32	2
56½	66	132	32½	2
57½	67	134	33	2
58½	68	141	33½	2½
59½	69	148	33½	2½
510½	70	155	34	2½
511½	71	162	34½	2½
6	72	169	34¾	3
61½	73	176	35½	3
62½	74	183	36½	3
63½	75	190	36¾	3½
64½	76	197	37½	3½
65½	77	204	37½	3¾
66½	78	211	38½	4

The following variations below the standard given in the table are permissible, when the applicant is *active, has firm muscles, and is evidently vigorous and healthy*:

Height, Inches		Chest at Expiration, Inches	Weight, Pounds
61 and under	64.....	1	8
64 and under	68.....	2	10
68 and under	69.....	2	12
69 and under	70.....	2	15
70 and under	73.....	2	20
73 and upward.....		2	24

To be acceptable, men below 64 inches in height must be of good physique, well developed, and muscular.

Variations in weight above the standard are not disqualifying, unless sufficient to constitute obesity. Unless exceptionally well proportioned, men above 6 feet 6 inches in height should be rejected.

(b) The arms being extended above the head, backs of hands together, the applicant is required to cough vigorously; any form of rupture may now be discovered by the hand and eye, but still better by the index finger passed up to the external ring.

(c) The arms remaining extended above the head, the applicant is required to take a long step forward with the right foot and bend the right knee; the genital organs are now conveniently exposed and varicocele and other defects in the scrotum may be recognized.

(d) Arms down and the man required to separate the buttocks with his hands, at the same time bending forward; this exposes the anus.

(e) Examine heart and lungs; rate of pulse and respiration.

(f) Upper extremities: Make sure that all joints are free and supple, from the phalanges to the shoulder.

(g) Lower extremities: The person under examination is required to leap directly up, striking the buttocks with the heels, to hop the length of the room on the ball of first one foot and then the other, to make a standing jump as far as possible and repeat it several times, to run the length of the room in double-time several times; after which his heart and lungs are reexamined.

(h) *Mental*.—The mental examination should be such as to develop whether or not the man examined is possessed of normal, sound understanding.

(i) *Vision*.—To determine the acuity of vision, without glasses, place the person under examination with back to window at a distance of 20 feet from the test types. Examine each eye separately, without glasses, covering the other eye with a card (not with the hand). The applicant is directed to read the test types from the top of the chart down as far as he can see, and his acuity of vision recorded for each eye, with the distance of 20 feet as the numerator of a fraction, and the size of the type of the lowest line he can read correctly as the denominator. If he reads the 20-foot type correctly, his vision is normal and recorded 20/20; if he does not read below the 30-foot type, the vision is imperfect and recorded 20/30; if he reads the 15-foot type, the vision is unusually acute and recorded 20/15, etc.

(j) In accordance with these conclusions, the minimum visual requirements are as follows: 20/40 for the better eye, and 20/100 for the poorer eye, provided that no organic disease exists in either eye.

(k) *Hearing*.—To determine the acuity of hearing, place the applicant facing away from an assistant who is 20 feet distant and direct him to repeat promptly the words spoken

by the assistant. If he can not hear the words at 20 feet, the assistant should approach foot by foot, using the same voice, until the words are repeated correctly. Examine each ear separately, closing the other ear by pressing the tragus firmly against the meatus. The examiner, whose hearing should be normal, faces in the same direction as the candidate and closes one of his own ears in the same way as a control. The assistant should use a low conversational voice (not a whisper), just plainly audible to the examiner, and should use numerals, names of places, or other words or sentences until the condition of the applicant's hearing is evident. The acuity of hearing is expressed in a fraction the numerator of which is the distance in feet at which the words are heard by the candidate and the denominator the distance in feet at which the words are heard by the normal ear; thus 20/20 records normal hearing, 10/20 imperfect hearing, etc. If any doubt should exist as to the truthfulness of the answers given, a watch should be used, care being taken that the individual does not know the distance from the ear at which it is being held; the watch used should be one whose ticking strength has been tested by trial on a normal ear. The hearing with both ears open should not be below 10/20.

3. The following defects are causes for rejection:

Mental.—Lack of normal understanding.

Skin.—Chronic, contagious, and parasitic diseases, when severe and extensive; chronic ulcers, deep or extensive.

Head.—Abrupt depression in skull, the consequence of old fracture.

Spine.—Curvature, caries, abscess. Lateral curvature is cause for rejection when it exceeds 1 inch to either side of the line of spinous processes, especially when it throws the shoulders out of symmetry.

Ears.—All catarrhal and purulent forms of otitis media; perforation of tympanum.

Eyes.—Acuity of vision below the requirements of paragraph 2 (j); conjunctival affections, including trachoma and entropion; strabismus, diseases of the lachrymal apparatus, exophthalmos, ptosis, asthenopia, nystagmus.

Mouth, Nose, and Fauces.—Deformities interfering with mastication or speech, chronic ulcerations, fissures or perforations of the hard palate, hypertrophy of the tonsils sufficient to interfere with respiration or phonation, loss of voice or manifest alteration of it. The person must have at least four serviceable molar teeth, two above and two below on one side and two above and two below on the other side, and so opposed as to serve the purpose of mastication. A good fitting bridge or plate where not more than one-half of the teeth are involved is not disqualifying.

Obstruction of nostrils, or foul discharges indicative of ozena.

Simple atrophic rhinitis is readily curable. Nasal polypi often mean chronic sinusitis, but are not a bar to acceptance for military service. Sunken or scarred nose is often indicative of syphilis, while a red bulbous nose suggests alcoholism or indigestion.

Neck.—Pronounced goiter, great enlargement or ulcerations of the cervical glands.

Chest.—Disease of lungs and heart, especially in flat or narrow or malformed chest. In examining the heart care must be taken not to ascribe to disease the hurried, sharply accentuated action sometimes due to nervousness, fright, or embarrassment, or the irregular action caused by the excessive use of tobacco. Nor should the examiner attach undue importance to the soft systolic murmurs often heard in growing athletic youths, functional and temporary in their nature.

Abdomen.—Chronic inflammations of the gastro-intestinal tract, including chronic diarrhea and dysentery and other diseases of the contained organs; great care should be exercised before exempting for these conditions; hernia in all situations.

Anus.—Hemorrhoids of a pronounced type, prolapsus, fistula and fissures.

Genito-Urinary Organs.—Syphilis when discernible by inspection and physical examination; tight urethral stricture, undescended testicle, chronic orchitis, marked hydrocele; chronic disease of the bladder and kidneys. Varicocele does not constitute a cause for rejection unless it is so large as to interfere with locomotion; it frequently occurs among the most robust men and often without their being aware of its existence. Gonorrhea, acute and chronic, is not disqualifying, but individuals so affected should be advised immediately to secure appropriate medical treatment pending receipt of orders to report for duty.

Affections Common to Both Extremities.—Chronic rheumatism and diseases of the joints of disabling type, irreducible dislocation or false joints, old dislocations if attended with impairment of motion or distortion of the joint, severe sprains, chronic synovitis, badly united fractures, caries, necrosis, atrophy or paralysis, extensive or adherent scars, permanent contraction of muscles.

Hands.—Webbed fingers, permanent flexion, extension or loss of motion of one or more fingers; loss or serious mutilation of either thumb, total loss of index finger of the right hand, total loss of any two fingers of the same hand, or loss of the second and third phalanges of all the fingers of either hand.

Lower Extremities.—Pronounced varicose veins, especially when attended with edema or marks of ulceration, pronounced knock-knees, club feet, flat feet, webbed toes, bunions, overriding or marked displacement or deformity of any of the toes, hammertoes.

The shin bone, if rough, nodulated, and tender, suggests syphilis.

A broad, flat sole is common in laboring classes, particularly among negroes, and is in no way disabling. In the flat foot which renders a man unfit for service the arch is so far gone that the entire border rests upon the ground, with the inner ankle lowered and very prominent and the foot apparently pushed outward. Flat feet are not infrequently the result of tuberculous process.

4. Any of the physical deficiencies mentioned above must be present in such degree as to clearly and unmistakably disqualify the man for military service before he can be found to be physically deficient and not physically qualified for military service.

5. Temporary effects of acute disease or of an injury are not to be regarded as justifying a finding that the person so affected is physically deficient and not physically qualified for military service, but may be regarded as justifying a reasonable delay in completing the physical examination in order that an opportunity for recovery may be afforded.

6. Upon the recommendation of the Provost Marshal General, medical officers will be directed, from time to time, to visit local boards for the purpose of observing the manner in which physical examinations are being conducted and conclusions based thereon. Such medical officers will be authorized to reexamine men whom the local boards have found to be physically deficient and not physically qualified for military service, and will be required to make a report of each such reexamination.

7. These regulations may be modified at any time by the President of the United States.

FORM NO. 14, P. M. G. O.

Prepared by the Surgeon General of the Army

PHYSICAL EXAMINATION

.....
(Surname) (Christian name.)

Serial No.....

STATEMENT OF PERSON EXAMINED

Have you found that your health and habits in any way interfere with your success in civil life? If so, give details:

Do you consider that you are now sound and well? If not, state details. Have you ever been under treatment in a hospital or asylum? If so, for what ailment?

I certify that the foregoing questions and my answers thereto have been read over to me; that I fully understand the questions and that my answers thereto are correctly recorded and true in all respects.

I further certify that I have been fully informed and know that making or being a party to making any false statement as to my fitness for military service renders me liable to punishment by imprisonment.

.....
(Signature of person examined)

..... M.D.,
Examining Physician.

Place,.....
Date,.....

PHYSICAL EXAMINATION BY EXAMINING PHYSICIAN OF LOCAL BOARD (Person under examination stripped.)

Weight, lbs.; height, inches.
Girth of chest (at nipples): At expiration, inches.
At inspiration, inches.
General examination (head, chest, abdomen, extremities):.....
Nose and throat:
Heart:
Genito-urinary organs (urine will be examined in suspicious cases):....
Hernia:

Dr. Joseph F. Tearney, who has retired on account of ill health.—Dr. Royal D. Sykes has succeeded Dr. Milholland as assistant chief medical examiner.

University Hospital Unit Organized at Baltimore.—The University Hospital Unit, comprising surgeons, physicians and nurses of the university, Maryland General and Mercy hospitals, has been completed and it is expected that within two weeks the unit will be off to the front. The physicians and surgeons comprising this unit are: director major, Archibald C. Harrison; adjutant, Capt. Arthur M. Shipley; quartermaster, Capt. William K. White; registrar, First Lieut. Edward A. Looper, all of Baltimore. Surgical staff, Major Frank Martin, Drs. Compton Riely, Herbert H. Haynes, Clarksburg, W. Va.; Hugh W. Brent, Daniel C. Patterson, Bridgeport, Conn.; Chadbourne A. Andrews, Tampa, Fla.; Eugene H. Hayward, Baltimore; Edward W. Johnson, New York, and Thomas K. Galvin, Baltimore, all with the rank of first lieutenant. Medical staff, Capt. Cary B. Gamble, Drs. J. Burr Piggott, Corbin Street, Washington, D. C.; Harry M. Stein, Erwin E. Mayer, all with the rank of first lieutenant. Laboratory staff, Drs. John Evans and D. C. Wharton Smith.

MASSACHUSETTS

Convalescent Hospital Donated.—Mr. and Mrs. James J. Storrow have donated the use of their summer home at Lincoln to the government, to be known as the Lincoln Convalescent Hospital. The staff will be made up of women physicians, including 4 administrative officers, 13 surgeons, 21 physicians, 13 specialists, 3 dentists, 64 graduate nurses and 36 surgical dressing nurses.

Personal.—Dr. Elliott P. Joslin, Boston, has been elected as assistant professor in Hartford Medical School.—Dr. Leverett D. Bristol, Boston, has been appointed state health commissioner of Maine.—Dr. Horace D. Arnold, Boston, has been elected chairman of the Council on Medical Education of the American Medical Association, succeeding Dr. Arthur Dean Bevan, Chicago.—A jury is said to have awarded \$8,000 damages to James W. Ray, in the suit brought for the loss of an eye, against Dr. John Morgan, Boston.—Dr. John A. Barry, Charlestown, fell from a second story window while attempting to unfurl a flag, fracturing both wrists and dislocating his right elbow.—Dr. William H. Coon has been appointed health officer of Kansas City, Mo.—Dr. William C. R. Hurley, Boston, has been appointed resident surgeon of the East Boston Relief Station, succeeding Dr. Joseph J. Hagerty, Norwood, who has become visiting surgeon at the Carney Hospital.—Dr. Albert F. Lowell, Gardner, has been appointed associate medical examiner (coroner) of Worcester County.

MICHIGAN

New Hospital.—The Cleveland-Cliffs Iron Company has announced that it will establish a hospital in Ishpeming. The new building will be three stories in height, brick and fire-proof, and will accommodate more than fifty patients.

Personal.—Dr. Eugene Smith, Detroit, has resigned as first aid surgeon of the police department.—Lieut.-Col. Angus McLean, Detroit, director of the Harper Hospital, Unit No. 17, has resigned as president of the Detroit Board of Health.—Dr. Roy A. Barlow, Ann Arbor, has been appointed associate otolaryngologist to the Mayo Clinic, Rochester, Minn.—Dr. Walter I. Lillie, Flint, has resigned from the Flint Ambulance Corps and has accepted a position as ophthalmologist at Rochester, Minn.—Dr. James W. Inches, St. Clair, has been reappointed health officer of Detroit.—Dr. Slocumb R. Edwards, eye and throat specialist on the medical staff of the Calumet and Hecla Hospital, Calumet, has resigned and will practice in Grand Rapids.

Courses in War Pathology and Bacteriology.—In order to meet the demand for instruction in pathology and bacteriology of infections and diseases peculiar to modern warfare, the University of Michigan has begun special courses in which the following subjects are taken up: pathology of war infections and diseases in general, by Prof. Aldred S. Warthin and Asst. Prof. Carl V. Weller, including the pathology of camp and trench infections, hospital infections, trauma, repair and military operations; bacteriology of camp and trench infections, by Asst. Prof. Paul H. De Kruif, including the preparation and application of vaccines; serum reaction, use and diagnosis, and control of vaccination; and the study of organisms important in wound and camp infections. The laboratory course will be supplemented by lectures and discussions.

MONTANA

Personal.—Dr. John T. Foley, Lewistown, has been elected chairman of the medical and civil committee of the local chapter of the Red Cross.

Research Association Organized.—A research association has been organized in Bozeman by Drs. James F. Blair, Clyde W. Jump and Roy E. Seitz.

Hospital Items.—More than \$100,000 has been secured for the Deaconess Hospital, Billings, by a campaign, which ended July 4.—Construction work has been started on the new hospital, which is being erected in Billings by the Sisters of Mercy. The building will be 200 by 100 feet, five stories in height and will accommodate 176 patients.—The ceremonies, attending the breaking of the ground for the second unit for the new Butte Deaconess Hospital, were held June 7. This unit will be the main surgical unit of the hospital. Funds for the institution now amount to \$76,000.—The Bozeman Deaconess Hospital began its seventh year of work, July 1. The building is much crowded and a new building is greatly needed.—The board of directors of the Havre Deaconess Hospital has decided to change the name to the Kennedy Deaconess Hospital of Havre, in memory of Mead Kennedy, who donated the site for the institution. A new building is to be erected at a cost of \$54,000.—The new Northern Pacific Hospital, at Missoula, will be ready for occupancy by August 1.

NEW JERSEY

Women Appointed Managers of State Hospital.—Under the law passed at the last session of the legislature, Mrs. H. Crittendon Harris, Glen Ridge, and Mrs. Seymour Cromwell, Mendham, have been appointed by the governor, members of the board of managers of the Morris Plains State Hospital.

New State Board Officers.—At the annual meeting of the state board of health in Trenton, July 3, Dr. William H. Chew, Salem, was reelected president, and Dr. J. Oliver McDonald, Trenton, was elected vice president. Dr. Charles B. Lee, Camden, successor of Dr. Edward A. Ayers, Branchville, was present with the board for the first time since his appointment.

Personal.—Dr. Charles S. Pancoast, Camden, will leave early next month to take charge of Field Hospital No. 3 on the French front.—A dinner was given at Newark, June 2, in honor of Dr. Britton D. Evans, medical director of the Morris Plain State Hospital, to celebrate the completion of a term of service of a quarter of a century. About 250 guests were present.

Medical Inspection and School Hygiene.—The third annual session of the New Jersey State Association of Medical Inspection and School Hygiene was held at Asbury Park, May 26, and the following officers were elected: president, Dr. Waldo U. Kurtz, Asbury Park; vice president, Dr. Eugene H. Goldberg Kearny; secretary, Dr. Ferdinand G. Angeny, Avon, and treasurer, Dr. Henry H. Brinkerhoff, Jersey City.

State Society Meeting.—The one hundred and fifty-first annual meeting of the Medical Society of New Jersey was held in Atlantic City, June 11 to 13, under the presidency of Dr. Philip Marvel, Atlantic City. The following officers were elected: president, Dr. William G. Schauffler, Lakewood; vice president, Drs. Thomas W. Harvey, Orange; Gordon K. Dickinson, Jersey City, and Philander A. Harris, Paterson; recording secretary, Dr. Thomas N. Gray, East Orange (reelected); corresponding secretary, Dr. Harry A. Stout, Wenonah; treasurer, Dr. Archibald Mercer, Newark; delegate to the American Medical Association, Dr. Edward Guion, Atlantic City. Lakewood was selected as the next place of meeting. The association unanimously adopted resolutions pledging the members of the society to sustain the government's present needs, and urging the members to purchase Liberty Bonds and to seek service in the Medical Officers Reserve Corps.

NEW YORK

Valentine Mott Society Election.—The twelfth annual outing of the Valentine Mott Medical Society was held in New Rochelle, June 30. Dr. Frederick P. Hammond was elected president; Dr. Joseph E. Lumbard, vice president; Dr. John Remer, secretary, and Dr. Michael C. O'Brien, treasurer.

Aviation Relief Hospital.—Construction work has been begun on the building of the Aviation Relief Hospital of the National Special Aid Society for the use of the aeronautic

section of the First Battalion of the New York Naval Militia at Bay Shore, L. I. The society has donated the hospital and also the entire equipment.

Transfer of Quarantine Deferred.—The transfer of the quarantine station on Staten Island to the federal government on the payment of \$1,395,275 has been postponed until more important matters have been gotten out of the way.

To Rebuild Sanatorium.—The rebuilding of the Sanatorium Gabriels, which was destroyed by fire a year ago, will soon begin. The main building will be replaced by a fire-proof structure of steel and concrete, 100 by 50 feet, five stories in height, and, in connection with this building, about fifteen cottages will be erected. The entire improvements will cost about \$1,000,000.

Niagara County Tuberculosis Hospital.—The final plans for the Niagara County Tuberculosis Hospital have been sent to Albany for approval by the state department of health. There will be an administration building and two pavilions with a capacity of ninety-two beds. The estimated cost of the buildings is \$100,000. The old County Hospital is to be used as an annex.

Tuberculosis Hospital Managers Hold Meeting.—At the annual meeting of the New York State Association of Managers and Superintendents of Local Tuberculosis Hospitals, held in Poughkeepsie, June 30, a resolution was adopted urging "in the strongest possible manner on those in charge of the medical examination of the new army that special and adequate measures be put into effect to secure such examination by those experienced in diagnosis of tuberculosis as will exclude all cases, active or latent." Dr. A. Clifford Mercer, Syracuse, was elected president; Dr. Aden C. Gates, Kingston, vice president; Dr. H. St. John Williams, Poughkeepsie, secretary, and Dr. Robert L. Bartlett, Rome, treasurer.

Personal.—Dr. David M. Totman has been reappointed health officer of Syracuse for the fifth term, commencing July 5.—Dr. Ralph R. Fitch, Rochester, head physician of the Franco-American Hospital, at St. Valery-en-Caux, France, was made a Knight of the Legion of Honor, July 4.—Dr. John H. Pryor has been elected president of the Buffalo Association for the Relief and Control of Tuberculosis.—Dr. De Lancey Rochester and Dr. Francis E. Fronczak were elected directors of the association.—Dr. Harry J. Bendes has been appointed first assistant physician of the J. N. Adam Hospital, Buffalo.—Dr. Francis J. Lennon has been appointed city physician of Buffalo.—Dr. Irene Tognazzini, house physician of the Syracuse Hospital for Women and Children, has resigned to accept a similar position on the staff of the Infirmary for Women and Children, New York.

Antidrug Law Goes Into Effect August 1.—The New York State Health Department makes the announcement that the amendment to the state antihabit forming drug law, enacted at the last legislature, and which was to become effective, July 1, will not go into effect until August 1. The reason for the delay is an inability under the state finance law to contract in advance for the required printing to comply with the new law's provisions. In the meanwhile circulars have been sent to all physicians, druggists, dentists, veterinarians and wholesale dealers and jobbers in drugs containing a copy of this law, and a form for making application for registration under the law, and also a form which is to be used for filing with the state department of health a verified itemized statement of all the drugs mentioned in Section 245 of said act in possession of the recipient of the letter. A duplicate of the inventory filed with the department of health is to be kept by the physician, together with other narcotic records for inspection by the proper officials. A fee of \$1 has to be sent with the application, and on receipt of the application an official order book is issued to the applicant bearing his name and registry number.

New York City

Personal.—Dr. Thomas W. Salmon has returned from England.

Fourth of July Injuries.—There was a total of ninety-three injuries due to Fourth of July celebrations treated in the hospitals of Manhattan and the Bronx as the result of accidents with firecrackers and toy pistols.

Large Narcotic Seller Convicted.—Dr. Riley C. Hammers, who has been operating a bogus sanatorium at Tampa, Fla., for drug users, and importing heroin and other narcotics from Havana for distribution throughout the eastern part of the United States, has been sentenced by Federal Judge Hand of this city for two years and nine months in the Federal Prison and to pay a fine of \$2,000. It is said that many of

the "dope peddlers" of the underworld here have been supplied by this physician.

Public Dehydrating Kitchen.—The Women's University Club, the Mayor's Committee of Women, and the Junior League have begun to can and dehydrate for the community the daily surplus of fruits and vegetables in the market. The work of canning and dehydrating is being done in the school lunch kitchen under the Williamsburg Bridge. The work of sorting has begun under the Erie Pier under the supervision of a committee of volunteer women workers. Each worker will receive a daily work card which will be redeemable in vegetables during the winter.

More Red Cross Gifts.—The New York County Chapter of the American Red Cross announces the gift of several large sums for the purchase of ambulances, among the gifts being one of \$7,000 from the Fruit and Produce Exchange. Another gift of \$7,000 was received from the Columbia Ambulance Corps and \$5,000 from Hunter College for the purchase of ambulances. Fully equipped ambulances have been donated by the Putnam County Women's Auxiliary, the Alexander Hamilton Institute, the Daughters of Pennsylvania in New York, the Mozart Society, and two from the New York chapter of the Daughters of the Confederacy.

OREGON

Personal.—Dr. George Parrish has been appointed acting health officer of Portland, Dr. Marius B. Marcellus, who is on duty with the National Guard, retaining the title of health officer.

Alumni Reunion.—The fifth annual meeting of the Alumni Association of the Medical School of the University of Oregon was held in Portland, June 25-27. At the annual banquet the presidents of the literary colleges, located in the Pacific Northwest, were the guests of the association. The following officers were elected: president, Dr. Adalbert G. Bettman, Portland; vice presidents, Dr. James P. Temiesie, Portland; James H. Robnett, Albany; Lafayette O. Roberts, Portland, and Mark W. McKinney, Seattle; secretary, Dr. Horace P. Belknap, Jr., Portland, and treasurer, Dr. Katherine C. Manion, Portland. Clinics were held at St. Vincent's and Good Samaritan hospitals.

State Society Meeting.—The forty-third annual meeting of the Oregon State Medical Association was held in Portland, June 28-30, under the presidency of Dr. Robert C. Yenney, Portland. The following officers were elected: president, Dr. Edwin E. Straw, Marshfield; vice presidents, Drs. James A. Best, Pendleton; Aaron Tilzer, Portland, and Harry J. Clements, Salem; secretary, Dr. Clarence J. McCusker, Portland (reelected), and treasurer, Dr. Katherine C. Manion, Portland (reelected); delegate to the American Medical Association, Dr. Walter T. Williamson, and councilors, Drs. Paul Rockey and Andrew C. Smith, Portland (reelected). Portland was selected as the meeting place for next year.

PENNSYLVANIA

Sanitary Units in Service.—Ambulance Company No. 4 was mustered into service at Coraopolis, June 14.—Field Hospital No. 4 was mustered into service at Pittsburgh, June 13.

New Schedule at Neversink.—At the meeting of the Berks County Tuberculosis Society it was decided to place the Neversink Mountain Sanatorium on a pay basis. Patients able to pay will be asked to contribute toward their treatment; indigent sufferers from tuberculosis will be given treatment as before.

Personal.—Dr. George L. Beswick, Wilmerding, Pittsburgh, has been elected Grand Sachem by the Great Council of Pennsylvania Redmen.—Dr. Samuel D. Shull has been elected chief of staff of the Chambersburg Hospital, succeeding Dr. Ambrose W. Thrush. Dr. Joseph P. Maclay has been reelected secretary.—Dr. W. F. Sappington, Fulton County, who has been attached to the Royal Army Medical Corps, has been ordered to France.—Dr. Susan S. Moyer has been appointed resident physician at the Harrisburg State Hospital.

National Guard Appointments.—The following appointments are announced: Major Theodore L. Hazlett, Pittsburgh, Field Hospital, No. 4; Major Frederick A. Hartung, Pittsburgh, Sanitary Train; Lieuts. George A. Deitrick, Northumberland, First Cavalry; William M. Workman, Lancaster, Ambulance Company No. 3; John B. Boger, Lancaster, Ambulance Company No. 3; Grant B. Weaver, Lancaster, Ambu-

lance Company No. 3; John E. Marshall, Lebanon, Fourth Infantry; Homer E. Halferty, Pittsburgh, Field Hospital No. 1; Alfred F. Compton, Lancaster, Ambulance Company No. 3; Milton V. Miller, Lancaster, Fourth Infantry; Charles V. Wadlinger, Schuylkill, Eighth Infantry; Benjamin F. White, Jr., McCain, Sixteenth Infantry; Albert A. Wagner, Pittsburgh, Ambulance Company No. 4; John C. Kerr, Pittsburgh, Field Hospital No. 4; Sloan A. Brown, Pittsburgh, Ambulance Company No. 4; Edward W. Douglas, Fayette, Field Hospital No. 4; Robert C. Hibbs, Pittsburgh, Field Hospital No. 4; Harry F. Baumann, Pittsburgh, Field Hospital No. 1, and George G. Shoemaker, Pittsburgh, First Field Artillery. —William H. Clewell, Summithill, has resigned from the medical corps. —Lieut. Charles B. Starr has been relieved from duty with the Fourth Infantry and assigned to duty with Ambulance Company No. 3.

Philadelphia

Government Approves Antinarcotic Bill.—The Antinarcotic bill is now a law, the governor having approved the measure on July 10. Social workers, health officials, physicians and prominent business men, all have labored for the passage of this act for more than two years and feel that they have one of the best legal weapons against the control of the drug evil.

All Passed.—The State Dental Board of Examiners announced on July 11 that the 250 applicants who took the examinations in Philadelphia and Pittsburgh during the month of June had all passed successfully. The next examination will be held in Philadelphia and Pittsburgh on December 5, 6 and 7.

Personal.—Dr. George Woodward has been elected president of the Philadelphia Art Alliance. —Dr. Marx S. Wiesen was shot and seriously wounded by a burglar who entered his home on the morning of July 12. —Dr. J. Milton Griscom has been appointed attending surgeon to the Wills Eye Hospital to succeed Dr. Samuel D. Risley. Dr. Risley, who has served on the staff of the hospital for twenty-seven years, was made consulting surgeon.

Changes in Medical Corps.—Dr. Charles J. Watson has been commissioned first lieutenant, Medical Corps, and assigned to Field Hospital No. 2. —Dr. William N. Parkinson has been commissioned first lieutenant and assigned to Field Hospital No. 3. —Major Frederick O. Waage has resigned and his resignation was accepted, June 20. —Major George S. Crampton has been relieved of assignment to duty with the administration staff and assigned as director, Field Hospital, Sanitary Train.

Naval Unit Formed.—The second medical naval unit to be formed in this city has been completed. It is composed of the staff of St. Agnes' Hospital, as follows: Dr. John A. McGlinn, lieutenant-commander, chief of the surgical division; Dr. Francis J. Dever, lieutenant commander, chief of the medical division; Lieut. Benjamin D. Parish, M.D., laryngologist and otologist; Lieut. Eugene A. Case, M.D., pathologist; Lieut. Gilbert M. Newburger, M.D., roentgenologist; Lieut. Joseph Hart Toland, staff surgeon, and Lieut. Russell S. Boles, M.D., staff physician.

CANADA

Investigating Hospital Methods in Toronto.—A committee of the Third Zone Hospital of the United States, in connection with the American Red Cross, has been in Toronto, studying the work of the Canadian Military Hospitals Commission, which includes the convalescent and reconstruction hospitals. The committee consists of Drs. Sigismund S. Goldwater, New York; Robert W. Lovett, Boston, and Charles H. Frazier, Philadelphia, and Mr. J. J. Webster, secretary of the committee.

Academy for United Medical Service.—The Academy of Medicine of Toronto has adopted a resolution calling for one united medical service in Canada to take the place of the present arrangements of a Canadian Army Medical Corps and a Canadian Hospitals Commission. The academy urges that medical care of all soldiers be placed directly under a surgeon-general, to be known as Surgeon-General of Canada, who should be directly responsible to the minister of militia, who should have a seat in the militia council. He will perform the duties of director of medical services, invalids, and be chief medical officer of the hospitals commission and of its executive. The academy recommended Surg.-Gen. John Taylor Fotheringham, C.M.G., Toronto, recently returned from overseas, for this position.

Personal.—Dr. Norman T. MacLaurin, Toronto, is going overseas as medical officer with a detachment of Forty-Eighth Highlanders, Toronto. —Major Alfred K. Haywood, formerly assistant superintendent of the Toronto General Hospital, has returned to Canada. He has been on active service since August, 1914, and returns to Canada to accept an appointment as superintendent of the Montreal General Hospital. —Dr. Maurice M. Seymour, commissioner of public health for Saskatchewan, has been visiting in eastern Canada. —Dr. William M. Hart, Regina, Sask., will return to Canada at an early date to take charge of the sanatorium at Fort Qu'Appelle, Sask. —Col. Charles Alfred Hodgetts, medical officer of the Canadian Conservation Commission, Ottawa, who has been doing splendid work for the Red Cross in England and France since the outbreak of war, has been made a Companion of the Order of St. Michael and St. George. —Lieut.-Col. Alexander J. Mackenzie, Toronto, was placed in command of Princess Patricia's Red Cross Hospital, London, England, June 8. Dr. Mackenzie went overseas nearly three years ago as medical officer of a Toronto Highland Battalion of the first contingent.

GENERAL

Army Medical Depot Opened.—A medical supply depot for the departments of the East and Northeast of the United States Army has been opened in Philadelphia at 1210-12 Arch Street. The depot is in charge of Major Carroll D. Buck of the Medical Corps.

Sioux Valley Physicians Elect Officers.—At the annual meeting of the Sioux Valley Medical Association, held in Sioux Falls, June 26 and 27, the following officers were elected: president, Dr. Walter R. Brock, Sheldon, Iowa; vice presidents, Drs. Alfred E. Spalding, Luverne, Minn., and John E. Summers, Omaha; secretary, Dr. George S. Browning, Sioux City, Iowa (reelected), and treasurer, Dr. Nelius J. Nessa, Sioux Falls, S. D.

Meeting of Eye and Ear Men.—At the annual meeting of the Pacific Coast Oto-Ophthalmic Society, held in Spokane, Wash., June 18 and 19. Salt Lake City was selected as the next place of meeting and the following officers were elected: president, Dr. Alexander R. Irvine, Salt Lake City; vice presidents, Drs. Harrington B. Graham, San Francisco, and Richard W. Perry, Seattle, and secretary-treasurer, Dr. Robert R. Hampton, Salt Lake City.

Bequests and Donations.—The following bequests and donations have recently been announced:

Hospital of the Woman's Medical College of Philadelphia, \$5,000, and American Institute of Scientific Research, New York, \$5,000, by the will of Dr. Anna Lukens, New York.

Memorial Home for Blind, Philadelphia, and Library for the Blind, each \$500, by the will of Mrs. Margaret M. Moor.

House of St. Giles, the Cripple, Brooklyn, Industrial Home for the Blind, Medford Sanitarium for Working Men and Women, Faith Home for Incurables, each \$1,500, by the will of Samuel Organ.

Warning Against Swindler.—A correspondent from New Rochelle, N. Y., announces that a swindler is working the eastern states. He is a man about 5 feet 10 inches in height, 45 or 50 years of age, with gray hair and mustache, gray eyes, and wears a gray suit. He calls on a physician, claiming to be an uncle of a former classmate, telling the story that he has been asked by his nephew to be sure and call on the doctor and to tell him how well he is doing. As he gets up to leave, the swindler states that he is stranded and asks for a dollar or so to enable him to get to the next town. It is said that he has victimized four physicians in New Rochelle alone.

Topics to be Discussed at the Southern Tuberculosis Conference.—At the Southern Tuberculosis Conference, to be held in Chattanooga, Tenn., November 9 and 10, the following topics have been suggested for discussion:

Relief-giving to tuberculosis cases and the relation of antituberculosis associations to relief agencies.

Hospital or home care in the treatment of tuberculosis.

Rest and exercise for tuberculosis patients.

The antituberculosis association as a political campaigner.

Finding the tuberculous negro.

Open air schools.

Tuberculosis legislation in Southern states, with special reference to district plan for control of tuberculosis.

Red Cross seals.

The relation of state to local associations, with particular reference to finances and program.

LONDON LETTER

LONDON, June 25, 1917.

The War

THE HEALTH OF MUNITION WORKERS

The Health of Munition Workers Committee has issued another report on industrial efficiency and fatigue which embodies researches by Dr. H. M. Vernon on output in relation to work, by Capt. T. H. Agnew of the Army Medical Corps on the health and physical condition of male munition workers, and on the health of female munition workers by Drs. Janet Campbell and Lilian Wilson. On the question of hours of labor, Captain Agnew found a difference between workers engaged before the war and wartime recruits to industry. In the former, the factor of industrial selection had probably operated, so that those employed are in some measure physically select workmen. Among the men and boys engaged since the war there was a distinct relation between the length of hours and the physical condition. Thus, while 22 per cent. of men working less than seventy hours a week were below the highest standard, the percentage rose to 31 in men working seventy hours and more. Among the boys, the percentages for those working less than sixty hours a week and those working sixty hours and more were, respectively, 6.7 and 10.6. The chief points in the recommendations are: (1) reduction of excessive hours, especially when bad transit facilities make a substantial addition to the length of the working day; (2) provision and improvement of canteens; (3) provision of adequate washing accommodation, which usually was very defective; (4) improvement of first aid equipment, and (5) insistence on hygienic qualifications of "welfare workers." The report on the women workers is more satisfactory. Most of the inspectors were "agreeably surprised at their general physical condition." The witnesses, entitled to speak with authority on the health of the workers, with hardly an exception, could not point to any exact data in support of their views. The investigation is obviously in a pioneer stage. The committee therefore emphasizes the need for the establishment of some permanent organization for the collection of scientific data, on which alone can be based the solution of industrial problems intimately connected with the future prosperity of the nation.

INFECTIOUS DISEASES IN THE PAST YEAR

In view of the existence of the war, the government report on infectious diseases in the year 1916 is of particular interest. Curiously several important diseases show a decline when compared with the period before the war. There were twelve cases of plague, four of typhus and 149 of variola, but no case of cholera. The incidence of typhoid has steadily dropped from 0.38 per thousand in 1911 to 0.16 in 1916. On the other hand, diphtheria, puerperal fever, erysipelas and poliomyelitis have shown little variation in the six years. Scarlet fever increased up to 1914 and then diminished. Cerebrospinal fever among the civilian population increased from 0.01 per thousand in 1913 and 1914 to 0.07 in 1915, and fell to 0.04 in 1916. The aggregation of a large proportion of the younger population of the country in camps favored outbreaks of this disease, which then spread to civilians. It is satisfactory that the energetic measures taken to cope with the disease have been successful. Notification of pulmonary tuberculosis in 1912 gave a rate of 3.03 per thousand. In 1916 the rate fell to 2.1, and other forms of tuberculosis showed also a decline, but less marked.

THE AIR RAID AND THE HOSPITALS

The aeroplane raid on London on the morning of June 13 was attended by numerous casualties among the civil population. It occurred so suddenly that the hospitals had practically no warning, such as they received in the case of the Zeppelin raids. The fast aeroplanes now used can arrive over the metropolis within half an hour of their appearance on the coast. At the time of the raid the garden of the London Hospital was full of convalescent patients in wheeled chairs, and on stretcher beds and couches, while several were walking about. All the patients who could not walk had to be brought in by volunteers while the raid was in progress and the raiders could be seen overhead close to the hospital. The balconies were also crowded with beds wheeled out on them. Within an hour of the raid the hospital had treated 207 patients, of whom nearly 100 were admitted. Up to the night of June 19, forty-four had died. At St. Bartholomew's Hospital, 135 victims were treated, of whom fourteen died.

The students proved invaluable in carrying in the wounded from conveyances of all descriptions.

MEDICAL OFFICERS KILLED AND WOUNDED

According to the latest returns, the number of medical officers killed in action since the commencement of the war is 137; fifty-eight have died from wounds and sixty-two from disease, and 707 have been wounded. The total of all these figures is 964.

PARIS LETTER

PARIS, June 21, 1917.

Death of Dr. Lucien Picqué

Dr. Lucien Picqué, consulting surgeon of the Army of the Orient, died recently at Rome. He received his M.D. degree in 1876. He was appointed to the military medical service, but resigned in 1880. He then became successively chief of the surgical clinic (1884), deputy surgeon of the state asylums of the department of the Seine (1886) and surgeon of the Hôpitaux de Paris (1887). During the present war he was appointed surgeon of the Army of the Orient at the time of its organization, and took an active part in the installation of the medical units that were first established at the Dardanelles and then at Saloniki. A few weeks before his death he had resigned his commission with the Army of the Orient, and had been charged with a special mission in Italy. It was while still engaged on this mission that he passed away.

As head surgeon of the Saint Anne asylum, Picqué had an opportunity to study at close range mental diseases in their relation to surgery. The results of his studies were set forth in a book entitled "Psychopathies et chirurgie" (1912). He published also a "Traité pratique d'anatomie chirurgicale et de médecine opératoire" (1913).

Death of Dr. Charles Mongour

Dr. Charles Mongour, agrégé professor of internal pathology and medical jurisprudence at the Faculté de médecine de Bordeaux, and physician of the Hôpitaux de Bordeaux, died recently.

Personal

The Académie des sciences has just chosen M. Leclainche as member of the academy to fill the vacancy caused by the death of Professor Chauveau, inspector-general of the veterinary service and author of numerous works on serotherapy, gas gangrene and vaccination against certain animal diseases, etc.

The War

NEW RULING AFFECTING THE APPOINTMENT OF MEDICAL OFFICERS WITH THE RELATIVE RANK OF LIEUTENANT

Justin Godart, undersecretary of state for the military medical service, has just adopted a new ruling, which enables doctors of medicine that are graduates of a French medical school, and that belong to the auxiliary service, to be appointed medical officers with the relative rank of second lieutenant. However, the applications presented by such candidates must be accompanied by certificates showing that they have passed the physical examination required for active army service.

FRENCH MEDICAL UNITS IN RUSSIA

Desirous of giving evidence to its Russian allies of the friendly solidarity existing between the two countries, the French government has organized a threefold medical mission to Russia with a view to lending them aid on their different army fronts. These units comprise surgical and roentgenologic services and a corps to provide for the evacuation of the wounded, etc. One of these groups is destined for the armies on the Russian southern front, a second for Trebizond and a third for the Persian front. One of these has already arrived safely at Petrograd, and will proceed immediately to its destination. The other two will leave France shortly.

AMERICAN WOMAN DECORATED WITH THE CROSS OF THE LEGION OF HONOR

Miss Grace Gassette of Chicago has just received a knight's cross of the Legion of Honor for services rendered in France throughout the war. During Miss Gassette's long stay with the American ambulance corps at Neuilly she has made a specialty of dressings for the wounded.

Marriages

LIEUT. FRANK MILES HEACOCK, Assistant Surgeon, U. S. Navy, Mare Island, Calif., to Miss Edith Faye Adams of Omaha, June 30.

LIEUT. EDWIN PERCY BUGBEE, Assistant Surgeon, U. S. Navy, Chelsea, Mass., to Miss Gertrude D. Freeman of Roxbury, Boston, July 3.

LIEUT. LORENZO FOSTER LUCKIE, M. O. R. C., U. S. Army, Los Angeles, to Miss Finette Turcotte, at Santa Barbara, Calif., June 18.

ROLFE CLARKE NORRIS, M.D., Methuen, Mass., to Miss Margaret Cardigan of Northampton, Mass., June 19.

LIEUT. THEODORE PETERS, M. O. R. C., U. S. Army, to Miss Gertrude Lenhardt of Norristown, Pa., June 27.

EDMUND ROGER SAMUEL, M.D., Mount Carmel, Pa., to Miss Emily Snyder of Stroudsburg, Pa., June 30.

KARL FREDERICK KOENIG, M.D., to Miss Mabel E. Frankenhof, both of Philadelphia, June 30.

EDWARD WINSLOW KARCHER, M.D., Boston, to Miss Edith Ives Quincy of New York, July 3.

CHARLES ROLAND, M.D., Reading, Pa., to Miss Pauline V. Schmidt of Philadelphia, June 30.

THEODORE DAVID BURGER, M.D., to Miss Jessie Evelyn Neill, both of Spokane, Wash., June 21.

THOMAS KIRBY DAVIS, M.D., to Miss Rose Vedder Mabon, both of New York, June 19.

CHARLES ERWIN PITTE, M.D., to Miss Ethel Julia Lyon, both of Chicago, recently.

JONAS LARSON, M.D., Axtell, Neb., to Miss Rose Kellar of Cloquet, Minn., June 19.

ARA A. SHARP, M.D., St. Louis, to Miss Mable Faulkner of Lafayette, Ind., June 27.

Deaths

Thomas Hamilton Hay, M.D., Stevens Point, Wis.; New York University, New York, 1883; aged 56; a Fellow of the American Medical Association; a specialist in tuberculosis; for several years a member of the medical staff of the Northern Wisconsin Hospital for the Insane, Winnebago, and of the Milwaukee County Insane Hospital; founder and for nine years superintendent of the River Pines Tuberculosis Sanatorium, Stevens Point; died in Elizabethtown, N. J., July 29, from heart disease.

James Francis Spelman, Anaconda, Mont.; University of Pennsylvania, Philadelphia, 1890; aged 49; a Fellow of the American Medical Association and formerly president of the Montana State Medical Association; surgeon and chief of staff to St. Anne's Hospital, Anaconda, and surgeon of the Butte, Anaconda & Pacific Railroad; for many years a member and chairman of the local school board; died at his home, July 1.

Nicholas Cornelius Schlitz, M.D., Des Moines, Iowa; Rush Medical College, 1892; aged 51; a specialist on internal medicine; formerly a Fellow of the American Medical Association; a member of the Iowa State Medical Association; for nineteen years a member of the faculty of Drake University, Des Moines; professor of pathology in Des Moines Dental College; died at his home, July 1, from malignant disease.

John William Watson, M.D., Boston; College of Physicians and Surgeons, Baltimore, 1900; aged 46; a Fellow of the American Medical Association; a member of the board of instruction of Tufts Medical and Dental School, Boston; assistant medical examiner (coroner) of Suffolk County, South District; died in the Deaconess Hospital, Brooklyn, June 23, nine days after an operation for appendicitis.

Herbert Gordon Jones, M.D., Utica, N. Y.; New York University, New York, 1881; aged 59; formerly a Fellow of the American Medical Association; ophthalmic surgeon to the Utica Masonic Home since 1893; visiting surgeon to St. Luke's Hospital, Utica, since 1886; coroner of Oneida County since 1885; president of the Oneida County Medical Society, in 1905 and 1906; died at his home, about July 5.

Robert F. Wallace, M.D., Chula Vista, Calif.; University of Tennessee, Nashville, 1886; aged 58; formerly a Fellow of

the American Medical Association and secretary of the Shasta County Medical Society, at one time a member of the board of health of Redding, Calif.; died in San Francisco, June 24, from injuries received in a streetcar accident ten days before.

Charles E. Beardsley, M.D., Ottawa, Ohio; University of Michigan, Ann Arbor, 1863; Bellevue Hospital Medical College, 1870; aged 82; a specialist on diseases of the eye, ear, nose and throat; a Fellow of the American Medical Association; surgeon of the Twenty-First Ohio Volunteer Infantry during the Civil War; died at his home, June 26, from heart disease.

Quitman Holton, M.D., Douglas, Ga.; Emory University, Atlanta, Ga., 1902; aged 45; at one time mayor of Broxton, Ga.; formerly a Fellow of the American Medical Association; a member of the Medical Association of Georgia; formerly president of the Coffee County and Eleventh District medical associations; died at his home, June 30, from tuberculosis.

James Henry Montgomery, M.D., Erie, Pa.; College of Physicians and Surgeons in the City of New York, 1884; aged 58; a Fellow of the American Medical Association; president of the Erie County Medical Society; surgeon to the Hamot Hospital, Erie, from 1888 to 1892; died in a sanatorium at Mercer, Pa., June 27, from heart disease.

Augustus Abraham Rosenbloom, M.D., New York; Cornell University, New York, 1902; aged 37; a Fellow of the American Medical Association; assistant gynecologist to the Cornell University Medical College Dispensary; attending gynecologist to the outpatient department of Sydenham Hospital; died at his home, June 28.

James Alexander Haven, M.D., Brookfield, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1890; aged 59; a member of the Medical Society of the State of Pennsylvania; general manager of the Summerville Telephone Company for nineteen years; died at his home, June 28, from acute gastritis.

Robert Buchanan Kennedy, M.D., New York; University and Bellevue Medical College, 1908; aged 33; a member of the Medical Society of the State of New York; assistant surgeon to St. Luke's Hospital, New York; captain in the Eighth Regiment of Coast Defense; died at his home, June 26.

Henry Jefferson Campbell, M.D., Huntingdon, W. Va.; Columbus, Ohio, Medical College, 1887; University of Louisville, Ky., 1893; formerly a Fellow of the American Medical Association; a member of the West Virginia State Medical Association; aged 56; died at his home, May 6, from heart disease.

Bert Heald Bailey, M.D., Cedar Rapids, Iowa; Rush Medical College, 1900; aged 42; one of the most prominent ornithologists of the Middle West; professor of zoology and curator of the museum of Coe College, Cedar Rapids, since 1900; died at his home, June 22, from abscess of the spleen.

Daniel Frederick Grasse, M.D., Chicago; Rush Medical College, 1899; aged 45; formerly a member of the Illinois State Medical Society; assistant in genito-urinary surgery in his alma mater; died in the Elgin State Hospital, July 3, from meningitis, due to an infection received in 1906.

Joseph H. Grable, M.D., Hyde Park, St. Joseph, Mo.; Ensworth Medical College, St. Joseph, Mo., 1895; aged 48; for many years a practitioner of Wathena, Kan.; local surgeon to the St. Joseph and Grand Island Railway; for the last six years an invalid; died at his home, June 25.

William M. Terrell, M.D., Graham, Texas; Vanderbilt Medical College, Nashville, Tenn., 1883; Atlanta Medical College, 1885; aged 62; formerly a Fellow of the American Medical Association; a member of the State Medical Association of Texas; died at his home, June 23.

A. H. Neathery, M.D., Farmersville, Texas; Vanderbilt University, Nashville, Tenn., 1853; aged 83; president of the First National Bank of Farmersville for thirty years; was struck by a Santa Fe freight train at Farmersville, April 24, and instantly killed.

Stewart Wilson Outwater, M.D., Saranac Lake, N. Y.; University of Bishop's College, Montreal, 1892; aged 48; a member of the British Medical Association and Medical Society of the State of New York; died in Montreal, April 15, from radium burn.

Austin Wilbur Sidney, M.D., Fitchburg, Mass.; Eclectic Medical College of Pennsylvania, Philadelphia, 1860; Dartmouth Medical School, Hanover, N. H., 1881; aged 93; a

member of the Massachusetts State Medical Society; died at his home, June 25.

George Abraham Teal, M.D., Kendallville, Ind.; Rush Medical College, 1882; aged 60; formerly a Fellow of the American Medical Association; for several sessions enrolling clerk of the Indiana Legislature; died at his home, July 1, from angina pectoris.

Phebe Rebekah Johnson, M.D., Fishkill, N. Y.; Eclectic Medical College of the City of New York, 1880; aged 73; for many years a practitioner of New York City; died at the home of her daughter in Larchmont, N. Y., July 3, from heart disease.

Jacob L. Berthold, M.D., Perham, Minn.; University of Maryland, Baltimore, 1886; aged 57; a Fellow of the American Medical Association; a member of the staff of St. James' Hospital; died at his home, July 6, from carcinoma of the colon.

William E. Provines, M.D., Albuquerque, N. M.; Hospital College of Medicine, Louisville, 1897; a member of the New Mexico Medical Society; while fishing on the bank of a stream near Springerville, Ariz., June 24, died suddenly from heart disease.

Thurston Green Packer, M.D., Smyrna, N. Y.; Bellevue Hospital Medical College, 1881; aged 74; formerly a Fellow of the American Medical Association; for many years health officer of Smyrna; died at his home, May 28, from cerebral hemorrhage.

Walter L. Pursselley, M.D., Springfield, Mo.; Missouri Medical College, St. Louis, 1897; aged 50; a member of the Missouri State Medical Association and county physician of Greene County; died at his home, June 21, from cerebral hemorrhage.

George Tilghman McWhorter, Riverton, Ala. (license, Colbert County, Ala., 1881); aged 68; formerly a Fellow of the American Medical Association; a member of the Medical Association of the State of Alabama; died at his home, June 29.

Richard S. Graves, Austin, Texas (license, Texas, Twenty-Sixth Judicial District Board, 1895); aged 73; a practitioner since 1871; for more than twenty-three years physician of Austin and Travis County; died at his home, June 24.

Albert Valentine Veazie, M.D., New York; Tulane University, New Orleans, 1909; aged 38; for several years surgeon on steamers of the United Fruit Company; died at the home of his father, New Orleans, June 30, from nephritis.

William Victor Howland, M.D., Jeffersonville, Ind.; Medical Reserve University, Cleveland, Ohio, 1877; aged 70; formerly a Fellow of the American Medical Association; a veteran of the Civil War; died at his home, May 18.

Frank Berry Reagor, M.D., Shelbyville, Tenn.; University of Tennessee, Nashville, 1891; aged 56; a Fellow of the American Medical Association; died at the home of his brother, in Shelbyville, June 29, from heart disease.

James A. Loggins, M.D., New York; College of Physicians and Surgeons in the City of New York, 1913; aged 33; formerly an intern in the New York Post-Graduate Hospital; died in Seattle, June 25, from miliary tuberculosis.

John Eugene Garrey, M.D., Aurora, Ill.; Rush Medical College, 1878; aged 69; formerly a member of the Illinois State Medical Society; a member of the staff of the Aurora City Hospital; died in Telluride, Colo., June 29.

James Leslie Penn, M.D., Gadsden, Ala.; Vanderbilt University, Nashville, Tenn., 1911; aged 31; formerly a member of the Medical Association of the State of Alabama; died at his home, May 2, from pulmonary tuberculosis.

Franklin H. MacFarland, M.D., Philadelphia; University of Pennsylvania, Philadelphia, 1892; aged 49; a Fellow of the American Medical Association; a member of the Philadelphia Pediatric Society; died at his home, May 20.

William Henry Bullis, M.D., Rochester, N. Y.; Queen's University, Kingston, Ont., 1884; aged 59; a member of the Medical Society of the State of New York; died at his home, June 28, a year after a surgical operation.

Samuel William French, M.D., Milwaukee, Wis.; Harvard Medical School, 1878; aged 67; a Fellow of the American Medical Association; one of the founders of the Emergency Hospital; died at his home, June 30.

Glenn Everett Miller, M.D., Whiteoak, Okla.; Eclectic Medical Institute, Cincinnati, 1906; aged 39; formerly a member of the Oklahoma State Medical Association; died at his home, June 13, from typhoid fever.

E. Christie, M.D., Lloyd, Fla.; Atlanta, Ga., Medical College, 1883; a member of the house of representatives from Leon County, Florida, and for many years a pharmacist of Lloyd; died at his home, June 23.

Isaac Lonzo Neely, M.D., Corydon, Ind.; Kentucky School of Medicine, Louisville, 1882; aged 61; formerly a member of the Indiana State Medical Association; died at his home, June 24, from chronic nephritis.

Archibald J. Kearns, M.D., Loup City, Neb.; Missouri Medical College, St. Louis, 1886; aged 59; a Fellow of the American Medical Association; died at his home, June 15, from arteriosclerosis.

Seba S. Bedient, M.D., Little Valley, N. Y.; University of Buffalo, N. Y., 1878; aged 61; a member of the Medical Society of the State of New York; died at his home, June 21, from typhoid fever.

James Partridge, M.D., Alton Park, Tenn.; Chattanooga, Tenn., Medical College, 1909; aged 46; formerly a member of the Tennessee State Medical Association; died at his home, June 24.

Walter Penquite, M.D., Chickasha, Okla.; Medical College of Ohio, Cincinnati, 1889; aged 53; a Fellow of the American Medical Association; died at his home, June 5, from myocarditis.

Robert C. Black, M.D., Gainesville, Tex.; Rush Medical College, 1858; aged 80; a surgeon in the Confederate service during the Civil War; died at his home, June 23, from heart disease.

Webster Eber Gray, M.D., Nashville, Tenn.; Meharry Medical College, Nashville, 1908; aged 40; professor of medical chemistry and botany in his alma mater; died at his home, June 23.

Amory Chapin, M.D., Boston; College of Physicians and Surgeons in the City of New York, 1881; who retired from practice twenty years ago; died at his home, June 25.

Edgar Barzillai Sharp, M.D., Berlin, N. J.; Hahnemann Medical College, Philadelphia, 1876; aged 62; died in his office, June 26, from angina pectoris.

Charles Hubbard Howland, M.D., New Haven, Conn.; Yale University, New Haven, 1880; aged 66; died in his office, June 25, from heart disease.

Thomas H. Chambers, M.D., Georgiana, Fla.; Albany, N. Y., Medical College, 1855; aged 85; died in a hospital in Daytona, Fla., June 22.

Richard H. Lewis, M.D., Kinston, N. C.; University of Pennsylvania, Philadelphia, 1886; aged 85; died at his home, May 15, from senile debility.

John James McWilliams, M.D., Charter Oak, Iowa; Rush Medical College, 1883; aged 56; died at his home, March 1, from paresis of the bowel.

Thomas Shaw, M.D., Ypsilanti, Mich.; University of Michigan, Ann Arbor, 1870; aged 71; died at his home, March 19, from general paresis.

Robert E. Lawrence, Dayton, Ohio (license, West Virginia, years of practice, 1881; license, Ohio, 1896); aged 68; died at his home, June 16.

Allan Anthony Kennedy, M.D., New Orleans, La.; Tulane University, New Orleans, 1906; died at his home, March 3, from pneumonia.

Belfield Neud Jobe, M.D., Danville, Tenn.; University of Tennessee, Nashville, 1897; died suddenly at Stewart Station, Tenn., April 26.

James M. Tubb, M.D., Bessemer, Ala.; Memphis Hospital Medical College, Memphis, Tenn., 1893; aged 66; died at his home, June 20.

Forest G. Cosby, M.D., Dixon, Ky.; University of Louisville, Ky., 1894; died suddenly at his home, April 25, from heart disease.

Joseph A. Phillips, M.D., Rockdale, Tex.; Marion-Sims Medical College, St. Louis, 1892; aged 55; died at his home, April 25.

Samuel B. Boyd, M.D., Knoxville, Tenn.; University of Pennsylvania, Philadelphia, 1865; aged 64; died at his home, June 13.

Silas Hubbard, M.D., Buffalo, N. Y.; Castleton, Vt., Medical College, 1843; aged 96; died at his home, May 18.

Albert Humphreys, M.D., Wooster, Ohio; Columbus, Ohio, Medical College, 1882; died at his home, June 4.

L. J. Dorsey, Batesville, Ark. (license, Arkansas, 1903); aged 76; died at his home, June 11.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

LOW'S WORM SYRUP

A Dangerous Santonin Mixture

Low's Worm Syrup is made and sold by Smith, Kline & French Company, Philadelphia. The preparation, like so many of the worm syrups on the market, is of the usual dangerous santonin-containing type, although no hint is given even of the presence of this product nor any warning that it contains a poison. The label on the product as sold at present declares the presence of 11 per cent. alcohol. The older preparation, some of which is still on the druggists' shelves and is furnished when Low's Worm Syrup is called for, is labelled as containing 18 per cent. alcohol. In each case, "the alcohol present is essential as a solvent and preservative."

The circular that accompanies the newer product when compared with the circular around the older product is seen to exhibit certain modifications which safeguard the manufacturer from legal action more than they protect the consumer from possible poisoning. The phrase "most safe and pleasant" of the older circular becomes simply "most pleasant" in the newer circular. Where before it was "simply an impossibility for worms to remain" where Low's Worm Syrup is given, the public now is told that, under similar conditions, it is "most difficult for worms to remain." The older circular recommended it—"even when there are no worms"—as a "most useful" preparation for children "with cholera morbus, dyspepsia, costiveness and general debility." "Tape worms of 15 or more feet" have been expelled, so the public is told in the new circular, by Low's Worm Syrup; the older circular is a little more specific, giving the measurement of the tape-worms as "15 to 35 feet in length." The older circular declares: "There is nothing like it." The new circular omits this statement; whether from a sense of modesty or a fuller appreciation of the possibilities behind the federal Food and Drugs Act, we do not know.

The directions on the bottle-label, both of the newer and the older preparations, are:

"A child under 1 year old may take $\frac{1}{2}$ teaspoonful 3 times a day; 2 years, 1 teaspoonful 4 times a day; 3 to 5 years old, 2 teaspoonfuls; 5 to 10 years, $2\frac{1}{2}$ teaspoonfuls. Adults, 1 tablespoonful, one hour before meals.

"Observe a mild diet.

"Continue its use until it acts as a purgative.

"For Tape Worm double the dose."

Some of the newer specimens of Low's Worm Syrup, purchased on the open market, were turned over to the Chemical Laboratory of the Association for examination. The chemists' report follows:

CHEMISTS' REPORT

"Specimens of Low's Worm Syrup were examined. The preparation tested was a thick, dark brownish syrup having an odor and taste resembling Dr. Hand's Worm Elixir. The presence of 11 per cent. of alcohol was declared. Further than this, the trade package furnishes no information concerning the composition of the preparation. A considerable quantity of suspended matter was noted. This was of a yellowish color, and, together with the therapeutic indications for the preparation, suggested the probable presence of santonin. Qualitative tests indicated the presence of santonin, alcohol, sucrose (sugar) and extractives from some emodin-bearing (laxative) drug, probably senna. The lack of a noticeable bitter taste indicated the absence in more than traces of many of the common laxatives, such as aloes or colocynth. If present, their quantities must be small. The purgative salts, such as Epsom salt, Rochelle salt, etc., were absent. Pomegranate and pink root, or their extractives, were absent. The quantitative examination was limited to the determination of santonin. The quantity found amounted to about 0.93 gm. per 100 c.c. of the preparation, or about 4.2 gr. per fluidounce. Each dram (teaspoonful) of the preparation,

therefore, contains a little more than one-half of a grain of santonin."

Santonin is a poison. One grain has produced serious poisoning in children and two doses of one grain each have been fatal. Total blindness and death are among the results that have followed the use of the drug. Headache, dizziness and convulsions, with stupor, loss of consciousness and death represent the train of symptoms following poisonous doses of santonin. As the chemists have shown, each teaspoonful of Low's Worm Syrup contains over half a grain of santonin. The directions as quoted above recommend that a child of two years be given one teaspoonful four times a day or the equivalent to two grains of santonin a day. The directions for children from three years of age and older calls for from 2 to $2\frac{1}{2}$ teaspoonfuls presumably four times a day, at least the wording of the label is so ambiguous that the mother may readily assume that that is what is meant. This means giving children from 4 to 6 grains of santonin daily!

The action of santonin, because of its excretion through the kidneys, is likely to be cumulative. Sollmann, in his "Manual of Pharmacology," warns that the drug should only be given under the supervision of a physician and states that half a grain may be given for two or three doses, according to age, to children of from two to five years of age "and then not repeated for at least three days." In spite of these facts, the Low's Worm Syrup circular urges mothers to "lose no time, but resort at once to Low's Worm Syrup" whenever their children are troubled with such symptoms as:

"Pain in the joints, 'all gone' feeling at the stomach, drowsiness, bad breath, picking at the nose, grinding of the teeth, a gnawing sensation of hunger, flashes of heat, chills or shivering, vertigo, disturbed sleep, startling dreams, want of appetite or excessive appetite, pain in the stomach or bowels, nausea, indigestion, costiveness and convulsions."

The disregard of public safety exhibited in the exploitation of Low's Worm Syrup brings back to mind the fact that the manufacturers of this nostrum, Smith, Kline & French Co., were one of the "patent medicine" concerns that wrote to New York druggists urging them to refuse to obey the law that requires a statement of the potent ingredients of all "patent medicines" sold in New York City either to be filed with the Department of Health or to be plainly printed on the label. THE JOURNAL in its issue of November 27, 1915, called attention to this and told of the reply that one law-abiding New York druggist sent to Smith, Kline & French Co. This druggist pointed out that the fact that the company was opposed to giving the Health Department a statement of the active ingredients of its preparation was "strong presumptive evidence that the claims you make for these preparations are false."

The problem presented by such preparations as Low's Worm Syrup is simple in principle but, because of the power of entrenched wealth, difficult of application: There is no excuse in economics or morality for putting on the market as a home remedy preparations containing so dangerous a drug as santonin. So long, however, as the laws do not prohibit this the least a manufacturer with any decent regard for public health and safety can do is specifically to warn the purchasing public that the preparation contains a dangerous drug.

A Panacea.—There is a salutary draught which eliminates every infirmity of the body and establishes the health. This draught you should always have by you. Its composition is as follows: Myrrhae, Feniculi, āā 3iij; Piperi, Anethi, āā 3i. Crush and mix thoroughly, and then add sufficient wine to form a paste. After this, put in a clean cloth, which should be carefully sewn up. Put this in [a mixture of] weak wine and beer and leave to mature for twenty days, or the longer the better. Then remove the cloth and drink daily a measure of the remaining wine before dinner and before supper. If you take this potion you will never ail. Beware, however, to gather and compound the herbs in a waxing moon, for if you neglect this and the moon be on the wane, the potion will be of nought avail.—Ancient Therapeutics.

Correspondence

THE ACTION OF THE HOUSE OF DELEGATES OF THE A. M. A. ON THE ALCOHOL QUESTION

To the Editor:—In THE JOURNAL, June 9, 1917, p. 1768, the following resolution appears as emanating from the Council on Health and Public Instruction:

WHEREAS, It is the unanimous opinion of the Council on Health and Public Instruction of the American Medical Association that alcohol has no drug value, either as a stimulant, as a tonic or as a therapeutic agent, and that it has no food value; and

WHEREAS, Its use as a beverage or as a therapeutic agent is detrimental rather than beneficial to the individual; therefore, be it

Resolved, That the House of Delegates of the American Medical Association, at its Sixty-Eighth Annual Session, declares it is opposed to the use of alcohol by individuals either as a medicine or as a beverage; and be it further

Resolved, That its use in medicine is permissible only in the preparation and preservation of pharmaceutical products.

I wish to register a protest against this council dealing with a matter which is outside of its sphere and which belongs to the Council on Pharmacy and Chemistry, which deals with matters therapeutic. The House of Delegates did not pass these resolutions but substituted:

WHEREAS, We believe that the use of alcohol as a beverage is detrimental to the human economy, and

WHEREAS, Its use in therapeutics, as a tonic or a stimulant or as a food has no scientific basis, therefore be it

Resolved, That the American Medical Association opposes the use of alcohol as a beverage, and be it further

Resolved, That the use of alcohol as a therapeutic agent should be discouraged.

And defeated the following safe and sane resolution:

The Section on Pharmacology and Therapeutics instructs its delegates to the House of Delegates that it is the sense of this section that the question of the therapeutic value of alcohol which has been long in dispute remains yet undetermined, and that hasty action taken in the stress of present circumstances would not be wise, and would not reflect fully the best therapeutic and pharmacologic opinions.

Furthermore, while recognizing the possible need of prohibition of the use of alcohol as a measure of public safety, it would ask that the two questions be considered separately on their respective merits.

I wish still more to protest the action of the House of Delegates, although I am conscious that this protest may be considered bold. With the great question of "prohibition," or the social questions involved, it may be the province of this council or of the House of Delegates to deal; but there is a great difference between the action of alcohol taken when it is needed and its action taken when it is not needed. My protest, moreover is based on the fact that such resolutions are hasty and do not represent careful consideration of the medical facts, and, furthermore, because I do not think that the House of Delegates has a right to pass dogmatic resolutions which differ absolutely from what thousands of members of the Association believe to be true. Such resolutions put in jeopardy any medical man who may prescribe alcohol with the honest belief that it does good in certain states of disease. His standing in court with this resolution presented to the jury might readily be impaired if grief-stricken friends should sue him on the ground that he had used a harmful drug. It may be proper for the House of Delegates to express its belief that alcohol is abused as a medicine, but to say that its use in therapeutics as a tonic, or stimulant, or as a food has no scientific basis is not only unwise, but, in the opinion of many eminent medical men, untrue and not supported by the majority of evidence. Space does not permit of quotations, but it may not be out of place to quote from the last edition of Sollmann's "Manual of Pharmacology," particularly as Dr. Sollmann is an active member of the Committee on Pharmacy and Chemistry. On page 547, he says of alcohol:

Its usefulness as a quickly acting stimulant can scarcely be doubted in the various forms of sudden circulatory collapse—syncope, exhaustion, hemorrhage, traumatic shock, snake venom, strychnin, aconite, veratrum poisoning.

And he recommends a dose of approximately 1 ounce of whisky or brandy, preferably hot, repeated every ten or fifteen minutes according to effect. On the same page he says:

The vasodilator effect may be useful in angina pectoris, and in chronic lesions of the heart small doses may be valuable to lessen the worries of the patient.

As to its value as a food, Sollmann says in discussing exhausting fevers:

"The beneficial effects are probably mainly nutrient, due to the direct *food-value of the alcohol* [italics his], and to the stimulation of the digestion and absorption of the food. The pulse becomes stronger and more regular." On page 549 he states that "if taken after exposure it prevents the tendency to congestion of internal organs," and, again, on the same page, he says "Small quantities of alcohol, taken with meals, therefore, tend to have a favorable action on digestion." Finally, Sollmann states that "in chronic conditions good results might be expected in adynamic states where the circulation or tone are defective—in the course of convalescence from fevers or exhausting illnesses."

Dr. Cushny of London is the first corresponding member of the Council of Pharmacy and in his book, page 143, he says, when considering the food value of alcohol:

The final result of all these investigations is that alcohol can take the place of some of the fats in the food and leads to the same economy of protein as the ordinary non-nitrogenous constituents of the dietary.

On page 150, Cushny says:

In sudden chill with tendency to fever alcohol is often of great benefit . . . Its efficacy would seem to be due to the relief of the congestion of the internal organs by the return of the blood to the skin.

Finally, it may not be out of place to quote Dr. Abraham Jacobi of New York, a recent president of the American Medical Association, who wrote in *American Medicine* for September, 1913, that after sixty years of practice spent among the sick only, and the recovering and the dying, he advocates the free administration of alcohol in grave septic cases, and cites a case of diphtheria, in a girl of 7, who was taking half a pint a day and for whom he ordered another half pint, and, again, the case of a boy of 3 years with formidable symptoms of mixed infection to whom he gave a pint of whisky daily, and he adds the significant words that he wishes his "readers to know that no amount of whisky will produce intoxication when its effect is wanted to combat sepsis." He does not attempt to explain the effects. He adds, "Let somebody explain; meanwhile, take the hint."

The matter may, perhaps, be thus summed up: 1. Alcohol is a powerful drug and, therefore, if used carefully, capable of doing good. 2. Thousands of physicians prescribe it in illness. 3. Great care should be exercised by a body of men acting as representatives of their colleagues in condemning dogmatically what many of their colleagues believe correct. 4. Such action may jeopardize the reputation of a professional brother. If the preamble of these resolutions is allowed to stand without protest, then, Dr. Jacobi and myself, along with a host of professional brethren, may find ourselves in jail for using an agent which is "detrimental" and, therefore, a poison, and likewise be sued for civil damages as well if we prescribe alcohol.

As I write this letter I am in receipt of a communication from a body interested in "prohibition" quoting the resolution of the Council on Health and Public Instruction, and asking that a letter be written to the authorities at Washington calling attention to this resolution. Indeed, it is requested that I telegraph the President confirming it.

I take it that the chief reason for the existence of the Association is to help its members and to exercise an influence which will aid in the growth of safe and sane judgment on all matters medical. I would respectfully urge that now, of all times, is the period when medical men should help balance the community by balancing themselves, and that the resolutions already quoted are not justified. Alcohol has been much abused as a drug, as have all powerful drugs; but that it has no drug value, no food value, and is detrimental when used as a therapeutic agent, I earnestly deny.

HOBART AMORY HARE, M.D., Philadelphia.

Dr. Hare's letter was referred to the secretary of the Council on Health and Public Instruction who comments:

Dr. Hare protests against the Council on Health and Public Instruction "dealing with a matter which is outside

of its sphere." The subject was not taken up by the Council on its own initiative. At the Detroit session a memorial from the National W. C. T. U. was presented to the Association through the secretary (see minutes Detroit session, page 5), in which the Association was asked for an expression of opinion on alcohol from a social rather than a therapeutic standpoint. This communication was referred to the Reference Committee on Reports of Officers, which recommended that it be referred to the Council on Health and Public Instruction (official minutes, Detroit session, page 69). This recommendation was approved by the House. The Council's warrant for taking up this matter is that it was instructed to do so by the House of Delegates.

Dr. Hare further says, "Such resolutions put in jeopardy any medical man who may prescribe alcohol with the honest belief that it does good in certain states of disease," although he does not specify how the medical man would be put in jeopardy. There is no state in which any properly trained and legally qualified physician could be put in jeopardy under the criminal law for using any remedy which in his professional judgment was indicated. Perhaps Dr. Hare has reference to civil suits for malpractice. In such cases, it is a well established principle in law that the acts of a physician must be judged by the professional standards of knowledge and practice prevailing among physicians at the same time and place. Resolutions adopted by the American Medical Association or any other body expressing an opinion on a scientific question would not be admissible as evidence in a malpractice suit. They might possibly be utilized by an attorney in an argument before a jury, but would have only such value as the jury might attach to them. In a civil suit for damages, the extreme penalty consists in the infliction of monetary damages and costs on the defendant. Even when found guilty of malpractice physicians are not imprisoned, so that there is no danger of Dr. Hare realizing his foreboding that "Dr. Jacobi and myself along with a host of professional brethren may find ourselves in jail."

The resolutions adopted by the House of Delegates are an expression of opinion on the part of this representative body of the medical profession of the United States as to the harmfulness of alcohol, especially from a social standpoint. They are to be regarded as a statement of general principles rather than as a dogmatic, dictatorial and infallible rule to be applied to all cases without exception. They will doubtless be so considered by the majority of the members of the Association. Scientific questions are not to be settled by vote. On the other hand, such an organization as the American Medical Association has certain social duties and responsibilities which it must meet from time to time by summarizing the consensus of opinion of the medical profession to the best of its ability on those questions which have a sociological bearing. Dr. Hare need have no fear, however, that any physicians will suffer for using their best scientific knowledge and judgment in the treatment of their patients.

FREDERICK R. GREEN,
Secretary, Council on Health and Public Instruction.

MILITARY SERVICE AND LIFE INSURANCE POLICIES

To the Editor:—The question as to how service in the army will affect life insurance policies is worthy of the attention of doctors who offered their services.

I have communicated with the companies with which I carry insurance, and give the information obtained for the enlightenment of those who have not yet investigated. If contemplating joining the army or the reserve, one should at once communicate with the companies with which one is insured, in order not to invalidate one's policies through failure to comply with the requirements of the policies.

The Reliance of Pittsburgh states, "Your policies do not contain war clauses, so your engaging in military or naval service will in no way affect the validity of the contract."

The Prudential states, "Your policies contain no war restrictions; therefore, service in the army will not affect the validity of the policies in any way."

The Equitable states, "Notwithstanding the fact that your policy does not by its terms cover military or naval service in war, the society takes pleasure in advising that it has decided that no additional premium will be charged—in the service of the United States—either at home or abroad."

The New York Life states, "Your policies are absolutely free of conditions as to residence, occupation, travel, habits of life and manner, time or place of death. No permit or extra premium will be required for military or naval service in time of war or in time of peace."

The Provident Life & Trust Company states, "The Board of Directors adopted the following Resolution on Fourth month 9th, 1917, 'Resolved, That any existing restrictions as to occupation, residence, travel, or military or naval service, be and are hereby waived upon all outstanding policies which have attained their first anniversary.' You are, therefore, at liberty to enter either the military or naval service, without prejudice to your policy."

The Fidelity Mutual of Philadelphia states, "Your policies provide that in the event of your engaging in military or naval service in time of war, an extra premium is to be paid, and permit obtained from the Company—For service abroad, or naval service, we are charging an extra premium of \$30 per thousand annually."

The Missouri State Life, which took over the Hartford Life, states, "The extra annual premium being charged by the company for a permit to engage in military or naval service outside the continental limits of the United States amounts to \$100 per \$1,000 of insurance."

These replies are of course for policies taken out before war was imminent or actually declared. All companies charge an extra premium for new policies taken out for the sole purpose of protection during actual participation in the war.

From the statements made by the various companies it follows that (1) one should communicate with one's insurance companies at once; (2) it makes a difference what companies one is insured in; (3) most insurance companies are treating their old policy holders fairly and trying to meet them more than half way.

W. SCOTT PIPER, M.D., Clearfield, Pa.

TRACHOMA A CIVIC AS WELL AS A MILITARY PROBLEM

To the Editor:—At a meeting of the Section on Ophthalmology of the American Medical Association last June, a resolution was passed requesting the government to be on the watch for cases of trachoma among voluntary and conscripted candidates for the army.¹

To exclude victims of trachoma from the ranks is no doubt desirable, but in so doing, first, the army will lose many men who in short time (from three to six months) could be cured of trachoma and be made safe as far as contagion is concerned. Secondly, these excluded persons return to their homes, continue to live under unhygienic conditions, and cannot be kept under supervision. The fact must also be borne in mind that many of these persons are employed in factories where they disseminate trachoma among their fellow workers. In this connection, it may be interesting to recall two facts, first, that trachoma was introduced into Europe on a large scale by the soldiery, namely, the French and English soldiers returning from Egypt after the Napoleonic expedition, 1798-1801, and second, that it was disseminated among the civilian population by the discharged soldiers affected with eye diseases. At one time there were so many trachomatous soldiers in the Belgian army that the government applied to Jungken, a celebrated ophthalmologist in Berlin, for advice. He recommended that they dismiss the trachomatous soldiers to their homes. By means of this ill-advised measure trachoma soon became diffused in Belgium to an extent that has been observed in no other European state.

1. The following resolution was adopted by the Section on Ophthalmology but was not transmitted for the approval by the House of Delegates required before a resolution "shall be issued in the name of the American Medical Association."

Resolved, That the Section on Ophthalmology of the American Medical Association call the attention of the surgeons-general of the army and navy to the fact that conscripted men from regions infected with trachoma might be the source of a widespread epidemic of the disease, and that strict measures be adopted for the prevention of such a disaster.

There is, of course, no danger of such an error being made today, but at least one European country engaged in the present war—Austria—decided some time ago that the exclusion of men of military age afflicted with trachoma was inadvisable from the standpoint of helping the individuals excluded, and unnecessary from the standpoint of military prophylaxis. It was found impossible to keep such excluded men under supervision and treatment; accordingly the authorities in Austria refused to accept trachoma as excluding the patient from military service, and also placed all trachomatous patients liable to military service in military institutions under the care of special physicians, until they were completely cured, after which they were sent for military service or were dismissed, according to the age at which the cure was effected. The average length of treatment was four months, and about 80 per cent. of the patients were cured within the period of liability to military service. During the service age, the trachoma patients were given regular military training at the garrison hospital.

I respectfully suggest, therefore, that instead of excluding trachoma patients from the American army, the practice initiated by Austria be followed by us.

Exclusion of men of military age on account of trachoma from service is desirable only from one point of view, that of army prophylaxis. Acceptance of these men followed by isolation, supervision, treatment and military training would insure civilian as well as army prophylaxis, and be a gain to the army and the community, as well.

ARTHUR S. TENNER, M.D., New York.

MEDICAL STUDENTS AND THE DRAFT

To the Editor:—There is a question highly interesting to a considerable number of medical students who blindly followed the advice given a few months ago by the surgeon-general, namely, to stay in school, resting assured that by doing so they would be best serving their country. But the time is now very near when the draft is to be put into operation and the only attention shown the medical student, which had any authority behind it, was the vague and unsatisfactory statement of the surgeon-general published in *THE JOURNAL*, July 7. The medical students of this and other cities want to know exactly where they stand and want to know soon.

It would be most unjust if the government, which advised the men to stay in medical school, thus losing their chances of obtaining commissions, should draft them without at least giving them an opportunity of enlisting in their chosen branch of the service.

Can you not secure us some prompt, *definite*, and authoritative statement?

R. V. BAKER, Portland, Ore.

IN AID OF BELGIAN PHYSICIANS

To the Editor:—I have received a letter from Mr. P. George Du Carpe, 9, rue Saussier Leroy, Paris, at the instance of Dr. Joseph A. Blake in reference to the following matter:

When the war is over, the doctors in Belgium and Northern France will wish to return to their offices, clinics, etc. When they do so they will find everything gone; no instruments, no means of examination of patients; in other words all office fixtures and clinical opportunities, save it may be here and there, will have disappeared.

There has been established a committee for aiding the refugees of the liberal professions, doctors, and others (*Comité d'appui des réfugiés des Professions libérales*) to meet this serious want. The patrons include MM. A. Ribot, president of the council; Leon Bourgeois, minister of labor, and other prominent persons. One of the vice presidents is Dr. Mauclair of the Faculty of Medicine in Paris. The treasurer is M. Charles Halais, 15, boulevard de Latour-Maubourg, Paris.

Some of our profession certainly will desire to aid in this laudable effort to reestablish our confrères in their civil work; any such may send their gifts to the treasurer, or, if they prefer to send any such sums to me at 1729 Chestnut Street,

Philadelphia, I shall be very happy indeed to forward them to the treasurer. All gifts to me will be acknowledged through the columns of *THE JOURNAL*.

W. W. KEEN, M.D.,
1729 Chestnut Street, Philadelphia.

THE HOME HOSPITAL UNIT

To the Editor:—This age, especially in the midst of a world war, demands the greatest individual efficiency. The slaughter of human lives puts man-power at its highest value. Physicians cannot be made in a day. The nation must preserve those now qualified and use them in such manner as will render most efficient service in maintaining its greatest asset, the life and health of its citizens. It is said that with 140,000 physicians in the United States, only half that number would be acceptable for army service, even then making no provision for the care of patients at home—the man left without his physician at a time when disease runs rampant amid the turmoil of war.

It becomes necessary, first, to organize the medical service at home; secondly, to systematize its work, and thirdly, to relieve the strain on the physician himself. This brings to us the remedy—the home hospital unit.

1. A hospital is organized in each community, located where it will be accessible to the most people, built on the plan of modern hospitals with private rooms, wards, outpatient department, etc., one or more physicians on its staff, a graduate trained nurse in charge of the nursing with assistants which she herself can train, and managed by a board of directors (three men and two women) in the same community, the physician in charge being *ex officio* chairman of this board. The hospital, of course, must have an ambulance.

2. Certain hours are established for physicians, rounds, operating, laboratory work, etc., and likewise for the various routine duties of the nurses. There are separate wards for obstetrics, diarrheal diseases of infants, typhoid fever, pneumonia, tuberculosis, nephritis, etc., with routine treatment of each when possible. Certain limited hours for visitors are prescribed.

3. The physician in charge no longer has to travel to see his patient; the patient himself goes where he can be best treated. The physician's time is consumed in doing that which he alone as a physician is qualified to do. Men can be trained to run ambulances in a day, but it takes four years to make a physician. This and many years of experience are not to be whittled away in idle gossip at the bedside or by exposure in bad weather over rough roads. Give him organized help, trained to nurse the sick in a house built for sick people and where remedies are at hand at a moment's notice. Remove the patient from his insanitary home and surroundings, at least till he recovers, then instruct him in the origin of his illness, how to continue well, how to render his surroundings healthy; printed pamphlets can be handed him on leaving the hospital.

This home hospital unit will outlive this and many wars. The standards of medical schools can continue their advancement, physicians can become fewer, mercenary men can seek other channels of adventure, and the health of the nation will be provided for.

THEODORE E. WANNAMAKER, JR., M.D., Cheraw, S. C.

Philadelphia Regulates Junk Shops.—The junk shop regulation bill has been passed by both houses of the legislature and approved by Governor Brumbaugh. This action is looked on as a distinct forward step toward better protection of the public health and also a further means of preventing fire and reducing crime. Under the regulations of this bill the location and operation of all junk shops will be controlled. The provision and introduction of this bill had the full support of the local health department and hereafter all junk dealers will be required to obtain from the division of housing and sanitation of the department of health, a permit for the location and conduct of a shop and all junk shops must be carried on in strict compliance with the rules of the bureau of health.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

QUESTIONS ON PREVENTIVE MEDICINE AND HYGIENE

To the Editor:—Kindly answer the following question that was asked in an examination held for health officer: Define (1) disinfection, (2) sterilization, (3) immunity, (4) death rate, (5) morbidity rate, (6) case fatality rate, (7) virus, (8) Schick test, (9) flash, (10) Mills-Reincke phenomenon, (11) Hazen's theorem. Please omit my name.
F. R. G.

ANSWER.—1. Disinfection means the destruction of the pathogenic micro-organisms which cause infection. 2. Sterilization means the destruction of all the lower forms of animal and vegetable life that may be in or on an object. 3. Immunity is the power which living organisms possess to resist and overcome infection. 4. The death rate is the ratio of the total number of deaths in a community to the population, usually figured in terms of number of deaths per thousand, ten thousand or hundred thousand. 5. The morbidity rate is the proportion of cases of a given disease occurring during the year per thousand, ten thousand or hundred thousand of population. 6. The case fatality rate is the percentage of cases of sickness which terminate fatally. 7. Virus is the toxin of an infectious disease. 8. The Schick test is the injection into the skin of $\frac{1}{50}$ of a minimal lethal dose of diphtheria toxin for a 250 gram guinea-pig. A positive reaction, which is the development of a reddened area with a white center at the site at which the toxin was injected into the skin, means the absence of antitoxin or susceptibility of diphtheria. A negative reaction means the presence of antitoxin or immunity. 9. The flash method refers to that method of pasteurizing milk whereby the milk is brought up to a temperature of 178 F. and chilled at once. This method is no longer approved by sanitarians, since it is not entirely reliable and does not give uniform results. The holding method, in which the milk is heated to 65 C. and kept at that temperature for from thirty to forty-five minutes, is more reliable. 10. The Mills-Reincke phenomenon relates to the marked decrease in the general death rate following filtration of the water supply. It was observed in Lawrence, Mass., in September, 1893, by Mr. Hiram F. Mills, and in Hamburg, Germany, in May, 1893, by Dr. J. J. Reincke. The name "Mills-Reincke phenomenon" was given by Sedgwick and McNutt in 1910. 11. Mr. Allen Hazen, a sanitary engineer, said in 1904 that "where one death from typhoid fever has been avoided by the use of a better water, a certain number of deaths, probably two or three, from other causes have been avoided." Hazen's theory is a formula for a numerical expression of the comparative effect of water purification on typhoid fever mortality and total mortality. It is not a precise mathematical statement.

The answers to practically all of the questions may be found in any of the modern textbooks on preventive medicine and hygiene.

DANGERS OF OPERATING THE ROENTGEN RAY

To the Editor:—I should like information as to the effect of the Roentgen ray on the generative organs. 1. Is the ordinary, unprotected operator of the Roentgen ray exposed to sterilization? 2. Has it been used as a means of sterilization in asylums, and what is the procedure? 3. Are three layers of lead foil an efficient protecting screen?

WILLIAM F. SHAW, M.D., Campbell River, B. C.

ANSWER.—1. It has been shown that the testicles are extremely susceptible to the Roentgen ray, and to avoid sterilization they should be protected from exposure. As to whether the unprotected operator is exposed to sterilization depends altogether on how much he is exposed to the Roentgen ray. In the ordinary use of the Roentgen ray, under conditions that are safe in general for the operator, there is no danger of sterilization.

2. The use of the Roentgen ray for sterilizing the insane or criminals has, of course, occurred to many persons, but we do not know of any practical application of it for this purpose in institutions.

3. Three layers of ordinary thin lead foil are not an efficient protection against powerful Roentgen rays.

Medical Education and State Boards of Registration

New York January Examination

Mr. H. H. Horner, director, Examinations and Inspections Division, reports the written examination held at Albany, Buffalo, New York and Syracuse, Jan. 29 to Feb. 2, 1917. The examination covered 8 subjects and included 80 questions. The percentage required to pass was 75. Of the 150 candidates examined, 116 passed, including 5 osteopaths, and 34 failed, including 1 osteopath.

Mr. Horner also reports that from Jan. 1 to May 1, 1917, 12 candidates were licensed through reciprocity, 3 through reregistration, 2 through the endorsement of credentials, 1 on recommendation of the state board, and 2 because of eminence and authority in the medical profession. The following colleges were represented:

College	PASSED	Year Grad.	Total No. Licensed
Yale University	(1914)	1
Northwestern University	(1911)	1
Rush Medical College	(1916)	1
University of Louisville	(1912)	2
College of Physicians and Surgeons, Baltimore	(1914)	1
Johns Hopkins University	(1913) (1914, 2) (1915)	4
University of Maryland	(1916)	2
Harvard University	(1907) (1916)	2
Tufts College	(1909)	1
University of Michigan Medical School	(1909) (1914)	2
Albany Med. Coll. (1910) (1911) (1914) (1915, 5) (1916, 2)		10
Columbia University	(1914, 3) (1915, 3) (1916, 4)	10
Cornell University	(1915) (1916, 4)	5
Fordham University	(1913) (1914) (1915, 3) (1916, 7)	12
Long Island College Hospital	(1916)	4
New York Homeopathic Medical College and Flower Hospital	(1914, 2) (1915, 3) (1916, 11)	16
New York Medical College and Hospital for Women	(1916, 3)	4
Syracuse University	(1916)	1
University and Bellevue Hospital Medical College	(1914) (1915, 4) (1916, 2)	7
University of Buffalo	(1913) (1916, 2)	3
University of Oklahoma	(1916)	1
Hahnemann Med. Coll. and Hosp. of Philadelphia	(1916)	1
Jefferson Med. Coll. of Philadelphia	(1915, 2) (1916)	3
Medico-Chirurgical Coll. of Philadelphia	(1915, 2) (1916)	3
University of Pennsylvania	(1912) (1915, 2)	3
Med. Coll. of the State of South Carolina	(1903)	1
Vanderbilt University	(1914) (1915)	2
University of Vermont	(1915)	1
Medical College of Virginia	(1914) (1916)	2
Queen's University	(1911) (1915)	2
University of Brussels	(1913)	1
National University, Athens	(1911)	1
University of Turin	(1914)	1

College	FAILED	Year	Reciprocity with
Leland Stanford Junior University	(1916)	1
George Washington University	(1916)	1
Howard University	(1916)	1
University of Georgia	(1916)	1
University of Maryland	(1912) (1916)	2
Boston University	(1912)	1
Tufts Medical School	(1912) (1915, 2)	3
Columbia University	(1914) (1915) (1916)	3
Fordham University	(1916)	1
New York Homeopathic Medical College and Flower Hospital	(1914) (1915, 2) (1916, 4)	7
University and Bellevue Hospital Medical College	(1915)	1
Hahnemann Med. Coll. and Hosp. of Phila.	(1915) (1916)	2
Jefferson Medical College of Philadelphia	(1904)	1
Medico-Chirurgical Coll. of Philadelphia	(1911) (1916)	2
Medical College of Virginia	(1915)	1
Queen's University	(1911) (1916)	2
University of Catania	(1912)	1
University of Naples	(1899) (1909)	2

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Yale University	(1913)	New Jersey
George Washington University	(1915)	Wisconsin
Cornell University	(1914)	Wisconsin
N. Y. Homeo. Med. Coll. & Flower Hosp.	(1913) (1916)	New Jersey
University of Cincinnati	(1915)	Ohio
Univ. of Penna.	(1905) New Jersey; (1910) Ohio; (1914)	Ohio
Medical College of Virginia	(1912) (1915)	Virginia
University of Virginia	(1912)	Virginia

Minnesota April Examination

Dr. Thomas S. McDavitt, secretary of the Minnesota State Board of Medical Examiners, reports the oral, practical and written examination held at Minneapolis, April 3-5, 1917. The examination covered 16 subjects and included 80 questions. The percentage required to pass was 75. Eight candidates were examined, all of whom passed. Nineteen candidates

were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Rush Medical College (1916)	82, 90, 93.		
Kentucky School of Medicine		(1902)	77
University of Minnesota	(1916) 89; (1917)	88, 90	
National University, Athens		(1905)	81

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
University of Colorado		(1914)	Colorado
College of Phys. and Surgs., Chicago (1893)	Nevada; (1908)		Iowa
Illinois Medical College		(1903)	Illinois
Northwestern University	(1911) (1914) (1915)	(1916)	Illinois
University of Illinois		(1915)	Iowa
State University of Iowa Coll. of Med.	(1905)	(1914)	Iowa
University of Louisville		(1911)	Wyoming
Boston University		(1903)	Illinois
John A. Creighton Medical College		(1916)	Nebraska
Omaha Medical College		(1896)	Nebraska
University of Nebraska		(1904)	Nebraska
N. Y. Homeopathic Med. College and Flower Hosp.		(1910)	N. Dakota
University of Virginia		(1907)	Virginia
Marquette University		(1916)	Wisconsin

Book Notices

STATE SANITATION: A REVIEW OF THE WORK OF THE MASSACHUSETTS STATE BOARD OF HEALTH. By George Chandler Whipple, Professor of Sanitary Engineering in Harvard University and the Massachusetts Institute of Technology. Volume 1. Cloth. Price, \$2.50. Pp. 377, with illustrations. Cambridge: Harvard University Press, 1917.

Dr. Whipple's review of the work of the Massachusetts State Board of Health will be read with profit by those interested in preventive medicine. Chapter 1 on the early history of public health in Massachusetts has all the fascination of a story. The reader learns, with the delight of meeting an old friend, that Paul Revere, the well known "rider" of whom he read and recited in his school boy days, was the chairman of the first board of health of Boston. Feb. 13, 1799, the people of Boston elected a board of health, and, March 9, the board organized by electing Paul Revere as president and Mr. John W. Folsom as secretary. Various health ordinances, either in the colony or in the town, had already been enacted, usually following some epidemic; but this was the first official health board to be organized. Among the rules and regulations promulgated by this board was one forbidding the sale or having in one's possession within the city of Boston any oysters from June 1 until September 1. Dr. Whipple records many other interesting incidents, such as the introduction of vaccination in 1800 by Dr. Waterhouse, the construction of the first water system consisting of bored logs joined together with lead, the development of the sewerage system, the filling in of waste and submerged land, the discovery of ether as an anesthetic, and the development of city markets, of which the old Faneuil Hall Market is the best known. The story of the work of Lemuel Shattuck is graphically and interestingly told, while the reading of the report of the first sanitary commission, made in 1850, is suggestive, even at the present state of sanitary development. Chapters 2, 3 and 4 deal with the history, development and various forms of the state board of health. Other chapters discuss the antitoxin and vaccine laboratories, protection of food and water supplies, the Lawrence Experiment Station and the water and sewage laboratories, the cost and achievements of the state board of health, and the present system of organization of the department of health of the state. Chapter 13 consists of biographic sketches of various prominent men who have at various times been connected with the board.

ADVICE TO WOMEN ON THE CARE OF THE HEALTH BEFORE, DURING AND AFTER CONFINEMENT. With Hints on the Care of the New-Born Infant and an Appendix on What to Get Ready for a Baby. By Florence Stacpoole, Diplomée of the London Obstetrical Society. Revised from the Fifth London Edition to Conform to American Practice by Lydia E. Anderson, R. N., President of State Board of Nurse Examiners, University of State of New York. Cloth. Price, \$1.25 net. Pp. 265. New York: Funk & Wagnalls Company, 1917.

This is one of the numerous books of advice to women so many of which have been published in the last few years. This one is well arranged and well written, and can be safely recommended.

Medicolegal

An Expert on Insanity Testifying as to Indications of Handwriting

(Raymond et al. vs. Flint et al. (Mass.), 114 N. E. R. 811)

The Supreme Judicial Court of Massachusetts, in this suit by an administrator and others to set aside a deed, etc., made by a Mrs. Dow, says that the superintendent of the Danvers State Hospital, after examining specimens of Mrs. Dow's handwriting, stated that they indicated a person advanced in years, an arteriosclerotic, or senile person, "by reason of the palsied writing and tremor which is characteristic of that period of life." The court sees nothing objectionable in this evidence. The opinion of an expert on insanity, although not an expert in handwriting, was admissible for the purpose of explaining Mrs. Dow's mental or physical condition. The peculiar characteristics of the handwriting may have been known to the witness, and it may have been the handwriting of such a person as he described.

Construction of Statute with Reference to Compulsory Vaccination of Schoolchildren

(Herbert vs. Demopolis School Board of Education (Ala.), 73 So. R. 321)

The Supreme Court of Alabama, denying a rehearing, affirms an order denying a writ of mandamus to compel the reception of an unvaccinated child into the Demopolis district public school after the municipality of Demopolis had enacted an ordinance providing that "no child shall enter any of the public schools of Demopolis who has not been vaccinated." The court says that, in defining the powers, etc., conferred on municipalities, Section 1289 of the code provides: "To adopt all necessary ordinances and enforce the same to prevent the introduction or spread of contagious, infectious, or pestilential diseases in the cities or towns, and to that end may provide for a system of compulsory vaccination and enforcement of the same." That statute is a particular expression of the police power of the state; and as such, in the preservation of the health of the people, there can be no real doubt of its constitutional validity, even though its effect is to commit to the municipal authorities a measure of discretion with respect to the circumstances under which the power thus delegated shall be made effective. The legislature avowed its conclusive judgment that the major end in view would be subserved by a system of compulsory vaccination, thus avoiding the application of the general doctrine illustrated in the decisions cited on the briefs for the appellant (petitioner), where the pronouncements were predicated of the absence of a legislative specification that compulsory vaccination was within the contemplation of the legislature when it wrote the general authorization under which the subordinate administrative agents sought to establish compulsory vaccination within their jurisdictions. Where the proper authority has so enacted, the regulation that vaccination is a condition precedent to the attendance of children on schools in their communities is a valid exercise of the police power for the prevention of disease and the preservation of the health. The right or privilege assured by the provision of the code that "every minor over the age of seven years shall be entitled to admission into, and instruction in any public school of his or her own race or color in this state" is subject to reasonable regulation, with respect to its enjoyment, by constituted authority on which is imposed by law of coincident dignity the obligation to guard and to preserve the health not only of schoolchildren but of all others within their jurisdictions who may be affected in consequence of the association and congregation of children in the schools of the community. The authority delegated to the municipalities of the state by statute (Section 1289) is to provide a system of compulsory vaccination. The power conferred is to require vaccination without regard to the will or wishes of the persons subject to the government or control of the municipalities. The method whereby this power may be made effective, as a least one of the means to prevent the "introduction or

spread" of smallpox, is committed to the discretion, reasonably exercised, of the municipality. If it be assumed, to the petitioner's advantage, that the quoted provision of the ordinance was all of the regulations the municipality had sought to establish touching the subject of smallpox and vaccination to prevent its introduction or its spread in Demopolis, it could not be pronounced void because its effect was alone visited on children eligible to attend the public schools therein. As a matter of classification for legislative purposes, the regular congregation of numbers of children in public school buildings and on playgrounds usually provided about these schools necessarily constitutes a condition different, with respect to hygienic circumstances, effects, and results, from that to be found in any other character of assemblage in a municipality. These differences, justifying regulatory classification, are suggested by the varying degrees of sanitary conditions prevailing in the homes of the pupils, and by the circumstances of association and contact ordinarily present among pupils in such schools. It is difficult to conceive of a higher obligation on municipal authorities, when sufficiently empowered, than to preserve and to conserve the health of pupils in their schools.

Taking Injured Seaman to Other than Marine Surgeon

(*The C. S. Holmes* (U. S.), 237 Fed. R. 785)

The United States Circuit Court of Appeals, Ninth Circuit, reverses a decree so far as it denied the libellant, one Fondahn, damages for an alleged failure to furnish him proper medical and surgical treatment. The court says that at about 6 o'clock one afternoon, when the schooner *C. S. Holmes* was about 10 miles off Cape Flattery on her way to sea, Fondahn, a sailor on the schooner, received a compound fracture of the right arm. The injury was very serious, the periosteum was torn, and bones protruded from a ragged wound. The arm was dressed by the master and sailors, and the master put the vessel about and sailed back toward Port Angeles, and with the aid of a tug, which was procured on the way, arrived at Port Angeles at about 3 o'clock the next morning. Thereupon sail was lowered and all hands went to bed. Early in the morning the master inquired for a physician, and was referred to one, by whom Fondahn was taken in charge, being taken to a hospital owned by the physician. About 8 o'clock that morning the arm was dressed. Seven days later Fondahn went to the Port Townsend Marine Hospital. While in charge of the physician at Port Angeles, the arm began to fester, and it later developed that the bones had not been in apposition and that they did not unite. At the marine hospital an operation was performed, and Lane plates were applied, but no cure was affected. The evidence was that a further operation would be necessary, and that a cure was doubtful, if not impossible. It was Fondahn's contention that the master was negligent in taking him to a physician at Port Angeles, and in not taking him to the one at the marine hospital at Port Townsend. This was opposed by the contention that the master's duty was to take him to the nearest point where medical attention could be obtained, and that by so doing he discharged the vessel from further obligation, which seems to have been the opinion of the district court. But the court of appeals is unable to agree with the court below that the master of the *C. S. Holmes* was guilty of no negligence in his treatment of Fondahn after the latter received the injury. It thinks it was the obvious duty of the master to take him to the marine hospital at Port Townsend. That was the only marine hospital on Puget Sound. Although there were marine physicians at other points, there was none at Port Angeles, and the court does not think the master of the *C. S. Holmes* was candid in stating that he thought there was one there. Moreover, the court was convinced by the evidence that the reason the master denied Fondahn's request that he be taken to Port Townsend, which was but 20 miles away, was that it would cost him \$100 more; that the master, owning an interest in the vessel, was controlled by a desire to reduce the expense as far as possible, and that his motives were further indicated by the fact that he gave the Port Angeles physician, when he left Fondahn in his charge, a permit authorizing Fondahn to receive medical treatment at

the hands of a marine physician, he well knowing that the physician was not a marine one, and that the permit was valueless to him for any purpose. The court is convinced that the injury was aggravated by the manner in which it was treated at Port Angeles, that Fondahn's pain and suffering were greatly increased, and that for the negligence of the master Fondahn should be awarded damages in the sum of at least \$500.

Social Medicine, Medical Economics and Miscellany

Report of Soldiers Returned as Cases of "Disordered Action of the Heart" (D. A. H.) or "Valvular Disease of the Heart" (V. D. H.)

This report, known as National Health Insurance, Special Report Series No. 8, Medical Research Committee, opens with an introduction by the committee describing the organization of the Hampstead Military Hospital lent by the committee in 1914 to the Army Council. This hospital has been devoted to the study and treatment of soldiers invalided home because of heart affections. It has been directed by Dr. Thomas Lewis, assisted by members of the Royal Army Medical Corps and the Canadian Army Medical Corps, together with volunteers from the United States. Sir Clifford Allbutt, Sir James Mackenzie and Sir William Osler have acted as an advisory committee. The hospital was situated in hilly ground, with access to open country, and the surroundings and charm of the hospital have been a considerable factor in its usefulness. The committee presents the scientific report of sixty-three pages by Dr. Thomas Lewis, setting forth the important information gained, and especially practical conclusions as to prognosis and treatment which have proved of great value.

The report is based on an exhaustive study of approximately 1,000 soldiers returned as sick during training or on active service, for actual or supposed defects of the cardiovascular system. Of these, 600 displayed a particular group of symptoms which are the actual basis of the report. This group of symptoms, for purposes of convenience, Dr. Lewis calls the effort syndrome. He lays great stress on the use of this term rather than the official diagnostic category current in the British Army, "disordered action of the heart," because the soldiers are led by the latter to the belief that they are affected with serious disease of the heart, and this belief becomes a bar to recovery. In addition, a number of the patients studied, although they presented no trustworthy signs of structural disease, had been returned with the diagnosis, "valvular disease of the heart." He urges the substitution of the term "effort syndrome," which does not affirm a theory of the pathology of the condition when soldiers are invalided home because of the following symptoms: breathlessness, pain, exhaustion, giddiness, fainting, with palpitation, headache, lassitude, coldness or sweating of the hands and feet, irritability, sleeplessness, inability to fix the attention, shakiness, or flushing.

The physical signs on examination have been: increased heart-rate, either constant or exaggerated in response to effort, posture and emotion; an exaggerated response of the blood pressure to emotion and effort; diffusion of the apex-beat, with forcible or jerky impulse; accentuation of the heart-sounds; intermittence of the heart, or respiratory irregularity. Occasional slight elevations of temperature have been common; the rate of respiration has been exaggerated after exercise, sometimes at rest; coldness, blueness, and wetness of the palms or soles is frequent; tremor of the hands is the rule, and the deep reflexes are generally exaggerated. The urine is hyperacid, usually deposits phosphates and calcium oxalate crystals; spermatozoa are common; urea is reduced, and many of the urines give a green reduction with Fehling's solution. The leukocyte count is increased, especially when patients are exercising, the increase affecting mainly the lymphocytes. Certain changes in the chemical composition of the blood have been ascertained.

Many of the patients have been said to have neurasthenia. The symptoms are, of course, many of them neurasthenic symptoms, but the diagnosis does not add to pathologic insight in Dr. Lewis' opinion. He objects equally to the terms "heart strain" and "irritable heart" or "soldier's or athlete's heart."

There follows an interesting discussion of what he considers the best method of sorting military patients suffering from cardiac derangements. He advocates the following method by two stages:—

A. Preliminary sorting. By this he would eliminate two groups: (a) Those with frank pulmonary tuberculosis or exophthalmic goiter. (b) Those with unmistakable signs of heart disease: mitral stenosis, aortic regurgitation, aneurysm, definite enlargement or grave irregularity (auricular fibrillation or flutter).

He believes that auscultation is the least valuable method of differentiation, and would wholly neglect systolic murmurs and such irregularities as intermittence or extrasystoles. This preliminary sorting would leave a group to be dealt with in a totally different way.

B. Second sorting (quick method). By this he would eliminate as unfit for any active duty:

1. Those in whom the onset of symptoms dates from rheumatic fever, or in whom there has been recurrent rheumatic fever.

2. Those in whom breathlessness on exertion has been tested objectively and is found to be persistently severe.

3. Those in whom precordial pain repeatedly prevents exercise, the patients manifesting hyperalgesia of the cardiac skin areas.

4. Those in whom the heart-rate is persistently high (120 and over) even in recumbency.

5. Those in whom a single exercise test, i. e., walking a flight of thirty steps, produces objective signs of distress, namely, an anxious expression, a respiratory rate of thirty-five or over which persists while the patient lies and is from time to time interrogated, or a pulse-rate which fails to fall within five beats of the pre-exercise level on lying for two minutes.

6. In addition it may be said that of those in whom the symptoms are of moderate severity but of many years' duration, only a very small percentage become fit for full duty categories. The class includes a number of soldiers who gave up games at school or who left heavy work in civil life on account of symptoms.

C. Second sorting (by graduated exercise).

All the men not promptly eliminated by the foregoing are then placed on exercise selected from the code of army exercises and already familiar to the men. They are carried out under a sergeant major instructor. The exercises begin with fifteen minutes of light exercises and increase by seven gradations to thirty minutes of hard exercise, eventually combined with marches of four or more miles, first without pack, then with pack, finally in full marching order.

These exercises are not merely useful in sorting the patients, but have become the essential method for their treatment. This is the most important practical outcome of the work. The patients gradually group themselves according to the highest grades of exercise which are borne without distress, and, in the eventual estimation of the fitness of the man for duty, this is the final test. Men who progress to the highest exercises and carry them out without distress for several weeks in conjunction with route marches become capable of full military duty. Those who show continued symptoms on lower grade exercises are discharged as permanently unfit. The intermediate patients are now put into light and sedentary duty classes. Since the introduction of this system, approximately 50 per cent. of the men who were not eliminated by the first sorting were returned to duty, half of them to full duty. Of 220 such discharged patients, 182 were still fit for duty three months later. By it, in addition, the average length of stay in hospital has been reduced from five and a half months to two months.

Rest in bed has proved harmful in all cases except those with severe precordial pain, severe headache, or severe giddiness. Digitalis has been without influence; bromid may be of service in the initial stages. Tobacco has tended to increase the symptoms. The removal of local foci of infection, such as carious teeth, infected tonsils, or a chronically

inflamed appendix, has been followed by conspicuous improvement in some cases. Where the symptoms have followed a febrile infection, exercise treatment has been proceeded with slowly and cautiously.

Part 2 of the report deals with detailed studies of the individual symptoms by different members of the staff. The carbon dioxide of the alveolar air in these patients was at the lower limit of normal as contrasted with the high carbon dioxide of patients with cardiac failure. Carbon dioxide tolerance was also apparently low. Pain was complained of by three fourths of the patients, of various characters from uneasiness to an actual ache, more rarely stabbing pain over the precordium. Hyperalgesia of the left chest was studied in a hundred cases, and was present in some degree in forty-eight, especially in those with a history of rheumatic fever or recent infection. In cases with severe radiating pain, the distribution was similar to that in angina pectoris. The cases with hyperalgesia responded much less satisfactorily to treatment, and it was an important sign in estimating subsequent capacity for duty. Palpitation was very frequent and had no prognostic significance, the associated pulse rate being the only thing of importance. The return of the pulse rate to normal after effort was slower the more marked the symptoms produced by the effort, and was quite regularly more protracted than in normal individuals.

There follow reports of pharmacodynamic tests, also reports on studies of the different signs, drawing attention especially to the lack of value of systolic murmurs for diagnosis or prognosis. Attention is called to the lack of correspondence between the force and diffusion of the apex-beat and the size of the heart as measured orthodiagraphically. Of special interest is the fact that the average size of the heart in these patients was less than the average normal. The diffusion of the apex-beat is therefore attributed to a more vigorous movement of the heart. Dilatation of the heart as a result of exercise was not seen in a single case. Electrocardiographic studies threw no light whatever on the condition. Details of the leukocyte counts and of the urinary studies are also given. Various factors in the patients' histories are then tabulated and studied with reference to possible etiology. Soldiers invalided from active service showed more favorable results than those invalided during training. When the disability was of long duration, but relatively mild, a large percentage did well during active service; but if their condition changed for the worse, recovery was slower and more unsatisfactory than in those in whom the symptoms had developed recently. The study of occupations showed that the incidence was very much higher in men recruited from sedentary or light occupations. Rheumatic fever or chorea had existed in 23 per cent. of the cases, and only 32 per cent. of these rheumatic patients returned to duty after treatment, as against 54 per cent. of the nonrheumatic, the figures being still more striking when those returned to light duty are subtracted. Infection played a considerable part in the clinical histories. In addition to the rheumatic infections, dysentery, typhoid fever, diarrhea, pulmonary infections, etc., were immediately followed by the symptoms in 33 per cent. of the patients. A number more had chronic infections or had had a less recent acute illness. The effect of an intercurrent infection has regularly been bad. Shell shock, wounds, and other accidents, and "gassing," do not appear to have played any important part in the production of the syndrome. Strain appears to have acted merely to bring out the symptoms, rather than as the true cause of the malady. The relation to tobacco is not clear. The relation to alcohol was of considerable interest, since 53 per cent. were total abstainers, and heavy drinking was unusual. It is possible that alcohol was avoided because it aggravated the symptoms.

Various hypotheses are discussed under general pathology, but no conclusions would seem to be warranted. Vagal tone was judged normal from the effects of atropin; the accelerator response was apparently exaggerated. No evidence was found for the assumption that hyperthyroidism is the cause, and no certain proof of myocardial disease could be obtained. Bacteremia was not demonstrated. The hypothesis of toxemia is discussed without any conclusions being reached.

Society Proceedings

COMING MEETINGS

Michigan State Medical Society, Battle Creek, Sept. 4-6.
Western Roentgen Society, Kansas City, Mo., July 20-21.

AMERICAN PEDIATRIC SOCIETY

*Twenty-Ninth Annual Meeting, held at White Sulphur Springs,
W. Va., May 28-30, 1917*

(Continued from page 148)

The Salts in Green Vegetables and the Effect of Different Methods of Cooking

DR. FREDERIC H. BARTLETT, New York: The feeding of green vegetables to young infants is becoming a common practice. The plan has been followed with infants as young as 6 or 7 months. Infants thus fed have shown an earlier closure of the fontanel and generally greater activity than those fed without such additions to their diet. This beneficial effect has been variously explained as due to the mere addition of an increased quantity of salts, to the particular combinations of the bases with the inorganic and organic acids present which provide the salts in an especially suitable form for use by the organism, and to a so-called vitamin effect. The general opinion is that the mineral content is the important factor. We undertook an analysis of cooked vegetables, considering separately the solid portion ordinarily given as food and the water used in cooking. We estimated the content in grams of solids of vegetables prepared by boiling, taking spinach, New Zealand spinach, young carrots, onions, string beans, asparagus and potatoes, and estimated the solids, ash, calcium, magnesium, phosphorus, potassium, sodium, sulphuric acid and iron, and also the total nitrogen and the nitrogen as protein. We also estimated the percentage lost in the water under ordinary boiling and that lost by steaming, and we estimated the contents in grams of vegetables prepared by steaming, and the approximate content of one tablespoonful of steamed vegetables of the various constituents. We found that a large proportion of the mineral content of most vegetables is lost by boiling. Calcium is the only constituent which is not affected by boiling. This loss is only slightly reduced by making the time of boiling a minimum. A great saving in the mineral content may be effected by steaming. Spinach is the best vegetable to provide a salt addition to the diet, because the loss by steaming is about one half what it is by boiling. Sodium is lost in a high degree even in steaming. One hundred gm. of the edible portion of uncooked vegetable when cooked yields approximately 3 tablespoonfuls of all vegetables, except carrots, which yield about 4.

DISCUSSION

DR. GODFREY R. PISEK, New York: Frequently young infants do not like vegetables. How do you get infants to eat the vegetables?

DR. J. P. SEDGWICK, Minneapolis: Josephine Barry, of the Department of Economics of the University of Minnesota, has made a study of the retention of salts in vegetables with different methods of cooking. She has shown the necessity of retaining these salts. Her work, however, is not as complete as that of Dr. Bartlett. We have been trying to find the amount of calcium necessary to produce a calcium retention. We find that an enormous amount is required, and that the amounts usually given therapeutically are insufficient. We gave 5 gm. in twenty-four hours during the first year, and found that if we used 3 gm. we did not get as good results. It takes twice as much calcium lactate as calcium chlorid to obtain the same results.

DR. L. EMMETT HOLT, New York: Careful attention should be paid to the minute subdivision of all vegetables fed to infants, as vegetables are in the nature of a foreign substance in the digestive tract of young infants. If the vegetables are rubbed through a fine sieve, the difficulty caused by undigested particles may be avoided. We are doing this in the Babies' Hospital, and it is surprising how little effect

vegetables prepared in this way have on the infant's stools. One point that cannot be emphasized too often is that it is a mistake to allow a child to have the bottle until 2 years of age. In such children we encounter some of the worst types of malnutrition.

DR. FRITZ B. TALBOT, Boston: Have you made an analysis of Swiss chard?

DR. PERCIVAL J. EATON, Pittsburgh: The water in which vegetables have been cooked may be added to bean or pea soup or used as the foundation of a soup, and the mineral salts may thus be conserved.

DR. ROWLAND G. FREEMAN, New York: I have found that children with poor digestive capacity do not digest vegetables well.

DR. PERCIVAL J. EATON: I wish to emphasize what Dr. Holt has said with reference to sieving the vegetables. We sieve all vegetables fed to children until the children are old enough to be trusted to chew their food. If one sees that this is done, children will have no trouble in digesting vegetables.

DR. ISAAC A. ABT, Chicago: We are using a mill with two closely adjusted plates that effectually pulverizes vegetables and other foods.

DR. HENRY HEIMAN, New York: I have had somewhat the same experience as Dr. Freeman. We must not lose sight of the fact that we may have unsplit carbohydrates as well as unsplit proteins. Our experience has taught us the necessity of feeding babies green vegetables as soon as possible. This is not alone for the iron contained in the vegetables but because they furnish other elements which are required for the growth of bone and other tissues.

DR. DAVID M. COWIE, Ann Arbor, Mich.: We have had some trouble trying to use as much spinach as we did carrots. We found that we did not get the cayenne pepper appearance in the stools if we used only 1 tablespoonful of carrot.

DR. HENRY F. HELMHOLZ, Evanston, Ill.: In a recently published article it has been shown that vegetables, dried, pulverized, and made into an emulsion, may be fed to infants 2 or 3 months old without any ill effects.

DR. FREDERIC H. BARTLETT, New York: If the vegetables are rubbed through a fine sieve they may be fed either through a bottle or with a spoon. It is a mistake to begin feeding vegetables in as large an amount as a tablespoonful. We have not made an analysis of Swiss chard.

Congenital Skin Defects

DR. ISAAC A. ABT, Chicago: The subject of this report was an infant normal at the time of birth, with the exception of two defective skin areas over each knee. The labor was normal. These areas were about 1¼ inches in diameter, symmetrical, and seemed to be, so to speak, irregularly punched out. The skin around the edges was drawn and puckered, presenting the appearance of ulcers. The base was beefy red and moist. A few small areas of this red ulcerated surface showed a yellow exudate. A whitish scar seemed to cross the ulcerated area, as though connective tissue bands indicated the beginning of a process of cicatrization. The ulcers from week to week became more cicatrized, and after five or six weeks were replaced by shiny white patches. Most writers attribute these skin defects to errors in development or to inflammatory adhesions between the external layers of the skin and the amnion. At the point at which this adhesion takes place, the growth of flat epithelium is retarded. As the liquor amnii accumulates, the so-called Simonart's bands are formed. If these bands are torn loose from the integument of the fetus, a skin defect remains.

DISCUSSION

DR. J. P. SEDGWICK, Minneapolis: Last winter we had a case of congenital defect of the scalp. I am sure we should see more of these cases if the new-born infants were turned over to the pediatrician.

Case of Hemorrhagic Disease in the New-Born Treated by Direct Transfusion

DR. J. H. MASON KNOX, Baltimore: The family history of this child was unimportant. The birth was spontaneous. The

child weighed 7 pounds, 6 ounces. I was called to see the infant when it was 2 days old, because it had vomited a considerable amount of bloody fluid. The child had no fever, and no cough, and nothing abnormal could be made out. During the examination, the child passed from 3 to 5 ounces of tarry stained material, evidently hemorrhage from the intestinal tract. Transfusion was determined on. About 50 c.c. of the mother's blood was received into 2 ounces of sodium citrate solution. With a syringe about 15 c.c. of this was introduced into the longitudinal sinus. The remainder was administered intramuscularly into the buttocks. The child was first seen at 9 a. m., and from this time until 3:30 p. m. the child passed several tarry stools, was greatly blanched, the pulse became thready, and respiration shallow. With rest the condition improved, and the following morning the child seemed better. Two drams of the mother's milk were given at 7 a. m. and repeated every two hours. The following day the baby had one hemorrhage from the bowels, probably a part of the original hemorrhage. From this time the child went on to recovery, and is at present apparently perfectly healthy.

DISCUSSION

DR. FRITZ B. TALBOT, Boston: These patients frequently have a high temperature at some stage of the disease. I had one case in which there was a profuse hemorrhage under the scalp and a temperature ranging from 102 to 106 F. The child recovered. I have wondered when the hemorrhage is under the scalp or into the muscles, where it is not excreted, whether the high temperature may not be due to the absorption of the hemorrhage.

DR. ALFRED F. HESS, New York: The question is suggested in this connection, which is preferable, direct or indirect transfusion, or whether one is as good as the other. I believe that direct transfusion is the treatment of election, that it is better than citrated whole blood. I think investigations show that the citrated blood is not the same as whole blood, and that a rise in temperature occurs when citrated blood is used.

DR. HENRY F. HELMHOLZ, Evanston, Ill.: Most of these patients will recover without direct transfusion. They can be cured by intramuscular injections of blood, which can be given in amounts up to 100 c.c.

DR. CHARLES GILMORE KERLEY, New York: Within half a year I have had three cases of this kind relieved by intramuscular injection. One-half ounce of blood injected into each buttock stops the bleeding just as effectually as the use of the serum by the Welch method. The fact that blood can be obtained so readily for infants and that one does not have the trouble of separating the serum makes this method a convenient as well as a satisfactory one.

DR. L. E. LA FETRA, New York: We have been giving the intramuscular injections of whole blood ever since Dr. Schloss first published his method. We have employed it in about fifty cases, making the injections into the loose tissues in the scapular region. We do not have to use large quantities of blood. It is more important that the injections be made at frequent intervals. If human serum cannot be obtained, horse serum may be used.

DR. J. H. MASON KNOX, Baltimore: The blood was injected into the vein because of the desperate condition of the child.

Enlargement of the Thymus Treated by the Roentgen Ray

DR. ALFRED FRIEDLÄNDER, Cincinnati: This paper is to be abstracted in *THE JOURNAL*, July 28, 1917.

DISCUSSION

DR. HOWARD C. CARPENTER, Philadelphia: There seem to be some cases in which the thymus is really enlarged in which the enlargement is not shown by the Roentgen ray.

DR. WILLIAM PALMER LUCAS, San Francisco: It has been my experience that we may find practically the same type of picture which Dr. Friedländer has shown in children without any clinical symptoms. I have followed such children for months without any symptoms arising. In cases of enlarged thymus with symptoms we have obtained similar results with Roentgen treatment, but not in two weeks.

DR. FRITZ B. TALBOT, Boston: We have had practically the same results as Dr. Lucas. Many times we cannot see whether or not we have a pathologic enlargement of the thymus with the Roentgen ray. We have seen the same improvement under Roentgen treatment as has been described. We had one case four or five years ago in which the symptoms disappeared, but last spring they returned, and a long course of treatment was necessary.

DR. DAVID M. COWIE, Ann Arbor, Mich.: I have had children in whom the Roentgen ray showed an enlarged thymus but we could not confirm that diagnosis. Again, we have had typical cases of thymus enlargement which were not shown by the Roentgen ray.

DR. SAMUEL MCC. HAMILL, Philadelphia: I have had cases with the Roentgen diagnosis of thymus enlargement, to which I have not paid a great deal of attention, but I finally decided to follow up such a case, and I kept the child in the ward for two weeks. We then had another roentgenogram taken which showed no shadow. I have wondered whether the exposure to the Roentgen ray in taking the picture could have had a therapeutic effect on the thymus.

DR. J. P. CROZER GRIFFITH, Philadelphia: I have seen this condition steadily disappear under Roentgen treatment. Children may have thymus enlargement without symptoms and die from it. Thymus enlargement is an accompaniment of status lymphaticus.

DR. ALFRED F. HESS, New York: It seems possible that the same picture produced by enlarged thymus might be produced by enlargement of the vessels at the base of the heart. This picture is sometimes seen in children with scurvy and in adults with beriberi. In such conditions the enlargement disappears with the disappearance of the disease. In making roentgenograms of babies we have found that some of the controls give pictures just like those of thymic asthma, and yet no symptoms of thymic asthma are present.

DR. J. H. MASON KNOX, Baltimore: Our roentgenologist is very skeptical as to whether we can detect thymus enlargement by either the Roentgen ray or physical examination.

DR. F. S. CHURCHILL, Chicago: How long have these cases been under observation?

DR. ALFRED FRIEDLÄNDER, Cincinnati: There are symptomless cases of enlarged thymus; others, again, produce pressure effects, or the symptoms of hyperthymus. As some of these cases are exceedingly threatening, and the thymus increases or decreases in size very rapidly, the fact that a case is apparently running a symptomless course is no reason for not reducing the size of the thymus. I have studied a large series of cases and have found that when there is enlarged thymus, if marked congestion occurs, as from whooping cough or bronchitis, it may light up symptoms and cause the death of the child. If we get a picture in which we suspect enlargement of the vessels at the base of the heart, a few treatments will effect a change if the condition is that of thymus enlargement, so that then the diagnosis will not be difficult. Some of these cases date back to 1903, and some are very recent. The first patient was treated in 1903, and is now hale and hearty.

Case of Congenital Heart Disease

DR. CHARLES HUNTER DUNN, Boston: The diagnosis in this case was pulmonary stenosis, defective interventricular septum, chronic intestinal tuberculosis, chronic tuberculosis of the mesenteric lymph nodes, possible tuberculous peritonitis, rickets, and terminal bronchopneumonia. The child survived fifteen months. At necropsy the heart showed very marked enlargement. The point of origin of the aorta and pulmonary arteries, respectively, were reversed, the aorta rising in front and to the right, and the pulmonary artery behind and to the left. The foramen ovale was entirely open. The tricuspid and mitral valves were normal except for widening of the orifices produced by dilatation of the ventricles. There was some hypertrophy of the wall of the left ventricle, and marked dilatation of the cavity of the right ventricle without notable hypertrophy of the walls. The aortic orifice was situated in the right ventricle somewhat further forward than the normal position of the pulmonary orifice. The pulmonary orifice was situated in the left

ventricle in the position normally occupied by the aortic orifice. It showed marked stenosis. There was an oval opening in the ventricular septum 5 cm. in diameter situated in the usual position of that lesion. The remarkable feature of this case was that the child should have lived so long, especially with the additional handicap of tuberculosis.

Restoration of Maternal Nursing After Sixteen Days of Complete Interruption

DR. THOMAS S. SOUTHWORTH, New York: Nine days after birth, an infant developed a severe cellulitis, which involved the right buttock, the entire lower part of the back from the ribs to the sacrum, the under surface of the chin, and the upper part of the neck. Owing to the erysipeloid appearance of the cellulitis, the child was removed from the breast and the mother sent home from the hospital. Two weeks elapsed during which time she made no attempt to pump her breasts or retain her milk. It then seemed that the baby would die if it did not receive breast milk. The mother began taking 1 pint of corn meal gruel and 1 quart of milk daily, following definite instructions. At first complementary feedings of malt soup mixture were given after each nursing. After a few days these were stopped and the breast milk sufficed. The child gradually overcame its various infections.

DISCUSSION

DR. CHARLES HERRMAN, New York: I have the chart of a case that shows the possibility of resuming breast feeding after an interruption of ten weeks. It is rather important to remember that in mothers who have stopped breast feeding it can be resumed if a persistent effort is made.

DR. J. P. SEDGWICK, Minneapolis: I know of one instance in which breast feeding was resumed after an interval of nine weeks. Cases have been reported in which breast feeding has been resumed after an interval of three or four months.

DR. HOWARD C. CARPENTER, Philadelphia: One instance came under my observation in which both a mother and her daughter were nursing babies at the same time. The babies were not thriving. I had these mothers exchange babies, after which both babies did well.

Case of Meningococcus Meningitis in the New-Born

DR. D. J. MILTON MILLER, Atlantic City, N. J.: This case was of particular interest because of its onset with conjunctivitis, mistakenly regarded as gonorrheal. A bullous eruption appeared in the second week of the disease. There was a prolonged latent period before the signs of meningitis were apparent, these not appearing until the fourth week. The spinal fluid gelatinized at once on withdrawal. The case was also unusual in regard to the large number of punctures of the fontanel, ten, in so young a patient, with no apparent ill effect beyond vomiting. There were in all 260 c.c. of serum introduced with no sign of serum disease. After the tenth injection of serum there was an apparent improvement, which was followed by a return of the symptoms and death.

Appendicitis in a Nine Month Old Baby

DR. ISAAC A. ABT, Chicago: This child gave a history of repeated attacks of bronchitis. The physical examination revealed symptoms and signs entirely referable to the respiratory system. The examination of the heart, abdomen and extremities was negative. At necropsy a perforating appendicitis was found.

Case of Pneumothorax in a Twelve Year Old Boy

DR. ISAAC A. ABT, Chicago: A boy was admitted to the hospital suffering from dyspnea. His previous history was unimportant. A needle was inserted into the thoracic cavity with a catheter attached. Later an incision was made and a tube inserted. The following day the right side of the chest became swollen, and the succeeding day the chest became edematous. The emphysema became general and the child died.

DISCUSSION

DR. J. P. SEDGWICK, Minneapolis: We had a case in which the infant developed a pneumothorax on the second day. This

child recovered. We were unable to find the cause of the condition in this child.

DR. HENRY F. HELMHOLZ, Evanston, Ill.: A case somewhat similar to Dr. Abt's first case came under my observation. We thought we were dealing with a right sided lobar pneumonia. Later symptoms of peritonitis developed, and we thought this was a pneumococcus peritonitis. At necropsy we found a focus in the gallbladder, and appendicitis. I cannot say which was the primary infection.

DR. J. P. CROZER GRIFFITH, Philadelphia: I recall a similar case in which we had no idea what the correct diagnosis was. At necropsy we found a perforated appendix.

Hereditary Multiple Exostoses

DR. DAVID MURRAY COWIE, Ann Arbor, Mich.: This patient, a boy, aged 10 years, showed nothing unusual except the multiple outgrowths and irregular thickenings of most of the bones of the skeleton, many of which were plainly seen on casual observation. The involvement was quite definitely symmetrical. In the upper extremities the humerus, radius and metacarpal bones showed thickenings and exostoses. The carpal bones showed no deformities. The femur showed thickening of the neck with blunt outgrowths projecting forward and downward. There was thickening of the lower ends with marked spinous outgrowths projecting upward on the inner and outer aspects. The tibia showed many spines projecting downward about the head. The ribs, clavicle, scapulae and large pelvic bones also showed the process. No prominences could be felt on the head. The father of this boy showed similar, larger, but not so numerous skeletal changes as those of the son. The changes seemed to have had little effect in hindering most of the bones from reaching their normal length and size.

(To be continued)

AMERICAN GYNECOLOGICAL SOCIETY

Forty-Second Annual Meeting, held at Pittsburgh, May 31 and June 1, 1917

(Concluded from page 145)

SYMPOSIUM ON THE RELATION OF THE GLANDS OF INTERNAL SECRETION TO GYNECOLOGY AND OBSTETRICS

Relation of the Pituitary to the Female Generative Organs

DR. EMIL GOETSCH, Baltimore: There is a close inter-relationship in function between the pituitary and sex glands. Overfunction of the pituitary anterior lobe is associated with overactivity of the sex glands. Deficiency of pituitary secretion is followed by underdevelopment and genital aplasia in the young and by sexual inactivity and retrogression in the adult. Primary alterations in the function of the sex glands, as in pregnancy and after castration, are followed by pituitary hypertrophy and hyperplasia. The specific action of posterior lobe extract on the smooth musculature of the uterus and bowel has led to the wide usage of this drug in obstetric practice and in the treatment of intestinal paresis following abdominal and pelvic operations. The administration of pituitary extracts is of distinct benefit in clinical states of pituitary underfunction.

The Pineal Gland Influence on Growth and Differentiation, with Particular Reference to Its Influence on Prenatal Development

DR. CAREY PRATT MCCORD, Detroit: A clinical syndrome is to be associated with disturbances of the functions of the pineal gland. Because of the involution of the pineal at puberty, the constitutional manifestations of pineal pathology appear to be confined to prepubertal years. The essential characteristics (apart from pressure and neighborhood manifestations) are (a) early sexual development evidenced in the enlarged genitalia, pubic hair, general body hair, and early change in voice; (b) precocious mental development,

manifested in maturity of thought and speech, and (c) general overgrowth of body to the extent that a child of 6 or 7 years may have the appearance of a child near puberty. The gland is not essential for the maintenance of life. The early symptoms following pinealectomy are attributable to the severe brain injury. No changes attend the removal of the gland in adult animals. The administration of pineal substance to young mammals is reported to hasten growth and sexual maturity. In unicellular organisms (paramecia), pineal extracts increase the rate of production to more than double that of controls. In larval forms (*Ranidae*), both growth and differentiation are hastened as a result of pineal feeding. The inference is allowable that the pineal gland is an organ of internal secretion whose functions, however, are of minor significance in the general activities of the endocrine system.

The Physiologic and Pathologic Importance of the Parathyroids

DR. CARL VOEGTLIN, Washington, D. C.: The presence of a minimum of parathyroid tissue in the body is essential for life and the continuation of normal metabolism. Parathyroid insufficiency seems to be characterized by an increased irritability of the nervous system to the galvanic current, which may be due to the withdrawal of soluble calcium salts from the blood and tissues. Parathyroid insufficiency leads to an alkalosis which is converted into an acidosis as a result of active tetany. Definite metabolic changes take place in animals after complete parathyroidectomy. Pregnancy puts an extra strain on the functions of the parathyroid, as evidenced by the appearance of tetany during this period in partially parathyroidectomized animals. Tetany has been observed during lactation in animals with parathyroid insufficiency. Interruption of lactation was followed by recovery. The offspring of partially parathyroidectomized animals exhibit a marked increase in nerve irritability. An intravenous injection of soluble calcium or strontium salts or hydrochloric acid almost instantly removes the symptoms of tetany. However, tetany may reappear after this treatment, and the life of such animals cannot be saved by the continued administration of calcium. The injection of parathyroid extract seems to have a temporary curative effect on tetany animals. Isotransplantation of parathyroid into animals with parathyroid insufficiency is usually successful. A condition which might justly be termed hyperparathyroidism is unknown at the present time.

Relation of the Parathyroids to the Female Genital Apparatus

DR. EUGENE H. POOL, New York: No direct relationship has been established between the parathyroids and the female sex organs; no morphologic changes in the parathyroids have been noted during pregnancy; yet apparently there is a connection between the parathyroids and the sex processes in the female. Tetany, the clinical evidence of insufficient parathyroid function, is somewhat prone to occur in menstruating, pregnant and puerperal women, as well as patients suffering from gynecologic diseases or who have undergone gynecologic operations. The cause of maternal tetany is now referred to parathyroid insufficiency. The function of the parathyroids is apparently closely connected with calcium. There is reason to believe that maternal tetany and lactation tetany are associated with calcium deficiency. Latent tetany, or a sub-tetanic condition, is much more common in pregnant and puerperal women than is usually assumed. In the treatment of maternal tetany, the administration of calcium in large doses is followed by beneficial results in the great majority of the cases.

The Thyroid in Relation to Gynecology and Obstetrics

DR. DAVID MARINE, Cleveland: There is evidence of a thyroid sex gland interrelation in the female in association with the development of secondary sexual characters, with menstruation and with pregnancy and also in the male at puberty, but to a very slight degree. The meager evidence available would tend to indicate that the interstitial cells of the ovary and, perhaps, also, the suprarenal cortex play a

major rôle in this relation in the female, as certainly the cells of Leydig do in the male.

The Endocrine Function of the Pancreas and Its Relation to the Sex Life of Women

DR. A. J. CARLSON, Chicago: There is, at present, no evidence of any specific relations of the endocrine functions of the pancreas to the gonads, male or female, or to menstruation, pregnancy and lactation. Absolute diabetes, induced after conception, leads to death of the fetus. Absolute diabetes probably renders conception impossible. Partial diabetes under careful dietary control permits of normal sex life of women (menstruation, normal pregnancy, normal child, lactation), and pregnancy under such conditions does not aggravate the diabetes. But in the absence of such dietary control the condition of pregnancy aggravates the diabetes in the mother, and uncontrolled diabetes in the mother is extremely injurious to the fetus. There is some evidence that in late stages of pregnancy the fetal pancreas may function for the mother.

Influence Exerted by the Suprarenal Bodies on the Genital System

DR. SWALE VINCENT, Winnipeg, Manit.: There is considerable clinical evidence that tumors of the suprarenal cortex are frequently associated with sex abnormalities, and that when cortical tumors occur in the female, an accentuation of male secondary sexual characteristics develops, and simultaneously a hypoplastic condition of the internal generative organs supervenes. Additional evidence as to a connection between suprarenal cortex and the sexual organs is furnished by the enlargement of the cortex during breeding and pregnancy. Feeding young animals with suprarenal gland substance seems to stimulate the growth of the testes.

Relation of the Ovary to the Uterus and the Mammary Gland

DR. LEO LOEB, St. Louis: The corpus luteum has a sensitizing action on the uterus. If the uterus is incised or mechanically stimulated at the time during which the corpus luteum is elaborating this growth substance, maternal placenta (deciduoma) is formed. The mechanical stimuli, therefore, assume in this respect the function which the ovum exerts under normal conditions. The form of growth response of each species is characteristic. No specificity exists in the sensitizing substance given off by the corpus luteum, as far as different individuals of the same species are concerned. The life period of experimental deciduomas is short, except in pregnancy, during which their persistence is prolonged. Corresponding to and dependent on the cyclic ovarian changes, uterine cyclic changes occur. The cycle consists of heat, growth, with associated glandular activity, regression and interval. Heat probably is due to maturation of the follicles and is dependent on the absence of the corpora lutea; growth activity is the result of corpus luteum secretions; regression marks the cessation of corpus luteum secretion, which is followed in the interval by a condition of rest. Pregnancy causing a persistence of the corpus luteum is characterized by an accentuation but not a prolongation of the active phase, and an inhibition of the uterine cyclical changes throughout gestation. While it is possible during pregnancy to produce experimentally a new ovarian cycle through excision of the corpora lutea, such a new ovarian cycle is not followed by a new uterine cycle. During pregnancy a mechanism is at work preventing the uterine mucosa from responding to the stimuli given off by various ovarian structures. It follows that the corpus luteum subserves at least two functions, inhibiting ovulation and producing a substance which causes growth in the uterus. The ovary shows other noncyclic functions. It has a trophic influence on the genitals, and either primarily or secondarily determines the development of the secondary sexual characters. The ovary likewise controls the development of the mammary glands. It exerts a trophic influence on this organ, and determines its normal cycle. During heat and subsequent to ovulation, proliferated changes occur; these cease while the corpus luteum develops and functionates. The incidence of breast cancer in mice is greatly reduced by castration.

Transplantation and Retention of Ovarian Tissue After Hysterectomy

DR. WILLIAM P. GRAVES, Boston: After extirpation of the uterus, vasomotor disturbance ensues with approximately equal frequency, whether the ovaries are retained in situ, totally ablated, or transplanted. Retention of ovarian tissue after hysterectomy is of little or no physiologic value, and may be productive of serious harm to the patient.

The Placenta Regarded as a Gland of Internal Secretion

DR. ROBERT T. FRANK, New York: The experimental work of the last decade proves that Halban was correct in ascribing to the placenta an action on the uterus and breasts. Placental extracts (mainly the lipoid fraction) rapidly induce hyperplasia of the uterus and breast gland tissue and nipples, in castrated or in noncastrated animals. The chemical substance which induces these changes can exert its influence in the absence of the thyroids, suprarenals, pancreas, or in the absence of thyroid and suprarenals combined. In view of the apparent identity of corpus luteum and placental substance, the question arises whether the placenta acts merely as a storage reservoir for corpus luteum secretion during the latter half of pregnancy, or whether the placenta elaborates a hormone of its own.

Relation of the Sex Glands to Metabolism

DR. JOHN R. MURLIN and DR. HAROLD C. BAILEY, New York: Removal of the ovaries of our dogs was followed by an increase in weight in both and a lowering of the metabolism in one from 12 to 17 per cent., and in the other from 6 to 14 per cent. We feel that indirect action has a bearing on this reduction, and we do not believe that the indications point decisively to the loss of a specific stimulus from the ovary affecting the oxidative processes of the cells.

DISCUSSION ON THE RELATION OF THE GLANDS OF INTERNAL SECRETION TO GYNECOLOGY AND OBSTETRICS

DR. J. WHITRIDGE WILLIAMS, Baltimore: The posterior lobe of the pituitary is a most powerful therapeutic agent, one which is doing a great deal of good and, also, a great deal of harm. The injection of a cubic centimeter of any of the ordinary pituitary extracts in many cases has a marvelous effect. Within three minutes after injection of this drug, the uterus, which previously has been acting in a very sluggish way, takes on intense activity, and often labor will be brought to a standstill within the next few minutes. About the thyroid, my practical experience with pregnancy complicated by goiters of various kinds has shown me that the condition can, in great part, be disregarded.

DR. GEORGE GELLHORN, St. Louis: In one case of kraurosis vulvae there has been permanent relief after feeding the patient ovarian extract. Another patient was temporarily improved after injection of the extract.

DR. JOHN G. CLARK, Philadelphia: The preservation of normal ovarian tissue is of vital value in younger women. If there is any one point that is definitely conclusive, it is the retention of ovaries or an ovary, regardless of whether or not the uterus is present. We have observed in the younger women that when ovaries suggestively diseased were preserved, these patients did not have a satisfactory or postoperative convalescence. A large proportion of them subsequently suffered pain and distress free from a pathologic condition. In fibroid cases in young women in whom the ovaries were normal, we saw infinitely better results than under the older methods when the ovaries were removed.

DR. FRANCIS CARTER WOOD, New York: We have tried the Beatson operation experimentally, and the influence of the removal of the ovaries on carcinoma of the breast. This operation produces a temporary effect, which is no doubt due to the removal of the secreting substance of the ovary or to nutritional and vascular conditions.

Clinical Study of Blood Pressure, Pulse Pressure, Hemoglobin in Postoperative Shock, Postoperative Hemorrhage, and Postoperative Cardiac Dilatation

DR. JOHN O. POLAK, Brooklyn: There is a constant rise of from five to fifteen points in the hemoglobin readings following anesthesia with ether, when such anesthesia occupies

more than thirty minutes. Consequently, allowance must be made for this rise in using hemoglobin estimations as a diagnostic sign in internal bleeding. The erythrocyte count is also increased, but its variation from the preoperative is so slight that it does not warrant any conclusions. In the majority of cases there is a moderate fall in both the systolic and the diastolic blood pressure following ether anesthesia. The blood pressure returns to normal, that is, to preoperative reading, in from twelve to forty-eight hours. The inhalation of oxygen after the withdrawal of the ether vapor diminishes this fall in blood pressure, but is only transient in its effect. In cases of shock, especially when there has been much blood lost during the operation, the fall in blood pressure is greater than after long operation without blood loss. The pulse pressure is a better index of hemorrhage or cardiac failure than the systolic pressure. There is a constant rise in the leukocyte count in hemorrhages, while the leukocytes fall in shock.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Obstetrics and Diseases of Women and Children, York, Pa.

July, LXXVI, No. 1

- 1 *Cesarean Scar, an Anatomic Study. J. R. Losee, New York.—p. 1.
- 2 Several Every-Day Obstetric Problems. J. B. DeLee, Chicago.—p. 15.
- 3 *Cesarean Section in Placenta Praevia. G. M. Boyd, Philadelphia.—p. 26.
- 4 Tampon Treatment of Placenta Praevia. J. O. Arnold, Philadelphia.—p. 38.
- 5 Accouchement Forcé in Placenta Praevia. A. W. Tallant, Philadelphia.—p. 46.
- 6 Intermediate Repair of Injuries of Genital Canal in Childbirth. B. C. Hirst, Philadelphia.—p. 50.
- 7 Immediate Repair of Injuries of Parturition. W. P. Pool, Brooklyn.—p. 53.
- 8 Methods of Treatment of Placenta Praevia. R. M. Beach, Brooklyn.—p. 57.
- 9 Dilatation, Vaginal Plastic Operations, or Stem Pessaries as Exclusive Treatment for Sterility. F. C. Holden, Brooklyn.—p. 64.
- 10 Case of Adenomyoma of Ovary. M. Rabinovitz, New York.—p. 67.
- 11 *Some Causes of Fetal Death. W. Pfeiffer, Brooklyn.—p. 74.

1. **Cesarean Scar.**—Observations were made by Losee from twenty different specimens of uterine scar removed from the uterus at or near term. All the previous cesareans were the transperitoneal operation of the high incision type. In nine there was a complete or partial rupture of the uterus, and in eleven an incision was made either through the old scar or adjacent to it, and the whole scar or the edges were afterward excised for examination. Many specimens were taken while the uterus was partially contracted, and others after rupture with complete contraction. Losee says that the strength of the uterine scar after cesarean section depends on the absence from the wound of infection and foreign material and on the perfect coaptation of the incised surfaces. A perfectly healed wound leaves the myometrium as strong after operation as before, so far as can be determined by the histologic examination of the tissue in the line of the former incision. A continuous suture in the myometrium adjacent to the decidua may assist in preventing the separation of the cut surfaces by blood clot or lochia in addition to the usual interrupted suture through serosa and myometrium. The placenta in a subsequent pregnancy has little or no effect in weakening the firmly united scar, but if the scar is already weak it may accentuate this weakness. Other than a small amount of fibrous tissue beneath the peritoneum, the myometrium in line with the former incision contains no scar tissue and the uterine muscle regenerates. Rupture invariably takes place through the site of the former scar and not through the adjacent muscle tissue. Without definite means of estimating the strength of the uterine scar after cesarean section subsequent pregnancies must always be carefully observed as they approach term.

3. Cesarean Section in Placenta Praevia.—Boyd and an associate have gone over the records of the Philadelphia Lying-In Charity, and found that in 8,697 cases there were fifty-nine of placenta praevia, one in 147. This high frequency is due to the fact that this institution does a large amount of emergency work. In fifteen of the cases, the patients were primiparas; and in forty-four, multiparas. Six cases were of the central type, and fifty-three, marginal and partial. The average length of gestation for a case was 7.3 months. Twelve of these women were at term—20 per cent. Seven mothers died—11.8 per cent. Of these seven cases, three were of the central type. All of the patients who died were exsanguinated on admission, and four of the seven were practically dying. Deducting these four, the mortality rate is 5 per cent. The methods of treatment employed were tampon, metreurysis, manual dilatation and podalic version. In two cases, cesarean section was performed. The total fetal mortality was 79 per cent., but in these cases only 50 per cent. of the infants were viable. At the Medico-Chirurgical Hospital, the records show that in 1,085 women treated, there were fifteen of placenta praevia with no maternal death. The fetal mortality, however, was 66.3 per cent. One patient was a primipara, and fourteen were multiparas. There was one cesarean section. In this case there was profuse hemorrhage with signs of infection. For this reason, the Porro operation was done. The mother recovered, but the child died on the following day. Taking the two institutions together, there were seventy-four cases. Leaving out of consideration the four women that were practically dead when admitted, the mortality in these cases was but 4 per cent.

11. Causes of Fetal Death.—Pfeiffer reports a case in which death was due to multiple twists in the cord.

American Journal of Physiology, Baltimore

July, XLIII, No. 4

- 12 *Influence of Thyroid Feeding on Carbohydrate Metabolism. S. Kuriyama, New Haven, Conn.—p. 481.
- 13 Variations in Irritability of Reflex Arc. Flexion Reflex Variations, Compared with Those of the Nerve Muscle Preparation. E. L. Porter, Philadelphia.—p. 497.
- 14 Behavior of Holothurians in Balanced Illumination. W. J. Crozier.—p. 510.
- 15 *Effect of Dextrose Given Intravenously on Blood Composition and Urinary Secretion. D. M. Davis, Baltimore.—p. 514.
- 16 *Effect of Epinephrin on Muscular Fatigue. C. M. Gruber, Albany, N. Y.—p. 530.
- 17 Effect of Phosphorus Poisoning on Catalase Content of Tissues. W. E. Burge, Urbana, Ill.—p. 545.
- 18 Nature and Properties of Metathrombin. A. R. Rich, Baltimore.—p. 549.
- 19 Changes in Clotting Power of Oxalated Plasma on Standing. A. R. Rich, Baltimore.—p. 571.
- 20 Diastatic Action of Saliva in Horse. R. J. Seymour, Columbus.—p. 577.
- 21 *Relation between Thromboplastic Action of Cephalin and Its Degree of Unsaturation. J. McLean, Philadelphia.—p. 586.

12. Thyroid and Carbohydrate Metabolism.—The influence of thyroid feeding on the glycogen content of the liver, blood sugar content, assimilation limit for dextrose and also on epinephrin hyperglycemia and glycosuria was studied by Kuriyama. Fresh thyroid gland of pigs or desiccated thyroid administered by mouth in doses of 3 to 5 gm. (fresh) or 0.5 to 1.7 gm. (desiccated) per day, decreased the glycogen content of the liver of white rats distinctly in three to five days. Control animals, fed on the same diet with the addition of muscle tissue or egg, do not show any such change, even when the food amount is regulated so that they lose as much in body weight as the thyroid fed animals. The influence of thyroid feeding on liver glycogen can be very easily removed by omitting thyroid from the diet. The liver shows its normal glycogen content two or three days after the cessation of thyroid administration, even when the loss of body weight has not been regained. This phenomenon seems to show that the changes resulting from thyroid feeding and causing the loss of liver glycogen, are not of a serious morphologic nature. When dextrose is introduced parenterally to fasted rats which show a very low glycogen content of the liver, the amount of liver glycogen increases markedly in a few hours. This does not seem to be the case in the thyroid fed rats.

Experimental hyperthyroidism does not change the sugar content of the blood in either rats or rabbits. Spontaneous glycosuria does not result from thyroid feeding in either rats or rabbits. The tolerance of thyroid fed rabbits for dextrose, parenterally administered, does not differ from that of normal animals. Nearly the same degree of hyperglycemia and glycosuria can be induced by epinephrin injection in thyroid fed as in control rabbits. The suprarenal gland of thyroid fed rats contains approximately the same amount of epinephrin as that of normal rats.

15. Blood Sugar and Urinary Secretion.—Under experimental conditions unusually free from disturbing influences, the sugar output per unit of time shows a direct relationship with the blood sugar level. On intravenous injection of a given quantity of dextrose, the amount of diuresis produced depends on the amount of water available, within certain limits. If a very concentrated solution is given, the body is robbed of water. If large quantities of water are given with the dextrose, its percentage retention in the body is increased and water is retained along with it, so that less sugar is excreted, despite diuresis. This retention is not confined to the blood, but occurs also in the tissues. If more water is available, more dextrose is excreted into the urine at a given level of blood sugar than when less water is available.

16. Effect of Epinephrin on Muscular Fatigue.—Gruber found that in the fatigued, unaltered muscle epinephrin may increase the height of muscular contraction by a twofold action, by improvement of the blood supply (vasodilatation) and by its chemical action on some substances in the muscle. In a muscle in which the nerve is cut and stimulated, epinephrin in small doses, however administered, does not better the circulation and must therefore produce its effect of increasing the height of muscular contraction by its chemical (specific) action alone. The following three processes which normally go on in the muscle may be greatly accelerated by epinephrin and it is not improbable that one or all of these will finally prove to be the way in which epinephrin produces its effects: (1) the conversion of glycogen into sugar; (2) the reconversion of lactic acid into sugar (transformation of fatigue products); (3) the oxidizing of lactic acid into carbon dioxide and water (destruction of fatigue products).

21. Thromboplastic Action of Cephalin.—McLean's experiments show that the thromboplastic action of cephalin bears a direct relation to its degree of unsaturation, the greater the degree of unsaturation the greater the degree of thromboplastic activity. Cephalin exhibits most effectively its power to hasten the coagulation of the blood shortly after its isolation from the tissues. Cephalin which has become saturated beyond a certain degree, either by reduction or oxidation, completely loses its thromboplastic activity. Cephalin in solution which has become saturated or partly saturated gives an acid reaction and retards the coagulation of blood. As cephalin becomes saturated it gradually loses its property of solution in ether or chloroform.

American Journal of Public Health, Boston

June, VII, No. 6

- 22 Military Sanitation in Present War. T. Saville, Cambridge.—p. 527.
- 23 Prevention and Cure of Acute Lobar Pneumonia. R. Cole, New York.—p. 548.
- 24 Alcohol; Public Health Problem. H. Emerson, New York.—p. 555.
- 25 Death Rate of Washington. W. F. Willcox, Ithaca, N. Y.—p. 562.
- 26 Composition and Relative Economy of Some Bread Sold in Washington, D. C. M. A. Pozen and M. Starbecker, Washington, D. C.—p. 570.

Annals of Medical History, New York

April, I, No. 1

- 27 Scientific Position of Girolamo Fracastoro (1483-1553), with Especial Reference to Source, Character and Influence of His Theory of Infection. C. Singer and D. Singer, England.—p. 1.
- 28 Greek Cult of Dead and Chthonian Deities in Ancient Medicine. F. H. Garrison, Washington, D. C.—p. 35.
- 29 Voltaire's Relation to Medicine. P. Bailey, New York.—p. 54.
- 30 Unpublished Bronze Ecorché. E. C. Streeter, Boston.—p. 73.
- 31 Burke and Hare and Psychology of Murder. C. W. Burr, Philadelphia.—p. 75.

- 32 Hebrew Prayers for Sick. C. D. Spivak, Denver.—p. 83.
33 Laryngology and Otology in Colonial Times. S. A. Friedberg, Chicago.—p. 86.

Boston Medical and Surgical Journal

June 28, CLXXVI, No. 26

- 34 Loss of Sight from Posterior Accessory Sinus Disease; Report of Three Cases. L. E. White, Boston.—p. 891.
35 Cranial Measurements of Persons Dying in Insane Hospitals. L. G. Lowrey, Boston.—p. 899.
36 Two Cases of Leiomyosarcoma. C. H. Hare, Boston.—p. 901.

July 5, CLXXVII, No. 1

- 37 Report of Service with First Harvard Surgical Unit Serving at British Base Hospital, with End-Results of Cases One Year Later. C. C. Simmons, Boston.—p. 1.
38 Ascending Lymphogenous Renal Infection. D. N. Eisendrath and O. T. Schultz, Chicago.—p. 10.

Cleveland Medical Journal

June, XVI, No. 6

- 39 Diagnosis and Treatment of Congenital Pyloric Stenosis. C. G. Grulee and D. D. Lewis, Chicago.—p. 387. To be continued.
40 Latent Tuberculosis; Its Importance in Military Preparation. E. R. Baldwin, Saranac Lake, N. Y.—p. 410.
41 *Bismuth Poisoning and Nitrite Poisoning from Use of Bismuth Subnitrate; Report of Three Cases. J. Phillips, Cleveland.—p. 419.

41. **Bismuth and Nitrite Poisoning.**—One of the cases cited by Phillips followed the injection of bismuth paste. It proved fatal. Three months before the patient jabbed a pitchfork into his left knee. The knee became swollen and red so that it was necessary to open the joint and drain. Because of a persistent sinus following incision, a month later this was injected with bismuth paste. The sinus closed over, but five weeks previous to death the patient began to complain of a sore mouth, which continued to get worse until he died. The blood examination on admission to hospital showed 3,900,000 red blood corpuscles, 30,000 white blood corpuscles and 70 per cent. hemoglobin. At first the case was thought to be one of cancrum oris, as the slough obscured the pigmentation. After about ten days the slough in the mouth separated, leaving a bleeding surface and then there could be made out very definite pigmentation of the mucous membrane and the line about the teeth. A roentgenogram of the knee revealed the presence of a large quantity of bismuth in the knee joint and in the crural bursa. The other two cases illustrate nitrite poisoning from the use of bismuth subnitrate. A 4-year-old child was given a dram of bismuth subnitrate in a starch enema because of colitis. Twelve hours later she became nauseated, was very cyanosed, pulse small and weak, and partial coma supervened. This condition continued throughout the day. The blood was very dark. The colon was irrigated repeatedly and injections of camphor given hypodermically, and within twenty-four hours she was very much better, the cyanosis being less marked. By the third day all the symptoms had disappeared. A man, aged 50, had been given an ounce of bismuth subnitrate in milk for Roentgen-ray examination of his stomach. During the night the symptoms of poisoning appeared and persisted for three days.

Florida Medical Association Journal, St. Augustine

June, III, No. 12

- 42 Gallstone Disease. J. E. Boyd, Jacksonville.—p. 363.
43 Roentgen Diagnosis of Gastro-Intestinal Tract. L. W. Cunningham, Jacksonville.—p. 365.
44 Prophylaxis of Syphilis of Central Nervous System. G. E. Henson, Jacksonville.—p. 367.

Indiana State Medical Association Journal, Fort Wayne

June, X, No. 6

- 45 Gastro-Intestinal Diseases Along Border. F. W. Foxworthy, Indianapolis.—p. 225.
46 Diagnosis of Maxillary Sinusitis. J. D. Heitger, Bedford.—p. 232.

Iowa State Medical Society Journal, Des Moines

June, VII, No. 6

- 47 Tubal Pregnancy. M. M. Ghent, St. Paul, Minn.—p. 203.
48 Early Hypertensive Cardioresenal Vascular Disease. J. W. Shuman, Sioux City.—p. 208.
49 Mouth Infections. M. N. Gernsey, Waverly.—p. 210.
50 Control of Tuberculosis. A. E. Kepford, Des Moines.—p. 211.

- 51 Diabetes and Practitioner. D. M. Berkman, Rochester, Minn.—p. 214.
52 Significance of Corpus Luteum. C. O. Epley, Laporte City.—p. 215.
53 Anterior Poliomyelitis. F. A. Hennessey, Calmar.—p. 218.
54 Hospital Organization. F. G. Murphy, Mason City.—p. 219.

Journal of Experimental Medicine, Baltimore

July, XXVI, No. 1

- 55 Relative Toxicity of Uranium Nitrate for Animals of Different Ages. W. deB. MacNider, Chapel Hill, N. C.—p. 1.
56 Efficiency of Various Diuretics in Acutely Nephropathic Kidney, Protected and Unprotected by Sodium Carbonate. W. deB. MacNider, Chapel Hill, N. C.—p. 19.
57 *Cultivation of Spirocheta Obermeieri. H. Plotz, New York.—p. 37.
58 *Valve to Regulate Delivery of Air and Ether Vapor in any Proportion. F. L. Gates, New York.—p. 41.
59 *Relation of Mosquitoes and Flies to Epidemiology of Acute Poliomyelitis. H. Noguchi and R. Kudo, New York.—p. 49.
60 *New Anaerobic Methods. W. G. Smillie, New York.—p. 59.
61 *Methods for Determination of Pneumonia Types. F. G. Blake, New York.—p. 67.
62 Cicatrization of Wounds. New Mathematical Expression of Cicatrization. A. J. de Beaujeu, France.—p. 81.
63 *Id. Bacteriologic Aspects of Wound. A. Vincent, France.—p. 83.
64 *Id. Use of Chloramin-T Paste for Sterilization of Wounds. M. Daufresne, France.—p. 91.
65 *Id. Sterilization of Wounds with Chloramin-T. A. Carrel and A. Hartmann, France.—p. 95.
66 *Toxin and Antitoxin of and Protective Inoculation against Bacillus Welchii. C. G. Bull and I. W. Pritchett, New York.—p. 119.

57. **Cultivation of Spirocheta Obermeieri.**—The successful cultivation of *Spirocheta obermeieri* directly from the blood of patients suffering from European relapsing fever is reported by Plotz. The studies were carried on in Serbia in the winter of 1915. The successful cultures, five in all, were made from cases clinically typical of European relapsing fever occurring in civilians and soldiers then residing in Macedonia. The method employed is the same as that used by Noguchi. Plotz succeeded in growing *Spirocheta obermeieri* from mice infected with relapsing fever. This spirochete had previously been kept alive by continued passage from animal to animal for a considerable length of time. It has been transplanted for five generations in two cultures.

58. **Valve for Regulation of Air and Ether.**—A valve is described by Gates for the control of ether vapor for anesthesia which regulates the mixture of ether vapor from a Woulfe bottle with air in any proportion, without changing the volume or the pressure at which the mixture is delivered. The regulation of the air stream both to and from the ether bottle controls the mixture accurately and is an essential feature of the valve.

59. **Epidemiology of Acute Poliomyelitis.**—The experiments performed by Noguchi and Kudo indicate that it is improbable that the virus of poliomyelitis is taken up by mosquitoes or by fly larvae. Not only does the virus fail to multiply, but probably it is rapidly destroyed within the body of the insects. The notion that these nonbiting flies may act as intermediary hosts or a virus reservoir is not justified by the evidence brought out in the authors' study.

60. **New Anaerobic Methods.**—Anaerobic methods have been devised by Smillie which depend on the catalytic action of platinized asbestos on hydrogen and oxygen. The methods may be utilized for the growth of anaerobes in test tubes, on Blake bottles, in flasks, and in a large container. Because oxygen is so completely removed, the methods are said to be of great value in the successful cultivation of absolute anaerobes.

61. **Determination of Pneumococcus Types.**—The most satisfactory method of determination of pneumococcus types in lobar pneumonia is by the intraperitoneal inoculation of a mouse with the patient's sputum. The diagnosis of type is made directly on the peritoneal exudate. Certain factors in the method commonly used have interfered with the rapid determination of types in an appreciable number of cases, notably the growth of other organisms in the peritoneal exudate, together with pneumococcus, and some confusion has arisen because occasional strains of pneumococci have been encountered that show cross agglutination reactions when undiluted immune serum is used. To obviate these difficulties a new method for the determination of types has been devised

by Blake. It depends on the fact that there is produced by the growth of the pneumococcus a soluble substance which is present in the peritoneal exudate of the mouse in sufficient quantity to give a specific precipitin reaction with the homologous immune serum. The precipitin method can be used in all instances in which the determination of types by the agglutination method is possible, and it possesses certain distinct advantages which make it available when the agglutination method is impracticable. It is of particular value as a time-saving device in those instances in which the presence of other organisms together with the pneumococcus in the peritoneal exudate causes a delay of eighteen hours or more before the type of pneumococcus can be definitely established. It is therefore recommended as the method of choice in all cases. If desired, both the agglutination and precipitin methods may be applied to the same specimen of peritoneal washings.

63. Bacteriologic Asepsis of Wound.—Vincent found that of twenty infected cases treated with Dakin's solution or chloramin paste, seven were bacteriologically sterile. This proved that, in general, 35 per cent. of the patients thus treated become bacteriologically aseptic. This degree of asepsis is not necessary in order to suture the wound, the absence of bacteria in films being sufficient. Complete sterilization of wounds, can, therefore, now be accomplished.

64. Chloramin-T Paste for Sterilization of Wounds.—According to Daufresne, Dakin's toluene sodium p-sulphochloramid, mixed with sodium stearate, forms a paste sufficiently active and stable to be used in the treatment of wounds. He uses the following formula: neutral sodium stearate, 86 gm.; chloramin-T, 4 to 10 gm.; distilled water, 1,000 c.c. The preparation of chloramin paste is as follows: Boil a liter of distilled water and add 80 gm. of stearic acid. When this has melted, gradually add enough caustic soda to saponify the fatty acid and after complete solution add 4 to 10 gm. of chloramin-T, according to the concentration desired. The mixture is then placed in a mixing machine and shaken until thoroughly cooled. The paste is a smooth, snow-white cream. The principal disadvantage of this paste is its poor power of preservation; numerous trials showed that 10 per cent. of chloramin-T disappeared per month. The stability of the paste is limited by the stability of the solution of chloramin-T, because the antiseptic is in solution in the paste.

65. Sterilization of Wounds with Chloramin-T.—Under the conditions of experiments performed by Carrel and Hartmann chloramin paste maintains the asepsis of a wound already sterile, and sterilizes an infected wound. Under the same conditions chloramin paste causes no apparent modification of the cicatrization curve of an aseptic wound.

66. Toxin and Antitoxin of and Protective Inoculation against Bacillus Welchii.—The experiments presented by Bull and Pritchett appear to admit of one interpretation only; namely, that the Welch bacilli, under suitable conditions of growth, produce an active exotoxin, to which their pathogenic effects are ascribable. The toxic product, moreover, acts on the local tissues and the blood in a manner identical with the action of the cultures. With the toxic product animals may be immunized actively and yield an immune serum which neutralizes the toxin perfectly and in multiple proportion. The toxic bodies would seem to be at least two in number: one causing blood destruction, hence an hemolysin, and the other acting locally on the tissues and blood vessels, causing edema and necrosis and probably exerting general toxic action in addition. The part each plays in bringing about the lethal effect seems to be determined by the manner of inoculation: to bring out the hemolytic action intravenous injection is indicated; to bring out the locally destructive action, subcutaneous or intramuscular injection is required.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

June, IX, No. 9

67 *Action of Sodium Citrate on Isolated Intestine. W. Salant and E. W. Schwartz, Washington, D. C.—p. 497.

68 *Action of Succinate and Its Hydroxy Derivatives on Isolated Intestine. W. Salant, C. W. Mitchell and E. W. Schwartz, Washington, D. C.—p. 511.

69 *Production of Renal Changes by Oil of Chenopodium and Fatty Oils, and Protective Action of Diet on Kidney. W. Salant and R. Bengis, Washington, D. C.—p. 529.

67. Action of Sodium Citrate on Isolated Intestine.—Salant and Schwartz found that a solution of hundredth-normal sodium citrate causes an increase in the force of the rhythmic contractions of the small intestine of the rabbit, the rate being reduced at the same time. A similar effect was observed with two-hundredth-normal sodium citrate, but it was less pronounced and not as constant. Still weaker concentrations were only rarely effective. Concentrations greater than hundredth-normal produced depression of contractility, almost complete inhibition being caused by tenth-normal sodium citrate. Recovery was observed in all cases after washing with Locke's solution. Depression only was observed when the large intestine of the rabbit was exposed to the action of different concentrations of sodium citrate. Depression of the small, as well as of the large intestine of the cat, was produced by sodium citrate in all concentrations above four-hundredth-normal. Weaker solutions had no effect. The action of sodium citrate is probably due to the stimulation of the sympathetic nervous structures.

68. Action of Succinate on Isolated Intestine.—In the experiments reported on by the authors, strong and medium concentrations of sodium succinate generally caused stimulation of the intestines, the effect on the small intestines being more marked. Strong concentrations of malate cause depression of the entire intestine, but weaker solutions may cause moderate stimulation of the small intestine and depression of the large intestine. Solutions of twenty-fifth to four-hundredth-normal concentrations of levotartrate cause stimulation of the small intestine and depression of the large intestine. Dextrotartrate causes depression of the large and of the small intestines with higher concentrations; with medium concentrations it may cause occasional stimulation only of the small intestine, but no change was observed in the large intestine. Solutions of hundred-normal mesotartrate, as well as of the racemate, may cause moderate stimulation of the small intestine. Depression of the large intestine is caused by all of the hydroxy derivatives, the action being increased with the number of the hydroxyl groups. Locke's solution plus tenth-normal sodium chlorid causes depression of the intestines. When twenty-fifth-normal is added, this effect is very moderate and is inconstant. Smaller quantities of salt do not affect contractility. The response of the large intestine to hypertonic solutions is more pronounced than that of the small intestine.

69. Production of Renal Changes by Oils.—According to Salant and Bengis the administration of the oil of chenopodium by mouth and subcutaneously may be followed by renal disturbances in rabbits fed exclusively on oats. Similar effects were caused by several fatty oils such as cottonseed oil, castor oil, olive oil and cocoanut oil when given by mouth, but not when injected subcutaneously. No evidence of impaired kidney function was obtained when the same, or even larger, doses were administered to rabbits on a diet of carrots. The results obtained with the oil of chenopodium are attributed by the authors to malnutrition of the kidney due to lessened blood supply. The changes following the injection of fatty oils are accounted for by assuming that the products of hydrolysis of the oils, especially the glycerin, might cause local irritation and congestion, thus favoring the absorption of poisonous products from the intestine which would cause renal irritation. The protective action of carrots might be due to the inhibition of the development of nephritic poisons in the intestine.

Journal-Lancet, Minneapolis

July 1, XXXVII, No. 13

70 Methods of Graphically Recording Tremors, Clonus and Reflexes by Means of Tremograph. R. E. Morris and H. W. Woltmann, Minneapolis.—p. 423.

71 Practical Value of Roentgen Ray in Gastro-Intestinal Diagnosis. H. S. Willson, Minneapolis.—p. 428.

72 Roentgen Diagnosis of Nontuberculous Diseases of Lungs. A. B. Moore, Rochester.—p. 430.

73 Early Roentgen Diagnosis of Pulmonary Tuberculosis. F. S. Bissell, Minneapolis.—p. 431.

- 74 Pylorospasm in Infants. J. P. Sedgwick, Minneapolis.—p. 437.
75 Tuberculosis and War. P. L. Benjamin, Minneapolis.—p. 442.
76 Simple Method of Removing Foreign Bodies. H. W. Stone, Wayzata.—p. 443.
77 Angioma and Radium. G. B. New, Rochester.—p. 445.

Journal of Cutaneous Diseases, Boston

May-June, XXXV, No. 5

- 78 Experimental and Clinical Studies of Toxicity of Dioxydiamino-Arsenobenzol Dichlorhydrate. J. F. Schamberg, J. A. Kolmer and G. W. Raiziss, Philadelphia.—p. 286.
79 Case of Granuloma Pyogenicum and High Blood Pressure. D. W. Montgomery and G. D. Culver, San Francisco.—p. 338.
80 Congenital Ichthyosiform Erythrodermia. G. M. MacKee and I. Rosen, New York.—p. 343.
81 Histopathology. W. J. Heimann, New York.—p. 362.

Laryngoscope, St. Louis

June, XXVII, No. 6

- 82 Case of Bilateral, Congenital, Osseous Atresia of External Auditory Canal, with an Exceptionally Good Functional Result Following Operation. L. W. Dean and T. R. Gittins, Iowa City, Iowa.—p. 461.
83 Lung Abscess as Sequel to Tonsillectomy. I. Frank, Chicago.—p. 474.
84 Extensive Carcinomatous Involvement of Accessory Sinuses of Nose with Intracranial Invasion. M. A. Warlow, Philadelphia.—p. 484.
85 Case of Safety Pin in Esophagus Displaced During Anesthesia and Lodging in Postnasal Space. A. S. Kaufman, Philadelphia.—p. 487.
86 Case of Membranous Infection of Nose and Antrum, Resulting Fatally. A. S. Kaufman, Philadelphia.—p. 488.
87 Removal of Tonsils as Prophylactic Measure in all Children of Four Years of Age. R. W. Perry, Seattle.—p. 490.
88 Case of Rare Foreign Body (Ring) in Oral Cavity. J. L. Lougee, Boston.—p. 497.
89 Fibroma of Left Nasal Chamber, with Extension into Postnasal Fossa; Report of Case. T. C. Worthington, Baltimore.—p. 499.
90 Sinus Disease with External Deformity Cured by Paraffin Injection. S. G. Dabney, Louisville, Ky.—p. 507.
91 New Nasal Septum Splint. M. F. Butler, Philadelphia.—p. 511.
92 Electric Noise Apparatus. M. Lubman, New York.—p. 512.

Medical Record, New York

June 30, XCI, No. 26

- 93 Complications of Acute Middle Ear Suppuration, and Difficulties of Making Diagnosis in Certain Cases. G. Bacon, New York.—p. 1127.
94 Radium in Carcinoma of Upper Air Passages. D. B. Delavan, New York.—p. 1130.
95 Diatheses in Childhood. J. Epstein, New York.—p. 1132.
96 Tonsil. D. P. Platt, Stamford, Conn.—p. 1134.
97 Physicians' Influence in Charity Work. T. D. Crothers, Hartford, Conn.—p. 1135.
98 Report of One Hundred Successful Operations on Anal Sphincters for Treatment of Various Complications. C. A. Bucklin, Glasgow, Scotland.—p. 1137.
99 Shame and Physician. J. H. Marcus, Atlantic City, N. J.—p. 1139.
100 Embolism of Central Artery of Retina. F. P. Hoover, Jacksonville, Fla.—p. 1141.
101 Trench Foot. B. Sherwood-Dunn, Paris.—p. 1143.

New York Medical Journal

June 30, CV, No. 26

- 102 Summary of Wassermann Tests Done During 1916 in Philadelphia General Hospital. R. C. Rosenberger, Philadelphia.—p. 1233.
103 Effects of Fatigue on Aged. A. L. Fisk, New York.—p. 1235.
104 Plea for Early Diagnosis and Treatment of Acute Catarrhal Appendicitis. M. Lewson, New York.—p. 1236.
105 Case of Bilateral Spontaneous Nontuberculous Pneumothorax with Necropsy. A. Meyer, New York.—p. 1238.
106 New Method for Auditory Percussion of Chest. R. M. Alexander, Reading, Pa.—p. 1242.
107 Use of Nitrous Oxid Analgesia in Obstetrics with Description of Simple Apparatus. T. H. Cherry, New York.—p. 1244.
108 Physiologic Therapy in Gonorrhea. A. G. Geyser, New York.—p. 1247.
109 Personal Service to Insane. J. F. W. Meagher, New York.—p. 1248.
110 Infantile Pyloric Stenosis. J. Epstein, New York.—p. 1251.

Surgery, Gynecology and Obstetrics, Chicago

July, XXV, No. 1

- 111 Use of Free Grafts of Whole Thickness Skin for Relief of Contractures. J. S. Davis, Baltimore.—p. 1.
112 *Pulmonary Fat Embolism—Frequent Cause of Postoperative Surgical Shock. W. W. Bissell, Rochester, Minn.—p. 8.
113 *Relation of Acidosis to Anesthesia. G. A. Caldwell and M. Cleveland, New York.—p. 22.

- 114 *Results Following Treatment of Pelvic Inflammatory Lesions by Surgical Measures. J. G. Clark and C. C. Norris, Philadelphia.—p. 33.
115 Spinal Anesthesia. C. C. Yount, Panama City, Panama.—p. 40.
116 Cholecystectomy. M. G. Seelig, St. Louis.—p. 45.
117 Benign Tumors of Intestines with Special Reference to Fibroma; Report of Case. E. L. King, New Orleans.—p. 54.
118 Fatty Tumors of Uterus; Report of Case. C. W. W. Elkin and S. R. Haythorn, Pittsburgh.—p. 72.
119 *Study of One Hundred Consecutive Fractures of Shafts of Both Bones of Forearm with End-Results in Ninety-Five. A. O. Whipple and F. B. St. John, New York.—p. 77.
120 Cardiolytic; Additional Case. J. E. Summers, Omaha.—p. 92.
121 Tuberculosis of Hip-Joint. J. K. Young, Philadelphia.—p. 95.
122 Hydatid Cyst of Liver; Report of Two Cases. G. B. Johnston and M. Willis, Richmond, Va.—p. 101.
123 Kondoleon Operation for Relieving Lymphatic Blocking; Report of Case. R. S. Barber, Brooklyn.—p. 104.
124 Diagnosis and Treatment of Tumors of Urinary Bladder. F. M. McCallum and C. K. Smith, Kansas City, Mo.—p. 105.
125 Congenital Rectovaginal Fistula; New Operation. C. A. Potter, St. Joseph, Mo.—p. 110.

112. **Pulmonary Fat Embolism.**—During the past eight months Bissell has observed six instances of fatal postoperative fat embolism in the necropsy service of the Mayo clinic. Three of these followed breast amputation; one, ventral herniotomy; one, craniotomy for brain tumor; and one, laminectomy for spinal cord tumor.

113. **Relation of Acidosis to Anesthesia.**—In thirteen cases receiving 20 to 40 gm. of sodium bicarbonate in the twelve hours prior to operation, the anteoperative urine showed neither acetone nor diacetic acid, while 76 per cent. showed acetone postoperatively, and 69 per cent. showed diacetic acid. The elimination of acetone and diacetic acid postoperatively with none in the anteoperative urine was accompanied by a greatly increased alkalinity of the blood, up to 53 mm. or even 59 mm. in some cases. In nine cases, in which the patients received 20 gm. of sodium bicarbonate in 500 c.c. of 4 per cent. glucose solution immediately after operation, Caldwell and Cleveland found the elimination of acetone and diacetic acid, only slightly different from that of the untreated cases. The carbon dioxide tension in this series was well over 40 mm. and in one case as high as 54 mm. in the blood taken after operation. These treated cases followed closely the untreated cases in all respects except the high carbon dioxide tension.

114. **Treatment of Pelvic Inflammatory Lesions.**—From a study of more than 500 cases in which the postoperative and remote results of surgical intervention in pyogenic infections in the fallopian tubes were considered, Clark and Norris conclude that a course of conservative preparatory treatment decreases mortality, and enhances the chances for securing a good functional restoration of the pelvic organs. In all cases of acute infections of the fallopian tubes they advise that the patient should be kept under observation until the course of the case is defined. (a) In the greater majority the temperature subsides, the pain disappears, the tubal enlargements decrease to impalpable proportions, and if the attack is a primary one, the patient may be given a respite from operation until a recurrent attack supervenes. Even under these recurrent conditions the conservative policy is again pursued until subsidence takes place a second time, when an abdominal operation is advised, with a view to treating existing conditions to the best possible advantage. Usually both tubes are removed and the ovaries are conserved. (b) If, under the conservative plan, the symptoms do not abate and the tube continues to enlarge, vaginal drainage is instituted, either by direct incision into the cul-de-sac or through the guidance of an abdominal incision.

In the purulent lesions of the tube, all operative procedures are attended with a higher mortality and a greater morbidity, whereas under a conservative waiting treatment a patient will seldom die during an acute infection. In all hazardous cases the increasing severity of the symptoms and the enlargement of pelvic masses give ample warning, and permit of a simple drainage operation that will tide the patient over the danger. Conservative operative procedures instituted with a view to restoring a closed fallopian tube seldom restore fecundity. The safer policy usually is to remove the tubes by a wedge-shaped cornual excision in all doubtful cases,

thus disregarding any attempt at restoration of fecundity. Hysterosalpingo-oophorectomy in sexually mature women, the subjects of chronic infections of the uterus and adnexa, is followed by a lower mortality and a greater certainty of restoration to health than are possible after conservative operations. Conservative operations employed with a view to preserving ovarian tissue should be limited chiefly to women under 30 years of age. The routine drainage of pus tubes through an abdominal incision is an unsatisfactory procedure from every standpoint, and should not be resorted to if it can possibly be avoided.

119. Forearm Fractures: End-Results.—Using the end-results in this series of 100 cases as the standard, Whipple and St. John are convinced that open reduction for fracture of both bones of the forearm in children is unnecessary. Reduction should be done at the earliest possible time. To "wait for the swelling to go down" is bad surgical practice because it is ignoring a cardinal principle of the repair of wounds in bone as well as in soft parts. Fluoroscopic examination should be used to determine the necessity for reduction and to insure the best reduction with the least trauma. Reduction and immobilization should be done with the patient under general anesthesia. Immobilization should prevent rotation of the forearm. The position of midpronation and midsupination is entirely satisfactory and comfortable except in fractures of the upper third, where full supination with the elbow in flexion is advisable. Early, gentle massage and active motions are advocated, but should be performed under the direct supervision of the surgeon. Forced passive motions, which cause the patient pain, are strongly condemned. Practically all cases of fractures of both bones of the forearm in children (uncomplicated by extensive trauma due to compound fractures and resultant infection) will have very satisfactory results, anatomically and functionally, with conservative treatment.

Tennessee State Medical Association Journal, Nashville

June, X, No. 2

- 126 *Syphilis and Internal Medicine. J. S. McLester, Birmingham, Ala.—p. 51.
- 127 Simplified Artificial Feeding. J. M. Lee, Nashville.—p. 58.
- 128 Management of Breast Feeding. O. W. Hill, Knoxville.—p. 62.
- 129 Patent Foods. O. H. Wilson, Nashville.—p. 67.
- 130 Treatment of Trachoma with Bulgarian Bacillus Culture. J. P. Crawford, Nashville.—p. 71.
- 131 Inflammation of Conjunctiva Resembling Trachoma. C. J. Broyles, Johnson City.—p. 73.

126. Abstracted in THE JOURNAL, April 28, 1917, p. 1287.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

June 9, I, No. 2945

- 1 *Status Lymphaticus from Clinical Standpoint. H. C. Cameron.—p. 753.
- 2 Case of Obstruction of Ureter by Abnormal Renal Vessel. R. P. Rowlands.—p. 755.
- 3 Three Cases of Ureteral Obstruction. G. S. Gordon.—p. 758.
- 4 Sanatorium Roll of Honor. N. D. Bardswell.—p. 759.
- 5 Pathology of Barcoo Rot (Veld Sore?). C. J. Martin.—p. 761.
- 6 Simple Device for Growth of Anaerobes on Plates. H. Henry.—p. 762.
- 7 Melena and Hematemesis Neonatorum. B. Solomons.—p. 763.
- 8 Strangulation Following Reduction (Left Inguinal Hernia); Laparotomy; Recovery. G. A. Harrison.—p. 763.

June 16, No. 2946

- 9 *Development of British Surgery in Hospitals on Lines of Communication in France. G. H. Makins.—p. 789.
- 10 *Some Anaerobes Found in Wounds and Their Mode of Action in Tissues. H. Henry.—p. 806.

1. Status Lymphaticus from Clinical Standpoint.—It is suggested by Cameron that the lymphoid overgrowth so commonly found postmortem in children is no more than an enlargement from the irritation of chronic catarrh in the corresponding mucous membranes. Such children during life show evidence of faulty nutrition or infection of all epithelial structures, hair, skin, teeth, conjunctiva and the mucous mem-

branes of respiratory and intestinal tracts. There is usually present a characteristic wateriness of the tissues, which is dependent to some extent on excessive carbohydrate feeding, and which is the main cause of the vulnerability to infection. Local treatment of the catarrhs alone is likely to be inefficient, and must be accompanied by a systematic attempt to achieve dehydration and improve the nutrition of the tissues. The status catarrhalis in the sense defined is a predisposing cause of rheumatism and tubercle, and carries with it a liability to sudden death at the onset of virulent infections, such as pneumococcal infections, measles or diphtheria.

9. British Surgery on Lines of Communication.—Speaking of wounds of the joints, Makins says, that the experience gained in recent previous wars regarding the treatment of wounds of the joints has proved of small avail in the present campaign, because it was obtained almost entirely from observation of the lesions produced by rifle bullets, which had proved themselves of minor gravity and capable of healing spontaneously with good results when subjected to simple treatment founded on the sovereign principle of rest. The problem of dealing with grossly infected joints, often enclosing a septic irregular fragment of shell and dirty clothing, perhaps further complicated by extensive fractures of the cancellous articular extremities of the bones, was therefore practically a new one to the surgeons engaged. Some definite facts have emerged from the first flood of difficulties encountered, and these may be shortly summarized as follows: 1. The wound of the soft parts clothing the joints is vastly more difficult to deal with than the articular cavity itself, and demands the most scrupulous care on the part of the surgeon. 2. The synovial capsule itself is capable of dealing unaided with an infection often of a really serious grade. 3. A strong tendency exists for an infection to localize itself, and the remaining portion of the capsule may remain free. 4. Drainage in the sense of the insertion of large tubes left in position for days or more is not only useless but also harmful. 5. That a gunshot wound of a joint cannot be dealt with too early, and with proper treatment forms one of the best subject wounds for primary suture. 6. That following the primary surgical intervention the main principle to be observed is that of complete rest gained by immobilization and extension.

General appreciation of these facts has resulted in the conclusion that a large majority of the joint injuries should be subjected to their chief active surgical procedure in the hospitals of the advanced lines, and hence the general hospitals at the present time receive only cases well on the road to recovery, or such as present the more difficult problem of dealing with established infection and suppuration.

10. Anaerobes Found in Wounds.—The pathologic processes in an infected wound, Henry says, are characterized by two main features—the production of gas and the death of tissue. Each group of anaerobes has its share in these processes, and the successive stages by which an anaerobe infection develops may be thus summarized: 1. The initial trauma in determining the death of tissue establishes a focus for growth. This is characterized by the latent period, which precedes any obvious clinical signs of anaerobic infection. 2. The first active phase of anaerobic infection consists in the development of the rapidly growing saccharolytic organisms, of which *B. welchii* is the chief. It is because of the richness of muscle in fermentable carbohydrate that this tissue provides such favorable conditions for the growth of organisms of the saccharolytic type. Their development results in the production of acid and gas. The gas accumulates first in the muscle and reaches the subcutaneous tissues by escape from the muscle. The pressure produced by gas and also by inflammatory edema fluid leads to an anemic condition in the tissues surrounding a wound, and this change initiates the second active period of anaerobic invasion. The muscle in the saccharolytic period is of a brick red color. 3. The second phase of anaerobic infection in a wound consists in active proteolytic digestion. This is characterized by death and digestion of the tissues. The process is accompanied by the formation of sulphuretted hydrogen and of volatile substances, which give the penetrating putrefactive odor so typical of the

later stages of infection. The previously red muscle becomes soft and different. It may be stained black by a sulphid of iron formed by the interaction of sulphuretted hydrogen with the iron released from broken down hemoglobin. The toxemia which develops at this period results from the absorption of toxic substances produced in the breaking down of the protein molecule, and cannot be attributed to the acid which is formed in the breaking down of the carbohydrate molecule. 4. The final phase is that of successful bacterial invasion of the blood stream. It occurs in most cases just at, or immediately preceding, the death of the individual.

Indian Medical Gazette, Calcutta

May, LII, No. 5

- 11 Gunshot Wounds in Bengal Stationary Hospital, Amara, 1915-1916. A. H. Nott.—p. 154.
- 12 Uncinariasis and the War Loan. C. Lane.—p. 161.
- 13 Uncinariasis and Hematinics; Report of Case. D. Perera.—p. 164.

Journal of Tropical Medicine and Hygiene, London

June 1, XX, No. 11

- 14 Keratoderma Punctata. A. J. Chalmers and A. Kamar.—p. 121.

Lancet, London

June 9, I, No. 4893

- 15 *Digitalis in Auricular Fibrillation. A. R. Cushny.—p. 865.
- 16 Treatment of Some Common War Neuroses. E. D. Adrian and L. R. Yealland.—p. 867.
- 17 Chylohemothorax from Wounds Involving Thoracic Duct. T. R. Elliott and H. Henry.—p. 872.
- 18 Menace of Morphine to China. W. Lien-Teh.—p. 874.
- 19 Experimental Production of Tuberculous Peritonitis in Guinea-Pigs Previously Exposed to Roentgen Rays. J. J. McGrath.—p. 875.
- 20 Operation for Loose Semilunar Cartilage. R. P. Rowlands.—p. 877.
- 21 Three Cases of Septic Infection Due to Otitis Media. W. Wilson and J. W. Barrett.—p. 878.
- 22 Cases of Ligation of Common Carotid Artery. J. J. M. Shaw.—p. 879.
- 23 Double Dislocation of Jaw Simulating Fracture of Skull. E. C. Hare and S. J. Cole.—p. 880.
- 24 Case of Ulnar Paralysis; Ulnar Median Anastomosis; Recovery. J. K. Haworth.—p. 880.

June 16, No. 4894

- 25 Paratyphoid Infections. C. H. Miller.—p. 901.
- 26 Amputations Considered from Artificial Limb Point of View. T. Openshaw.—p. 905.
- 27 Neurasthenia in Soldiers of Home Forces. F. W. Burton-Fanning.—p. 907.
- 28 *Treatment of Neuritis. H. Sainsbury.—p. 911.
- 29 Freud's Psychology of Unconscious. W. H. R. Rivers.—p. 912.
- 30 Salvarsan and Intramin with Reflections on Chemotherapy. J. E. R. McDonagh.—p. 914.

15. **Digitalis in Auricular Fibrillation.**—In the account Cushny gives of the action of digitalis in auricular fibrillation the effective action is the blocking of impulses from the auricle. Another result of digitalis on the animal heart is the increase in the strength of contraction. Whether this plays any part in the improved efficiency of the heart cannot be answered at present, as one has no means of measuring accurately the contraction of the human heart. Cushny says that undoubtedly the movement is stronger, but this may be due to the slower beat, which allows of a better recovery in the period of rest. In the perfused animal heart the systolic increase occurs at least as soon as the lessened conduction, and this seems evidence in favor of the improved circulation in patients also depending in part on the increase of systole. But the argument, Cushny admits, is not convincing, since in perfusion experiments the dose of digitalis is necessarily larger than that used in man in order to bring on the action within the time limits of an experiment.

28. **Treatment of Neuritis.**—The treatment employed by Sainsbury was recommended to him by Dr. Hugh Wingfield. It consists in the direct application of the strong hydrochloric acid of the B. P., in common parlance fuming hydrochloric acid, to the skin, along the line of the inflamed and painful nerve. The acid in question contains 31.79 per cent. of gaseous hydrochloric acid and has a specific gravity of 1.160; this acid is capable of safe application to the bare skin. The *modus operandi* is first to mark out the line of the nerve pain and tenderness as it happens to present itself in the

individual. In general it has been Sainsbury's practice to carry a broad line of application, some 1½ inches across, straight down the back of the thigh from the gluteal fold to the popliteal space; another application of like breadth for about 3 inches behind the head of the fibula along the oblique course of the external popliteal nerve at this spot; lastly, for some 5 to 6 inches behind the external malleolus directly downward; and below the malleolus obliquely on to the dorsum of the foot. The extent of the tenderness will guide more or less as to the extent of the application. A wad of cottonwool, firmly compressed into a knob of the size of the knuckle of the middle finger, is used to suck up the acid, of which about half a dram to a dram will be required. The charged wad, grasped by the finger and thumb (previously petrolatumed), is then carried gently along the line of application above described. The degree of firmness may be increased subsequently if necessary, and the part may be painted two or three times at one sitting if the skin bears the acid well; the first application should be light and single in order to gage the sensitiveness of the part, and if the integument happens to be thin and delicate it should receive correspondingly light treatment. A considerable smarting is sometimes complained of; in other cases little more than a tingling or sense of mild heat is felt. After the application a light covering may be thrown over the part till the skin is dry. The smarting soon passes off and the slight redness induced disappears also; no dressing is required. Rarely, in delicate skins, is a papular rash excited; it should be allowed to subside before reapplication of the acid. Blistering has not been observed. The treatment may be repeated twice a week if need be, perhaps oftener; it should be continued so long as the pain and tenderness continue. Massage may with advantage supplement the treatment and particularly if there has been obvious wasting.

Archives Mens. d'Obstétrique et de Gynécologie, Paris

January-March, VI, No. 1-3, pp. 1-96

- 31 *Disease of Ovaries or Tubes Complicating Pregnancy. A. Brindeau.—p. 1.
- 32 *Radiotherapy of Uterine Cancer. S. Recasens (Madrid).—p. 34.
- 33 Compulsory Notification of Abortions. L. Tissier.—p. 56.
- 34 *Influenza in 1916 from Obstetrical Standpoint. E. Chomé.—p. 66.

31. **Salpingo-Ovaritis Complicating Pregnancy.**—Brindeau has found records of ninety-three cases of this kind, and he thinks they are more common than this but are sometimes overlooked. He has encountered twelve such cases himself, which he describes in detail, and tabulates the details of the other ninety-three. Old salpingitis and ovaritis may not prevent conception, and if long extinct they may not give trouble during pregnancy. But sometimes they are responsible for adhesions, pains, displacement of the uterus, torsion of the tubes or extra-uterine pregnancy. If there is a spark still alive in them they may entail septic trouble. This occurs early in pregnancy in about 31 per cent. of the cases; in the others usually not until the close of the pregnancy or in the puerperium. Abortion and delivery are peculiarly liable to set the infectious mechanism in action. The peritonitis is an actual perforation peritonitis in such cases. Treatment can be only surgical, and the sooner the better as the only means to save the mother and allow the pregnancy to continue. In the forty-four cases tabulated, 86 per cent. of the women were saved by the operation; in a parallel series without operation only 38 per cent. survived. The operative measures included five colpotomies with 60 per cent. recoveries; ten salpingectomies with 90 per cent. recoveries; four hysterectomies with 50 per cent. recoveries; eleven bilateral castrations, and five with appendicectomy plus salpingectomy with 100 per cent. recoveries.

32. **Radiotherapy for Uterine Cancer.**—Recasens writes from Madrid to extol the advantages of combined radiotherapy of cancer of the uterine cervix. He has applied it in 200 cases during the last three years, all his experience showing that the cancer cells are so peculiarly sensitive to radio-active substances that 70 per cent. of his inoperable cases were cured and 100 per cent. of the operable. The interval since in the inoperable cases has been over two years in 27 (out of 47), and over one year in 45 out of 79. For cancer of the body

of the uterus, operative removal is preferable when the woman is not fat. In the fat women we can count on curing 50 per cent. by the combined radiotherapy. Various combinations were tried but the easiest and most effectual was to apply the radioactive substance for not longer than twenty-four hours at first, at eight day intervals, gradually shortening the exposure and lengthening the intervals to two or three weeks. Roentgen exposures are given with it to act on the deeper tissues and lymphatics which escape the influence of the radioactive substance. He uses aluminum filters, 1.5 mm. thick, at first and later 7 or 8 mm. thick, wrapped in gauze or rubber. When the doses were too large, the filtration inadequate, or the intervals too short, during his early tentative experiences, necrotic processes were observed resembling a Roentgen-ray burn, and not healing for four or five months. It is important to distinguish this trophic trouble from the cancerous process as the former demands suspension and the other, continuation of the exposures.

34. Influenza from the Obstetric Standpoint.—Chomé comments on the gravity of influenza when it occurs in epidemic or endemic form in a maternity. In many cases it runs a septicemic course, with secondary localization in the peritoneum. At the Tarnier maternity last year eighteen parturients developed influenza and six of them died. In two cases the death seemed to be due to pulmonary complications; in the other four to septicemia with peritonitis.

Bulletin de l'Académie de Médecine, Paris

May 22, LXXVII, No. 21, pp. 655-682

- 35 *Danger of Malaria and Yellow Fever Getting a Foothold in France. R. Blanchard.—p. 657.
- 36 *Abortive Treatment of Erysipelas. Capitan.—p. 669.
- 37 Apparatus for Endo-Urethral Diathermia. E. Roucayrol.—p. 673.
- 38 *The Pupil Reactions. (Les lois de l'isocorie et de l'anisocorie normales. Corollaire et variations pathologiques.) A. Tournay.—p. 680.

35. Danger of Malaria and Yellow Fever in France.—Blanchard states that the intermediate mosquito hosts of these diseases are found in southern France, and that a committee has been organized to determine which sections are free from them, so that the convalescents can be directed there. He remarks that the English troops in Macedonia did not suffer from malaria by any means to the extent of the French troops. The British officers considered the Macedonia campaign a "medical war," and gave the medical officers full charge of it, with highly favorable results for the health of the troops. "Would that it had been the same in the French army!" he exclaims.

36. Abortive Treatment of Erysipelas.—Capitan found all measures ineffectual until he began to give a subcutaneous injection every day of 50 c.c. of antistreptococcus serum. In very severe cases he gave an injection morning and evening. These doses were kept up for two, three or four days; in one case for five days. In another case very severe erysipelas of the face, with much swelling, disappeared within forty-eight hours, after two injections of 60 c.c. A quinin tonic is taken internally at the same time. There were no accidents from the serotherapy but quite frequently there was a serum rash, with pains in the joints, sometimes intense. These by-effects developed about five days after the last injection of serum. He makes a point of injecting 2 c.c. of the serum four hours before the main injection, to ward off any danger of anaphylaxis.

38. Laws of Pupil Reaction.—Tournay has found that the pupils react alike in normal conditions when the eyes look forward, but when looking to one side the pupil on that side becomes larger than the other in a few seconds, while the other contracts.

Paris Médical

May 26, VII, No. 21, pp. 421-436

- 39 Official Welfare Work for Children in Belgium. R. van Roy.—p. 431.
- 40 The Normal Upper Radio-Pronator Reflex. E. Landau.—p. 426.
- 41 *The Cough with Heart Disease, Especially Hyposystole or Asystole. A. Blind and R. Ricard.—p. 428.
- 42 Symptoms from Injury of the Neck Back of the Parotid Gland. (Syndrome de l'espace rétro-parotidien postérieur.) M. Villaret.—p. 430.

- 43 Roentgen Localization and Extraction of Projectiles. B. de Laborie.—p. 431.
- 44 *Postoperative Albuminuria. A. Satre.—p. 434.
- 45 Activation of Cobra Venom by Serum of Nephritics. G. Blechman.—p. 434.
- 46 Albuminuria in Incipient Tuberculosis. G. Blechman.—p. 435.

41. The Cardiac Cough.—Blind and Ricard warn that the cough with heart disease must not be mistaken for incipient tuberculosis. There is no doubt that cases of this kind have sometimes been sent by mistake to sanatoriums for the tuberculous, and the subsidence of the cough under repose and tonics has improved the statistics from the institution. There is little or no expectoration with the incessant spasmodic cough in question; it is most frequent at night, as a rule, and is not soothed by cough medicines. The cough is aggravated by sodium benzoate, and is favorably influenced only by cupping, a milk diet, theobromin or digitalis. It may appear in the young with valvular disease before there is any dyspnea, tachycardia or arrhythmia. This cough develops more frequently with mitral than with aortic valvular trouble, especially those of rheumatic origin. The cause is a localized subacute edema of the lung, and this subsides under heart tonics.

44. Postoperative Albuminuria.—Satre found albuminuria most constant after operations on the abdominal, genital and urinary organs. In case of preexisting kidney lesions rapid operating is necessary. He declares that the general anesthesia kept up for an hour or longer might prove fatal just as well without any operation, other things being equal. He noticed albuminuria after accidental traumatism, showing that the shock is the main factor rather than the anesthetic in postoperative albuminuria. In four instances he witnessed the subsidence of preexisting albuminuria after an operation.

Presse Médicale, Paris

May 17, XXV, No. 27, pp. 273-280

- 47 *Overlooked Inherited Syphilis. R. Sabouraud.—p. 273.
- 48 *Diphtheria Antitoxin in Powder Form for Local Treatment of Bacilli Carriers. R. Benard.—p. 275.
- 49 Congenital Stricture of the Urethra. Artus.—p. 276.
- 50 Geometric Chart for Direct Localization of Projectiles. H. Deverre.—p. 277.

May 21, No. 28, pp. 281-296

- 51 *Fate of Autoplastic Bone Grafts. L. Bérard.—p. 281.
- 52 *Operative Treatment of Varicocele. G. Lerda.—p. 284.
- 53 The Pulmonary Sequels of Pneumonia. M. Letulle.—p. 288.
- 54 *Disinfection of Wounds by Electrolysis of Circulating Therapeutic Fluid under Continuous Aspiration. G. Chick and H. Miniot.—p. 295.
- 55 General Anesthesia with Ethyl Chlorid in War Surgery. M. Boureau.—p. 296.

47. Overlooked Inherited Syphilis.—Sabouraud classifies in five groups the children with inherited syphilis. The first three groups are familiar to all, but the others are constantly overlooked, and yet they comprise more children than all the others combined. He has encountered families with many children and no miscarriages in which every child was stamped with the inherited taint, even when the father had been long and thoroughly treated. He makes a practice of applying the Wassermann test in all dubious affections in children, and states that those who do this will be appalled at the findings. Human beings naturally are harmoniously proportioned, and when this is not the case, some inherited taint of one kind or another is responsible. All those who visibly fail to conform to this law of harmonious development are suspicious, and the suspicion of syphilis is confirmed by the discovery of supernumerary cusps on the inner side of the upper first large molars—the tubercle of Carabelli. All the dental anomalies of syphilis had been described by dentists long before their connection with syphilis was recognized by practitioners. Children with these extra cusps are exceptionally subject to skin diseases, spina venosa, etc., the inherited taint opening the portals to affections of all kinds. The Wassermann test shows that among the old syphilitics who consider themselves cured, there are now about thirty who are plainly not cured to every one that is actually cured. Syphilitics should not be allowed to marry until they have had a negative Wassermann reaction for two or three years

after treatment has been suspended. Otherwise they will beget children whose teeth will show the inherited taint which will render them easy victims to any diseases they may chance to encounter. A third or half of those children who are repeatedly under the doctor's care have inherited syphilis.

48. Treatment of Diphtheria Bacilli Carriers.—Benard insufflates antitoxin in the form of a powder and states that this has rapidly freed the throat of the diphtheria bacilli, even in old carriers. It seems the easiest, simplest and most effectual method known to date. None of the children with diphtheria became carriers in the fifteen cases thus treated, and four convalescent adult carriers and fourteen healthy carriers were also "cured" in a short time. The city of Nevers had two school epidemics of diphtheria last year, and Benard organized a special class of the carriers alone. This "carrier school" opened with twenty-two scholars, but in two weeks it had to be closed as under the insufflation treatment no further diphtheria bacilli could be found. One child had shown diphtheria bacilli in smears taken at eleven different examinations in the course of several months. Twelve days after the insufflation treatment was begun, the second of two negative examinations permitted his discharge. The formula used was antitoxin powder 10 gm.; 0.9 gm. novarsenobenzol; 1 gm. pulverized benzoin, and 100 gm. bismuth carbonate. The powder is blown in three or four times a day, twice through each nostril and into the throat.

51. Fate of Bone Grafts.—Bérard reproduces the roentgenograms taken at intervals through several years in two cases in which a graft 10 or 11 cm. long had been implanted after fracture of the radius or tibia. The graft was taken from the fibula on the other side. In the radius case the tissues were healthy and the graft, freed from periosteum, healed perfectly in place, and the limb is strong. The tibia in the other case had been fractured four times and conditions were pathologic. The graft with its periosteum healed in place and the leg was used normally for three years. Evidences of dystrophy became apparent then and the graft was absorbed, with pathologic fracture. The ultimate outcome of autoplasmic bone grafts, with or without periosteum, thus seems to depend on the healthy condition of the parts receiving the graft.

52. Varicocele.—Lerda comments on the necessity for individualizing operative treatment for varicocele according to the conditions encountered. Conservative scrotoectomy, taking up folds in the vaginalis, is sufficient in cases in which the nervous troubles predominate or the scrotum is stretched and flabby without a tendency to hernia. In all other cases he advises operating through the inguinal canal, and he gives an illustrated description of the different technics that may be applied. When there are angiosclerotic lesions and lesions of the testicle with atrophy of the cremaster, he applies the Nahrat-Nilson method. When the dilatation of the veins is more pronounced than the sclerosis, and the fibromuscular layers seem strong, he applies the Carta-Mori method, that is, he slits the cremaster fascia into two side strips and shortens it by invaginating the upper portion into the lower, fastening it with a few stitches to the lesser oblique and the transverse muscles. When the varicocele is accompanied with hydrocele as a manifestation of inflammatory reaction on the part of the vaginalis, or cysts showing lesions in the epididymis, he applies his modification of Parona's method. The testicle is drawn out, a long rectangular flap with base below is cut in the vaginalis and the vaginalis is turned back and drawn up, the flap serving as a long handle reaching to the inguinal ring to which it is sutured. This suspends the testicle firmly and easily at the desired height.

54. Electrolysis in Treatment of Wounds.—The disadvantage of therapeutic electrolysis in treatment of wounds has always been that the electrolyzed fluid grows constantly more caustic, and hence acquires a corrosive action in time. This can be obviated by keeping up a constant flow of the fluid through the wound, aspirating out the irrigating fluid and not allowing it to stand in the wound. This preliminary communication from Tuffier's clinic states that experimental and clinical experiences with this method have been very favorable. The antiseptic is thus being constantly generated fresh in the depths of the infected cavity just where it is needed.

Correspondenz-Blatt für Schweizer Aerzte, Basel

May 26, XLVII, No. 21, pp. 657-688

- 56 *Improved Orthopedic Devices for the Wounded. O. A. Hug.—p. 657.
57 *Experiences with Mercury Vapor Quartz Lamp. (Künstliche Hohen Sonne.) P. Sokolow.—p. 673.

June 2, No. 22, pp. 689-720

- 58 *Therapeutic Induced Pneumothorax in Treatment of Pulmonary Tuberculosis in the Pregnant. Van Voornveld.—p. 689.
59 The Sugar Content of the Blood the Criterion for Renal Diabetes. H. Ryser.—p. 703.

56. Improved Orthopedic Devices.—Hug gives twenty-two half-page pictures showing the way in which contractures, ankylosis, traumatic talipes and other deformities can be corrected by a simple rope, pulley and weight device, applying traction along the lines where it is specially needed. In all the applications of this principle the limb above the point must be held immovable, buckled with a broad strap to a small table, for example. At night the limb should be partially immobilized in overcorrection.

57. Mercury Vapor Quartz Light in Therapeutics.—Sokolow writes from Zurich what he thinks is the three hundred and first article that has been published on this subject. He has used this form of phototherapy during the last fourteen months in sixty-seven cases of internal, skin or nervous affections, and reports "right good results." It failed in certain cases, so that it must be regarded, he says, as only one link in the chain of therapeutic factors at our disposal.

58. Pneumothorax Treatment of Tuberculosis in the Pregnant.—Voornveld expatiates on the advantages of inducing pneumothorax when a woman with active pulmonary tuberculosis becomes pregnant. This not only helps the woman herself, but by its damming up of the toxins generated by the tubercle bacilli, it permits the fetus to develop normally. One of Forlanini's early cases was a woman who became pregnant after she had been bearing for eighteen months an induced pneumothorax. The pneumothorax was maintained through the pregnancy and lactation period which all passed as under normal conditions. Combiaso in 1914 and Real in 1913 reported somewhat similar cases. Voornveld while physician in chief of the Turban sanatorium at Davos had a patient with severe and extensive left pulmonary tuberculosis, and six months pregnant. Tubercle bacilli and elastic fibers were numerous in the sputum, and the subfebrile temperature testified to the active process, and to the grave prognosis unless the pregnancy was interrupted or an artificial pneumothorax induced. He decided on the latter and the sputum soon lost the elastic fibers and bacilli. The pregnancy, delivery and lactation proceeded as under normal conditions. In order to secure this inactivation of the tuberculous process in the lung, he took special pains to determine and maintain the optimal conditions in respect to the amount of pressure and the size of the pneumothorax. As delivery approached, he kept up this optimal condition by repeated small reinjections, and as the uterus was evacuated he increased the pneumothorax to correspond, not giving the compressed lung any chance to expand. The danger for the lung from the straining during labor was materially mitigated by the interposition of the elastic pneumothorax. All this required close supervision of the patient, but it saved the child, and possibly the mother might not have come through otherwise. He regards this systematic pneumothorax treatment in proper cases as opening new perspectives for treatment of tuberculous pregnant women.

Gazzetta degli Ospedali e delle Cliniche, Milan

April 26, XXXVIII, No. 33, pp. 513-528

- 60 *Lumbar Hernia. G. Campora.—p. 513.
April 29, No. 34, pp. 529-544
61 Medicated Animal Charcoal in Dyspepsia. (Lo zimantrax nella terapia medica.) C. B. Farmachidis.—p. 529.
May 3, No. 35, pp. 545-552
62 *Recurring Rachitis. G. Radice.—p. 545.
63 True Spasm of the Pylorus. G. Cresolc.—p. 549.

60. Lumbar Hernia.—Campora describes a case of a large reducible hernia in the lumbar region in a man of 61. At the operation the hernial sac was found empty and the orifice was closed by suturing the edges of the muscles together.

Campora tabulates the details of sixty-six similar cases he has found on record since 1731. In three of the cases the hernia was bilateral; in one the kidney was involved in the hernia. In several cases the hernia was mistaken for an abscess; in a number the hernia became incarcerated. Campora has made a special study on cadavers of conditions favoring lumbar hernia. Palpation of a lumbar hernia shows the increase of the tumor during coughing. There may be sharp pain during work, or no pain, and the tumefaction usually subsides as the subject reclines on the other side. Lumbar hernia shows little tendency to become incarcerated, but it may prove important from the standpoint of industrial accidents.

62. **Recurring Rachitis.**—Radice's patient was a boy of 17 with a few skeletal traces of infantile rachitis. He had twelve brothers and all were reputed to be in good health. At the age of 16, while lifting a weight, during his factory work, he had sudden pain in his knees, which grew progressively worse, accompanied by tremor and exaggeration of the reflexes and muscular excitability in general. By exclusion Radice ascribes the disturbances to an upset in the endocrine system due to the flaring up of his rachitis.

Pediatrics, Naples

May, XXV, No. 5, pp. 257-320

- 64 *Cerebrospinal Meningitis. F. Randone.—p. 257.
- 65 Pseudohernia from Involvement of Abdominal Muscles in Paralysis Following Poliomyelitis. U. Provinciali.—p. 270.
- 66 *Pituitary Deficiency in Connection with Adenoids. S. Citelli and P. Caliceti.—p. 278.
- 67 Present Status of Idiopathic Splenomegaly: Gaucher's Disease. R. Vaglio.—p. 290.

64. **Cerebrospinal Meningitis in Southern Italian City.**—Randone refers to Syracuse where there were twenty-two cases recorded in the last two years. In some cases there were several relapses, with final recovery, but in two the ventricles became involved and the condition was deemed too grave for trephining. The sick were all children from 10 months to 13 years old, with the exception of the father of two of the sick children. He had the disease in a severe form, with relapses. In some exceptional cases the onset was of the septicemic type, the meningeal symptoms not appearing at first. When meningitis is epidemic, lumbar puncture should be done whenever a child is sick with an obscure syndrome. An eruption resembling measles developed in one child during convalescence. When the disease was found to be prevailing, the authorities provided a special hospital for it, and rapid recovery was the rule, only one child in the hospital dying. In every case in which serotherapy was applied early and in adequate doses, at home or in the hospital, recovery was prompt and complete. The only mishaps: three deaths, deafness in one case and squint in another, were in cases that had progressed for some time before a physician saw the child. Randone mentions that an antiserum of Italian origin seemed most effectual, and he suggests that antisera should be prepared with as many strains as possible, and particularly with meningococci from a recent epidemic. If those from the prevailing epidemic could be utilized, the results might be still better.

66. **Adenoids Entailing Pituitary Insufficiency.**—Provinciali reports three cases of the mental backwardness, weak memory, tendency to drowsiness or insomnia, and inability to concentrate the attention which, combined, form Citelli's syndrome, encountered in persons with adenoids or other affections in the nose and sphenoidal sinus. The disturbances evidently involve the pituitary body in the nasal and sinus trouble. The three cases described were in soldiers, all presenting feminine characteristics, actual pituitary feminism, along with Citelli's psychic syndrome as described above. The three soldiers have the adenoid facies, and are decidedly mentally backward, all of which might have been prevented, it is emphasized, if the adenoids had been removed in time, and this followed, eventually, with pituitary treatment. This might have restored the balance and permitted normal physical and mental development. The temperature reaction in injection of pituitary extract further confirmed the assumption of pituitary deficiency. The roentgenoscopic findings were normal.

Policlinico, Rome

June 3, XXIV, No. 23, pp. 725-756

- 68 *Factitious Affections in Military Circles. A. Ascarelli.—p. 725. Commenced in No. 22, p. 697.
- 69 *Factitious Conjunctivitis. M. C. Francaviglia.—p. 735.
- 70 *Minor Electric Signs of Sciatica. V. Neri.—p. 740.
- 71 *Test for Detection of Simulation of Total Deafness. G. Bilancioni.—p. 743.
- Surgical Section, No. 5, pp. 193-232*
- 72 *Solitary Cysts in the Kidneys. M. Magnini.—p. 193. Commenced No. 4, p. 180.
- 73 *Gangrene of the Gallbladder; Recovery O. Cignozzi.—p. 213.
- 74 *War Wounds of the Skull. A. Chiasserini.—p. 219.
- 75 Varieties of Femoral Hernia. G. Serafini.—p. 230. To be continued.

68-69. **Factitious Affections.**—This number of the *Policlinico* and the one before are devoted to artificially induced lesions and affections of various kinds. Among those with serious by-effects is otitis induced with caustics or boiling oil, etc. Usually only one ear is affected, and there is a history of an old chronic ear trouble. In one case facial paralysis followed, in others complete destruction of the auditory canal and mastoiditis, and in two cases fatal meningitis. Acute conjunctivitis induced by castor-oil seeds, has a peculiar washed-meat aspect.

70. **Minor Electric Signs of Sciatica.**—Neri remarks that sciatica occurs in almost epidemic form among the soldiers in this war. There is scarcely a hospital anywhere without some genuine or imaginary cases of sciatica. Quantitative disturbances in the response to electricity are common even in the early and mild cases of true sciatica. This is tested best on the internal popliteal nerve or the sciatic at the lower margin of the gluteus maximus, closer to the tuberosity of the ischium than to the trochanter.

71. **Simulated Deafness.**—Simulation of deafmutism was detected by Sicard from the man's misspelling of words according to the sound. Bilancioni has encountered some cases of factitious total deafness which resisted all tests and experiments until he succeeded in breaking the volitional inhibition of the malingerer by general anesthesia. Two or three whiffs of ethyl chlorid answered the purpose. This brief and harmless narcosis proved effectual in every instance.

72. **Solitary Cyst in the Kidney.**—Magnini found on exposing the kidney that there were two cysts, both on the convex side, one the size of an egg, the other as large as one's fist. The kidney elsewhere seemed normal, and, instead of the contemplated nephrectomy, he merely evacuated and excised the cysts and sutured together with catgut the lips of each cavity. Neither of the cysts reached to the pelvis. The operation concluded with nephropexy. The patient was a woman of 45 who for two years had had attacks of severe pain in the right kidney region, spreading to the small pelvis, and lasting for about four hours. There was also discomfort and a dull pain in the lumbar regions, and during the last six months a tumor could be palpated in the right hypochondrium, but there was no pyuria or polyuria. The diagnosis had been hydronephrosis. The histologic findings are illustrated and compared with similar cases on record. The data indicate that solitary cysts differ from polycystic kidneys in every respect. The cause is some circumscribed inflammatory process at some part in the kidney parenchyma, not merely a mechanical injury, and the urine may be normal throughout.

73. **Gangrene of the Gallbladder.**—The man of 39 had had two attacks of gallstone colic during the last seven years. The present attack, with vomiting and febrile onset, lasted forty days before the gallbladder was removed. It was gangrenous throughout and contained 205 gallstones, but the absence of adhesions and the other findings indicated that the inflammatory process was of comparatively recent date. The gallbladder was completely covered with omentum; this had prevented the escape of gallstones from the gallbladder.

74. **Skull Wounds.**—Chiasserini analyzes his experience with twenty cases of shell wounds of skull and brain. They emphasize the importance of early and thorough operative treatment, not later than five, eight or ten hours at farthest, if complications are to be warded off.

Riforma Medica, Naples*May 19, XXXIII, No. 20, pp. 533-560*

- 76 *Traumatic Factitious Arthritis of the Knee. A. Mori.—p. 533. Commenced in No. 18, p. 480.
77 Ambrine Not a Specific and Not a Drug; Merely a Protecting Sheath. G. Fabiani.—p. 542.
78 *The Cardiopathology of War. L. Ferrannini.—p. 545.
79 Five-Day Fever. U. Gabbi.—p. 546.

76. **Factitious Arthritis.**—Mori warns that at first it is scarcely possible to distinguish between a true traumatic arthritis and the artificially induced injury. But the course of the case soon shows whether the trouble involves the joint proper or merely the soft parts.

78. **Present Status of War Cardiopathology.**—Ferrannini quotes some recent writers on the question whether recruits with heart disease can be accepted. Weil, Josué and Kramer insist that when the functional capacity of the heart is reduced, even though the heart trouble is excellently compensated, yet the compensation may break down. Compensation is more likely to break during long marches than under emotional stress, etc. Tobacco, alcohol and acute infections are other potent factors. Osler further calls attention to the greater probability in such cases of some slight infection settling on the heart and starting an infectious endocarditis. Weil advocates eliciting the oculocardiac reflex in examining the applicant, as this arrests inorganic murmurs while it renders the organic more prominent. Goodhart urges that all dubious cases should be referred to heart specialists. Parkinson found that over 50 per cent. of ninety soldiers sent back from the front on account of cardiac insufficiency had shown signs of it before enrollment. A number were great smokers; a few had been hard drinkers, and a few had been through exceptionally exhausting fatigue. In only five had the first symptoms developed after an acute infection. In 30 per cent. there was valvular trouble, recognized before enrollment in all but three. He comments on the frequency of latent heart disease among civilians, result of some infection early in life, saying that it might remain latent indefinitely in civilian life but it flares up under the stress of military service. Gunson regards dysentery as responsible for many cases of "soldiers' heart." Cluzet has recently reported interesting studies of electrocardiography of the wounded.

Brazil-Medico, Rio de Janeiro*April 28, XXXI, No. 17, pp. 139-148*

- 80 Injurious Effects of Football under the Age of 18. H. Autran.—p. 139.
81 *Fatal Case of Intestinal Trichocephalosis. A. A. da Matta.—p. 141.

81. **Trichocephalosis.**—The necropsy of the child of 4 showed the ascending and descending colon crowded with specimens of trichocephalus, 123 in all; over 57 per cent. were females. The anemia had been profound and the eggs of the parasites numerous in the stools.

Cronica Medica, Lima*June, XXXIV, No. 648, pp. 189-220*

- 82 *Sarcoma of Fallopian Tube. E. Bello and M. Castañeda.—p. 189.
83 *Injection of Phenol in Treatment of Hemorrhoids. E. Esemel.—p. 192.
84 Factitious Affections from Medicolegal Standpoint. (Simulación de las enfermedades.) G. F. Davilla.—p. 200.
85 *Mistakes in Diagnosis of Abscess in the Liver. E. Odriozola.—p. 204.
86 Posterior Vertex Presentation Is Unphysiologic. E. F. Odriozola.—p. 211.

82. **Sarcoma in Fallopian Tube.**—The octipara of 40 noticed a small tumor in the lower abdomen in 1915. It could be easily moved around and caused no disturbance for a year. Then profuse and repeated uterine hemorrhages developed, and the tumor increased progressively in size. Before consenting to an operation she waited until the anemia and debility were extreme; coagulation time seven minutes. She was given 500 c.c. saline daily by the drip method, with injection of cacodylate and epinephrin and calcium chlorid by the mouth. The tumor proved to be a round-cell sarcoma in the tube, which measured 19.5 cm. long by 6 cm. wide. Smooth recovery.

83. **Phenol Treatment of Hemorrhoids.**—Esemel gives an illustration of the three instruments he uses in injecting a

20 per cent. solution of phenol in equal parts neutral glycerin and distilled water. (The method was described recently in these columns, May 19, 1917, p. 1514.) He lauds this "medical intervention" as most excellent, superior to all other bloodless methods, while it can be done by any physician. From two to six drops of the phenol solution are injected into each hemorrhoid.

85. **Mistake in Diagnosis of Liver Abscess.**—In Odriozola's case a man of 27 presented symptoms which he diagnosed as indicating a cancer of the liver while necropsy revealed merely a large abscess in the posterior portion of the liver. Among the lessons taught by this blunder are that suppuration in the liver must be excluded in every case of enlargement of the organ, with fever, before any other trouble is even thought of. Abscesses in the convex aspect of the liver are most frequently mistaken for other affections. There may not be the slightest trace of jaundice, and gastrointestinal disturbance is by no means common. Pain in the shoulder occurs early and is acute and persistent, much more than with any other affection. Puncture from the front and side are negative, and when this is the case, puncture from the rear is called for, cautiously avoiding the course of the inferior vena cava. The blood picture is not characteristic, but complications in pleura and lung are most instructive. On suspicion of an abscess, operative treatment is indispensable. Rapid anemia may accompany a simple abscess, as in this case. The condition was so grave when first seen that operative treatment was almost out of the question even if the diagnosis had been correct.

Semana Medica, Buenos Aires*April 26, XXIV, No. 17, pp. 487-510*

- 87 *Pregnancy and Delivery in a Case of Double Uterus. S. F. M. Moreno.—p. 487.
88 Possible By-Effects with Glycarsenobenzol. L. Moss.—p. 490.
89 Chapter from Autobiography. E. R. Coni.—p. 491.
90 Condurango in Therapeutics. S. P. Redondo.—p. 495.
91 Lymphocytosis in Syphilis. C. P. Mayer and A. C. Gourdy.—p. 500. Continuation.
92 *The Defensive Lipoids. F. M. Urrea.—p. 506.

87. **Delivery with Double Uterus.**—Moreno relates that the second uterus behaved the same as the gravid uterus to a certain extent, increasing in size and the cervix passing through a phase of dilatation.

92. **The Defensive Lipoids.**—Urrea is chief of the biologic laboratory of Toledo, Spain, and he has made a special study of lipoids, and of cholesterol in particular. The latter is found in abnormal amounts in the blood, he recalls, in all severe toxic processes, as with nephritis and typhoid, the highest point being reached with the turn for the better of the disease. There is also an excess of cholesterol in the blood with atheroma. There is much evidence to prove that cholesterol neutralizes toxins, but that, once neutralized, it forms with them compounds not readily eliminated. As they are unable to escape from the organism, in time they become deposited on the interior of the vessel walls, thus inducing arteriosclerosis. High frequency electric currents by stimulating the organic oxidations may rejuvenate the defensive ferments in the elderly. He adds that, besides arteriosclerosis, cataract and gallstones start with the precipitation of cholesterol. This could not occur if the oxidation processes were constantly lively. Once constituted, treatment is problematic and difficult. Hygiene and avoidance of infections is the only means known to date for warding off hypercholesterolemia with the evil effects of imperfect elimination of the cholesterol from lack of intra-organic oxidations.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam*April 14, I, No. 15, pp. 1173-1256*

- 93 The Potassium Ion and the Automatic Work of the Heart. H. Zwaardemaker.—p. 1174.
94 Case of Multiple Small Tumors of the Sweat Glands. (Syringohamartoma multiplex.) W. L. L. Carol.—p. 1183.
95 *Uremia in Cholera. W. Valk and C. D. de Langen.—p. 1190.
96 Narcolepsy in Young Woman. G. C. Bolten.—p. 1196.

95. **Uremia in Cholera.**—The retention of nitrogen in the thirty-four cases tabulated amounted to from 3.31 to 5.9 gm.

urea per liter of the blood serum in 50 per cent. of the patients. In ten others it ranged from 1.75 to 2.72 and in only seven was below this. In another group of four cases Ambard's constant was calculated from the urine and blood. The retention of nitrogen in 50 per cent. was thus higher than the figures obtained even with contracted kidney. The communication, which issues from the public hospital at Batavia, emphasizes that there was no intake of nitrogenous food by the cholera patients and the decline in weight from the loss of fluids and the thickening of the blood does not suffice to explain this extreme uremia. There must have been formation of urea from the albumin of the body. All the patients died that had this high nitrogen blood content. In two dubious cases, with no vibrios to be found, the high urea content of the blood confirmed the diagnosis. In one the uremia declined and recovery was anticipated and occurred. In the other, two days later the retention had reached a higher figure, and death soon followed.

Hospitalstidende, Copenhagen

May 30, LX, No. 22, pp. 521-548

97 *Alimentary Glycosuria in Rats with Hypoglycemia. V. Schmidt.—p. 521.

98 *The Consciousness during Stupor. A. Wimmer.—p. 527. Commenced in No. 21, p. 497.

97. **Alimentary Glycosuria in Rats.**—Schmidt tabulates the findings in two groups of rats. One strain showed hyperglycemia to begin with, but both presented alimentary glycosuria on feeding with carbohydrates.

98. **The Consciousness during Stupor.**—Wimmer refers to the stupor of psychic origin, such as epileptic seizures, drunkenness, catatonia, etc. It is often surprising to find what a clear appreciation and understanding of what has been going on are displayed by persons rousing from a period of catatonia during which they lay like a lifeless statue with closed eyes. He describes with much detail a case of this kind. It shows that certain catatonia symptoms, when we know their psychogenesis, lose their diagnostic importance. As a rule, however, the period of stupor is a blank in the memory.

Hygiea, Stockholm

May 16, LXXIX, No. 9, pp. 417-464

99 *Gallstones and Indications for Operative Treatment. L. Wolff.—p. 417.

100 *Gangrene of the Thumb after Application of Compound Solution of Cresol. S. von Stapelmohr.—p. 438.

99. **Gallstone Colic and Indications for Operative Treatment.**—Wolff remarks that in the few cases of gallstone colic in his practice in which the symptoms at the first attack were so severe that operative measures were inevitable, he always found a complicating acute pancreatitis. He emphasizes further that acute gallstone trouble and acute appendicitis have to be treated on different principles. The first attack of cholecystitis is seldom severe; gangrenous inflammation of a previously sound gallbladder does not occur easily. The temperature must be taken in the rectum, as sweating and collapse may reduce the temperature of the skin; 104 F. indicates severe infection, but the latter may occur with moderate temperature. The persistence of high temperature speaks for serious conditions. A single chill and transient fever do not call for an operation, but recurring chills and persistent fever demand it, as also a rapid weak pulse, pronounced local muscular resistance, persistent pains and tenderness not banished by a second and third dose of morphin (0.01 gm.).

He quotes a writer to the effect that on suspicion of the gangrenous form the operation must be done at once as we would rush to save a drowning man without asking whether he wanted to be saved or not. The least suspicion of pus in the gallbladder should be regarded as a relative indication for an operation, with the patient's consent, as the organ thus affected rarely recovers entirely and there is always danger of further and more serious trouble. Contrary to the indications with appendicitis, castor oil is advised. If this abolishes completely the painfulness of the gallbladder, this shows that the gallstone trouble is tending to a latent phase. In about 80 per cent. of the cases, the cholecystitis is of the

serous type, and under internal treatment it may subside into a lifelong latent phase. With this the fever and jaundice are transient, the pain is bearable and is relieved more or less with morphin, and the general condition is not so grave. If the course turns for the worse, delay in operating is not so dangerous as with appendicitis. An early operation, even with the gangrenous form, has given only 2 or 3 per cent. mortality; after perforation has occurred the mortality has been 17 per cent. or more. In conclusion he reiterates that internists must learn to call on the surgeon in the moderate cases so that he may be ready to intervene at the proper moment, instead of postponing this until the surgeon has to contend with excessively grave conditions.

100. **Compound Solution of Cresol Gangrene.**—Stapelmohr reviews the literature on carbolic (phenol) gangrene and reports a case in which the terminal phalanx of the thumb sloughed off and had to be amputated after application of a 5 per cent. dilution of compound solution of cresol. It had been applied by the patient herself, the thumb dressed with it for a total of twelve hours and then submerged in the solution for two hours longer, the fifth day after a cut.

Ugeskrift for Læger, Copenhagen

May 10, LXXIX, No. 19, pp. 727-770

101 *Transient Partial Heart Block. (Forbigaaende Atrieflagren.) C. Schwensen.—p. 727; (Forbigaaende Atrieflimren.) C. Schwensen.—p. 740.

102 *Relative Economic and Physiologic Role of the Dietary in Different Classes of the Populace. M. V. Bjørum and P. Heiberg.—p. 744.

103 *Relative Cost of Food near the Basal Minimum. M. V. Bjørum and P. Heiberg.—p. 748.

104 *Relative Cost of Food in Towns in Denmark and Sweden. P. Heiberg.—p. 751.

101. **Transient Heart Block.**—Schwensen describes in minute detail two cases of auricular flutter of rheumatismal origin, and reviews the history of this anomaly, the diagnosis and treatment. His first patient was a typical example of a slight organic disturbance in the bundle of His associated with high vagotony. The latter was responsible for the extreme degree of the partial heart block. The effect of digitalis and of atropin confirmed this diagnosis. The patient was a iii-para of 50. She had a little dyspnea on exertion and sometimes she suddenly and briefly lost consciousness after exertion, and felt distressed afterward, with palpitations of the heart, but there was no tendency to edema.

The second patient was a clerk of 24, and digitalis in small doses increased the degree of heart block and thus slowed up the ventricle beat. This allowed the heart muscle a chance to rest between the contractions. The diagnosis in both cases was based on the comparison of the radial pulse and the auscultation findings, the heart beat keeping time with the pulse. If there had been extrasystoles, a contraction would have been heard in the long pause. The diagnosis of auricular flutter would not have been positive without the electrocardiograms; fifteen are reproduced. The slight organic trouble in the bundle of His-Tawara is liable to become aggravated with any intercurrent infection which renders the outlook grave.

Schwensen describes further a case of auricular fibrillation occurring in a married laboring man of 32 during and after a severe attack of pneumonia followed by bilateral parotitis. After a brief period of tachycardia combined with functional heart block the symptoms of auricular fibrillation developed and persisted for two weeks. Then the normal auricle beat returned suddenly. Treatment had been with camphor and caffein. Evidently there had been no organic trouble, the fibrillation being merely a toxic phenomenon.

102-104. **Cost of Dietaries According to Income.**—Bjørum and Heiberg give a number of tables showing cost and calories of the food classified by the incomes. They show that statistics in this line are of little value unless the income is taken into account. Bread is the regulator, the poorer getting their calories from a larger proportion of bread. Comparison of conditions as to calories and prices in a Swedish and a Danish town showed better conditions in the latter.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXIX, No. 4

CHICAGO, ILLINOIS

JULY 28, 1917

THE INFLUENCE OF WAR ON MEDICAL SCIENCE*

JAMES EWING, M.D.
NEW YORK

The influence of medical science on the conduct of war has been strikingly illustrated in all the great conflicts of the last two decades. On the other hand, the influence of war on medical science is less frequently considered; but the present conflict seems likely to exert a far-reaching effect on American medicine.

The last example of a war conducted without the aid of medical science was our own brief passage at arms with Spain. Here, pestilential disease broke out in violent epidemic form in all the camps; malaria and dysentery more than decimated the troops in Cuba, who were saved from annihilation by these diseases and yellow fever only by prompt removal from the danger zone. I saw whole shiploads of acutely ill soldiers landed at Camp Wickoff in 1898 without any evidence of having received medical care during their voyage from Cuba. The army ration in those days was provided by practical men who supplied the canned goods, which acted as acute intestinal irritants, instead of a successfully adapted nutriment. Typhoid infection reached such a grade of virulence as to prove fatal in from seven to ten days, with enormous lymphoid hyperplasia resembling leukemia, and practically every line soldier who landed on Long Island from Cuba was infected with malaria or dysentery or both.

Shortly afterward the Japanese conducted a much more extensive warfare with the aid of medical science, and with nearly complete elimination of infectious disease as a cause of death. During the present world conflict medical control held the incidence of communicable disease to its normal ratio, until apparently in recent months, when the cumulative effects of undernutrition and defective hygiene, among both armies and civilian population, have permitted unusual ravages by our old enemy the "white plague," and given an unexpected opportunity immediately embraced by the pestilential smallpox. A highly significant demonstration is now being given in Europe of the decisive effect of predisposing causes in the development of infectious diseases. We have always

known that undernutrition favored tuberculosis, but there has never before been such overwhelming proof as is now furnished by the increase of tuberculosis in France and Germany. For us the lesson to be drawn is the prime importance of nutrition as a preventive of disease. Already there have been outbreaks of measles and meningitis among congregations of enlisted men in this country. The seeds of poliomyelitis so widely sown last summer may find conditions favorable for an even more extensive epidemic in our camps, unless it is rigidly guarded against, or unless, as seems more likely, age is the decisive immunity factor.

Thus, it is almost a truism that medical science, in its control of preventive medicine and sanitation, makes modern war possible. Here, I venture to point out that our progress in this war will depend more on the success with which the medical department applies the rules of prevention, sanitation and nutrition, established in the laboratory by laboratory men, than on the cure of established disease. Thousands of trained physicians will treat the sick and care for the wounded, but there will be more responsible duties in applying the rules of sanitation and preventive medicine.

Suddenly, without warning, we are to be tested on the basis of the grade of knowledge the American medical profession now possesses in the field of preventive medicine and hygiene. It is too late to make good existing deficiencies. We must stand on past records and existing conditions.

Thus, war, applying a rigid standard of utility, places first emphasis on a department of medical science which is commonly regarded as most theoretical. It is also one which is among the least prominent in present schemes of medical education, and I take this opportunity of urging that greater prominence be given to this subject by the Council on Medical Education in this Association. There are good departments of public health and hygiene in several American medical schools but not in many, and there is one special hygienic institution projected; but the rank and file of the American medical profession is poorly trained in this field. Fortunately there are indications, in the wide experience and brilliant achievements in Cuba, Panama and the Philippines, and in the high standing of our hygienists, that American sanitary science will successfully meet the new demands thrust on it.

Another influence of war on American medicine, already in effect, has been the enforced development

* Chairman's address, read before the Section on Pathology and Physiology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

of scientific medical literature. Prior to 1914, Germany held a monopoly of medical publication, both of results of research from all parts of the world and of the fruits of discussion and speculation. The sudden closing of this outlet has thrown on America the task of providing the medium of scientific discussions in many departments of medicine. Several new journals have already appeared, all of them of high grade, most of them from laboratory circles. Great importance for American medicine attaches to this movement. I venture to think that the conciseness and perspicacity which ought to characterize American literary productions offer advantages over some of the European standards which have thus far prevailed. Writing makes an exact man and reading a broad man, and the existence of abundant literary channels cannot fail to strengthen American medicine in two directions in which it is, perhaps, least proficient.

Educational facilities in America have made rapid development during the past decade, but the devastating catastrophe that has overtaken Europe throws on America a new responsibility as well as an opportunity to provide on a larger scale for both post-graduate and undergraduate medical training. Already there has been an influx of foreign students of medicine, and in order to meet their requirements and maintain ourselves as competent leaders and teachers, there is a call for more modern, more elastic, and better organized institutions in all departments of medicine, especially in the fundamental medical sciences.

If these demands are to be met there must be firm resistance against any temptation to suspend scientific activities in the universities because of the demands of the war. It is to be hoped that the sources of voluntary support on which our research and educational institutions largely depend may not be taxed out of existence, or crippled in capacity, or estranged, by unwise legislation. A portion of the vast increase of the wealth of the country should in some way be made available in the support of medical science. An early end of the war is to be hoped for, so that the increased wealth may not be dissipated by a continuation of the enormous military outlay now in preparation. There can be little doubt that the exhaustion of resources in Europe will entail a period of lean years for many of the interests of science. We may not again make our wonted visits to the highly respected centers of medical learning in Europe with the same subservience as in former times. Moreover, it must be admitted, with regret, that somewhat different standards will in future be employed in estimating the relative value of foreign and domestic training in medicine. Americans have fully acknowledged and liquidated their debt to European medical science; in the minds of some they have overvalued it; but now the times have changed, and we shall repel the enemy whether he come in the form of a military invasion, or as a more subtle undemocratic and materialistic philosophy, or as autocratic and overadvertised science.

In the new era thus opened in American medicine, and accelerated by war conditions, the necessity of establishing the strictest standards of intrinsic worth

and utility necessitated by war conditions will assure that physiology and pathology exert a commanding influence, for these are the central medical sciences beyond the established boundaries of which medical activities proceed at their peril. In educational schemes, these fundamental branches must be inculcated in their fullest scope, so that every graduate in medicine shall acquire a sound physiologic and pathologic common sense.

In the conduct of research, a knowledge of physiology and pathology must be regarded as an essential qualification, if research is to be genuine and medicine is to make real progress. Otherwise practical medicine will have blind leaders, will be swayed by every wind of doctrine, and will be caught in the eddies of incompetent speculation.

Finally, in the distribution of material resources and moral support, physiology and pathology must receive a liberal share, for these sciences are not self-supporting; they do not appeal to the untrained or the practical man; they owe their existence to design on the part of the intellectual leaders of medicine, and their vitality in any land is a measure of the loyalty which physicians hold to their profession.

The history of American medicine, especially its progress during the past decade, is the sound assurance that the future support of these fundamental branches of science will be adequate.

477 First Avenue.

Medicine in China.—The backwardness of medicine in China at present, according to Dr. Wu Lien Teh (*Survey*, Jan. 6, 1917), is due to theories, based on an incomplete knowledge of anatomy and physiology, which have prevailed among all classes for over 3,000 years. The ancient Chinese, however, he says, were far ahead of their times, and taught and practiced inoculation for smallpox; medical statistics were published by the government during the Chou Dynasty, 600 years before Hippocrates; medical men were required to pass a state examination before being allowed to practice; isolation of cases of infectious diseases was practiced; intracranial surgery was known; a national pharmacopeia, handed down for nearly twenty centuries, included such drugs as mercury, arsenic, iron, sulphur, camphor, aconite, castor oil and digitalis, and organotherapy was practiced. The science of hygiene was known, and though modern sanitation is rarely seen in Chinese cities, it is said that a certain system of personal hygiene is practiced. Su Wen Ling Ch'u in his book, 2,600 years ago, defined hygiene as health preservation in order that life may be lived to an old age, and advised "restraint in all appetites, and cleanliness in house and person."

Chou Kung (1105 B. C.), brother and adviser of the first emperor of the great Chou Dynasty, recognized the value of medical statistics, as he showed by giving the following advice:

In every country there are sick as well as healthy people. When treating the former they should be separated into those suffering from internal and those suffering from external complaints (that is, medical and surgical cases), and careful notes kept. At the end of the year these notes should be arranged and the records tabulated. From information thus obtained, rules regarding treatment and dieting may be revised, and, wherever possible, adopted. If, after this, future statistics show that out of ten patients treated all get well, every satisfaction may be felt. If, however, only one out of ten dies, the results may be regarded as good; if two out of ten die, the results are only fair; if three out of ten die, they are poor, if four out of ten die, they are bad.

The relation of diet to health was also recognized, and food was rarely eaten uncooked. Regarding diet Chou Kung says:

In spring eat more sour stuff; in summer, try more bitter things; in autumn, cook more hot dishes, and in winter, consume more salt food.

GUNSHOT FRACTURES OF THE SHAFT
OF THE HUMERUS*

JOSEPH RILUS EASTMAN, M.D.

INDIANAPOLIS

Since nearly every case of gunshot fracture of the bones of the extremities is compound and infected, there arises in practically every instance the important question whether or not one should strive in the presence of infection, perhaps taking the form of active phlegmon, to secure coaptation and provide extension.

Four measures, as stated by Rydigier von Ruediger, are of indisputable value: (1) reposition, brought about in the most gentle and cautious manner; (2) the most precise and uninterrupted immobilization not disturbed during the change of dressings; (3) a supportive apparatus, allowing free access to the wound; (4) a supportive apparatus, the making and use of which requires the least technical skill and experience.

It is established that many gunshot wounds of the soft parts, even in soldiers coming from the necessarily insanitary trenches, heal by first intention, as Simon and Pirogoff have stated. In the case of gunshot wounds of osseous tissue, however, a stage of infection with suppuration, while not fairly to be recognized as an obligate stadium, as Strohmeyer contends, is certainly present in an overwhelming majority of instances. For example, in our gunshot fracture material in Reserve Hospital No. 8, Vienna, embracing more than 500 cases, we have operated in less than a dozen which healed by first intention.

In gunshot fractures of the humerus with active infection and with extensive swelling and great tender-

infection without regard for the unfavorable position of the fragments. Nearly always, however, immobilization is possible, and likewise extension may be provided, even if it be in so simple a form as gravity extension brought about by the downward pull of the



Fig. 2.—Hoffmann splint abduction with slight gravity extension.

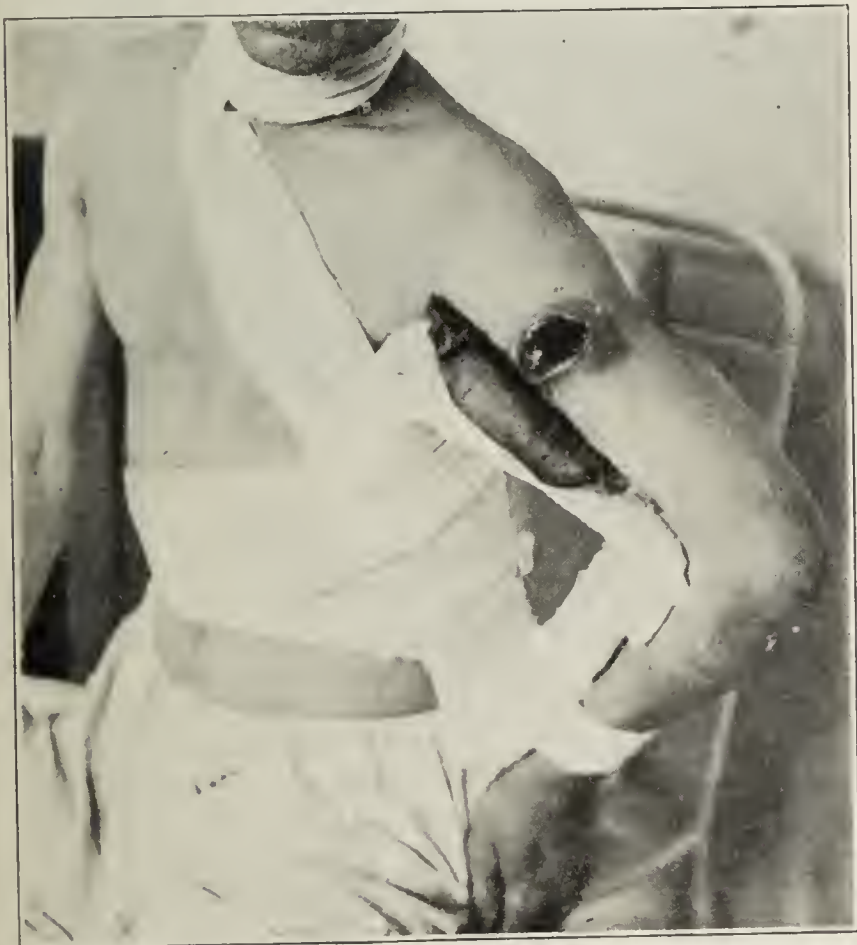


Fig. 1.—Middelдорpf triangle abduction with extension by gravity.

ness, the obstacles in the way of securing good immobilization and extension are sometimes insurmountable, so that the surgeon must be content first to treat the

heavy swollen member lying on a simple internal splint.

Von Eiselsberg, Rydigier, von Haberer, Burian and many others have spoken of the desirability and need of greater attention to the position of bone fragments in the presence of infection. Perthes,¹ on the other hand, in speaking of badly infected femur fractures, advises against measures aimed at reposition until acute infection has subsided. This, however, as Rydigier observes, should apply only to radical or forcible means to secure coaptation and extension. There is little or no difference of opinion as to the advisability of providing rest and extension, if thereby nothing is done which interferes with the proper treatment of the phlegmon.

In the correct position of the bone fragments, drainage is better than when the bone ends lie in abnormal relation in lacerated muscle tissue (Rydigier), and the reposition of fragments is easier before extensive scar formation has shortened and hardened the soft parts.

In a large number of gunshot humerus fractures it has seemed inadvisable because of severe pain and swelling to apply any extension device which could in any way cause circular constriction of the arm. Thus, weights hanging by bandages from the flexure of the elbow or any extension apparatus causing pressure over the infected swollen area or near it were, as is perhaps quite obvious, found to be impracticable.

The weight of the dependent heavy swollen arm itself often operates to excellent advantage in securing a moderate degree of extension. With the added weight of a plaster cast, a Toepfer or Kramer woven-wire splint or the much superior open heavy wire splint of Thomas, Eiselsberg or Englemann, the last three allowing free access to the wound, there develops traction from the gravity pull alone.

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Perthes: München. med. Wchnschr., 1915, p. 756.

In the use of the Middeldorpf triangle (Fig. 1), an excellent splint is provided for the support of the humerus fragments and for their retention in alignment, while the weight of the swollen arm furnishes some downward traction.



Fig. 3.—Modification of Hoffmann splint. Ratchet device regulates abduction and degree of gravity extension.

While the abducting splint of Hoffmann (Fig. 2) and its various modifications (Fig. 3) provide comfortable support for the fractured arm, they do not allow of gravity extension, as does the Middeldorpf triangle (Fig. 1).

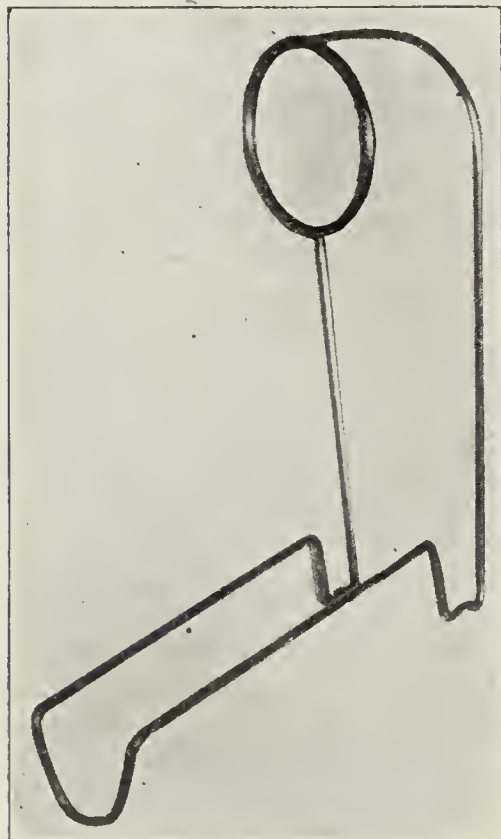


Fig. 4.—Thomas wire splint.

Splints like that of Hoffmann, which hold the humerus in abduction at or near a right angle with the spine, are of greatest service in the case of gunshot fractures of the upper end of the humerus shaft, owing to the possibility of stiffness or ankylosis of the shoulder joint. In such a case the upper arm is with prudence fixed in marked abduction for the reason that should stiffness or ankylosis supervene, the mobility of the entire upper extremity will be dependent on the mobility of the scapula alone, and the arc of mobility of the ankylosed shoulder is greatest if the fixation has occurred with the humerus in abduction so that when the arm hangs at the side, the tip of the scapula approaches as nearly the midline of the back as possible (Wullstein-Wilms).

In gunshot fractures of the upper humerus without great swelling of the soft parts, strong traction may be secured by using the wire splint of Thomas (Figs. 4 and 5) or my wooden modifications of it (Figs. 6 and 7). Here extension is maintained by a broad bandage or cravat across the upper forearm at the flexure of the elbow, and counterextension is provided by the axillary part of the splint. Elastic pull is furnished by a rubber band or spiral spring interposed in the cravat at its attachment below.

In fractures with wounds on the inner side of the arm, the device of Burian shown in Figure 8 may be utilized for immobilization and extension. Two cravats, one in the axilla and the other at the elbow, both attached to cords passing over pulleys, receive elastic traction from a spiral spring at the back of the splint.

More important than any splint or cast for the treatment of gunshot fractures of the humerus is the principle that each case requires individual consideration—that no one device is suitable for all cases. For



Fig. 5.—Thomas wire splint. Extension by elastic traction at flexure of elbow.

example, in fractures suitable for the Hoffmann splint, it may be impossible to immobilize the arm with comfort in abduction at right angles to the spine, in which instance resort may be had to a simple modification of the Hoffmann splint shown in Figure 3 which allows any degree of abduction. The post supporting the upper arm-rest moves on a ratchet on the base lying against the thorax. Thus, the degree of abduction may be changed at will without disturbance of the dressings.

Not many patients with gunshot fractures of the upper arm will find adhesive plaster or masteol² and weight extension comfortable, owing to the tenderness and pain of the infection. To most of the soldiers thus wounded, we have found such extension methods intolerable. In a few instances in which swelling and tenderness were not marked, masteol extension has been well borne, especially when the extension was combined with rest in bed. In general, however, it

2. Masteol is a glue made of alcohol, benzin, Venice turpentine and resin with which flannel straps are attached to the extremity.

may be said that a traction splint like the wire splint of Thomas, permitting, as it does, traction on all fragments in all directions and allowing free access to wounds wherever situated and not confining the patient to bed, is greatly superior to adhesive strap extension.

In treating the infection of gunshot humerus fractures, in addition to immobilization, removal of infected bits of clothing, incision and drainage, it will not infrequently be desirable to employ hot, wet antiseptic dressings. The Thomas splint permits the application of hot fomentations to any part of the arm.

For the hot, wet dressings, Dakin's neutral solution of chlorinated soda has proved of great merit. It is cheap, a very important matter in war surgery, and is highly bactericidal. Bedridden humerus fracture cases, that is, those with extensive infections, may be treated by continuous through and through irrigation, as are the infections of the lower extremity. Thus, in deep and extensive infections of the arm, a rubber tube is inserted to the bottom of the wound or entirely through

without doubt hastened the drying up of secretions and stimulated epithelial growth in many cases. Pyogenic bacteria and contaminating saprophytes succumbed rapidly in the sun.

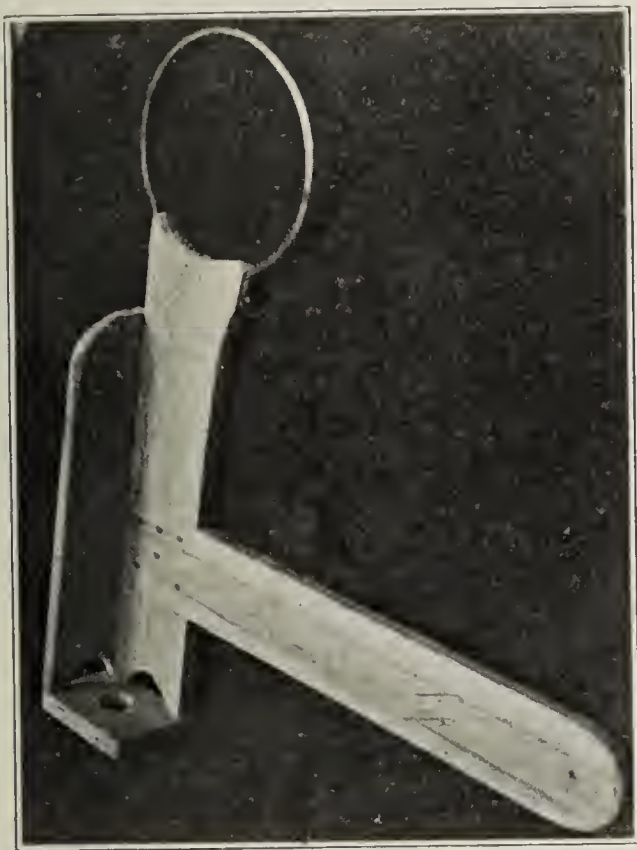


Fig. 6.—Author's wooden splint, light in weight but not serviceable if wound is on inner aspect of arm.

the member, and the solution is allowed to flow into or through the wound by the drop method, as suggested by Carrel. Excellent results have been attained in fractures of the lower end of the humerus with shattering of the elbow by placing the arm in a continuous hot bath of neutral solution of chlorinated soda.

Solution of aluminum acetate (Burow's solution) is likewise popular in Austria for the continuous bath in infections.

Ambulant patients have large hot, wet dressings of neutral solution of chlorinated soda applied around the drainage tube and over the open wound. The dressings are changed at frequent intervals.

The open method of treating fracture wounds recommended by Braun, Loercher and Walzel has proved to be a valuable resource, obviating, as it does, the frequent painful changing of dressings with destruction of granulations, and minimizing foreign body reaction. In favorable weather, infected gunshot fractures, like all other infected wounds, were exposed to the sun's rays for several hours daily. The solar rays



Fig. 7.—Wood modification of Thomas splint.

With subsidence of infection after all signs of inflammation have passed, gunshot fractures of the humerus may be treated safely by the more forcible methods of extension, for example, with the bridged plaster-of-Paris cast of Rydiger, in which two segments of plaster, the one encasing the shoulder, the other the elbow, are held apart by an iron brace. The iron bridge is bent at right angles above and below, and the ends are incorporated in the two plaster segments.

A screw like that used to render wire taut is set in the brace, and extension is developed by forcible separation of the two segments of plaster cast. Obviously, forcible extension may also be secured with the Thomas wire splint or any one of its modifications.

Unfortunately, shortening of the soft parts and scar formation as well as callus militate strongly against the success of extension methods if

these are not applied early; hence the reasonableness of beginning extension as early as possible in all infected gunshot fractures of long bones.

In those cases of severe infection demanding postponement of all efforts to correct deformity until fixation of the fragments in faulty position has become so firm as to exclude extension treatment, resort must be

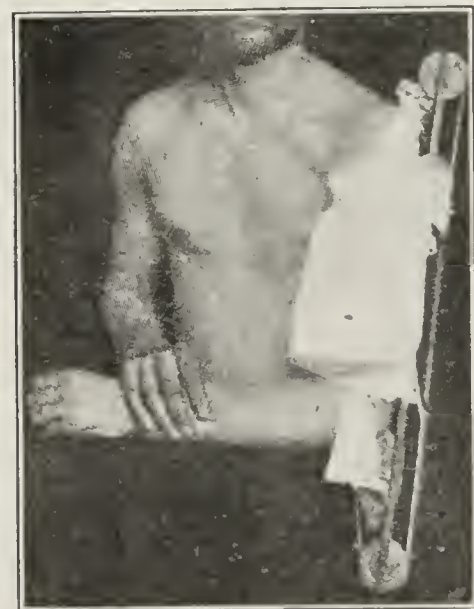


Fig. 8.—Burian pulley splint.

had to open operation as the only means of restoring normal anatomic relations and functions. The Lane plate, wiring, bone peg and dowel graft methods are all useful in appropriate cases. We have used the



Fig. 9.—Bridged splint. The weight of such a splint applied to upper arm gives considerable gravity extension.

Lane plate in cases in which the tendency to angulation was such that it was feared the dowel graft or intramedullary bone peg might break. Wiring was employed in long oblique fractures, and intramedullary autogenous bone grafts were used in all cases in which the shape and position of the fragments were such as to



Fig. 10.—Method of splinting with plaster in badly comminuted humerus fractures.

admit of their use, that is, when the medullary canal was well preserved in the ends of both fragments. Intramedullary grafts were preferred to dowel grafts because of the greater strength of the former.

The Lane plate was used, for example, to unite the pointed ends of fragments which it would have been difficult to unite directly by bone grafting. An advantage of the Lane plate is based on the circumstance that apparently cured infections often reappear after bone plastic operations. The reawakening of dormant infection is a recognized and not infrequent sequel of operation in gunshot fractures. The Lane plate, if it must be removed because of the reappearance of infection, can be taken out easily, certainly much more easily than an intramedullary bone peg.

In view of the fact, noted by all surgeons of experience in the operative treatment of gunshot fractures, that infections apparently entirely healed for many weeks will reappear as the result of trauma, hemorrhage, etc., incident to operation, no open operation for the correction of deformity due to gunshot fracture should be undertaken until several months have elapsed after the disappearance of every sign of infection.

As an evidence of the respect in which the Austrian surgeons hold this late infection or their dread of it,



Fig. 11.—Swelling accompanying infected humerus fracture contrasting use of encircling bandages for traction.

mention may be made of a proposal of Finsterer, made to the Vienna Society of Military Surgeons, that after healing of infected fractures with bad deformity, no attempt should be made in many instances to operate at the site of fracture but as remote from it as possible. For example, after healing of an infected fracture of the upper third of the femur or humerus with decided angulation, the bone should be divided at a lower level, compensation made for the angulation above, and the bone elongated as tendons are lengthened by splitting the bone longitudinally with a circular motor saw and cutting out laterally above to the right and below to the left, sliding the sawed surfaces along each other until the proper degree of elongation is secured (Fig. 13).

ABSTRACT OF DISCUSSION

DR. LEONARD FREEMAN, Denver: Dr. Eastman, I think, deserves our utmost commendation for bringing this subject before us, because, although we are at war with Germany, we are very glad to know what Germany is doing scientifi-

cally in the treatment of wounds. Dr. Eastman has particularly emphasized the use of the Steinmann pins or nails, which are driven through the lower end of the femur, the



Fig. 12.—Continuous irrigation with neutral solution of chlorinated soda in infected humerus fracture.

upper end of the tibia, or the os calcis, for making extension in fractures. I think attention should be called to another method of making extension in a similar way, because the pins driven through the bones are apt, in the course of time, to cause necrosis. The same thing can be done by silver wire looped around the upper part of the os calcis, between the Achilles tendon and the tibia, without penetrating the bone. For this purpose is needed a long needle fixed in a handle, with an eye near the point. The needle is first plunged directly through, above the os calcis, between the Achilles tendon and the tibia, and the wire is threaded into its eye and pulled through. Then, facing the bottom of the foot, the needle is plunged upward through the tissues of the bottom of the heel along either side, and out of the skin-openings through which the wire passes, and the ends of the wire threaded into the needle and drawn out through the bottom of the heel, so that in the end we have the wire slung around the os calcis, with its long ends projecting through the skin of the heel. The advantages of this procedure lie in this: it is simple, it keeps the foot up straight, the bone is not injured and there is no pressure of the wires on the skin of the sides of the foot; in fact, there is no pressure on the soft parts at all. If, every two or three days, the small perforations where the wires come out are painted with 2 per cent. iodine, there will be no infection about the wounds, as I have repeatedly proved to my satisfaction.

DR. BERNARD H. OBEREMBT, Milwaukee, Wis.: I had both the pleasure and privilege of being with Dr. Eastman in Austria and I would like to confirm all he has said. One of the important things is splinting the fractures for transportation. In every case, when properly splinted, the infections when they came to the base hospital were not so severe, while patients with badly splinted fractures suffered severely in transport, their phlegmon was much greater, their constitutional symptoms were a great deal worse and their treatment was necessarily a great deal more severe; so we cannot urge too strongly on all our men at the front that they should properly and thoroughly immobilize every fracture that is sent back. The best splint was, for femur fractures, the Hey-Grove splint. It is cheap to make, easily made, it gives extension continuously, even while the patient is being moved, and the wound is accessible at all times for thorough and easy dressing.

As to the treatment of these infected, comminuted fractures, Dakin's solution (neutral solution of chlorinated soda, Carrel-Dakin) was used in more than 3,000 cases in our institution, with very gratifying results. Every one of us could speak highly for the use of it. The idea expressed by a lot of men that all that is necessary to clean up these wounds is Dakin's solution, will only put Dakin's solution in disgrace if we continue to believe that. Most of these cases clean up so rapidly that one can suture in eight or ten days. Practically all these cases are of low grade infection, or streptococcus infection, large incisions and perfect drainage are required. In all infected wounds it is essential to remove every bullet or shrapnel and all pulverized bone and the bone splinters which have become detached from their periosteum. They are all foreign bodies and must be removed to give the Dakin solution a fair chance. We used many other methods and continue to use them. Both the aluminum acetate and Dakin's solution give excellent results, especially in the con-

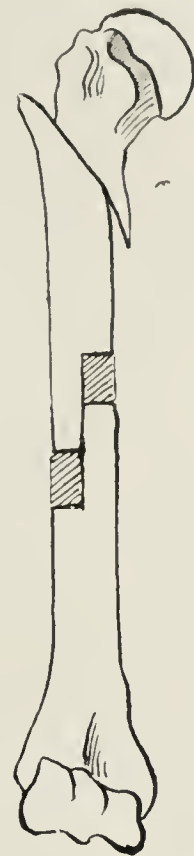


Fig. 13. — Finsterer's method of restoring length of shortened humerus, advocated by him because of the danger of reawakening infection by operation at site of fracture.



Fig. 14.—Open air and sun treatment of infected fractures in garden at Reserve Hospital No. 8, Vienna.

tinuous bath. In some of the cases in which Dakin's solution did not prove as efficient as we hoped, we changed to the aluminum acetate with better results. On the other hand, when they did not do well on the aluminum acetate we

changed to the Dakin solution, often with improvement. So it is well that every man should thoroughly understand the use of Dakin's solution. The solution itself constitutes the smaller proportion of the cure, but its use, and how to use it and to use it properly, acquire a good result, in other words, the mechanical treatment of infected wounds in the Carrel-Dakin method is 80 per cent. of the cure.

DR. FRANK P. CORRIGAN, Cleveland: Going back beyond consideration of the ultimate treatment of these cases and in line with Dr. Oberembs's remarks about early care, immediately after the casualty occurs, I have a suggestion to offer for the transport of these cases. This consists of an extensible frame and compressing sleeve woven so that it contracts and expands. This could be employed by any one immediately after the casualty occurs. It has the merit of applying even compression to the limb, and so controlling hemorrhage. It gives extension and counter extension. In connection there is a clamp that fits over the stretcher rod which gives rigidity.

CONSIDERATIONS ON EPIDERMOLYSIS BULLOSA *

AUGUSTUS RAVOGLI, M.D.

CINCINNATI

The case of epidermolysis bullosa under consideration was one of a very severe type, which was reported by Nelson¹ in 1916. The condition of the patient was constantly growing worse, and the parents, who were wage earners, being unable to care for the patient, he was taken to the Cincinnati General Hospital, and placed in my service in the dermatologic department. It will be helpful to review the history of the patient as given by Dr. Nelson.

REPORT OF CASE

E. P., boy, aged 11 years, of Cuban parentage, was born in Tampa, Fla. The father and the mother are both in good health. They assert that they have never had any eruptions on the skin, but the paternal grandfather had "running sores," due to some bad disease.

The patient was the fifth child in the family. He was normal and fairly developed at birth. The mother recently has had some miscarriages. When the patient was born, the mother could not nurse the babe, and a wetnurse was employed. The parents say that this nurse had some eruption of the skin. When the babe was 9 days old, eruptions of small bullae appeared on different parts of the body and head. Since then bullae have developed on the body continuously with the exception of the scalp. The parents report that the eruption is worse in summer. Every little injury to the skin becomes the seat of the bulla. Within half an hour from the injury, the skin turns red and bullae soon appear. They are at times formed in the place in which others were healing up. The blebs usually contain straw-colored serum, but many bullae contain blood-stained serum. Some of the blebs burst and the raw surface heals up in a few days, while in other instances the blebs remain intact, the serum is reabsorbed, and the epidermis is cast off in the form of thick scales. Slight itching precedes the development of the bulla. In five or six days the lesions become healed, leaving a brownish pigmentation with a rough, scaly epidermis.

It is interesting to note the complete absence of the nails of the fingers and toes. The parents report that the nails were present at the birth of the child, but that when he was 1 year old they disappeared. While in the hospital service, the boy fell off the bed, causing a cutaneous wound on the forehead which required a few stitches. No bullae appeared around the wound or on the bruised skin.

With the exception of the bullous eruption, the general health of the boy has been good. At the age of 5 years he had measles. He is rather undersized for his age. He has a full growth of dark hair on the scalp. The iris is dark brown. Teeth are not normal, being large, somewhat rough at the gums, and with faulty implantation. His mentality is fair; he goes to the school in the hospital, is rather bright and learns easily. An inspection of the body shows nearly the entire cutaneous surface stained with irregular pigmentation of a marbled appearance, with some whitish patches intermingled, the result of superficial cicatricial areas. The parts which have been chiefly affected are the extremities, which are more exposed to trauma. The whole surface of the elbows are reddish violaceous, covered with shreds of dried epidermis which formed the bullae, and small bullae are found in clusters in this region. The forearms show also some pigmented spots mingled with whitish cicatricial tissue marking the location of former bullae. The hands and fingers are considerably deformed; the same reddish violaceous color noted on the elbows is seen on the whole hand. Shreds of epidermis yet hanging indicate that the bullae were located mostly in the palms. The fingers are deformed, thick, red, and covered with scales and kept in semiflexion. The fingers have no nails; all traces of the matrix unguis are entirely absent, being replaced by thick whitish skin.

The skin of the back and of the gluteal region is in the same dark pigmented condition, with recurrent bullae, especially where the trousers press against the skin. In the lumbar and femoral regions, bullae, some of which are 2½ inches in length, are to be observed. They are narrow in a transverse direction, representing the string which held up the trousers. The knees are brownish-red with cicatricial areas to which hang epidermic scales, and with some crusts covering the broken bullae. The legs, bluish red, are darkly pigmented, intermingled with thin superficial areas of cicatrix. Ulcerated places are scattered in an irregular disposition.

The feet, red-bluish, are covered with shreds of epidermis, which formed the vaults of the bullae. Epidermic scales are more abundant on the soles. The toes have no nails; on the ungual region of the second toe of the right foot a bulla can be seen, round and filled with bloody serum, which happened there when the picture was taken. The epidermis of the whole part is thick with dark pigmentation, scaly, wrinkled, hard and inelastic, yet the boy is able to walk and play without much discomfort.

The bullae are formed in a short time in the areas of the skin exposed to trauma or to irritation. The feet are often covered with bullae on the surfaces where the slippers were tied. Some of the bullae, as stated, contained a light straw-colored serum, others bloody serum. Probably the difference in the fluid forming the bulla depends on the result of the intensity of the traumatism. In general, the boy is healthy; during the last months that he was in the hospital he had a good appetite, receiving an unrestricted diet, and all his functions were regular. The urine was normal, no indican, and the blood count revealed nothing abnormal. The Wassermann test, which Dr. Nelson¹ found negative, was likewise confirmed in the hospital laboratory.

COMMENT

The most interesting points in the case are the formation of bullae, which began to appear a few days after birth, on any part exposed to traumatism or irritation, marked infiltration and discoloration after the lesions had subsided, the bullae showing some tendency to a concentric disposition, and the total absence of the nails.

This case, however, is in contrast with the case of epidermolysis bullosa reported by Wende, in which there was complete lack of hair of the scalp, eyebrows, and eyelashes. The nails in our case had completely disappeared, and were replaced by a smooth epidermis. In the case of Wende some residual distorted nails could yet be seen. Similarly, in the illustration of a

* Read before the Section on Dermatology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Nelson, A. W.: Epidermolysis Bullosa, *Urolog. and Cutan. Rev.*, 1916, 20, 378.

case by Heller² the matrix unguis has yet some rudiments of an atrophic nail.

CAUSATION

Every disease should be studied from its etiologic side; when the producing agent has been ascertained, the prevention and treatment can be determined. The finding of toxic products as a result of the metabolic process in the system has afforded an explanation of several affections of obscure origin. These toxic elements accumulate in the system either from lack of excretion, or from a superabundance of their production. These substances may be the result of normal changes in the tissue functions or of an atypical decomposition of the albumin. Abnormal conditions of digestion in the intestinal tract often produce toxic elements which, when brought into the circulation, become the cause of different skin eruptions. Some of these eruptions are associated with acute disorders of the stomach and intestine, as urticaria, eczema and pruritus, while others are the production of chronic disturbances, as several forms of acne. Epidermolysis bullosa (so called) hereditaria, a stubborn and rebellious affection, has been referred also to autotoxic dermatoses, on purely speculative views.

By an increased irritation on the skin, exudation can be produced in the urticarial wheals, with the detachment of the epidermis forming bullae. In the delicate skin of children this condition often occurs; it is not only caused by a possible internal disturbance, but is also observed following bites of the mosquito or the *Cimex lectularius*.

The theory of autotoxic substances explains diseases of unknown etiology, such as dermatitis herpetiformis. Epidermolysis bullosa could be regarded as a hereditary liability of the skin to respond to any irritation, the formation of the bulla being the result of a lymph stasis,³ the compression of the shoes, the irritation from any injury causing the effusion and the accumulation of serum under the epidermis.

On the other hand, we cannot overlook the influence of the disturbances of the circulation on the production of skin eruptions. The congestion of blood in the blood vessels may be the result of the irritation exercising spastic control, or of the paretic condition of the nerves regulating the circulation, the vasomotor nerves. If the nerve is degenerated, the inactivity of the blood vessels will be permanent, while poisonous elements acting on the dilatatory nerves produce an effect which is only temporary.

There would appear to be in these cases a common origin, which produces lesions of different appearance, but in substance the same. It is for this reason that we find points of analogy between dermatitis herpetiformis, urticaria pigmentosa, epidermolysis bullosa, and even purpura and pemphigus. Manifestations of an inflammatory nature, depending on toxic agents, affect the vascular apparatus in a different degree, according to the individual susceptibility. George Henry Fox,⁴ in 1883, pointed out the exciting causes of urticaria, consisting in certain forms of irritation of the terminal nerves acting within or without the body. He demonstrated a definite relation of the irritation to the eruption as evident as the cause to the effect.

Manifestations of a vasomotor nature from paralysis of these nerves is chiefly revealed by the impairment of the functions of the nerve constrictors. These alterations are permanent when caused by a divided or a degenerated nerve, but are only temporary when of poisonous origin. The recurrence of the symptoms and their obstinacy are often the clinical signs of a maintained irritation on the nervous area. The blood vessels, as the result of protracted constriction,

suffer in their histologic structure, showing a condition similar to that found in arteritis and sclerosis, and the results, asphyxia and gangrene, are nearly identical. The enlargement of the blood vessels, passive stasis, is in many cases a collateral one consequent to the constriction — or can it be the result of an irritation on the vasodilator nerves? All contractions of

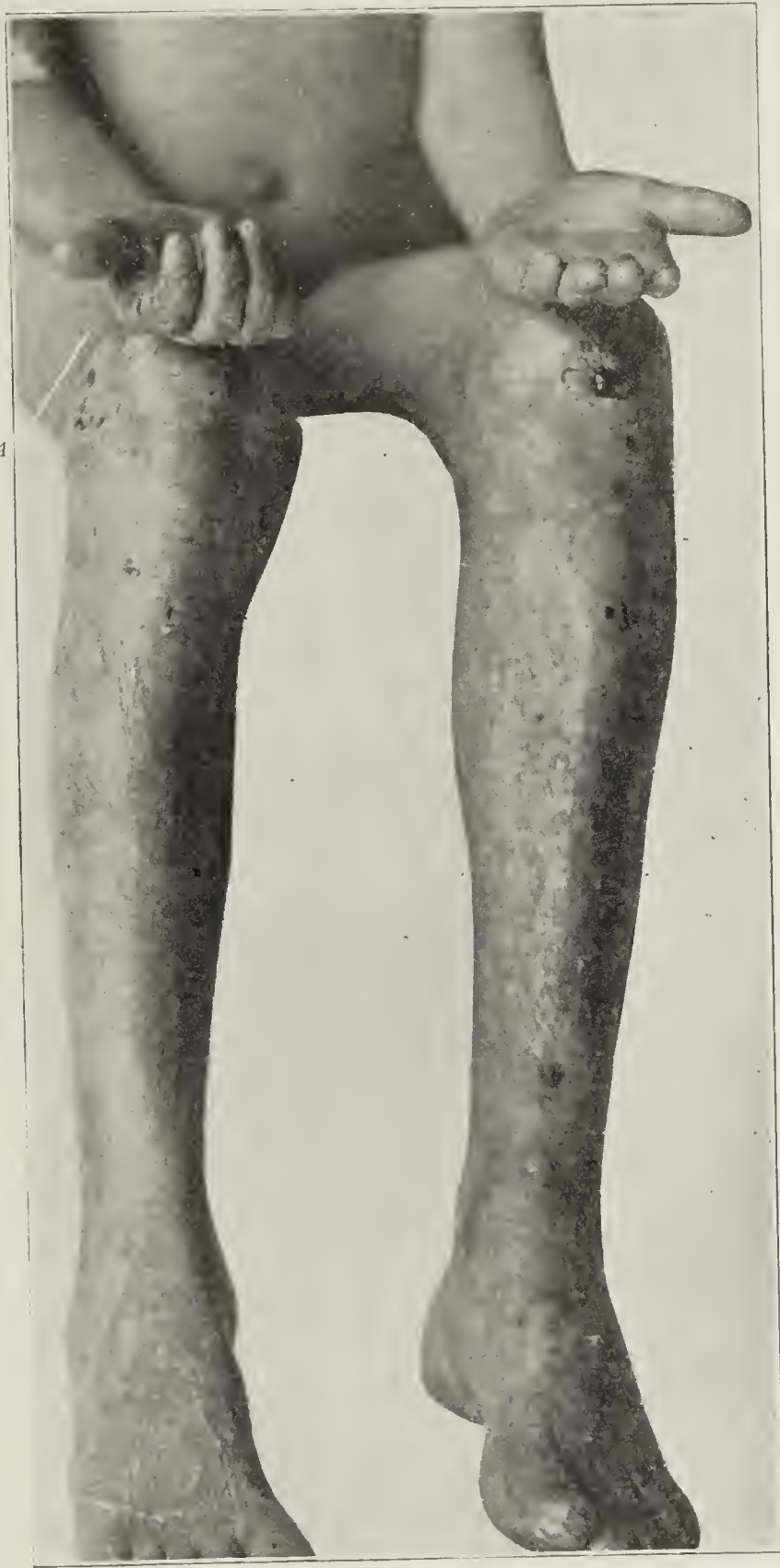


Fig. 1.—Epidermolysis bullosa. A, absence of finger nails; epidermic shreds from bullae.

2. Heller, Julius: Nagelkrankheiten: Handbuch der Hautkrankheiten Mracek, 1909, 4, 600.

3. As shown experimentally by Weidenfeld: Zur Physiologie der Blasenbildung, Arch. f. Dermat. u. Syph., 52, 3.

4. Fox, G. H.: The Etiology of Urticaria, Jour. Cutan. and Ven. Dis., January, 1883, 1, 108.

muscle tissue follow the action of the nerves which regulate their functions. The irritation of the vasomotor nerves can act on their peripheral ramifications, or reach the vasomotor center in the medulla oblongata; there is also a system of individual centers in the spine. For this reason, irritations on the system of vasomotor nerves may come from the brain, from the heart, from the skin, and from the blood vessels themselves. From the cutaneous surface, impressions of a sensitive nature may be carried to the center and produce muscular contraction.

In this case it will be interesting to consider the action of the trisplanchnic which, by causing constriction and hyperemia in the abdominal organs, throws a surplus of blood into the capillaries of the skin. In the case under discussion, the congestion of the cutaneous blood vessels has to be considered as of a passive rather than of an active type. Pinkus⁵ referred to the irritation of the vasomotor nerves in causing the contraction of the arteries which is to be observed in some neuritic cutaneous affections, and in all eruptive manifestations, which often accompany nervous diseases.

The terminal ends of the sensitive nerve fibers when under an irritation have great influence on the vasomotor system. The results of the irritation are readily seen at the point of application in the form of hyperemia, edema and urticaria. In these cases the irritation may not be transmitted through the center to the motor nerves, but there is a short system of communication between the last sensitive fibers and the motor fibers which causes the eruption to remain local. The irritations through the sensitive nerves reaching the center have great influence on the blood pressure through an increased heart action. When the veins have difficulty to return the blood to the center, cyanosis and hemorrhages take place. In other instances we see erythromelia (Pick), glossy skin (Weir Mitchell), and livid or marmorated skin. In cases of paralysis of the secretory nerves in the affected region, diminution of perspiration is found. Those nervous manifestations show the beginning of functional neuroses, which are not our present object of study.

In this case we observe irritation on the surface of the skin, the sensitive end-fibers of the nerves bring the impression to the peripheral centers of the vasomotor nerves, at which point it is converted into a spastic contraction of the small arteries. The spasm is soon followed by relaxation, the vessels are dilated and the blood fills them, thus causing congestion. From the filled blood vessels an exudation of serum takes place, which in urticaria forms an edematous condition of the skin, or when in larger quantity forms bullae as in epidermolysis bullosa.

PATHOLOGY

Biopsy has revealed little of the intimate pathologic process of the disease. The first studies of Goldscheider, Elliot,⁶ Blumer, Colombini,⁷ Wende⁸ and others on epidermolysis bullosa hereditaria, and those of B. Ochs, Bukowski,⁹ Fred Wise and Lautman on epidermolysis bullosa in an acquired form, all agree that the findings in the affected skin are those usually

present in inflammatory exudative processes. The vesicles in their early formation are more or less deep in the malpighian layer. The cover of the bulla is made up of the stratum corneum, with part of the mucous layer more or less degenerated. The floor of the bulla is formed by the denuded papillary layer of the corium, the papilla being bare and distorted; serum fibrin and cells form the contents of the bulla.

Some edema and infiltration in the corium are present, revealed by a kind of vacuolization in the granular layer of the epidermis, and by the detached condition of the basal layer from the papillae. The capillary vessels are congested and somewhat dilated, surrounded by small infiltrating cells. The contents of some of the bullae were clear, others were yellowish, turbid, and others brown and bloody; they have also contained leukocytes, a few eosinophils, blood corpuscles and pigment granules.

The findings of Engman and Mook¹⁰ differ from those of the other observers. According to their studies, the principal changes occur in the elastic tissue fibers, which they assert are absent or sparsely distributed in the papillary and subpapillary layers of the cutis. By the absence of the elastic fibers in the upper portion of the derma, they explain the histologic picture of the normal skin of these patients, and the clinical phenomena of the affection. On various occasions we have stated that the elastic fibers have a great influence in maintaining the fluids in the tissues at an even pressure, and also to control the growth of the collagenous tissues. This point of view affords a good explanation of the formation of the bulla. On the other hand, it is not easy to believe that the whole surface of the skin may be subject to such a histologic dystrophic condition. Moreover, most of the patients usually recover; hence it would be necessary to admit a new formation of the elastic fibers, which we know when once lost, are never reformed. The skin which has been the subject of repeated attacks of bullae has naturally undergone changes in its fine histologic structure, and the delicate elastic fibers may have been distracted, disturbed and atrophied; but we can hardly admit it to be the result of the exudation in the tissues of the derma.

SYPHILITIC HEREDITY

In my opinion the cause will be found in some disturbed condition of the vasomotor nerves, either from a somatic disorder in the meninges or in the connective tissues surrounding the vasomotor ganglions, and causing such irritability to react in the skin to each slight trauma. Some condition of irritability may find its origin in a toxic condition in the circulation from a disordered admixture of the internal secretions. Indeed, when the suprarenal glands are increased in their activity and the other glands are not able to counteract their action, general disturbances occur, which in the skin are revealed by increased pigmentation, discoloration due to the deposits of oxidized epinephrin in the tissues of the skin. I do not want to theorize on the possibilities of the origin of the disorders causing the irritability of the vasomotor system. Syphilis has been mentioned very little, but in those cases of epidermolysis bullosa associated with dystrophies, I cannot refrain from the idea that in those sufferers a syphilitic hereditary taint can be traced to either the parents or the grandparents. In many cases, hereditary or congenital syphilis is shown

5. Pinkus, F.: Allgemeine Pathologie der Circulationstörungen der Haut, Handbuch der Hautkrankheiten, F. Mrazek, 1, 349.

6. Elliot: Am. Jour. Cutan. and Gen.-Urin. Dis., 1895, 13, 10.

7. Colombini: Monatsh. f. prakt. Dermat., 1900, 1, 457.

8. Wende, G. W.: Jour. Cutan. and Gen.-Urin. Dis., 1902, 20, 537.

9. Bukowski: Ein Beitrag zur Lehre von der sogenannten Epidermolysis bullosa hereditaria, Arch. f. Dermat. u. Syph., 1903, 67, 163.

10. Engman and Mook: Interstate Med. Jour., July, 1910.

in the babe a few days after birth in the form of bullae on the feet and soles. This condition has received the name of hereditary bullous syphilid. Pemphigus neonatorum is nothing more than a syphilitic manifestation. Vesicular eruptions in clusters or small bullous eruptions are seen on the soles of the feet and palms of the hands in persons who have had syphilis, which had been forgotten because the Wassermann test had been negative. In case of syphilitic polyneuritis, through the courtesy of Dr. H. Hoppe, we have seen an eruption of large bullae affecting the soles of both feet, together with the nervous symptoms.

In our little patient there are present stigmata indicative of a syphilitic taint in spite of a negative Wassermann test. In the case of heredity it is possible that a few undeveloped spirochetes, in the form of spores, or encysted spirochetes not fully developed, contaminate the ovum. They lodge themselves in the developing blood vessels of the fetus, causing an alteration in the connective tissues surrounding the vasomotor center or the peripheral ganglions. This tardy specific inflammatory process may gradually subside, and the spirochetes may even be dead; but hardening or a sclerotic condition of the delicate tissues may remain, which acts as an irritation of the vasomotor ganglions, revealed by the formation of bullae on any irritation of the skin. This hypothesis has been suggested by the findings in the meninges in a postmortem of an old syphilitic, who had suffered for years with a stubborn case of parapsoriasis.

It can also be possible that through a hereditary taint an altered condition of the internal secretions is produced. The possibility that a few spirochetes have caused somatic alterations of the suprarenal glands with the results of an increased quantity of epinephrin in the blood which has brought a toxic influence on the vasomotor nerves is not entirely to be discarded. Neither can we exclude syphilitic affections of these glands, when we have cases reported and well demonstrated of syphilis of the thyroid and of the hypophysis. Thompson¹¹ reports a case of syphilitic

involvement of the thyroid with severe symptoms of hyperthyroidism in an old man who denied all knowledge of venereal diseases but who evidenced a positive Wassermann reaction and made symptomatic recovery from mercurial and iodid treatment.

In regard to syphilitic affections of the hypophysis, Simmonds¹² referred to cases of diseases of this organ especially in congenital syphilis. They were carefully studied. The pathologic alterations consisted in

miliary gummas, or in the new formation of plasma cells, and interstitial growth of connective tissues.

Epidermolysis bullosa hereditaria exists, and in several instances cases of this disease have been reported occurring in several members of a family for the second and third generations. The cases of Bettman¹³ and Valentine¹⁴ are of the greatest interest, showing the disease reproduced in several members of the family to the third generation. Stelwagon and Gaskil,¹⁵ Engman and Mook¹⁶ and others have reported cases in which only one member of the family had shown this peculiar affection. In several cases under observation, my attention was not called to the existence of the same symptoms in other members of the family; they were isolated cases.

PROGNOSIS

If we study the patients with a common type of the disease, it will be observed that after many relapses they recover. The skin regains its tonus and the old bullae heal up easily, leaving little or no pigmentation, and finally disappear. In reference to epidermolysis bullosa hereditaria, or better, epidermolysis bullosa congenita of a dystrophic type, we have never had occasion to study the case for the patient's lifetime. In the case of Hallopeau,¹⁷ which he considered as resulting from

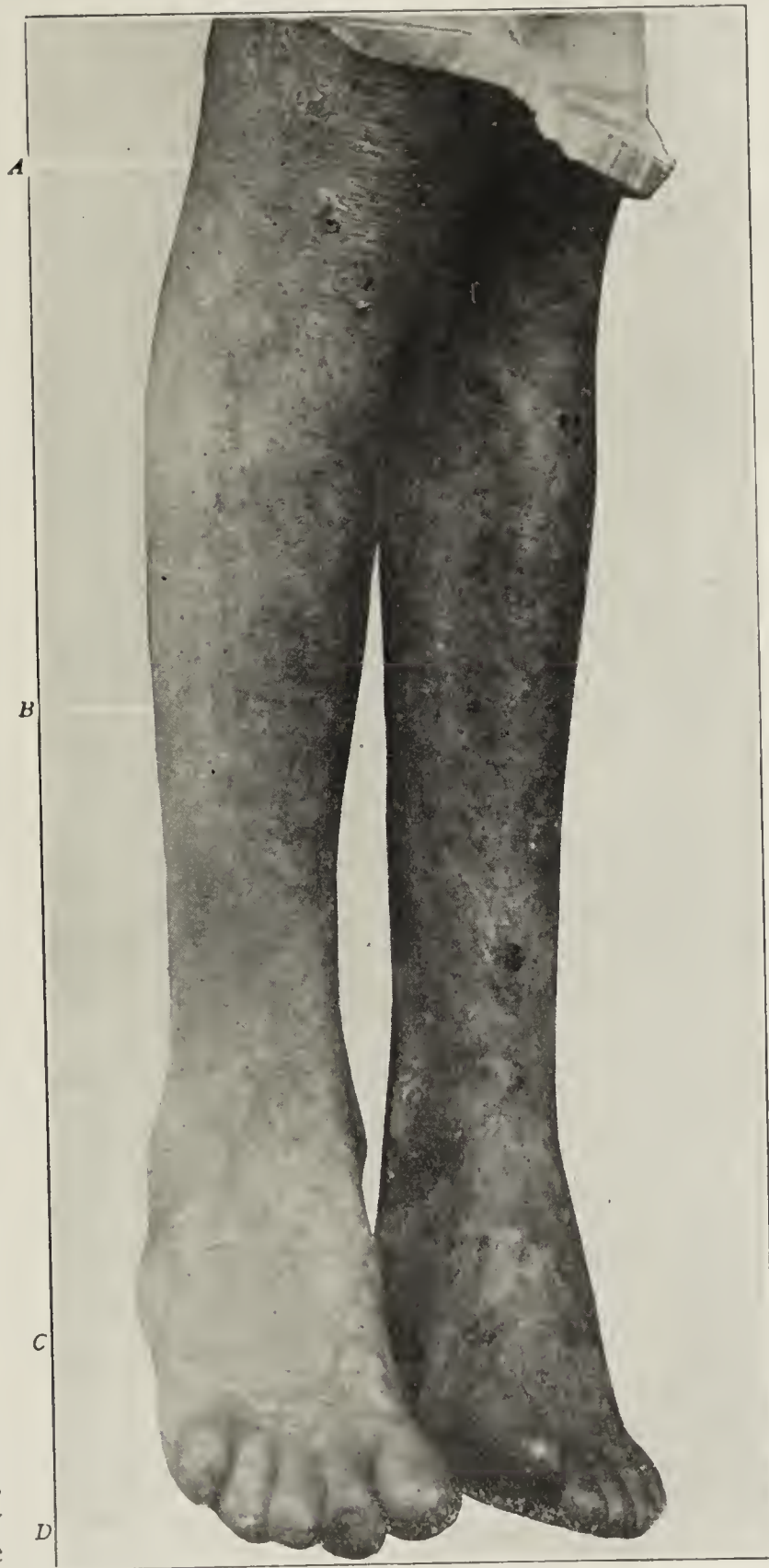


Fig. 2.—Epidermolysis bullosa. A, excoriations resulting from bullae; B, pigmented spots; C, superficial scar with epidermic shreds; D, absence of nail bullae on the second toe right.

11. Thompson, Lloyd: Syphilis of the Thyroid, *Am. Jour. Syph.*, 1917, 1, 179.
12. Simmonds, M.: Ueber syphilitische Erkrankungen der Hypophysis, *Dermat. Wehnschr.*, 1914; *Festschrift Zur Eröffnung des neuen Instituts für Schiffs- und Tropen-Krankheiten in Hamburg*, p. 194.
13. Bettman: *Dermat. Ztschr.*, 1903, 10, 561.
14. Valentine: *Zur Kasuistik der Epidermolysis bullosa hereditaria*, *Arch. f. Dermat. u. Syph.*, 1906, p. 87.
15. Stelwagon and Gaskil: *Jour. Cutan. Dis.*, 1912, p. 428.
16. Engman and Mook: A Study of Some Cases of Epidermolysis Bullosa, with Remarks upon the Congenital Absence of Elastic Tissue, *Jour. Cutan. Dis.*, February, 1906, p. 65; A Further Contribution to the Study of Elastic Tissue in Epidermolysis Bullosa, *ibid.*, June, 1910, p. 275.
17. Hallopeau: *Ann. de Dermat. et de Syph.*, 1898, 2, 721.

trophic alterations, the patient continued to show bullae after any little trauma throughout life.

An interesting question arises whether or not the two forms have to be considered identical, and arising from the same causes. A patient referred by Vidal¹⁸ manifested severe dystrophies of the nail, and atrophy and desquamation of the skin, bullae appearing only in the first months of life, chiefly on the hands and soles; later bullae ceased to gather.

The variability of the symptoms has been the cause of some difference in the nomenclature, so we find that Philippon¹⁹ terms a case epidermolysis bullosa habitual, traumatic. Colcott, Fox and Bowen²⁰ reported cases as bullous dermatitis. Luithlen²¹ considers many cases of this kind reported as pemphigus by Duhring, Roach, Brooke and Marshall to be epidermolysis bullosa. The case of Hebra, under the name of hereditary pemphigus, very likely was one of epidermolysis bullosa hereditaria, as several members of the same family had suffered the same bullous eruption.

This disease has to be entirely separated from pemphigus. It resembles pemphigus only in the formation of bullae, which are simply epiphenomena. Pemphigus is a generalized bullous eruption, with disturbance in the excretory function of the kidneys. In pemphigus the urine is of neutral reaction and under the microscope shows renal cells and casts. We can define pemphigus as a bullous eruption produced by the poisoning of the system from toxic elements not removed from the body by the filtering action of the kidneys. In epidermolysis bullosa, Nikolsky's sign, which is constantly found in true pemphigus, is not present.

TREATMENT

After our considerations of this obscure affection we have come to establish these etiologic factors: 1. Heredity in some cases. 2. A vulnerability of the skin. 3. Disturbed stability of the vasomotor system. All these systemic conditions must be recognized as having an origin or a focus of toxicity in the organism. On this theory we have established the treatment. The use of remedies vaguely and in a haphazard way, as Pollitzer²² said, is less likely to lead to clear ideas, than an experience even based on a false theory. A working hypothesis, even if it is proved wrong, is more advantageous than no theory at all. Following my idea of a possible hereditary syphilitic taint, I have given in several cases of simple epidermolysis bullosa repeated small doses of calomel, and I was gratified to see satisfactory results. Of course, while one-sixth grain of calomel is being administered, with 1 or 2 grains of sodium bicarbonate, nothing interferes with the use of iron tonics to improve the general nutrition.

The patient in the case under discussion was treated with small doses of calomel, and with an iron tonic. His mouth unfortunately did not tolerate the calomel, and on account of the stomatitis we were compelled to discontinue its use. Yet we did not deviate from our first idea. Injections of neosalvarsan, 0.3 gm. each in oil, were administered in the gluteal muscle, once a week. From the first injection the bullae began to diminish in number and size. After the fourth injection

few bullae were to be seen, and the boy had greatly improved in general nutrition and in the condition of the skin. He was discharged from the hospital service as well, and nothing further was heard from him.

It seems that the use of arsenic in the form of neosalvarsan has given the best results. Colombini praised the use of arsenic in increasing doses, together with iron tonics. In all cases of pemphigoid eruptions following vaccination in children, the best results have been obtained from the injections with solution of sodium cacodylate. In two cases a culture was taken and an autovaccine was prepared, of which injections were given every other day; no results could be observed.

From the therapeutic results it can be stated that in epidermolysis bullosa hereditaria or congenita, or in acquired form, the best remedies are mercurials and arsenicals. Whether they act on the system correcting the diathetic condition, or by preventing or opposing formation of toxic elements in the blood, or whether they influence the vasomotor nerves restoring their functional stability, or act on the somatic structure of the skin, diminishing its vulnerability, is not known to us. All that we can say is that by their use we have obtained good results.

ABSTRACT OF DISCUSSION

DR. HAROLD N. COLE, Cleveland: I did not hear Dr. Ravogli speak of a lack of elastic fibers in the skin of these patients afflicted with epidermolysis bullosa. In my cases there was such a lack.

DR. CHARLES J. SHEPARD, Columbus, Ohio: Two cases of epidermolysis bullosa have recently come under my observation. The first was in a student about 23 years of age, presenting small sized blebs as a result of traumatism, especially on hands and feet. He gave a history of having had lesions of various sizes earlier in life and always following a slight injury. His trouble began in early childhood, and preceding generations of the family showed the same condition.

The second case was in a young boy 10 years of age, the blebs following the slightest irritation and varying in size from 1 or 2 inches in diameter to the size of the palm. The skin showed pigmentation and atrophic changes. The hair was fine and thin. The nails on both hands and feet were shed and the fingers presented a webbed appearance. His general health was below par. No family history of a similar condition was obtained.

DR. A. RAVOGLI, Cincinnati: After a slight injury, a knock or rubbing, the skin gets red, hyperemic; after five or six hours it is slightly edematous, swollen like an urticaria wheal, the epidermis is distended, and so a bulla is formed in a few hours. It is worthy of remark that once the boy fell out of bed, cut a big gash on his forehead and no bullous formation took place.

In reference to a certain similarity between dermatitis herpetiformis and epidermolysis bullosa hereditaria, it is undeniable. Both are obstinate, persistent, only the eruptions in dermatitis herpetiformis occur mostly on the trunk, arms and thighs, without any injury of the skin, while in epidermolysis bullosa the bullae are formed after injury to the skin. Bullous eruptions of persistent nature follow vaccination. It seems that poisonous substances formed in the vaccine pustule, probably of streptococcal origin, infect the lymph spaces of the skin, reproducing inflammatory symptoms in the form of vesicles and bullae.

Cases of epidermolysis bullosa hereditaria, or acquired, after several years get well. Hallopeau, however, reported a case in which the formation of bullae lasted nearly all of the patient's life.

If lack of elastic fibers could be the cause of this hereditary condition, no improvement or recovery could be possible, because the elastic fibers once lost are not reformed. The

18. Vidal: Reunion hebdomadaire des medecins de l'Hôpital St. Louis, April 14, 1889.

19. Philippon, L.: Gior. ital. d. mal. ven., 1900, No. 5.

20. Bowen, J. T.: Jour. Cutan. and Gen.-Urin. Dis., 1898.

21. Luithlen, F.: Epidermolysis bullosa hereditaria, Handbuch. der Hautkrankheiten, Mracek, 1, 753.

22. Pollitzer, S.: The Principles of the Treatment of Syphilis, Jour. Cutan. Dis., September, 1916.

disease disappears gradually, and consequently it cannot be due to a permanent dystrophic condition.

A young man who was employed in a dry goods store, every time he handled boxes, the following day had bullae on his hands and arms wherever the box had knocked the skin.

The internal administration of mercurials has given good results. In my case small calomel powders, one-sixth grain, once or twice a day in association with sodium bicarbonate, could not be continued on account of the sensitiveness of the patient's gums. Salvarsan, 0.3 gm., in oil in intramuscular injections gave good results. He was discharged from the hospital service. After fourteen days no bullae had reappeared.

THE PRODUCTION OF AN ANTIPOLIOMYELITIS SERUM IN HORSES

BY INOCULATIONS OF THE PLEOMORPHIC STREPTOCOCCUS FROM POLIOMYELITIS *

EDWARD C. ROSENOW, M.D.

ROCHESTER, MINN.

It is a well established fact that the serum of patients and monkeys which have recovered from poliomyelitis has a neutralizing¹ and protective power² against the virus of poliomyelitis. Inoculations of virus as well as of cultures of the globoid organism³ which fail to produce at least abortive attacks of poliomyelitis fail also to produce neutralizing and protective substances in the serum; hence immunity does not result. The recent work of Amoss⁴ proves further that the globoid organisms of Flexner and Noguchi⁵ have indeed little antigenic power. The need of immunization experiments along other lines in this disease is therefore apparent.

A restudy of the bacteriology of poliomyelitis during the past epidemic has emphasized anew the possible rôle which bacteria of ordinary size may play in the etiology of this disease. A pleomorphic streptococcus or micrococcus having elective affinity for the central nervous system in animals has been isolated quite constantly from the atrium of infection and the central nervous system,⁶ the brain and cord⁷ and the spinal fluid⁸ in human poliomyelitis, and from the central nervous system of monkeys paralyzed with virus.⁹

It has been shown that under certain anaerobic conditions the organism may become exceedingly small, filterable and anaerobic, resembling very closely the globoid organisms of Flexner and Noguchi. More-

over, the mechanism by which the large forms become small has been demonstrated.⁹ Injections of the large form of this organism into two monkeys soon after isolation has rendered the animals immune to virus,¹⁰ a result not obtained with a streptococcus from another source.¹¹

On the basis of these results, immunization experiments with aerobic cultures of the pleomorphic organism were instituted.

Recently Nuzum has reported on the protection of animals against the large form of the organism with the serum from a horse that had been injected repeatedly with aerobic cultures. Mathers and Tunnicliff¹² have shown a specific increased opsonic power of the serum toward this organism in poliomyelitis in children. Neustaedter and Banzhaf¹³ appear to have developed a neutralizing serum in a horse by injecting large doses of filtrates of active virus.

I wish now to record the essential facts in the immunization of horses with cultures of the pleomorphic streptococcus, the results of experiments in neutralizing and protecting against virus with the immune serums thus obtained, and the findings of agglutination and complement-deviation studies.

IMMUNIZATION OF HORSES

The method followed for immunizing horses was that worked out by Flexner and Amoss¹⁴ and Amoss and Wollstein¹⁵ in the production of antidysentery and antimeningitis serum, respectively. Advantage was thus taken of the principle first noted by Fernet and Müller,¹⁶ Bonhoff and Tsuzuki,¹⁷ and Gay and his pupils,¹⁸ of the very rapid production of antibodies following injections of antigen at brief intervals.

Increasing quantities of the pleomorphic streptococcus were injected intravenously for three consecutive days, this being followed by a rest period of seven days. A desensitizing dose of approximately one tenth of the immunizing dose was given on the first day of each period after the first. The immunizing dose of the first day of each period was that of the last previous injection. The dose on the second and third days of each series was increased approximately by one tenth. The temperature was used as a guide to dosage. If the temperature which rose soon after the injection had not returned to normal at the time for the next injection, the antigen was not given until it had returned to normal.

The bacteria for injection were grown aerobically in ascites-dextrose broth or dextrose broth in tall col-

* From the Mayo Foundation.

* Read before the Section on Pathology and Physiology at the Sixty-fifth Annual Session of the American Medical Association, New York, June, 1917.

1. Levaditi, C., and Landsteiner: *Recherches sur la paralysie infantile experimentale*, Compt. rend. Acad. d. sc., 1910, **150**, 131.

2. Flexner, Simon, and Lewis, P. A.: *Epidemic Poliomyelitis in Man*, The Activity of the Virus, THE JOURNAL A. M. A., Jan. 1, 1910, pp. 45-46.

3. Flexner, Simon, Noguchi, Hideyo, and Amoss, H. L.: Concerning Survival and Virulence of the Micro-Organism Cultivated from Poliomyelitic Tissues, Jour. Exper. Med., 1915, **21**, 91-102.

4. Amoss, H. L.: The Cultivation and Immunological Reactions of the Globoid Bodies in Poliomyelitis, Jour. Exper. Med., 1917, **25**, 545-556.

5. Flexner, Simon, and Noguchi, H.: Experiments on the Cultivation of the Microorganism Causing Epidemic Poliomyelitis, Jour. Exper. Med., 1913, **18**, 461-485.

6. Rosenow, E. C.; Towne, E. B., and Wheeler, G. W.: The Etiology of Epidemic Poliomyelitis: Preliminary Note, THE JOURNAL A. M. A., Jan. 21, 1916, pp. 1202-1205.

7. Mathers, George: The Etiology of Acute Epidemic Poliomyelitis, Infect. Dis., 1917, **20**, 113-124. Nuzum, J. W., and Herzog, William: Experimental Studies in the Etiology of Acute Epidemic Poliomyelitis, THE JOURNAL A. M. A., Oct. 21, 1916, pp. 1205-1208.

8. Nuzum, J. W.: Bacteriologic Findings in the Cerebrospinal Fluid of Poliomyelitis Serum, THE JOURNAL A. M. A., Nov. 11, 1916, pp. 1437-1439.

9. Rosenow, E. C., and Towne, E. B.: Bacteriologic Observations in Experimental Poliomyelitis of Monkeys, Jour. Med. Research, 1917, N. S., **31**, 175-186.

10. Rosenow, E. C.; Towne, E. B., and Wheeler, G. W.: Observations on Immunity of Monkeys to Experimental Poliomyelitis, THE JOURNAL A. M. A., Jan. 27, 1917, pp. 280-282.

11. At the time these experiments were reported, the monkeys had resisted one intracerebral injection of highly active virus. Since then, they have resisted three or four injections each of highly active virus without showing symptoms of poliomyelitis.

12. Mathers, George, and Tunnicliff, Ruth: A Reaction of Immunity in Acute Poliomyelitis, THE JOURNAL A. M. A., Dec. 23, 1916, pp. 1935-1936.

13. Neustaedter, M., and Banzhaf, E. J.: An Antipoliomyelitis Horse Serum, THE JOURNAL A. M. A., May 26, 1917, pp. 1531-1533.

14. Flexner, Simon, and Amoss, H. L.: The Rapid Production of Antidysenteric Serum, Jour. Exper. Med., 1915, **21**, 515-524.

15. Amoss, H. L., and Wollstein, W. M.: A Method for the Rapid Preparation of Antimeningitis Serum, Jour. Exper. Med., 1916, **23**, 403-417.

16. Fernet, W., and Müller, M.: Zur Herstellung und Verwendung präzipitierender Sera insbesondere für den Nachweis von Pferdefleisch, Ztschr. f. biol. Techn. u. Method., 1908, **1**, 201-206.

17. Bonhoff, H., and Tsuzuki, M.: Ueber die Schnellimmunisierungsmethode von Fernet und Müller (Präzipitine und Hamolysine), Ztschr. f. Immunitätsforsch. u. exper. Therap., 1909-1910, Orig., **4**, 180-194. Tsuzuki, M.: Ueber die Schnellimmunisierung nach Fernet und Müller (Agglutinine), Ztschr. f. Immunitätsforsch. u. exper. Therap., 1909-1910, **4**, 194-209.

18. Gay, F. P., and Fitzgerald, J. H.: An Improved Rapid Method of Producing Precipitins and Hemolysins, Univ. California Pub. in Pathology, 1912, **2**, 77-82. Locke, E.: A Rapid Method of Producing Bacterial Agglutinins, Univ. California Pub. in Pathology, 1912, **2**, 91-96.

umns for from eighteen to twenty-four hours at from 33 to 35 C. (91.4 to 95 F.). After centrifugalization, the supernatant broth was decanted and the bacteria were either washed or directly suspended in salt solution so that 1 c.c. of the suspension contained the growth from 15 c.c. of the broth culture. Most of the suspensions used were freshly prepared, but in some instances they had been kept in the ice chest for several weeks. All strains injected were cultivated for at least two generations, nearly all having been plated at least once on blood-agar. Blood-agar cultures were made of all suspensions at the time of injection.

Various methods have been employed for maintaining the original immunizing properties. Strains have been cultivated under anaerobic and aerobic conditions on blood-agar slants, in deep stabs of ascitic tissue agar and in tall tubes of ascitic tissue fluid. Strains from human poliomyelitis have been kept in latent life by preserving the brain and cord substance from animals paralyzed with cultures, in sealed pipets in the ice chest. Portions of the brain and cord and large quantities of recently isolated cultures from human and monkey poliomyelitis have been dried in vacuo.

EXPERIMENTS

HORSE 1.—A large black horse, 4 years old, weighing approximately 1,600 pounds, was given injections which were begun Nov. 2, 1916, and were continued until May 1, 1917. The first three injections contained heat-killed (60 C. [140 F.], thirty minutes) strains from the brain and cord of human poliomyelitis, the next nine injections contained strains both from human poliomyelitis and paralyzed monkeys, and all subsequent injections contained cultures of the pleomorphic streptococcus isolated from the brain and cord of monkeys paralyzed with virus in the usual way. The doses ranged from the equivalent of the growth from 160 c.c. of broth to as high as the equivalent of the growth from 1,400 c.c. Test bleedings were made previous to the first injection, and November 2, November 4, December 22, January 8, January 30, March 3, April 3, May 14 and May 16. December 27, three days after the third injection of living bacteria, the horse had fever, and his hind extremities were so weak that he could scarcely get up. The fever and weakness soon disappeared. April 5, a suspension containing staphylococci was injected accidentally. April 7, the horse had fever and developed arthritis of the right hock. April 9, he had arthritis of the knee of the left fore leg. April 17, the fever had disappeared, the arthritis had largely subsided, and the injections were resumed. Dead cultures, however, were now injected for the next three series of injections. The last dose was given, May 1, and consisted of the growth from 600 c.c. of broth of a strain in the third generation from a recently paralyzed monkey. May 14, the animal was unable to get up on account of weakness in the hind extremities. It was bled 6,000 c.c. May 16, weakness of the hind extremities still prevented it from getting up. It was then etherized and bled to death, approximately 36,000 c.c. of blood being obtained. A moderate amount of serous fluid was found in the left ankle joint and the right hock. There were no lesions of the viscera except a few subendocardial hemorrhages in the right ventricle. The vessels in the gray matter of the lumbar cord were hyperemic. Cultures of the blood yielded a staphylococcus, and those from the spinal cord showed diphtheroid bacilli. Frozen sections of the lumbar cord revealed little or no round-cell infiltration.

HORSE 2.—A large bay, 8 years old, weighing approximately 1,200 pounds, was injected at intervals, according to the method described, with live cultures from human and monkey poliomyelitis in relatively massive doses from November 22 to December 13. During the eighth injection (December 13) he developed marked symptoms of acute anaphylactic shock and died in a few minutes. He was bled just previous to injection and soon after death.

HORSE 3.—A medium-sized bay, 3 years old, weighing approximately 1,200 pounds, has been injected according to schedule since Jan. 30, 1917. The pleomorphic streptococcus from human poliomyelitis has been employed exclusively. The first six injections consisted of suspensions of the dried bacteria prepared last summer from strains recently isolated from the brain and cord. Later, there were added suspensions of strains found to be agglutinated in high dilution by the serum of Horse 1 and grown continuously on blood-agar, in deep stabs of ascitic tissue agar, or filed away last summer in sealed pipets containing the aspirated brain substances of rabbits and guinea-pigs paralyzed with cultures. Except for alarmingly severe symptoms on several occasions immediately following the injections, this horse has remained well. Test bleedings were made, January 30 (before injection), March 2, April 3 and May 14.

THE EFFECT OF IMMUNE HORSE SERUM ON VIRUS IN VITRO

In these experiments the technic followed was that used by other workers in this field. Five per cent. emulsions of physiologic sodium chlorid solution of fresh or glycerinated brain and cord were prepared by grinding the material in a mortar with sterile quartz

TABLE 1.—THE EFFECT OF VARIOUS IMMUNE SERUMS ON VIRUS

Monkey	Inoculation	Result
103	Virus + NaCl solution; control	Mild symptoms; resisted second inoculation
93	Virus + normal monkey serum; control	Mild symptoms; resisted second inoculation
102	Virus + normal horse serum; control	Severe symptoms; etherized, 13th day
94	Virus + virus immune serum; Monkey 24	Remained well
95	Virus + culture immune serum; Monkey 43	Severe symptoms; recovered
96	Virus + culture immune serums; Monkeys 53 and 61	Remained well
97	Virus + culture immune serum; Rabbit 1078	Severe symptoms; etherized
98	Virus + acquired immune serum; Human 802	Remained well
99	Virus + acquired immune serum; Human 784	Remained well
100	Virus + culture immune serum; Horse 1	Remained well
101	Virus + culture immune serum; Horse 1; 1:1,000	Remained well; paralyzed by second inoculation

sand, filtering it repeatedly through paper or in some instances passing it through a Berkefeld filter. The filtrate was thoroughly mixed with the serum to be tested, and, for controls, with the sodium chlorid solution and the corresponding normal serum. It was then placed in the thermostat for two hours and in the ice chest for from eighteen to twenty-two hours. All monkeys (*Macacus rhesus*) were injected intracerebrally, under ether, with 1 c.c. of the respective mixtures. In each series of experiments the monkeys chosen were of approximately the same weight.

The experiment summarized in Table 1 was begun Feb. 7, 1917. The emulsion was prepared from fresh brain and cord of Monkey 85, which became paralyzed on the eighth day following the injection of a virus which had been passed successively through six monkeys. The first three experiments (Monkeys 103, 93 and 102), served as controls. All developed mild but unmistakable symptoms of poliomyelitis. Monkey 94, injected with virus digested with serum from Monkey 24, which had recovered from poliomyelitis, served as an additional control in that it showed the technic to be adequate for the destruction of virus by serum known to have such action. Monkey 95 developed severe paralysis, the serum of Monkey 43 not

having destroyed the activity of the virus. Monkey 43 had been injected previously with a strain of streptococcus grown large from typical globoids, and was found later not to be immune to virus. Monkeys 53 and 61, whose serums destroyed virus, as evidenced in the experiment on Monkey 96, had been immunized

TABLE 2.—EFFECT OF IMMUNE HORSE SERUM ON VIRUS

Monkey	Inoculation	Result
112	Virus + NaCl solution; control	Mild symptoms; recovered; resisted second inoculation
113	Virus + normal horse serum; control	Mild symptoms; recovered; died from ulcerative colitis, 35th day
114	Virus + immune serum; Horse 1	No symptoms; died of ulcerative colitis, 21st day; no infiltration
115	Virus + immune serum; Horse 1; 1:1,000	No symptoms; paralyzed by second inoculation
116	Virus + serum from sporadic poliomyelitis (521)	No symptoms; paralyzed by second inoculation

with cultures of the pleomorphic streptococcus recently isolated from paralyzed monkeys. Their serums agglutinated specifically the pleomorphic streptococcus from both human and monkey poliomyelitis. The serum of Rabbit 1078, which was used in the experiment on Monkey 97, had no digestive action on virus. Rabbit 1078 had been injected repeatedly with the heat-killed pleomorphic streptococcus. When used, its serum had been kept in the ice chest for forty days. The serums used in the next two experiments (Monkeys 98 and 99) were obtained from cases of sporadic anterior poliomyelitis, and destroyed the activity of the virus. The serum used to digest the virus in the last two experiments (Monkeys 100 and 101) was obtained from Horse 1, Jan. 30, 1917, eight days previously. It destroyed the activity of the virus completely, even in a dilution of 1:1,000.

In the experiment summarized in Table 2, the same virus after passage through one more monkey (Monkey 106) was used while fresh. The experiment was again controlled both positively and negatively. The controls with sodium chlorid solution and normal horse serum developed poliomyelitis, but the control with human poliomyelitis serum did not. The

TABLE 3.—THE EFFECT OF IMMUNE HORSE SERUM ON FILTERED VIRUS

Monkey	Inoculation	Result
141	Virus + NaCl solution; control	Symptoms, 5th day; completely paralyzed, 6th day; etherized
143	Virus + Immune serum; Horse 3	Symptoms, 8th day; severely paralyzed, 10th day; recovered
144	Virus + Immune serum; Horse 3; 1:1,000	Symptoms, 6th day; completely paralyzed, 7th day; etherized
146	Virus + Immune serum; Horse 1	Symptoms, 13th day; severely paralyzed, 16th day; recovered
145	Virus + Immune serum; Horse 1; 1:1,000	Symptoms, 5th day; completely paralyzed, 6th day; died, 7th day

horse serum used was obtained the day previously (March 2, 1917) from Horse 1. As in the previous experiment, it destroyed activity of the virus in dilutions of both 1:1 and 1:1,000.

The experiment summarized in Table 3 was begun, April 15, 1917. The effect of the serum from both Horse 1 and Horse 3 was tested against highly active glycerinated virus that had been passed through a

Berkefeld filter. The control (Monkey 141) became completely paralyzed in six days, and was etherized when respiratory failure was imminent. The activity of the virus appeared to be diminished but not wholly destroyed by an activated mixture of serums from Horse 3, as shown by the experiment on Monkey 143. In dilutions of 1:1,000 the serum had little or no effect (Monkey 144). In the experiment on Monkey 146, an activated mixture of the serum from Horse 1 (January 30, March 3 and April 3) appeared to diminish the activity of the virus, as manifested by a delay of eight days over the control for the onset of paralysis, by the comparative mildness of the paralysis, and by the fact that the monkey recovered. In dilutions of 1:1,000 this mixture of serums had no effect (Monkey 145).

In an experiment performed Feb. 20, 1917, the inactivated serum from Horse 1, which was obtained

TABLE 4.—PROTECTION OF MONKEYS AGAINST POLIOMYELITIS WITH IMMUNE HORSE SERUM

Monkey	Inoculation	Treatment	Result
89 2.3 kg.	0.5 c.c. Virus 85	Intraspinal and intravenous injections of immune serum; Horse 1	No symptoms for 56 days; slight symptoms following second inoculation
90 3.8 kg.	1 c.c. Virus 85	Intraspinal and intravenous injections of immune serum; Horse 1	No symptoms for 56 days; severe paralysis, 9th day after second inoculation
91 2.2 kg.	0.5 c.c. Virus 85	Alternate subcutaneous and intravenous injections of heat-killed pleomorphic streptococcus	Severe paralysis, 11th day; no improvement following injection of immune serum, Horse 1; died of colitis, 19th day
92 2.5 kg.	0.5 c.c. Virus 85	Subcutaneous injections of heat-killed pleomorphic streptococcus	Severe paralysis, 13th day; recovered following injections of immune serum, Horse 1
147 3.5 kg.	0.5 c.c. Virus 889	None; control	Symptoms, 5th day; severe paralysis, 7th day; prostrate, 10th day; etherized
149 3.6 kg.	0.5 c.c. Virus 889	One intravenous injection of sensitized pleomorphic streptococcus, 11 days previously	Symptoms, 12th day; severe paralysis, 13th day; recovered
173 1.8 kg.	0.5 c.c. Virus 165	None; control	Severe paralysis, 7th day; apparent protection following injection of immune serum, Horse 1; recovered
174 1.8 kg.	0.5 c.c. Virus 165	Intravenous injections of immune serum; Horse 3	Severe paralysis, 10th day; recovered
175 1.7 kg.	0.5 c.c. Virus 165	Intravenous injections of immune serum; Horse 1	No symptoms; well 24th day

January 30 and which digested virus when fresh (Table 1) had only a slight destroying power over highly active fresh virus, the onset of the paralysis in two monkeys being delayed only one and two days, respectively, over that of the control. April 23, the serums of the bleedings of Horse 1 from January 30 to April 3 were mixed, and on April 24 the mixture was passed through a Berkefeld filter. This filtered mixture in one experiment was found not to diminish the activity of the virus. It appeared, then, that when fresh, the serum obtained January 30 and March 2 from Horse 1, immunized chiefly with the pleomorphic streptococcus from monkeys paralyzed with virus, had the power to destroy the activity of fresh, moderately virulent virus completely and to inhibit the effect of highly virulent glycerinated and filtered virus, a power which it appeared to lose on standing. The serum from Horse 3, immunized entirely with strains from human poliomyelitis isolated a long time previously, had no apparent effect.

PROTECTION OF MONKEYS AGAINST EXPERIMENTAL
POLIOMYELITIS. WITH IMMUNE HORSE
SERUM

In Table 4 are summarized three series of experiments which were undertaken to determine the protective power of immune horse serum against intracerebral injections of virulent virus. The serum from Horse 1 used in the first series of experiments, begun February 7, was obtained, January 30.

Simultaneous intraspinal injections of 2 c.c. and intravenous injections of from 5 to 10 c.c. were made for two consecutive days. Five additional intravenous injections of from 5 to 14 c.c. were made every second or third day. The animals were completely protected, as shown by the controls (Monkeys 91 and 92) which were injected with a vaccine. They succumbed to poliomyelitis, however, following a second injection two months later, a further proof that infection had not occurred. Additional evidence of the activity of the virus is afforded by the results recorded in Table 1, this series of monkeys having been inoculated with the same virus.

In the experiments on Monkeys 147 and 149 (outlined in Table 4), the effect of a single immunizing dose of the sensitized pleomorphic streptococcus was tested against a heterogeneous virus of high virulence.¹⁷

A mixture of strains from human poliomyelitis isolated last summer and recently isolated strains from paralyzed monkeys were grown in dextrose broth, washed in sodium chlorid solution and suspended in the filtered mixture of the serum from Horse 1. The bacteria were agglutinated almost immediately, and after the suspension had been kept at 35 C. (95 F.) for two hours were washed in sodium chlorid solution. Five c.c. of a rather dense suspension were then injected intra-

venously. That a degree of protection was afforded was indicated by a delay of seven days in the onset of the paralysis over that of the control, by the comparative mildness of the symptoms, and by recovery of the animal.

In the last series of experiments, summarized in Table 4, the serums were obtained on the day the experiments were begun, May 14. Intravenous injections of 10 c.c. were made immediately after inoculation of virus, the following day and then every second day for four additional injections. The serum from Horse 3 had slight protective power, there being a delay of only three days over the control in the onset of symptoms (Monkey 174). The serum from Horse 1, on the other hand, completely protected Monkey 175, and two intravenous injections of 12 c.c. each appeared to protect the control (Monkey 173) from a fatal attack.

The effect of the curative properties of these serums after paralysis had begun has been tested, in all, in twenty-four monkeys. Simultaneous intraspinal

(2 c.c.) and intravenous (from 5 to 12 c.c.) injections were given in three instances, and intravenous injections (from 10 to 12 c.c.) in the rest. In no instance were injections made oftener than once in twenty-four hours. If the serum had been kept for some time in the refrigerator, it was usually activated with guinea-pig complement just previous to injection.

If the serum appeared either to lessen the symptoms or to arrest the paralysis, or if the treated animals recovered when the untreated controls died of respiratory failure or surely would have died if they had not been etherized, the result was put down as favorable. If it had no apparent effect, it was put down as indifferent.

Out of seven treated monkeys in which the results were indifferent, four showed severe ulcerative colitis, two marked tuberculosis and one meningitis due to hemolytic streptococcus. These, therefore, were not suited for testing the efficacy of the serum. Of the remaining seventeen, the serum from Horse 3 was injected into four (once in one, twice in two and three times in one) with no apparent effect on the course of the disease in any instance. Three of these monkeys died, and one was etherized when respiratory failure seemed imminent. The remaining thirteen were treated with the fresh or activated serum from

Horse 1. The results were indifferent in three and favorable in ten. All of the former received only one injection. Of the latter, two received one injection; two, two injections; one, three injections; one, four injections; three, five injections, and one seven injections. All of the ten recovered, with varying degrees of residual paralysis.

The experiments on the protective and curative power of these immune serums, therefore, indicate that while the serum from Horse 3 had little

or no effect, the serum from Horse 1 had definite protective and curative power, a finding directly in accord with the results of the neutralization experiments.

PROTOCOLS OF EXPERIMENTS

Protocols of the last three experiments summarized in Table 4 will serve to illustrate:

EXPERIMENT 1.—Control.—Monkey 173, *Macacus rhesus*, 1.8 kg.

May 14, 1917: Etherized; 0.5 c.c. of glycerinated virus (751¹¹) from Monkey 165 injected into right frontal lobe.

May 15-18: Appeared well.

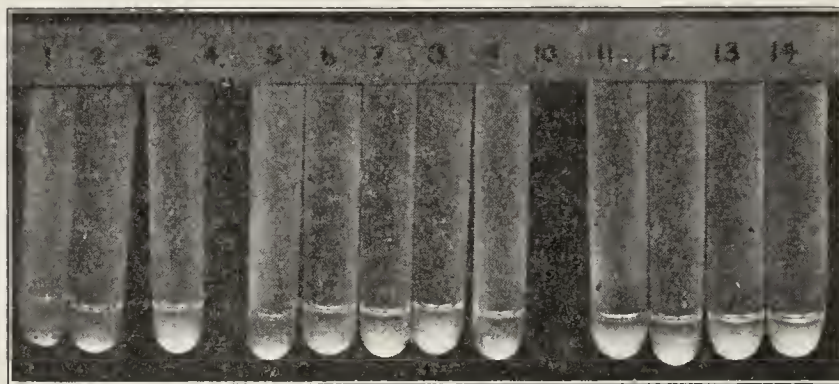
May 19: Appeared irritable, no weakness.

May 20: Irritable and undoubtedly weak in left leg.

May 21, 8:30 a. m.: Tremor of head and muscles of hind extremities; unable to bear weight on legs, and dragged the right. 4 p. m.: Undoubtedly weaker; dragged both legs; had tremor and weakness of muscles of left arm. Twelve c.c. of immune serum from Horse 1 (obtained May 14) injected intravenously.

May 22, 8 a. m.: Definitely weaker in hind extremities; no extension of paralysis in arms. 3 p. m.: Injection of serum repeated.

May 23: Only slightly weaker in hind extremities; no demonstrable weakness in arms.



Agglutination of pleomorphic streptococcus from human poliomyelitis. This strain was not used in the immunization of horses. Tubes 1 to 3 contain normal horse serum; Tubes 5 to 9, immune serum from Horse 1; Tubes 11 to 14, immune serum from Horse 3. The dilutions of serum and antigen (dextrose broth culture) are 1:1, 1:10, 1:100, etc., respectively, in each series. Note agglutination in low dilutions and its absence in higher dilutions by the normal horse serum, and the absence of agglutination in low dilutions and marked agglutination in high dilutions by the immune serums.

17. Kindly sent me by Dr. W. E. Wayson, of the Public Health Service, Washington, D. C.

May 24: Right arm badly paralyzed; hind extremities completely flaccid; left arm also weak, but monkey could move it in all directions.

June 2: Marked improvement; the tremor of the head had disappeared; arms stronger, animal pulled himself on perch; able to sit up but legs still flaccid.

June 7: Improved.

EXPERIMENT 2.—*Attempt to protect against virus with serum from Horse 3.* Monkey 174, *Macacus rhesus*, 1.9 kg.

May 14, 1917, 5 p. m.: Etherized; 0.5 c.c. glycerinated virus (751¹¹) from Monkey 165 injected into right frontal lobe. 5:10 p. m.: Twelve c.c. immune serum, Horse 3 (obtained May 14), injected intravenously.

May 15, 12 m.: Appeared well; injection of serum repeated.

May 17, 9:30 a.m.: Appeared well; injection of serum repeated.

May 19, 3:30 p. m.: Appeared well; injection of serum repeated.

May 20: Appeared well; no weakness.

May 21, 7:30 a. m.: Appeared slightly irritable, but no weakness. 4 p. m.: Injection of serum repeated.

May 22, 3 p. m.: Extremely irritable; fur roughened; weakness of hind extremities; injection of serum repeated.

May 23: Weaker, very tremulous.

May 26: Marked paralysis of all extremities; some power in left arm; tremor of head still present.

June 2: Severe paralysis of all extremities; can move left arm slightly; tremor of head still present but less marked.

June 7: Condition much the same as on June 2.

EXPERIMENT 3.—*Attempt to protect against virus with serum from Horse 1.* Monkey 175, *Macacus rhesus*, 1.8 kg.

May 14, 1917, 5:20 p. m.: Etherized; 0.5 c.c. of glycerinated virus (751¹¹) from Monkey 165 injected into right frontal lobe. 5:30 p. m.: Twelve c.c. of immune serum from Horse 1 (obtained May 14) injected intravenously.

May 15, 12 m.: Appeared well; injection of serum repeated.

May 17: Appeared well; injection of serum repeated.

May 19: Appeared well; injection of serum repeated.

May 20: Appeared well; no weakness.

May 21, 7:30 a. m.: Appeared well; no weakness. 4 p. m.: Injection of serum repeated.

May 22, 3 p. m.: Appeared well; injection of serum repeated.

May 23: Appeared well; no weakness.

June 7: Has appeared well and has shown no symptoms of poliomyelitis at any time.

AGGLUTINATION AND COMPLEMENT-DEVIATION EXPERIMENTS

Numerous agglutination experiments have been made with the pleomorphic streptococcus, with the serums from immunized horses, with the serums from patients who have recovered from poliomyelitis, and with the serums of monkeys paralyzed with virus. As controls, normal serums of these species and numerous strains of streptococci from sources other than poliomyelitis have been used.

The agglutinating titer of the serums of the horses (especially Horse 1) has become very high, agglutinations having been obtained in dilutions as high as 1:1,000,000. The serums from both Horse 1 and Horse 3 agglutinated alike the strains from human and monkey poliomyelitis as shown in the accompanying illustration. By the use of these serums it is now possible to differentiate the strains which appear to bear etiologic relation to poliomyelitis from strains of streptococci found in tonsils which undoubtedly have no such relation, and from strains of streptococci which may be found occasionally in the nervous system of uninoculated animals.

The serums from twenty-three patients who had recovered from poliomyelitis, and the serums from twenty-seven monkeys which became paralyzed following injections of virus have been found to agglu-

minate specifically the pleomorphic streptococcus isolated both from poliomyelitis in man and from experimental poliomyelitis in monkeys. The serums from forty-three persons who have not had poliomyelitis, and the serums from twenty-seven normal monkeys failed entirely to agglutinate these strains, or agglutinated them in lower dilutions than the respective immune serums. Only two of a large number of strains of streptococci from a wide range of sources were agglutinated by poliomyelitic serums to a degree comparable to the agglutination of the pleomorphic streptococcus. Antipneumococcus, antistreptococcus, antimeningococcus and antigonococcus serums had little or no more agglutinating power over these strains than normal horse serum.

Complement-deviation tests made by Dr. Sanford, while incomplete, show that both Horse 1 and Horse 3 have developed specific antibodies that in high titer have complement-deviating properties with the antigens made from strains isolated from human poliomyelitis and from experimental poliomyelitis in monkeys. Moreover, by using these immune horse serums for determining the properties of bacterial suspensions from various sources, it has been found in many instances that strains isolated from both human and monkey poliomyelitis have marked antigenic properties, while similarly prepared antigens from other sources do not have these properties.

SUMMARY

It has thus been shown that:

1. The serum of horses immunized with aerobic cultures of the pleomorphic streptococcus from both poliomyelitis in man and experimental poliomyelitis in the monkey developed specific antibodies, agglutinins and complement-deviating properties, the agglutinins appearing to be present in large amount because the serums cross-agglutinate these strains specifically in very high dilutions.

2. The serum of patients and monkeys which have recovered from attacks of poliomyelitis cross-agglutinates specifically many, but not all, of these strains in the lower dilutions.

3. What is of greatest significance, the serum of the horse immunized with recently isolated strains from experimental poliomyelitis in the monkey appears to have developed neutralizing, protective and curative power against the virus of poliomyelitis.

ABSTRACT OF DISCUSSION

DR. MYER SOLIS-COHEN, Philadelphia: In the Jules E. Mastbaum Research Laboratory of the Jewish Hospital, Philadelphia, Dr. George D. Heist and I made some immunologic studies of the streptococci found in poliomyelitis. We made agglutination tests which in a way are in accord with Dr. Rosenow's results, although we do not regard streptococci as lending themselves so well to such a test. We also studied the opsonic action of poliomyelitic serum on these streptococci. With the strain we employed, one isolated by Kolmer and his associates, we found an opsonic index above normal in all of the forty-five poliomyelitic serums we tested.

With the object of determining whether it is one strain of streptococci or several so commonly found associated with acute anterior poliomyelitis, we secured cultures also from Rosenow, Mather and Nuzum, who have isolated the streptococcus from poliomyelitis material in various parts of the country. We have grown these cultures side by side on the same mediums, and have applied to them fermentative and other cultural tests found useful in the classification of streptococci. We immunized rabbits with strains from the different sources, and with the immune serums so obtained

performed opsonic tests on each strain to see if a serum giving phagocytosis with the strain with which the rabbit was injected would act similarly with the other strains. In working with pneumococci, for instance, we have found, as have others, that a Type I serum contains thermostable opsonin for Type I only and not for Type II or III. With these same immune rabbit serums, we also performed cross-agglutinations, which gave results similar to those obtained in our opsonic tests.

With a few slight variations we have found that the strains sent us by the different workers are the same organism. Culturally and serologically there appears to be very little difference between the strains from different sources.

DR. CARROLL G. BULL, New York: Dr. Rosenow's paper interests me very much, since I have carried out a large number of experiments along this line. My results and interpretations were diametrically opposed to those of Dr. Rosenow. Streptococci or "poliomyelitis cocci" were isolated from the tonsils and central nervous tissues of patients having acute poliomyelitis and tested for pathologic effects on rabbits, guinea-pigs, cats, dogs and monkeys. To control these experiments, streptococci were isolated from a large number of nonpoliomyelitic patients and tested on rabbits and monkeys. The two series of cocci manifested similar pathogenetic properties, producing brain abscesses, purulent meningitis, kidney abscesses, arthritis and paralysis, but not poliomyelitis. Monkeys that recovered from the initial inoculations were given several subsequent injections to increase their immunity to the cocci. The serums of the immunized monkeys possessed specific opsonins and agglutinins to a marked degree, but they did not neutralize poliomyelitic virus in vitro, and these monkeys were just as susceptible to intracerebral inoculation of the virus as normal monkeys. These experiments were made not only once, but many times, and in no instance was there the slightest evidence that these cocci are immunologically related to poliomyelitic virus or have any relation to the disease.

Dr. Amoss has just completed some experiments which show that poliomyelitic virus is not only noninfectious for rabbits, but does not survive in the brain of these animals as long as seven days.

Dr. Rosenow's protection experiments with immune and normal horse serums are not convincing. The controls are not satisfactory. We cannot say that we have protected a monkey against a five-day virus unless a control animal is inoculated with the same emulsion or filtrate at the same time and succumbs to the infection within that limit of time. Mild symptoms following an intracerebral inoculation mean little or nothing. The control must come down. Salt solution and normal horse serum sometimes neutralize a filtrate of the virus. Agglutination tests with streptococci and allied organisms are very unsatisfactory, since the same strains tested at different times with the same serums give different results. It is possible that I failed to obtain the true "poliomyelitis coccus." In this case, paralysis and nervous infections were caused by other cocci, and these symptoms and lesions have no specific significance.

Finally, pyogenic lesions are difficult to reconcile with the pathology of poliomyelitis, since these complications have never been observed in cases of poliomyelitis in man or monkey. A disease as definite and self-limited as poliomyelitis must have a definite and fixed etiology.

DR. A. I. RUBENSTONE, Philadelphia: Is it not possible that in immunizing experiments the presence of the brain serum has an enormous influence in protecting against toxicity? I have noticed that an injected virulent streptococcus mixed with a normal serum does exert a protective action.

DR. E. C. ROSENOW, Rochester, Minn.: I am delighted to hear that the strains I sent Dr. Solis-Cohen produced immune bodies which were specific for his strains from poliomyelitis.

Regarding the objections raised by Dr. Bull, I must say that the neutralizing and protective experiments were carefully controlled, and while rather weak virus was used in some of the experiments, highly virulent virus was used in others. One monkey was protected against a five or six-day virus, and a virus producing paralysis in this short time is

conceded by all to be highly virulent. The agglutination experiments were thoroughly controlled and were done in sufficient numbers to exclude error which might be due to variations in agglutinability of streptococci in general.

Regarding the inability of Dr. Bull to obtain the same results in experiments on small animals, I need only to point out differences in the methods used as given in his report. He has grown the bacteria for injection chiefly on the surface of ascites dextrose agar; we have grown them chiefly in deep tubes of ascites dextrose broth with or without tissue. All but 10 per cent. of his injections were made with "streptococci" in the second or third culture generation; the majority of animals in our experiments received the primary culture or emulsions of tonsils, or the pus from abscesses in tonsils, and when pure cultures were injected, painstaking effort was made to obtain the more or less characteristic "pleomorphic streptococcus." His report includes only tonsil strains from human poliomyelitis, and only one strain from fresh brain and cord from a monkey paralyzed with virus adapted to this species; we have obtained positive results with both tonsil and brain and cord strains from fresh material from human poliomyelitis. He made his experiments during cold weather, as the epidemic was nearly over; we made ours in two widely separated localities during hot weather at the height of the epidemic. He injected twelve guinea-pigs weighing from 400 to 500 gm., with negative results; we injected hundreds weighing from 100 to 350 gm., with positive results in many.

Dr. Bull appears to expect "streptococci," without strict regard to their infecting or other qualities, although from poliomyelitis, to protect monkeys against virus. We have already emphasized in a published report that ordinary streptococci do not protect monkeys against virus, but this appeared to be so in two experiments with the pleomorphic streptococcus when in the proper condition.

The methods and conditions of experimentation will have to be more alike before conclusions can be drawn. The fact is that we have proved that in epidemic poliomyelitis there is present in the infection atrium and central nervous system a streptococcus-like organism which has peculiar properties. One of these is the tendency to localize electively in the central nervous system of animals producing lesions and paralysis, a property which it soon loses on artificial cultivation. These facts, together with the ones given in the paper under discussion, bear out the suggestion made previously that the pleomorphic streptococcus or micrococcus in some way bears etiologic relation to epidemic poliomyelitis.

Labor in the Warring Countries.—The National Children's Bureau in the interest of the children and youth of our country has been making a study of labor in the warring countries, under war conditions, and issues timely warning so that the unfortunate experiences of those countries may not be repeated in the United States now at war. French Minister of Munitions Thomas is quoted as saying:

"The experience of war time has only demonstrated the necessity—technical, economic, and even physiologic—of the labor laws enacted before the war. In our legislation secured in time of peace we shall find the conditions for a better and more intense production during the war."

In France and also in England earlier standards of hours, which were relaxed in the hurry of the first months of the war, are being restored, not only, it is said, to protect the health of the workers, but also for the sake of industrial efficiency, present and future. Canada, Australia and New Zealand are said to have maintained their labor standards with little variation. The status of this question in France at present is set forth in the official bulletin (July 31, 1916) on the uses of war as follows:

With the continuance of the war it becomes necessary not only to find the best possible disposition of the forces available for our war industries but also to avoid every cause for exhaustion or weakening of the labor employed in our factories. There is a close relation between the conditions in which we place our workers and the improvement or the increase of our war products. For the very sake of the national defense we must conserve all their physical strength for the workers who are responsible for the manufacture of arms and for the output of our factories.

PROPHYLACTIC USE OF VACCINES IN
THE GREAT WAR*

N. E. WAYSON, M.D.

Assistant Surgeon, United States Public Health Service
WASHINGTON, D. C.

The diseases which are perhaps most detrimental to the efficiency of military bodies are those of the intestinal tract. To the ubiquitous dysentery and typhoid fever are added in Europe the paratyphoid fevers and cholera. It is particularly to combat these diseases that boiling of the drinking water, chlorination of the water supply, disinfection of the dejecta, and separation of the infected with or without symptoms, together with earlier and accurate bacteriologic diagnosis, have been so intensively and thoroughly practiced in the military bodies now fighting. With the manifold exigencies of war, however, these precautions are not sufficient, and the individual fighting unit must be given detailed attention. The failure of these general sanitary measures during this war involving trench fighting, together with previous military experience with antityphoid vaccination, was the incentive for attempts at immunization of the individual. Hence, in March, 1914, France adopted Labbé's legislation for compulsory vaccination against typhoid, and the execution of the law was vigorously prosecuted in October, 1914. The Russian Medical Association proposed similar vaccination in their army early in 1915, and the medical as well as some military authorities of England advocated compulsory antityphoid vaccination in the armies of Great Britain, at the beginning of the war. Reports show that the troops on the west front of the German army were vaccinated against typhoid in the late fall and winter of 1914 and 1915.

Anticholera vaccination has been practiced among those troops which were exposed in endemic areas, such as exist on the eastern front of the war zone.

Antidysentery vaccination has apparently not been widely practiced in the armies of the belligerents.

The problems involved in the attempts to immunize soldiers against these scourges have been summarized and emphasized by Theobald Smith.¹ Some facts to which he gives prominence are:

The object of immunization is to raise the resistance of the body. . . . No kind of vaccination is invariably and completely protective. We may, however, hope to convert a fatal into a nonfatal attack, a mild attack into one so mild as to remain unrecognized, or into complete protection.

The essential factor to be kept in mind is to raise such resistance with the least injury to the subject.

There is a clearly marked distinction between groups of organisms as to the capacity of the hosts to be immunized experimentally.

The object of immunization is to suppress the invader; the problem underlying is to find the precise aggressive weapons which prevent the invader from multiplying.

The principals of the group of organisms which concern us are those to which the hosts lend themselves well to experimental immunization; and one of the precise aggressive weapons is that which gives rise to the immune substances in the host, namely, the antigen.

ANTIGEN

The antigens or vaccines used in the various armies and military bodies have been as numerous as are the peoples at war. The preparation of these vaccines, however, has had for its guiding principle the conservation of all the "immunogenic qualities" of the organisms involved, and the destruction of their infectivity. The latter has necessitated the use of dead or greatly attenuated bacteria.

The attenuation or killing has been variously accomplished by heating, by the application of chemicals (chiefly phenols and ether), by autolyzing, and by sensitizing with an immune serum. Conservation of the "immunogenic" substances (some thermolabile) has been accomplished by using that degree of heat which closely approximates the thermal death point of the organism, erring on the side of too low a degree, and adding some chemical disinfectant as a preservative; by the use of chemicals alone; by autolysis, or by sensitization.

The English have made use of Wright's typhoid vaccine as modified by Leishman. This vaccine is monovalent (containing the one strain of the typhoid bacillus, the Rawling strain). The choice of this strain was dependent apparently only on its adaptability to homogeneous emulsification. The cultures are grown in plain broth for forty-eight hours, heated to 53 C., and made up to contain a 0.5 per cent dilution of compound solution of cresol. The vaccine contains a billion organisms to the cubic centimeter. Later the cultures were grown on agar and emulsified in salt solution.²

The Canadian contingents, at least some of them, were originally inoculated with vaccines made from agar cultures.

The French have used several vaccines, principally those of Chantemesse, Vincent and Besredka. Vincent states that the laboratory at Val-de-Grâce has supplied his vaccine to the armies of Greece, Italy, Serbia, Spain and Turkey. Vincent's vaccine is polyvalent (containing ten strains of the typhoid bacillus). The cultures are autolyzed in salt solution, and killed by exposure to ether for from thirty-five to forty minutes, which procedure extracts simultaneously many of the lipoidal substances contained in the organism. Vincent considers these lipoidal substances febrigenic and responsible in part for the local reactions.

The vaccine of Chantemesse is monovalent, made with agar cultures of from eighteen to twenty hours' incubation, emulsified in salt solution, and heated to 56 C. Tricresol is added to make a final dilution of 0.25 per cent. The vaccine contains a billion organisms per cubic centimeter.

Besredka's method is founded on the employment of a living, sensitized vaccine. The typhoid bacillus is grown for forty-eight hours on agar, emulsified, and antityphoid serum added. After twenty-four hours' exposure to the serum, the living organisms are decanted and washed, and then emulsified anew in physiologic sodium chlorid solution. The use of Besredka's vaccine seems to be limited.

Goldscheider states that Marx's vaccine was used in immunizing one of the divisions of the German army on the west front. This vaccine is apparently a heat-killed culture, emulsified in salt solution, to which phenol is added to make a final dilution of 0.5 per cent. The official German vaccine is made from agar cul-

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Smith, Theobald: Underlying Problems of Immunization, Address before the Congress of American Physicians and Surgeons, 1916.

2. Personal communication to the author.

tures, suspended in salt solution, killed at 55 C., and sufficient phenol added to make 0.5 per cent. Each cubic centimeter contains one third of an oese.

The Russians originally employed Wright's antityphoid prophylactic, but later used a polyvalent vaccine.

The choice of strains is dependent on several factors. Some authors elect the use of a strain from the local epidemic, but all are in accord that strains should be chosen with regard to their antigenic value. Toxicity is considered desirable by some and undesirable by others. This disparity of opinion is based on the question of the relation which toxicity has to "immunogenic" qualities. Estimates of these qualities are at present based on tests of agglutinogenic and protective power in experimental animals.

The experience of the English and Canadians, and thus far of the Americans, shows no preferential efficacy of a polyvalent, as opposed to a monovalent typhoid vaccine.

Dosage.—The dosage of these vaccines varies but slightly in the total amount given, and in the intervals after which the individual doses are administered. The total amount inoculated ranges from 1,600 million to 4,000 million bacteria, in the practice generally in vogue, and the intervals of dosage vary from five to eight days. While this is stated as the practice, it must be recalled that many of these vaccinations are most irregular in the periodicity of dosage, and incomplete in the number of doses, and consequently in the total amount administered. This irregularity and incompleteness of the vaccination occurs through military exigency, fabrication and illness on the part of the subjects, and, to some extent, on a lack of appreciation of the necessity for thoroughness by the sanitary officers.

The number of doses varies from two to four or more. It is the opinion of several authors who have made analytic studies of the effects of the vaccination that three at most, and frequently two inoculations are as effective as four or more.

There seems, however, to be a growing tendency to increase the total amount of antigen, in the belief, as Weber concludes from his findings in experimental work, that "the mass of vaccine injected is important, not only from the point of view of the solidity of the immunity, but from the precocity of its appearance; the more the dose is increased the more sure is the animal inoculated to have an immunity which will resist infection."

Fiessinger, who writes from an apparently large experience, concludes his studies with the admonition, "Do not vaccinate lightly."

Widal and Salimbeni recommend large doses, even as much as 10 billion organisms at a single dose, and conclude from their experimental observations on man that the reaction is not more severe than with lighter dosage. Their advocacy of a single injection of a large amount is with the obvious appreciation of the necessary irregularity and incompleteness of a vaccination divided into several administrations, over periods which permit troops being moved great distances from the place of initial inoculation.

Reinoculation.—The period after which reinoculation is practiced has been dependent largely on Wright's observations in India, and has varied usually from two to four years. Experience has apparently been contrary to inoculation at such long intervals, and the present practice seems to be a revaccination at from eight months to a year. No reports of a

second revaccination were found, although there are reports of individuals who gave an anamnesis of typhoid at 16 years of age, in their early twenties, and again in the army in their early thirties.

VACCINATION

Methods of Vaccination.—These are chiefly parenteral, though Lumière and Chevrotier have advocated, and used enterally, gelatin-coated pills of a dried mixed polyvalent typhoid-colon vaccine. This method has not yet had an extensive use, but the English commission has reported unfavorably concerning its efficiency. The advantages of such a method of administration are self-evident, provided it were effective.

The technic of the parenteral administration is that of hypodermic injection, practiced aseptically. The sites most frequently chosen are the subclavicular, deltoid and subspinous areas. The skin is painted with tincture of iodine, or washed with alcohol, 60 per cent., and injection is made subcutaneously. With a battery of a few syringes and several needles, which can be intermittently boiled, several hundred men can be inoculated within a short space of time. Rubber-capped phials or bottles are used as containers for the vaccine. The Canadians, having exhausted their supply of rubber caps, used finger cots rolled up to make a strong collar for the neck of the bottle, and paraffined these for storage and shipment. Hermetically sealed ampules are also used as containers of the vaccine.

Results of the Vaccination.—The results of these various vaccinations may be analyzed from the standpoint of the immunization problems emphasized by Smith. In other words, what are the immediate effects on the host, and what are the effects on the course of the disease, and on its dissemination, since there is no absolute immunity?

Reaction of the Host.—The effects of vaccination vary, from those of local reddening and edema, persisting for twenty-four hours and progressively disappearing, to a severe general reaction, marked by shock and collapse. The percentage of general reactions is perhaps well illustrated by the observations of Maurange on 39,215 injections; he found the results given in Table 1. As will be noted, he does not define the various grades of reactions, but the high percentage showing no reaction would suggest that the operation was comparatively harmless.

TABLE 1.—PERCENTAGE OF REACTIONS OBSERVED BY MAURANGE

Types of Reaction	Typhoid Percentage	Para-B. Percentage
None	92.23	98.59
Feeble	6.18	1.41
Moderate	1.40	0.00
Pronounced	0.19	0.00

The general reaction is usually accompanied by fever, the most common rise being to 38 C. (100.4 F.) or slightly higher. The symptoms occur within a few hours, beginning with depression, headache, anorexia, pains in the joints, and diarrhea. The most persistent of these symptoms is headache; but malaise frequently lasts forty-eight hours, and may be accompanied by anorexia. This degree of reaction is common in from 4 to 10 per cent. of robust men.

Severe reactions are usually attended by fever of several degrees, and by one or more of the following symptoms: rigors, vomiting and diarrhea, catarrhal icterus, prostration and collapse. These reactions may

persist for as long a period as fifteen days, and may occur after any one of the individual inoculations. The percentage of occurrence, however, is very small. To avoid these reactions it is necessary to be alert as to the contraindications to the vaccination.

Contraindications.—The age of the subject is of but little importance as a contraindication. Maurange states that he has carried out inoculations in individuals of from 4 to 46 years of age. Children show no reaction.

Contraindications may be divided into physiologic and pathologic groups. The most frequently occurring physiologic condition to be regarded as a contraindication is fatigue. It has been noted by most authors that men who are worn out from work and lack of food are prone to have a more severe reaction.

Among the pathologic conditions to be considered are angina and bronchitis, together with malaise or any of the prodromes of acute or chronic infections. The thermometer is here a valuable ally.

Patients with paludism and chronic syphilis need not be exempted from vaccination; but old tuberculous cases merit careful examination, and if the least doubt exists, owing to a history of hemoptysis or pleurisy or to the findings of anemia, rapid pulse, or fever, the patient should not be vaccinated.

Organic diseases to be enumerated as contraindications are noncompensating renal disturbances, diabetes, noncompensating myocardial and endocardial involvements, aortitis and arteritis, cachexias, gastro-intestinal disturbances, and alcoholism. Contraindicatory signs are high blood pressure, albuminuria, tender liver, and abnormal pulse findings.

A severe reaction to a previous inoculation should be considered a contraindication. There is, however, no objection to the administration of the first inoculation during the incubation period eight days immediately previous to the onset of typhoid fever.

With these contraindications in mind, the precautions to be observed in conducting the vaccination are evident, but may perhaps be emphasized with advantage.

Precautions.—Chief among these precautions is rest, for at least two days, for men vaccinated. Vincent attributes the lack of severe reactions in the Japanese experiences to the routine of two days' rest in bed following the injection, and the selection of the men vaccinated. A selection of men can be rapidly made by a query as to how they feel. Even this precaution serves to prevent the inoculation of those with malaise without fever who are in the incubation stage of acute infectious diseases, such as meningitis. Men concerning whom there are doubts should be examined carefully, including an interrogatory, observation of evening temperature, physical examination of the heart and lungs, and a urine examination. In one series, a routine urine examination of 6,040 young men revealed forty-four unsuspected albuminurias.

Goldscheider, Vincent and Maurange severally recommend, in doubtful cases, a test dose of 0.25 c.c. of the vaccine.

Maurange uses the pulse rate in repose as a criterion for the vaccination of tuberculous subjects, vaccinating those with a pulse rate of from 70 to 80, and not vaccinating those with a pulse rate over 90. He states that he has immunized 127 tuberculous patients without untoward results, and that persons with joint and bone tuberculosis stand the vaccination well.

The failure properly to select men for inoculation has resulted in some untoward complications following the vaccination.

Complications.—The complications noted have been those of arthritis, nephritis accompanied by hematuria and uremia, and pulmonary and intestinal involvements. The most frequent pulmonary disturbance was that of a dry, diffuse bronchitis. In several cases there was a recrudescence of pulmonary tuberculosis in which the fever remained high for a long time. Chantemesse has emphasized the occurrence of the recrudescences of tuberculosis during antityphoid immunization.

The severe reactions and untoward complications attendant on the neglect of the precautions emphasized have done much to retard the general adoption of a most efficacious prophylactic measure. It should be considered that not every one can be vaccinated against typhoid fever.

Among those, however, even in the presence of contraindicatory findings, who have been carefully vaccinated, the results are most favorable in the effect on the course of the disease, and perhaps on its dissemination.

COURSE OF THE DISEASE

The effect on the course of the disease is well established. The duration of the fever is lessened. The percentage of patients showing a temperature of 39.6 C. (103.3 F.) or over is lessened by about fourteen, in a study of 300 cases. The structure of the fever curve is the same in the vaccinated as in the nonvaccinated; but the duration of the fastigium is shortened, and in the vaccinated, it is more often absent. The fever curves of the vaccinated are more frequently those of light cases. A remitting form of fever is, however, more common in the vaccinated; also a condition of typhoid infection without fever is more common. This condition is one in which the patient's fever disappears, but malaise, diarrhea and rose spots persist.

The general condition of the patient is better in the inoculated than in the uninoculated. The toxic cerebral symptoms are lessened. The heart, pulse and respiratory activity are more favorably maintained. Complications are rarer in the inoculated, especially heart muscle affections, phlebitis and enteric hemorrhages, otitis and other purulent processes. There is no lessening of the recurrences by inoculation. Convalescence in the inoculated is frequently strikingly light and rapid.

Two inoculations seem to affect these changes more favorably than one, and three more favorably than two; four inoculations seem to have no greater effect than three. It is to be noted that these modifications correspond closely with the clinical pictures of paratyphoid infections; hence, a bacteriologic diagnosis is necessary for accuracy in the determination of the effect that antityphoid vaccination may have on the course of typhoid.

According to several investigators, who have made careful studies of agglutination curves in typhoid infections, among both the nonvaccinated and vaccinated, the determination of both diagnosis and immunity is most uncertain by this serologic test. The serums of many patients never agglutinate the infecting organism, and others lose the power to agglutinate before convalescence. Intercurrent febrile conditions, such, even, as angina and rhinitis, are sufficient to increase the agglutinating titer in the serum of the

vaccinated. Vaccination after a previous case of typhoid, even as remote as twelve years, tends to increase the agglutination titer of the serum. Hemoculture has been adopted as the safest criterion for the determination of the infection, and no test of immunity, other than exposure and reinfection, has been evolved. Positive findings by hemoculture are less frequent in the vaccinated.

The effects on the dissemination or morbidity of the disease cannot be shown with any accuracy from the reports which are at hand, and only a compilation, during times of less stress, of the experiences of the many military medical officers involved in this study will enable us to form an intelligent opinion. The reports submitted are fragmentary, usually emphasizing the effect on typhoid morbidity and mortality of one, two or three inoculations, in contrast with the nonvaccinated, without including any reference to the percentage of incidence in the entire division or corps of men, or even to the percentage of vaccinated in the nontyphoidal affections. Further, there has not been a scientific separation of the typhoid fevers, in many of these reports. However, in such careful and complete analyses as have been made, there seems to be a 60 to 70 per cent. protection against infection.

The mortality has been even more reduced, since the case mortality is about three times as great in the nonvaccinated as in the vaccinated.

English reports state that up to January, 1916, 1,365 cases of typhoid have occurred in the British army in France and Belgium. Further, up to 1916, the death rate for typhoid among the British troops in active service was less than that for the male civil population of similar age in England and Wales.

In those bodies of men concerning whom there are complete statistics with regard to the prophylactic use of the typhoid vaccines, such as in the Japanese marines and seamen, one finds a reduction in morbidity of approximately 66 $\frac{2}{3}$ per cent., and an equally great reduction in mortality.

As indicated above, final conclusions cannot be drawn from the reports at hand. One of the great disparities in these reports is the failure to indicate what is meant by typhoid fever.

The separation of typhoid fever into three distinct infections was effected a long time ago, but the prevalence of paratyphoid, and the interrelations of typhoid and paratyphoid have become manifest much more recently. And only during the war have the paratyphoid infections become of great importance.

Widal and Courmont regard paratyphoid among the troops as the most prominent epidemiologic fact of the war.

Lehman, in a review in 1916 of our knowledge of the geographic distribution of paratyphoid A infections, considers this variety of paratyphoid to have had, previous to the war, a distribution relatively limited, in comparison with typhoid. He considers it a disease of tropical and subtropical Asia and Africa, and is dubious concerning the reports from Europe and America of the presence of the organism in food, in the intestinal canal of animals, in water, and in milk. He believes that its dissemination is chiefly through the medium of "carriers," especially as it usually runs a light course, and presents many ambulant cases.

The expeditionary forces at the Dardanelles had a considerable incidence of paratyphoid infections among them.

Landouzy, in December, 1914, reported a predominance, in certain districts of France, of the paratyphoid fevers over the typhoids.

Bernard and Paraf, in an analytic study, reported in 1915 a great preponderance of paratyphoid infections in the antityphoid vaccinated over those in the nonvaccinated, presenting the remarkable figures given in Table 2. Unfortunately these authors do not give the relative proportion of the normal contingents who were given the antityphoid vaccination. Rist, however, in 1916 reported a careful analytic study of a small series of 215 cases of typhoidal infection with 621 controls of nontyphoid diseases, among which he determined the percentage of antityphoid vaccinations. *He finds that the percentage of protection afforded against infection with typhoid is offset by the same percentage of increase in paratyphoids.* This percentage is identical, to within a figure in the second decimal place.

TABLE 2.—PREPONDERANCE OF PARATYPHOID INFECTIONS OVER TYPHOID

	Cases	Vaccinated	Non-vaccinated
Typhoid (Eberth bacillus) ...	77	45	32
Paratyphoid	248	222	26

Labbé also reports in 1916 the figures concerning antityphoid vaccination given in Table 3.

TABLE 3.—PROTECTION AFFORDED BY ANTITYPHOID VACCINATION

	Cases	Vaccinated	Non-vaccinated
Typhoid (Eberth bacillus) ...	241	19	222
Paratyphoid	150	120	40

These French experiences, together with those of the expeditionary force at the Dardanelles, have shown the relative futility of vaccinating with the simple typhoid vaccine, and have resulted in the serious consideration, and to some degree, adoption by the French of a triple vaccination, simultaneously administered, or of a triple mixed vaccine.

MIXED VACCINES

Experimentation by Widal and others has shown that vaccination of animals with equal parts of the three heated vaccine viruses (typhoid, paratyphoid A and paratyphoid B) produces in their blood evidences of simultaneous immunization against the three infections.

Kabeshima reduced the morbidity of typhoidal fevers among the Japanese marines by injecting separately the vaccines of typhoid, and paratyphoid A and B. He states that the simultaneous injection of the three vaccines was not attended by a greater percentage of severe reactions in experimental animals or men than was the injection of the simple typhoid vaccine.

Independent of the vaccinations practiced with this method against the three diseases, the Japanese physicians have had recourse to another preparation, a triple vaccine against typhoid and paratyphoid A and B prepared by mixing in equal parts each of the three heated viruses.

From his experiments on guinea-pigs with the use of this mixed triple vaccine, Kabeshima has established the fact that these animals acquired a resistance to the virus of each of these diseases equally as strong as when the vaccinations were made with the separate vaccines.

With respect to man, the injection of the triple mixed vaccine has been effective aboard the Japanese war vessel *Katori*. What the results were in these sailors, from the point of view of effectiveness, after vaccination with this mixed triple vaccine, the author does not state; he speaks only of the reactions which were caused by this triple method.

Reactions and Inconveniences of This Vaccine.—This combination of the three vaccines raises another question.

The persons who receive the triple vaccine, according to the Japanese authors, do not show local or general reactions appreciably stronger than those caused by a dose of the simple vaccine. It is known, however, that these reactions last at least two days, and that the number of the vaccinated who show a fever between 39 and 40 C. (102.2 and 104 F.) after the triple vaccination is twice as large as after the simple vaccination. According to Kabeshima's figures, the proportion is about 5 per cent. of those inoculated, with the use, however, of six times the amount of bacilli per cubic centimeter as in the simple vaccinations.

Vincent, in describing previous experiences of the French with a triple mixed vaccine, and commenting on the procedure, with the view of adopting a method of triple immunization, gives a comprehensive criticism of the problems involved. He says:

In 1913, and also in 1914, it was further used at Oudjda under the direction of Dr. Grenier; the respective proportions of the three antigens was in 1913: typhoid vaccine, two-thirds; paratyphoid A or B, one-third; in 1914, equal parts of these. . . .

The immunity conferred on men, to the number of more than 4,000, who have received the mixed vaccine, was shown to be as effective against paratyphoid fevers as against typhoid. The same results have been reported in the Italian army.

It has been clearly established, by observation made in man, that the protective effects due to the three mixed vaccines are not neutralized. They are superimposed in the same way when one vaccinates simultaneously against typhoid and against smallpox, a common practice in France, or against cholera and smallpox. . . .

It may be stated here, that if a really effective immunizing result is to be obtained with the mixed vaccine, it is self-evident that it is necessary to inject simultaneously the necessary dose of each vaccine in order to produce the immunity against each of the three diseases.

It follows, then, that if one seeks to obtain at once the triple immunity, the advantage can be counterbalanced by a practical inconvenience, not at all to be ignored, namely, the increase of the number of local and general reactions.

Such is in fact the factor which may hinder the generalization of the immunity with a mixed vaccine.

Dr. Grenier has stated to me that in the last attempts which were carried out at oriental Morocco in 1913 and 1914, the reactions in the soldiers vaccinated with the mixed vaccine were moderate, hardly more severe than those caused by antityphoid vaccine alone; but for vaccination a selection of the men had to be made, those who were well rested.

Under the present conditions, in soldiers' recently enlisted exposed to the fatigue of military initiation, marches, daily drills, night marches, or those stationed in the trenches or in the neighboring camps and exposed to the conditions of war, it appears wiser to make series of the antityphoid vaccinations and the antiparatyphoid, except under special conditions which permit the mixed vaccination.

This practice of successive vaccinations has been carried out a large number of times, notably at Val-de-Grâce. Those who have been successively injected with the different vaccines have not complained of fatigue and have not shown

abnormal febrile reaction. They have appeared regularly for the full series of injections.

Moreover, it is possible greatly to simplify this practice. A good immunity can be obtained with two injections of antityphoid vaccine. This reduced vaccination, made with doses a little increased, was practiced on my recommendation on a large number of men at the beginning of the war. It has been very effective. These two antityphoid injections can be then followed by two or three injections of antiparatyphoid vaccine A or B, or A plus B. This last mixture, which contains only two vaccines is well supported.

We endeavor, for this reason, to extend the employment of the antiparatyphoid vaccine when it is necessary. In special cases, of which the vaccinating surgeon is the best judge, the mixed vaccine can be used. In a general way, it appears preferable, especially under the conditions stated, not to extend this practice systematically; especially when it is possible to make successive vaccinations.

Widal and Chantemesse concur in this opinion on the use of a triple mixed vaccine. (Incidentally the method of separate triple vaccination is that practiced in the American army.)

The paratyphoid fevers are common in the Italian army, and pursuant to the advice of Vincent this army has been using his etherized, mixed, triple vaccine since 1912.

Tarrasevitch states that the Russian army made use of simultaneous vaccination against the three typhoids in the later vaccinations; and further, that in Moscow, 25,000 men received simultaneous vaccination against the typhoids, cholera and smallpox with only 5 per cent. presenting a moderate or severe reaction.

Castellani states that 170,000 Serbian soldiers were vaccinated with a combined tetravaccine recommended by him, which included cholera together with the three typhoids. The vaccines were prepared by killing twenty-four hour agar cultures suspended in salt solution with phenol.

CHOLERA

Reports on the use of anticholera vaccination are confined largely to experiences on the eastern front.

The anticholera antigens are prepared by heating suspensions of twenty-four hour agar cultures in physiologic sodium chlorid solution and by phenolizing these; or only by phenolizing the suspensions, adding phenol to a strength of 0.5 per cent. The official German vaccine contains two oese of culture in a cubic centimeter. Killed organisms are always used, as opposed to Haffkine's method of vaccination with attenuated live organisms; strains are chosen from the local epidemics.

The vaccine contains usually 2 mg., wet weight, of organisms to the cubic centimeter.

The dose administered is 1 c.c., followed in from five to seven days with a second dose of 2 c.c.

Anticholera vaccination has been made compulsory in the Austrian army, and provisions have been made for vaccinating the civil communities in the area of military operations. Reinoculation for cholera has been instituted after three to four months, since the immunity is evanescent, apparently lasting only from six to seven months.

Bujwid, who used a sensitized typhoid vaccine and phenolized cholera vaccine, notes that the typhoid reaction is more severe than the cholera reaction, the latter producing a painful swelling in a few hours, with a rise in temperature to 38 C. (100.4 F.), rarely to 39 C. (102.2 F.), and is of shorter duration than that of the typhoid.

Bujwid states that anticholera vaccination is not as efficient as antityphoid vaccination. Hoffman, however, reported that among German troops, when advancing in the regions of the Bug and Rokitano marshes, the mortality among the uninoculated was from 35 to 50 per cent., while among those inoculated it was from 0 to 20 per cent.

Kaup (Austrian) stated that after the soldiers had been inoculated, the morbidity was from 1 to 5 per cent., though the exposure was great. The course of the disease was mild, and the mortality was from 0 to 20 per cent., as opposed to from 40 to 60 per cent. in the uninoculated.

A Polish newspaper, in commenting on a winter epidemic of cholera in Poland, remarks, "Cholera seems to be a disease which attacks the civil population and spares soldiers."

While anticholera vaccination has been restricted largely to its use among troops operating on one front, the results obtained are favorably comparable to those obtained from antityphoid vaccines.

Concerning the third important intestinal disease, dysentery, reports are very sparse.

DYSENTERY

Antidysentery vaccinations have apparently not been widely practiced.

Hever and Luksch report their use in a small epidemic in a civil community in Germany. The strains found were both the Shiga-Kruse and the Flexner. Their results are not convincing.

The English have been experimenting with several chemicals for the detoxication of the Shiga-Kruse types, and have some preparations of vaccines made in this manner.

Castellani recommends a polyvalent vaccine containing the strains of Shiga-Kruse, Flexner and Hiss-"y," to be prepared by killing twenty-four agar cultures suspended in salt solution with 0.5 per cent. phenol, and administering doses of 125 million organisms, contained in 0.5 c.c. of suspension.

Hever and Luksch found that children bore the antidysenteric vaccination well with slight or no symptoms, and that no untoward effects were produced in adults.

Landouzy warns us that much of the "trench diarrhea and dysentery" is caused by paratyphoid infection, in which diarrhea is practically a constant finding.

CARRIERS

The modification of the usual course of these diseases, to that of a mild febrile disturbance, with many ambulant cases, or to one without symptoms, recognized only by a routine bacteriologic diagnosis, has introduced another problem for the military and for civil communities—the "carrier" problem. Many of these vaccinated patients become carriers, especially those vaccinated against cholera.

Kaup, who had a large experience with cholera, warns of the danger of the carrier, especially with regard to his transportation to prison camps and to civil communities. He states that many carriers develop in new troops vaccinated, and coming to the front in the presence of cholera.

Rosenthal and Werz, who made some studies in the German army, found nearly 2 per cent. of carriers in a general examination of 686 wounded. In 248 cases examined, the cholera vibrio was found in 3 per cent. of those inoculated twice. Of the carriers, nine

showed no agglutinins in their blood, and but two a weak reaction. They found difficulty in distinguishing between the carriers and the light cases.

SUMMARY

The present war has emphasized the inadequacy of general sanitary measures, without individual immunization, in the prevention of the infectious diseases of greatest military importance, namely, the intestinal infections.

The problems in this immunization are those common to all artificial immunization, modified by the readiness with which the hosts lend themselves to the reaction to the group of organisms involved.

The antigens used during the war have varied somewhat in respect to preparation and dosage. However, they have had as the basic principle for their preparation the choice of that method which conserves the immunogenic characteristics, with a destruction of their infectivity.

There seems to be a tendency toward increasing the dosage of the antigenic principles, based on the facility of administration of the entire dosage, at one inoculation, and on the belief that the mass of vaccine injected is important.

The period of immunity, after these vaccinations, is in general shorter than has been supposed hitherto, as determined by Wright's observations in India.

The methods of vaccination practiced are both enteral and parenteral. The former method is of limited usage, and does not at present promise good results.

The parenteral injections are made subcutaneously, and can be carried out very rapidly. With the proper selection of robust men, preferably under 40 years of age, this method is unattended by severe results.

The results of the vaccination may be variously considered from the standpoint of the effects on the subject, on the course of the disease in the host, and on the frequency with which the disease attacks, and on its rapidity of dissemination.

The subject reacts locally by redness and swelling, and, in a small percentage of patients vaccinated, by a general reaction.

The general reaction may be light, consisting of headache, anorexia, and slight fever; or severe, with a mild reproduction of the typhoid fever syndrome, or with more toxic symptoms.

These severe reactions, as well as complications attending them, can be largely avoided by attention to contraindicatory signs and conditions.

Such contraindications are both physiologic and pathologic. Chief among the physiologic conditions is fatigue; and among the pathologic states are those conditions prodromal to acute and chronic infections, together with organic, respiratory, renal or circulatory involvements, and systemic diseases.

Failure to adopt the precautions of rest following vaccination, and of a selection and examination of men about whom there is doubt concerning their fitness for vaccination, may lead to such complications as nephritis, pulmonary and intestinal involvements, and even the recrudescence of a subsiding or latent tuberculosis.

The effect on the disease is to shorten its duration and to mollify its intensity. While such positive statements cannot be made with regard to the protection afforded against infection, there is sufficient evidence

to show that both the morbidity and the mortality are greatly decreased.

The diagnosis of typhoid fever has been made more difficult by vaccination, since the serologic reactions usually found are altered by vaccination. Hemoculture affords the best criterion for diagnosis, and here again vaccination has interfered by making the cultivation of the causative organism from the blood apparently more difficult.

Careful studies have shown that, with the separation of the typhoid fevers, there has been a tremendous prevalence of paratyphoid infections current, with reduction of infection by the bacillus of Eberth following vaccination. Since no protection seems to be afforded by simple antityphoid vaccination against the paratyphoid infections, triple immunization is recommended and practiced by simultaneous injection of vaccines of each of the organisms, or by injection of a mixed vaccine containing all three.

The method of triple immunization has been found to be efficient in reducing the morbidity and mortality from these fevers in the Japanese experience, and in that of the French at Morocco. The reactions attending this method are not of much greater severity than those of the simple antityphoid vaccination.

Anticholera vaccination has been limited to the troops engaged on the eastern front. The vaccines have been made of killed cholera vibrios, of local strains. They are administered in two doses, and are productive of less severe reactions than the typhoid vaccinations used on the Austrian eastern front.

The immunity is more evanescent, necessitating reinoculation after an interval of from three to four months.

The results of the vaccination were favorable on the course of the disease, its morbidity and its mortality.

Antidysentery vaccination has been but slightly practiced.

The modification of the course of these intestinal infections, to that of a mild febrile disturbance, has produced many "carriers" and has thereby created an additional serious problem for both the military and civil communities.

ABSTRACT OF DISCUSSION

DR. FRED I. LACKENBACH, San Francisco: Will Dr. Wayson explain the matter of dosage? If, in using mixed vaccines, he doubles or trebles on the dosage over the single strain? Also, if by "mixed" vaccines he refers to the *Bacillus paratyphosus* A and B, as well as the *Bacillus typhosus*? Also, has the United States government adopted the use of the mixed vaccines in its practice?

DR. J. F. ANDERSON, New Brunswick, N. J.: I should like to ask Dr. Wayson if the Besredka vaccine was a living vaccine or a killed vaccine, and the periods of potency of the vaccine used.

DR. HERMAN SPITZ, Nashville, Tenn.: Regarding Dr. Wayson's statement that the use of a vital reaction is unreliable in these conditions, I should like to report that in a series of some 200 patients (including both sexes and all ages) who received the prophylactic vaccine, the Widal reaction was uniformly negative. The vaccine used consisted of two strains of *B. typhosus* and one each of *B. paratyphosus* A and B. Three and four doses were given. I want to ask Dr. Wayson if he can offer some explanation why the Widal is negative.

DR. WALTON F. DUTTON, Tulsa, Okla.: For the benefit of those who practice in malarial districts I would cite one case. Last summer I treated a patient with estivo-autumnal fever with quinin. The patient recovered from the attack of malaria, but did not appear to improve in general health. The

condition simulated a pretyphoid state. Typhoid prophylactic vaccines were used and the patient began to improve rapidly and made a good recovery.

DR. CARL C. WARDEN, Ann Arbor, Mich.: I believe that ultimately the solution of the healing of infectious diseases will be attained through these vaccine therapies; and I believe the most recent advances are those outlined by Dr. Miller today. The question how vaccines work comes up. Recent studies on the toxicity of human and other serums have shown the following facts: that blood lymph or whole blood or serum or plasma may be rendered toxic by almost any substance brought in contact with it. In other words, the serum may be rendered toxic not only by bacteria, but also by certain protein solutions, by substances such as agar, starch, charcoal, kaolin or any other substance which possesses surface. Studies show that a serum so rendered toxic will produce certain symptoms in some animals but not in other animals into which the serum is injected, or will reproduce the same reactions in the body of the animal as in the diseased body. These are anaphylactic reactions and may be produced in any degree. This seems to indicate that the action of the substance is a physical one, as the same reaction may be produced by any substance. Two serums may differ as to accomplishing the same thing because of variation in the precipitation of the globulins. The injection of vaccines into the human being apparently excites a definite reaction which must be regarded as anaphylactic shock, and this anaphylaxis is part of the immune reaction going on in the body as a result of infectious disease; but that is not all of the immune reaction; accordingly, such treatment as is applied to infectious diseases will yield a certain percentage of good results in a large number of cases, but will not cure all cases of infectious diseases. Granting that these reactions are part of the grand immunity process, we have evidence to show that a great many so-called immune reactions are also part of the same grand immune reaction. Precipitins and agglutinins, complement fixation and opsonins and anaphylaxis may be regarded as representing different phases only of the same large phenomenon of immunity. If we consider such reactions as precipitins or complement fixation, we can show that they occur between three substances—the antibody, the complement, and the antigen which permits a definite reaction to occur with the adsorption of complement. In syphilis and gonorrhea, to which I particularly refer, we have such immune reaction depending on the specificity of an appropriate antigenic substance of a fatty nature. When experimentation on infections shall have progressed further, then the application of vaccine therapy to infectious diseases will start on its right course.

DR. NEWTON WAYSON, Washington, D. C.: The dosage of mixed vaccines varies considerably in practice. There is, however, the usage of the same proportion of each organism, simultaneously given, in a maximum of 500 millions in the first dosage, 1,000 millions in the second. There is a tendency to make the dosage larger, rather than smaller. The United States practice I cannot give you authoritatively, but I am informed that all troops will be vaccinated against typhoid and paratyphoid, and the mixture of paratyphoid A and B and typhoid will represent one third and two thirds, respectively. It will be a simultaneous triple vaccine and not a simple mixed vaccine. The simple typhoid vaccine will be given in the usual dosage. By mixed vaccine I mean a vaccine composed of typhoid and paratyphoid A and B. By triple simultaneous vaccine, I mean vaccines by three injections: one of the typhoid, one of the paratyphoid A, and one of the paratyphoid B. The Besredka vaccine is not a killed vaccine. The period of potency of vaccine is uncertain. Weber and Wassermann, who have done considerable experimental work, think a vaccine should age three weeks, and that beyond this, the age may be almost indefinite without affecting potency. Their experimental work was on laboratory animals.

The unreliability of the Widal reaction is dependent on two factors. I cannot explain why the agglutinins disappear; but it has been found on careful analyses in typhoid fever that the Widal reaction occurs at very irregular periods,

appearing as late as the eighteenth or twentieth day of the disease, as early as the seventh or eighth day, and sometimes never occurs. Also, first to occur may be a predominant agglutination for the typhoid bacillus, later a predominance for the paratyphoid A or B, and later a rising agglutination for the paratyphoid A or B bacillus. A second factor which makes the diagnosis unreliable is that a patient vaccinated against typhoid may show toward the typhoid bacillus a high agglutination titer, which disappears, to return when the patient is affected with a slight bronchitis.

WAX PARAFFIN FILM IN THE TREATMENT OF BURNS*

M. L. EMERSON, M.D.

Chief of Surgical Staff, Samuel Merritt Hospital
OAKLAND, CALIF.

Following the suggestion of Dr. D'Arcy Power, and using his formulas for a film, I have completed treatment in 100 out of about 250 cases treated. After the hundredth case I ceased to record the histories. The treatment was used in certain selected cases in which it seemed most indicated. The patients were selected from my service at Merritt Hospital and the Union Iron Works. Brush burns or superficial abrasions or epithelial scraping of skin surfaces are included in this number, burns from electric current, fuse explosions, hot rivets, molten metal, oil flames, hot bitumen, steam, scalds and dry heat, as well as granulating surfaces. Burns are usually localized, while the scalds are more extensive. Their pathology being the same, the treatment will be considered together. For the sake of brevity, these various burns will be considered under three headings: first degree, those which involve the superficial layer of the skin characterized by redness without vesication; second degree, those which involve the corium and are characterized by the formation of vesicles and bullae, and third degree, those which destroy the entire skin and partially or completely carbonize fat, fascia, muscles and underlying structure.

FIRST DEGREE BURNS

CASE 1.—J. R., rivet heater, had a flash burn on the side of the neck from a sudden explosion of crude oil. The burn extended from the maxilla down to the shirt collar from the front of the neck to well back under the ear. The first treatment consisted of cleansing the part of grease and dust particles with 0.5 per cent. iodine in benzin. The part was then thoroughly dried with a small warm air electric blower, such as hair dressers use for drying the hair. A very fine filament of wax was now sprayed over the surface. No other dressing was applied. The application relieved the pain. After three similar applications at intervals of twenty-four hours, the patient was discharged as cured. The film in this type of case must be very thin. A thicker coating without a gauze dressing will curl up and peel off.

CASE 2.—A similar burn covering the entire back of the neck was treated in the same way, and the patient was discharged after two applications.

CASE 3.—A flash burn the size of a dollar on the left cheek was given three applications, after which the patient was discharged.

There being no broken surface and no chance for infection, the type of burn illustrated in Case 2 generally is cured in a few days with any of the recognized treatments. Carbonized carron oil, phenolated grease or petrolatum, starch and soda, anything that

excludes the air, generally gives relief. These burns are seldom covered by dressings unless they are on the hands.

SECOND DEGREE BURNS

These are the most common, over 70 per cent. being tabulated out of the entire group. The majority are infected, especially if oils and medicated grease are applied as a first dressing. Carron oil, composed of equal parts of lime water and sweet oil, is popular among mechanics, but it is the bugbear of the surgeon. Many patients treat themselves first, and then come to the clinic for treatment of the infection.

CASE 4.—A second degree burn on the anterior surface of the leg, 3 by 4 inches square, was treated for seven days by moist dressing. The skin was thoroughly dried, every pocket of superficial skin was removed with cuticle scissors, and the wax film was applied. A considerable discharge looking like yellowish pus followed the first dressing, but this soon cleared up.

The continued moisture collecting under the wax seems to be one of the great disadvantages. However, this wound healed kindly under twenty-seven days' treatment of daily wax application, which I consider a fair result. It would probably have healed just as quickly under a moist dressing of physiologic sodium chlorid solution, sodium bicarbonate solution or a 1 per cent. watery solution of picric acid, the advantages of the latter being that the dressings can often go from two to five days without being changed.

CASE 5.—A brush wound covering the entire outer aspect of the right arm from the shoulder to the elbow, superficial in character yet one which should be classified as a second degree injury, showed but little contusion; the superficial abrasion was caused by the breaking of an air hose, causing a friction rub over the outer aspect of the arm denuding it of the superficial epithelium. The wound healed completely under six daily applications of wax.

This I consider an ideal case for wax treatment. This type of wound is not so serious as it looks, especially if the deeper structures of the skin have not been traumatized, and there is no extensive hemorrhage from the surface. They always become infected if grease is applied, and it is always tempting to place a medicated salve over this type of injury. It requires two or three weeks to heal up the infection, especially if the grease application is continued. These wounds do well under a dry application of dusting powder, one part of salicylic acid to three parts of boric acid. However, the wax worked admirably in this case, probably better than any other form of treatment would have done.

CASE 6.—A foot burn covering the anterior aspect of the foot from the ankle to the toes, while classed as a second degree burn, presented three or four small areas that were much deeper which seemed to be very slow in healing. Many of these burns could be classified as first, second and third degree. In these small areas I placed small pledgets of gauze saturated with phenolated camphor, and then covered the entire area with wax. This worked nicely. The burn healed under fourteen daily treatments of the wax film.

CASE 7.—A burn on the back of right hand, the size of a silver dollar, seemed very stubborn under the wax treatment, requiring thirty-seven daily treatments. I imagine it would have healed much faster under a picric acid or boric acid compress.

The great majority of all patients with burns continue working. One can well imagine how slow the healing must be in a malleolus burn the size of a silver

* Read before the Alameda Medical Association.

dollar, especially when it approaches the third degree. Perhaps, therefore, in recording the results of these cases, I am not doing justice to the wax film or any other method of treatment, because the parts are not placed at rest.

CASE 8.—An extensive forearm burn from hot bitumen involved the posterior aspect of the arm from the wrist to the elbow. The bitumen film was peeled off, and the superficial blistered skin removed. The arm was washed with warm phenolated solution, and then cleansed with 0.5 per cent. iodine-bezin solution. A moist compress of neutral solution of chlorinated soda was changed twice daily for four days. The wax treatment was then applied and continued for sixteen days. The wax was left on for twenty-four hours. Each day there was a free puddle of yellowish pus-like material of seropurulent character under the wax film. This puddle of exudate was so abundant that I was compelled to discontinue the treatment. Each day the wound was cleansed. A moist compress of neutral solution of chlorinated soda was placed over the surface for ten minutes, then the surface was glazed dry with the hot air blower, and the wax was applied. The wax treatment in this case continued for sixteen days without any apparent improvement anywhere on the wound. I then placed moist picric acid gauze on the arm, and had the patient return in forty-eight hours. Parts of the wound were now dry. Some were still moist. I renewed the picric acid gauze and directed him to report in three days. One half of the wound was now dry, covered with a dry yellow film of stained epithelium. The next dressing showed the wound covered with dry epithelium, except a patch the size of a dollar which was covered with granulations. This was the condition of the wound after thirty days' treatment. The patient then moved to San Francisco. What has become of the granulating patch I do not know. Perhaps the preceding wax film treatment facilitated the rather rapid healing under picric acid, but the abundant secretion under the wax after sixteen applications discouraged my further use of it in this case. Endeavoring to remove all possible infection from wounds before applying the wax film, I used a saturated solution of salicylic acid (watery solution), a method quite common preceding skin grafting. When the wound was sealed with wax, however, a puddle of pus would soon follow, and the abundant moisture would seem to delay the healing. Cultures showed this yellowish exudate to contain staphylococci in all cultures taken.

THIRD DEGREE BURNS

In observing third degree burns, I have never seen a burn the size of a dime heal in less than six weeks' treatment by any other method than skin grafting. It often takes from three to five weeks to determine whether or not a burn is going to be a third degree burn. Under compress dressings the deep skin will struggle for life. About the time the wounded derma looks as though it was going to come to life, it apparently breaks down over night and sloughs off—a liquefaction necrosis. Often the wound is charred—carbonized—and will remain so for a couple of weeks before it begins to slough. Then it will be a week or ten days in sloughing before it is suitable for skin grafting. It is impossible to skin graft a wound while the patient is working. Zonas silk smeared with scarlet red will help, but nothing in my hands has completed the healing under the time mentioned above.

CASE 9.—A submalleolus burn the size of a dollar was dressed for four weeks by compress, when ready for skin grafting. The wax filament was used for thirty consecutive days. Exuberant granulation appears to be a great factor under the wax treatment. The granulations became so pronounced in this case that they had to be trimmed down every four or five days. The epithelium did well for a few days,

but when the wound got to the size of a quarter it became so sluggish that I resorted to picric acid gauze. This soon caused a dry scab to form under which epithelization was completed in twenty-five days more, making twelve weeks for the entire healing of this wound. A similar wound took thirteen weeks to heal under scarlet red.

CASE 10.—A carbuncle crater the size of a quarter on the shoulder, filled with granulating tissue, was treated thirty days with wax, but discontinued thereafter and completed under picric acid gauze.

CASE 11.—A granulating wound on the inner side of the leg over the middle third of the right tibia, arising from an open incision for an abscess, demonstrated no improvement whatever after thirty applications of wax, although the wound looked ripe for skin grafting when the wax treatment was commenced. This patient was then sent to the hospital and treated by skin grafts.

Out of twenty-three cases of third degree burns, I have not been able to heal one with the wax paraffin treatment. After from twenty to thirty applications of the wax I had to resort to the aseptic scab produced by picric acid gauze or scarlet red on oil silk, or boric acid compress. The formula given by Dr. Powers is: white wax, $3\frac{1}{2}$ parts; paraffin, $3\frac{1}{2}$ parts; resin, $\frac{1}{2}$ part. This works well applied with a cotton applicator or small varnish brush, but is too dry to apply with an atomizer. The proprietary preparations which seem to carry more paraffin seem to work better with the atomizer. The technic of application was to render the burn as clean as possible, remove all epithelium, glaze the wound dry with the warm air blower, or use a Politzer bag over an alcohol flame or fan the wound until it was perfectly dry. The wax was then applied at about 130 F. either through the sprayer or with a camel's hair brush. When a thick coating covers the wound, fine filaments of absorbent cotton are pasted on until the entire wax is covered. With the spray this is tedious, so we first sprayed the wound to save traumatism, then used the brush to apply the cotton over the partially cooled wax, and then covered it all with gauze and bandage.

DISADVANTAGES

1. An infected wound is covered with a sealed dressing.
2. There is a copious seropurulent exudate in every dressing removed.
3. We have no way of controlling the temperature of the wax. Taken from the boiling water at 212 F., it is too hot. Cooling at 114, it is too cold. The degree of pain caused the patient is the only means one has of knowing if it is too hot, unless one tries it first on the back of the hand.
4. Around the skin edges it is painful.

ADVANTAGES

1. In certain types of second degree burns it is about as good as any other dressing.
2. It keeps dirt and sweat out of the wound.
3. It is a great producer of exuberant granulations.

CONCLUSIONS

I regret that I cannot accomplish results said to be attained by other clinicians in third degree burns. Growing skin over night, or growing it by wholesale, which were the topics on the subject I read about in certain popular magazines, has not been my experience.

I believe the wax film is a good addition to the various methods for treating certain denuded surfaces and burns, but not a cure for all types of injury.

1307 Broadway.

EXTERNAL URETHROTOMY AND SEMINAL VESICULOTOMY

COMBINED IN A SINGLE OPERATIVE PROCEDURE *

EUGENE FULLER, M.D.

NEW YORK

In an extensive and continuous personal experience with seminal vesiculotomy dating since 1901, complicating surgical conditions have naturally many times been encountered which tend to render the operation difficult, and in the class of cases now to be considered, existing complications were such as formerly either to bar me from performing vesiculotomy or else to force me to undertake that procedure only as a late sequel to other surgery. In early articles bearing on the surgery of the seminal vesicles, I have been careful to emphasize that it is often necessary to resort to catheterization in the after-treatment, and that consequently the urethra should be explored before operation to determine that no obstruction to the passage of a catheter exists. In cases in which catheterization has not seemed feasible, I later advocated opening the floor of the bladder between the seminal vesicles for introduction and retention of a catheter to drain the bladder. In 1910 I called attention¹ to this procedure and the uses to which it could be put. Postprostatic cystotomy does not contemplate a repair or correction of an existing urethral lesion. It simply serves as a means of avoiding the passage along the urethra of an instrument during the few days subsequent to a seminal vesiculotomy when such instrumentation may be called for to relieve retention.

The class of cases to be here considered are those in which a severe lesion of the seminal vesicles coexists with marked disorganization of the deep urethra. Acute or chronic systemic sepsis is the resulting complication which most frequently forces the surgeon to prompt action in these cases, though retention of urine, complete or partial, may be the impelling cause. Hitherto when the surgeon has been forced to act in this connection, his object, as a rule, has been simply to establish free urinary drainage, thus partially relieving the patient for the time being. This palliative surgery may save life and by so doing allow the patient to drift back into a state of invalidism. The reason for this is that not all septic foci are thereby eliminated.

My former method of dealing with these cases was by resort to two or perhaps more separate surgical procedures. In case of acute retention combined with acute sepsis, the perineum would be opened freely and also a suprapubic vesical opening might be made, should free urinary drainage not be otherwise assured. In such a case two other subsequent operations would probably be demanded to insure complete recovery, namely, seminal vesiculotomy and a repair operation in connection with the urethral lesion. In cases in which the urethral obstruction was not complete and the sepsis not of a grade of extreme severity, I often performed first a seminal vesiculotomy combined with postprostatic cystotomy, and then later as a second operation external urethrotomy and a repair of the urethral lesion.

There were various objections to treating these cases by multiple operations, aside from the chief one already mentioned of the failure promptly to eliminate all septic foci. Such failure materially increased the risk as regards mortality, and besides this, in a case still septic, surgical repair following a primary operation was slow and unsatisfactory, inviting persistent fistula in connection with urinary drainage and nonunion where plastic repair work had been attempted. When a patient has been through a severe illness and a surgical ordeal, it is often difficult to get him to consent to necessary supplemental operations in the near future, or at least I have so found it, a result being that the patient may finally leave the hospital still suffering, generally dissatisfied with what has been done for him, and strongly inclined to seek other surgical advice. On several occasions I found a second operation demanded as an emergency measure before convalescence had been established following a primary procedure. This occurred mostly in cases in which inflammatory exudation about a deep urethral lesion increased rather than diminished after the bladder had been drained through a postprostatic cystotomy. In the majority of instances, when the passage of the urine is diverted from the urethra, improvement follows in connection with the inflammatory status of a urethral lesion; but in these minority instances the exudation increased sufficiently to block the urethra, thus causing retention as soon as the postprostatic vesical opening closed. The development of such an emergency is objectionable from a surgical standpoint, and should be avoided if possible. These surgical objections were sufficient to lead me to treat cases of this description by one radical and combined surgical procedure undertaken as a single operation. My experience in so doing has been highly gratifying.

The combined operation cannot be performed by maintaining the body of the patient in one position on the operating table. One change is always required, and often a further change is desirable. In the latter cases, however, a further change consists simply of a shifting of the body back from the second position to the original first position in order the better to adjust drainage tubes and packing. My operative technic in connection with seminal vesiculotomy has already been fully reported.² The same can also be said regarding the surgery employed in connection with the deep urethra.³ In the combined operation the patient is first placed in the knee-chest position for drainage of the seminal vesicles and of the adjacent postprostatic extravescical region, provided such area has become involved. After gauze packing has been adjusted, the patient is then turned into the lithotomy position, the perineum incised by a free median incision, the deep urethra opened, and the neck of the bladder freely incised. The next step of the operation is to treat or repair the existing lesion of this part. This may call for urethral resection, the elimination of urethral false passages, the drainage of areas of suppuration, etc. The maintenance of perineal vesical drainage by the insertion of a rubber tube is always a feature of this operation. When active suppuration is present it may be necessary to leave the perineal wound open and packed with gauze; otherwise it is often feasible after

* Read before the Section on Genito-Urinary Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Fuller, Eugene: Post-Prostatic Cystotomy, *Med. Rec.*, New York, Oct. 22, 1910.

2. Fuller, Eugene: Extraperitoneal Rupture of the Bladder: Its Surgical Management, *THE JOURNAL A. M. A.*, Dec. 12, 1914, p. 2114; Drainage of Extravesical and Extraperitoneal Suppuration of the Male Pelvis, Oct. 25, 1902, p. 1021; *Med. Rec.*, New York, 1913, **84**, 691.

3. Fuller, Eugene: *Med. Rec.*, New York, April 2, 1910.

repairing or eliminating lesions to close the perineum with the exception of the opening left for the passage of the vesical drainage tube. When the perineum is closed, it is often necessary to maintain in the urethra a drainage tube to act as a splint as described in my article³ already referred to in dealing with the surgery of the deep urethra. Aside from those, there are two tubes necessary in connection with the seminal vesiculotomy. All packing and sutures are removed at the end of five days, and the tubes generally at the end of ten days after operation. In order to illustrate and to make clear the necessary field for this combined surgical operation, the clinical history of a few cases will be recited.

REPORT OF CASES

CASE 1.—A man, aged 36, entered the City Hospital with retention and in a septic condition. He had been well until about a month before, when he contracted his first gonorrhea. Examination revealed bulging periurethral abscess just anterior to the penile scrotal junction. The perineum was swollen, brawny, and tender to the touch, evidencing deep suppuration also in that region. Rectal exploration revealed great tumefaction, tenderness and heat, involving the entire postprostatic area. It seemed plain that there were three independent foci of active suppuration, and that thorough drainage of these together with the bladder were promptly demanded to save life. The patient was put in the knee-chest position. The seminal vesicles were opened together with the perisciminal vesicular tissues. About 4 ounces of pus were liberated. The patient was then put in the lithotomy position and the perineum opened freely. A large amount of pus was liberated by this incision. After the bladder had been opened for drainage, this region was packed. The periurethral abscess was next opened by an incision through the urethral floor. This thorough procedure combated the systemic-sepsis. The patient left the hospital in a very satisfactory condition.

CASE 2.—A man, aged 45, entered the City Hospital chronically septic and so rheumatic that he walked with great difficulty. Both ankles were tumefied red and very tender to the touch. There was hardly any control of urination, and there was much frequent vesical tenesmus. Control of the bowels was uncertain. There was more or less continuous rise of temperature. The patient had been strong and vigorous till about three years previously, when he contracted gonorrhea. The history was that retention followed, and that the bladder had been opened and drained by way of the perineum, leaving the patient in the present condition. Examination revealed considerable scar tissue in the perineum and some induration. Manual examination through the rectum revealed the entire postprostatic space filled with indurated tissue which completely enveloped the seminal vesicles, extending forward into the prostatic capsule and laterally to the borders of the pelvic space. This extensive lesion involved the trigonum, causing marked pericystitis. There was disorganization of the deep urethra, it being difficult to pass an instrument into the bladder owing to a sulcus or pouch on the floor and just anterior to the prostate. The seminal vesicles were opened and free dissection made into the surrounding tissues. The perineum was then opened, the sulcus dissected out, and the prostatic fibers encircling the vesical neck cut through, this incision being extended backward so as to include the anterior portion of the trigonum, which was also involved. The patient made an extremely satisfactory recovery. All the septic and inflammatory conditions disappeared, together with the pericystitis. He left the hospital comfortable and with good control of the bladder.

CASE 3.—A man, aged 38, entered the City Hospital with difficult, frequent and very painful urination. At times the urgency was so great as to occasion persisting vesical tenesmus. Chills and fever were prominent symptoms. There were marked perineal pain and general distress referable to

the pelvic, sacral and hypogastric regions. There was a history of early gonorrheas and urethral stricture. There had been much urethral instrumentation, and on two occasions there had been perineal operations for stricture. Each operation had apparently served to increase the symptoms of discomfort, and for a long time past it had seemingly been impossible to pass instruments into the bladder. Instruments passed along the urethra were deflected into one or more false passages. There was much induration in the perineum. Rectal examination revealed extensive hard cicatricial involvement of the prostate and seminal vesicles. Such involvement also included all the postprostatic fibrous structures, indicating that formerly there had been extensive suppuration in this region. An attempt to repair the urethra by operation, neglecting the lesion involving the seminal vesicles, would, it then seemed to me, invite another failure. Accordingly seminal vesiculotomy was first performed, and then the perineum was opened, the urethra partially resected, the false passages eliminated, and the rigid contracted neck of the bladder cut through. The patient made such a complete recovery that he left for France, expecting active military service.

CASE 4.—This patient was a man, aged 70, whose chief symptoms were severe perineal pain often involving the rectal region. During periods of exacerbation, the pains would radiate down the thighs and into the hypogastric and sacral regions. Urination was difficult and frequent. The stream was slow to start and lacking in force. On several occasions retention had occurred, necessitating the passage of a catheter. There was no urethral obstruction. The bladder was considerably contracted, any distention over 6 ounces causing great pain. Aside from an old chronic streptococcus infection, the urine showed nothing abnormal. The present symptoms had commenced twenty-five years previously. As a young man he once had gonorrhea. The senior Otis had operated on the patient's anterior urethra many years before, but nothing that had ever been done for him had apparently resulted in relief. There had been a frequent resort to opiates, and when he came to me the drug habit in a moderate degree was established. Years ago there had been considerable discomfort from priapism, and sexual indulgence had then increased his discomfort. For years there had been no such indulgence. There was no tuberculous history. Rectal examination revealed the prostate atrophic and very sclerous. The seminal vesicles were tumefied, very sclerous, and so sensitive to the touch that the patient cried out with pain, asserting that therein lay the seat of his pain and discomfort. There was marked rigidity and contraction of the prostatic neck of the bladder. A bougie à boule could be easily passed into the bladder, but its extraction was difficult, as the shoulder of the instrument caught and was held by the contraction. Cystoscopic examination revealed the bladder trabeculated. The surgical indications were to open the seminal vesicles and to cut through the contracted prostatic neck of the bladder. When the seminal vesicles were opened, numerous small calculi were found in each to account for the extreme pain and sensitiveness. Next the perineum was opened, the vesical neck incised, and a tube inserted into the bladder. The structures making up the rectal wall were thin and atrophic; and this, in view of the age of the patient, caused me to make a counter suprapubic vesical opening to insure especially free drainage, and the more to guard against postoperative tenesmus. I had a fear that sloughing of the rectal wall might result should there be unnecessary tenesmus following the operation. The operation was highly successful, the patient leaving the hospital free from pain, and voiding urine without obstruction.

COMMENT

My present experience with this combined surgical procedure is confined to ten cases, in nine of which the patients recovered satisfactorily. The one who died was septic before operation, owing to streptococcus involvement of both seminal vesicles. Aside from this, some prostatic hypertrophy had to be removed when a contracted vesical neck was incised. In this

case, on the seventh day after operation, when convalescence was seemingly established, persistent hemorrhages occurred, suggestive of hemophilia. The patient died about one week after the occurrence of the first hemorrhage, horse serum and thyroid having no seeming effect.

ABSTRACT OF DISCUSSION

DR. E. O. SMITH, Cincinnati: We are all familiar with Dr. Fuller's work on the seminal vesicles and his particular method of perineal drainage with the urethral splint. I have used this method, but not in this particular group of cases. It was in cases in which there were persistent fistulas that could not be closed otherwise, and in which there was no particular inflammation of the vesicles. I can readily understand how this method would be very valuable in the class of cases presented by Dr. Fuller. Of course, we do not see a great many cases that have three foci of infection at one time, but it is purely a matter of common sense to open all the sources of infection. The simple opening of the perineum in the particular case reported would not have given the patient relief, because the seminal vesicles were also foci of infection.

DR. R. H. GIBBONS, New York: I am glad to know that Dr. Fuller has added external perineal urethrotomy to his theretofore most successful operation of vesiculotomy. A young man contracted gonorrhea. His family physician treated him. He told the patient to take plenty of water, plenty of milk, no stimulants, no tobacco, etc., and no injections, and in due time he got well, apparently. Later he contracted another infection. He then went to a general surgeon who used sounds, etc., and still the discharge kept up. Then he went to a general practitioner, who instilled silver nitrate into his deep urethra and cleared up his discharge in five to ten days. Then he began to have distress and suffering, and became wretched and miserable. He had boils here and there, so-called abscesses, and eventually he went to Eiselsberg's famous clinic in Vienna, where he was subjected to various tests, and Eiselsberg told him he did not know what the trouble was, but thought there was a piece of bone in his rectum. He had an abscess in his rectum. A prominent genito-urinary man in New York saw him repeatedly, and many Wassermann tests were made, with a diagnosis of syphilis. Finally another general surgeon found a tumor and cut into it. He then came into my hands. I made an examination and thought he had sacro-iliac disease, but the next day I changed my mind and thought it was all due to a vesiculitis, and asked him to go to Dr. Fuller, which he did not do for some time. In Chicago another surgeon examined him, and said: "Young man, you've got tuberculosis, and you've got to go away to live out of this country; go where there is plenty of sunshine." He came back to New York and told me what this gentleman had said. I called in Dr. Virgil P. Gibney, who convinced him that he had no such trouble. I then had him see Dr. Fuller. He was fairly well then and Fuller advised him to wait a year. At the end of a year Dr. Fuller dissected out the vesicles. If that operation had been done at the opportune time all this misery, suffering and suspense would have been saved. The patient got well, except that he had a peritonsillar infection, which I attributed to the trouble in the genito-urinary tract. The tonsils were removed.

DR. EUGENE FULLER, New York: This paper deals with a method which has not hitherto been described. I put it on record as an efficient method of dealing with a class of cases which had not received curative attention, as I think you will agree if you are in institutions where you get hold of such patients as we do at the City Hospital. Many patients are sent there with the expectation that they are surgical lemons, but in reality they are the very best cases to tackle, because to get results one has to do something a little better than the preceding fellows. Many of the cases under consideration have been straightened out; most of the patients had gone the rounds of the best hospitals and had fetched up at the

City Hospital as the last resort. One of them is now doing his bit fighting at the front.

When I first employed this procedure I felt that opening the seminal vesicles and then the deep urethra, at the same time splitting the prostatic neck into the trigonum, looked radical, and it is radical. You hear men say, "That is too radical," and perhaps that "he is a butcher," etc., but I think that sort of comment is rather a compliment to a man than otherwise if his patients get well. I hope the gentlemen of the section will try to manage these cases along this line, and not be afraid of the free openings any more than one need be afraid of the free opening of an abscess.

The case that Dr. Gibbons spoke about was extremely interesting, because that man had, primarily, suppuration in connection with his seminal vesicles, and this suppuration had seeped its way through the bony structure of the back above the sacrum and had pointed outside. I had never before seen such suppuration so pointing. A dorsal incision had previously been made and a piece of the sacrum had been chiseled out, on the assumption that the bony structure was the primary seat of the disease. In the performance of seminal vesiculotomy in this case I found certainly over an inch of dense fibrous tissue to be incised before reaching the focus of the seminal vesicle abscess. We drained it—that was several years ago—and I feel that I did not drain it sufficiently long as the man was slow in getting well. I think in a case like that in which the abscess walls were so thick, it would be well to keep the drainage tube in for a couple of months rather than the customary ten days.

ABSORBABLE METAL CLIPS AS SUBSTITUTES FOR LIGATURES AND DEEP SUTURES IN WOUND CLOSURE *

E. WYLLYS ANDREWS, M.D.

CHICAGO

Metallic clips can be inserted much more quickly than any suture. They are also more rapid than stitches for closing deep layers and bleeding vessels but would, of course, leave the wounds full of small foreign bodies unless some absorbable metal could be used. I have been trying various metals and alloys with a view to finding those most absorbable, hoping to combine the good qualities of the animal ligature with the strength and speed of the metal clip, clamps and staples.

A large part of the time required for any operation is that used in tying ligatures and in deep suturing. In some operations this amounts to 80 or 90 per cent. of the whole time spent. If we make a "study of efficiency" in wound closure we see at once that there is a great deal of lost motion in first seizing and subsequently tying large numbers of vessels. Could not these two acts be made one? If each artery forceps carried its own clip or circlet so as to leave behind a tightly closed vessel when removed, wound hemostasis would be much simplified and shortened. The more numerous the forceps required and the more inaccessible the location, the more advantageous are the clips by comparison.

Harvey Cushing has advocated small silver clips for closing little vessels in brain surgery. Their advantage over heavy forceps or needle and thread is obvious in delicate structures which do not bear rough handling. Almost the same advantages are apparent in operations in other parts of the body. Not only for

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

ligatures, but as a substitute for deep sutures, clips have the advantage in speed and security. The deep suture forceps recently described by me enables the operator to place stitches rapidly in any deep location, but even this requires the tying of knots which is less speedy than the placing of clips. Sometimes the safety and rapidity of the old-fashioned Michel "agraffes" has tempted me to use them in deep wounds at the cost of leaving foreign body, just as certain operators practice leaving hemostatic clamps in deep wounds a few days instead of hemostatic ligatures. In using clips I have attached to them strong cords or fine chains which were left hanging from the wound for drainage and to secure easy removal. The pendant cords or chains are useful drains in nearly all such cases and will bring out the adherent clips in eight or ten days.

A little experience with using clip forceps rather than common hemostats will convince any operator that this surgical wrinkle combines two important steps into one. If we seize every bleeding point with clip-carrying forceps instead of empty forceps, we seize and tie the artery in one motion. I was led to try this first in cadaver and in dog operations as a mode of speeding up and later in a considerable number of operations on man. I am convinced of its practical value both in deep ligating and deep suturing. To this method two objections are apparent.

1. Some small branches and some wrongly placed hemostats do not need ligatures.

2. Foreign bodies are left in the tissues.

To the first objection it may be said that our technic would be better if we had a routine of ligating *all* vessels however small, and that seizing wrong points could be avoided by care and practice. Bissell's recent work on fat embolism shows the importance of tying all veins as well as all arteries.

The second objection—that of leaving foreign bodies behind—is the occasion of this paper, which refers to my efforts to find an absorbable metal or alloy of metals which will disappear ultimately when buried in wounds.

An ideal absorbable metal is pure magnesium which, as shown by our experiments and as was known some time before, disappears rapidly in healthy tissue and leaves no irritant residue. But this metal is brittle and weak in small pieces.

In a series of animal and human operations I tested a variety of metals by implanting small pieces in living tissue and soon found that several common ones of low melting point were absorbed or disappeared with fair rapidity in aseptic wounds. Several of these—aluminum, zinc, cadmium—were tested carefully as to rate and time of absorption, and while the results seemed inconsistent, they prove a generally constant ratio of absorption for each metal tried when all the conditions were exactly equal.

LABORATORY RESEARCH ON ABSORBABLE METALS

The first work was done in the laboratories of the Morris Research Institute in a series of operations on dogs, with the assistance of Dr. Edmund Andrews, in 1915. The size, time and per cent. lost daily is shown in Table 1. The location chosen was usually the space between the rectus muscle and anterior or posterior rectus sheath.

These experiments show that the four metals tried last in the tissues from fourteen to 1,000 days. It is clear that these results are not consistent, since the ratio is not always the same with the same metal. This

is especially marked in comparing the rate of absorption in large and small pieces. The 4 gm. piece of aluminum lost only 0.10 gm. in twenty-one days or 2.5 per cent., equaling about 0.1 of 1 per cent. per day, while the 0.12 gm. piece lost 0.025 gm. and almost 25 per cent. in fourteen days, or almost 3 per cent. per day, and a 0.10 gm. piece lost 0.030 in twenty-eight days, 30 per cent., or about 1 per cent. a day.

It would appear that the total absorption was dependent more on surface exposed than the weight of metal. Thin wires and sheets gave up as much material to absorption as large thick pieces of the same area. Also the inconsistencies shown by these tests are partly due to the greater power of some tissues to absorb metals as compared with others. It is my opinion also that good or poor repair in the wound and septic or aseptic healing has much to do with the course of absorption. Chemically it would seem that absorbable metals are those corroded by alkalies, such as aluminum, cadmium, zinc and magnesium. All absorption, however, is dependent on close vital contact with living cells and is retarded or prevented by the presence of wound secretion, especially pus.

TABLE 1.—TIMES OF ABSORPTION OF FOUR METALS

Dog No.	Metal Used	Weight, Gm.	Weight (Gm.) Removed			Per Cent. Absorbed	Per Cent. Absorbed One Day	Time for Total Absorption, Days
			After 14 Days	After 21 Days	After 28 Days			
1	Magnesium	0.07	0.016	.....	.....	77	5	20
2	Magnesium	0.05	0.000	.....	.....	100	7	14
3	Magnesium	0.45	0.000	.....	.....	100	7	14
4	Cadmium	0.70	0.70	.....	.....	0	0	50
5	Cadmium	0.75	.....	0.321	.....	57	2	40
6	Cadmium	0.40	.....	.....	0.13	70	2.5	40
7	Zinc	0.14	0.076	.....	.....	52	3.5	30
8	Zinc	0.35	.....	0.304	.....	12	0.5	200
9	Zinc	0.15	.....	.....	0.121	20	0.8	167
10	Aluminum	0.12	0.075	.....	.....	40	3	33
11	Aluminum	4.00	.....	3.90	.....	2.5	0.1	1,000
12	Aluminum	0.10	.....	.....	.075	25	1	100

To make these results consistent we have only to repeat these experiments in large numbers and with uniform technic as to exact size and form of metal pieces tested. My work shows, however, a definite ratio between various metals as to time of disappearance when pieces of equal size are similarly implanted in living tissue. Magnesium again proved the most rapid in disappearance, as it is the most benign and innocent in all its salts and oxids. Aluminum apparently is slightly more soluble in the body than zinc or cadmium, but all three are capable of disappearing in a few weeks' time when small pieces, say 0.01 gm. to 0.10 gm., are inserted. Bismuth absorbs very slowly, as do arsenic and antimony, but these metals lack toughness and malleability.

Other metals, silver, bronze, lead, nickel, steel, copper, etc., we know will remain unaltered except by slight tarnishing for indefinite periods in the living structures. This is also true of the amalgams of hard metals with mercury. Pure tin and lead are absorbed almost imperceptibly if at all. While pure magnesium is the quickest and safest of all metals to leave in living tissues, being rapidly absorbed and leaving no toxic residue, its physical properties, aside from its extreme lightness, do not recommend it for ligature, clips, or any use demanding tensile strength. Magnesium wire and ribbon cannot be tied even in loose

knots, as it breaks immediately on kinking. It cannot be twisted even loosely without showing its brittle nature. It is true it can be made into solid rings and bobbins and buttons. Intestinal buttons made of it will disappear by absorption or oxidation if not passed, as will pins and intramedullary cylinders in bones. Lespinasse has used cylinders or rings of pure magnesium for blood vessel anastomosis. L. L. McArthur on theoretical grounds suggested some years ago that various alloys be tried of magnesium with stronger metals so as to combine absorbability with toughness. His suggestion was not acted on practically at that time.

The animal experiments above tabulated I made the basis of observations given in Table 2.

TABLE 2.—THE RANK OF THE VARIOUS METALS

Absorbability	Tensile Strength	Malleability and Flexibility
1. Magnesium	1. Aluminum	1. Zinc
2. Cadmium	2. Cadmium	2. Cadmium
3. Zinc	3. Zinc	3. Aluminum
4. Aluminum	4. Magnesium	4. Magnesium

It would appear certain that each of these metals possesses a superiority in some factors and all have a softness and absence of spring temper which is desirable. It is this soft yielding quality which makes pure silver wire so much superior to bronze or steel in wire suturing, and which gives the German silver skin clips their power of remaining set. Any metal with springy elasticity refuses to be molded into place and hold its shape, so as to hold well. One of the strongest known wires is the aluminum bronze recommended by Dr. M. L. Harris for sutures. This has vastly more tensile strength than pure silver or pure iron wire of the same size, but I have never found it anything but vexatious because of its high modulus of elasticity and spring temper.

We were reduced to the half dozen metals of the soft consistence, rapid corrosion and low melting point, and evidently could get the qualities needed only by some alloy or combination. Alloys do not always have the combined qualities of their ingredients so that some experiments were made by alloying magnesium with the several other absorbable metals to get a union of good qualities.

My idea was that the nearest alloy to pure magnesium which would be as flexible as, say, sheet cadmium, zinc or aluminum and could be knotted without breaking would be best.

The mixtures first tried were: Magnesium and aluminum, equal parts; magnesium and cadmium, equal parts; magnesium and zinc, equal parts. These were all of a pasty consistence like soft solder when half melted and had all the bad properties we wished to avoid. They were hard, brittle and without tensile strength. One mixture, magnesium 25, zinc 35, aluminum 40 per cent., was so brittle it could be powdered in a mortar. Doubtless annealing and rolling would improve these metals, but no mixture we have had made equals aluminum or cadmium in toughness or zinc in soft malleable temper.

So far my efforts to alloy magnesium with either of these metals have not given the qualities I sought, many of the mixtures tried lacking in ductility, flexibility and toughness. Some alloys are now being prepared which I hope to find more suitable by preventing oxidation during the mixing.

Ordinary surgical clips or imported (Michel "agraffes") and the form of horse-shoe and clam-shell

clips, described by me in a previous paper, are made of the alloy known as German silver. It has exactly the right qualities mechanically for this work. These clips lock firmly wherever placed by their own property of inelastic "setting."

I find absorbable metals of the kind above mentioned, I mean aluminum, cadmium and zinc, to work equally well for buried clips. Buried wire staples and little clamps or clips disappear in the tissues in a few weeks if small and light.

For larger work bone plates, intermedullary pegs, nails and screws, magnesium answers well and disappears in one or two months, especially if perforated or fenestrated and made as thin as possible. It has nothing like the strength of steel for Lane plates, but compares favorably with ivory or bone pegs for placing in the shafts, pegging the head of long bones.

Pure aluminum wire and commercial alloys are especially good if made into cables and used to sew fascia and deep muscles. Here it has no striking advantage over a perfect animal ligature except that it is rapidly and certainly made sterile by boiling. Alkalies must not be added to solutions for boiling aluminum or zinc, as they dissolve it rapidly.

The tiny absorbable metal clips and staples are a great gain in many operations. If we seize all bleeding points at first with clip bearing forceps we may put on a few unnecessary ones, but clearing the field at once of dangling hemostats is a great saving of time and I think a surer method than tying ligatures. I never saw in any clinic full immunity from knots and ligatures occasionally slipping. The same may be said of the sac of a hernia, the stump of an appendix or fallopian tube or the neck and vessels of the cystic duct.

Closure of deep wound layers is less easy than individual pedicles but shows an equal gain in speed over suture. The inner layer of an intestinal anastomosis is very rapidly made by a row of clips. In the lumen of the bowel these need not be absorbable, as they fall into the canal later. With the horse-shoe clip the parts are held in apposition by a clamping action as by the Murphy button. For fascial wound layers the metal must be absorbable. Here wound closure is much more rapid than by needle or thread. For obliterating varices and angiomas they are also more speedy and bloodless. For fixation of certain movable viscera, nephropexy, gastroplication, omental fixation, as in Talma's operation, or various suspensions of prolapsed organs, absorbable metal staples and clips are quite easy and rapid of application. This is also true of ligations in continuity of veins or arteries with or without resections of their trunks. When as a factor of safety two or more ligatures are desired on one vessel, time lost is much less with clips than with ligatures. This applies to operations on aneurysms or large varices or to all large vessels, as the thyroid vessels in lobectomy or the carotid artery when tied for any reason.

On the whole I have been more than satisfied so far as we have applied the metal fasteners in our work, and I can see many useful applications not yet fully tested.

CONCLUSIONS

1. Speed and safety of hemostasis is much improved by using metal clips.

2. If of absorbable metal or alloy they do not act permanently as foreign bodies. If of ordinary metal,

they should be attached to cords or chains and later drawn out.

3. Several pure metals are absorbable, but have not quite ideal physical qualities.

4. Efforts to make ideal alloy are encouraging but not yet wholly successful.

5. Other appliances — plates, screws, buttons, bone splints, and wire sutures can also be made of absorbable alloys when perfected.

A STUDY OF ONE HUNDRED SELECTED CASES OF PITUITARY DISEASE*

ISADOR ABRAHAMSON, M.D.

AND

HYMAN CLIMENKO, M.D.

NEW YORK

The ductless glands with their important influence on the growth, development and maintenance of the body, physical and mental, occupy a notable position in the realm of medicine today, yet a few generations ago they were wholly neglected and almost unknown.

About the middle of the last century Claude Bernard, Brown-Séquard and others popularized their use in therapy; but the suggestions offered by them were not followed up, and the value of the work then accomplished was largely forgotten. Langley and Gaskell in England, Beidl in Vienna, and Bouchard in France have in recent years vastly increased our knowledge of the action of these glands. On the facts these observers have discovered, a complete system of therapy has been erected and generalizations regarding their influence in disease have been recklessly enunciated as dogmas. Coincidence became confused with causation.

As clinicians add to our store of facts, the skepticism of the validity of these dogmas daily increases. Indeed, we are now in danger, perhaps, of a reaction in which we shall tend not to overestimate but rather to underrate and despise the power of glandular therapy. This tendency is dangerous to progress, and we must counteract it by judicially weighing all theories and by accepting none which are not adequately substantiated. Yet our attitude must not be merely passive. We must patiently strive to gain further knowledge to replace unverified belief in glandular activity; we must patiently add to our store of facts concerning the powers of glandular products and then await the day when a medical Newton will justly correlate these facts and enunciate for us the laws which control them.

OBSERVATIONS IN SELECTED CASES

In this spirit we have studied a hundred selected cases of pituitary involvement which have come under our observation within the last sixteen years. One or the other of us has personally studied each of these hundred cases: forty cases of acromegaly, fifty of hypopituitarism, forty-five dwarfs and one giant. The clinical and other details of this study we shall later publish. Among the symptoms of pituitary disease, such as adiposity, bony changes, sugar tolerance, polyuria and sexual manifestations, we wish, at this

time, to discuss only two, namely, sugar tolerance and polyuria.

SUGAR TOLERANCE

Cushing and others maintain that disease of the posterior and intermediate lobes of the pituitary affects carbohydrate metabolism. Cushing reported, in advanced pituitary disease a marked increase in the sugar tolerance. He states that in hyperpituitary conditions sugar tolerance is decreased, in hypopituitary conditions sugar tolerance is increased. Cushing dealt entirely with alimentary glycosuria. Vigevano, from his experiments on dogs, concluded that the entire gland had a greater antiglycosuric effect than had the posterior lobe alone. Blumenthal demonstrated that the rate of sugar absorption by the alimentary canal was inconstant, and Woodyatt and other investigators that a similar lack of uniformity characterized the rate of absorption of sugar introduced intravenously.

The sugar tolerance is determined by the ratio of sugar absorption to sugar utilization. Woodyatt and his co-workers found that, when the sugar absorption was not in excess of the sugar utilization, pituitary conditions, such as acromegaly, gigantism and genital dystrophy, did not influence the sugar tolerance. The results obtained by Cushing, therefore, depended on the inconstant sugar absorbability, via the intestinal mucosa, and not on any change in sugar metabolism which pituitary conditions cause. An alimentary sugar tolerance similar to that described by Cushing may be found not only in myxedema and other morbid states but even in normal subjects, as our studies conclusively demonstrate. In a series of brewers who daily consumed enormous quantities of beer, we never found sugar in the urine, although we tested them repeatedly. We have given large quantities of sugar daily to a number of persons. To the same large dose some reacted with glycosuria, whereas others did not. In pituitary cases, the results of our experiments were as inconstant as with normal individuals.

A study of thirty cases revealed that four patients had diabetes; all of them were of the hypopituitary type; one of them was a dwarf; five had a high sugar tolerance; of these, three were of the hypopituitary type and two acromegalic. Twenty-one had a low sugar tolerance; of these, fourteen were acromegalics and seven were of the hypopituitary type. There is no constancy in the sugar tolerance manifested in these conditions.

No physiologic basis exists for attributing a relationship between the pituitary gland and sugar tolerance. We have, moreover, an absence of clinical basis for this alleged relationship. Sugar tolerance, therefore, must be discarded as a pathognomonic sign of pituitary disease.

POLYURIA

If there is excess of water in the blood, the hemoglobin percentage is low. If there is a diminution in the fluidity of the blood, the hemoglobin percentage is high. Haldane and Priestley used the hemoglobin percentage as a guide in their investigation of the excretion of water from the blood through the kidneys; they gave to men copious drafts of water, and found that they did not thereby affect the hemoglobin percentage. They exposed other men to prolonged sweating and found that the hemoglobin percentage was still uninfluenced. There is, therefore, some mechanism which tends to maintain a uniformity in the concentration of the blood. A fixed relation exists, therefore, between blood concentration and diuresis.

* Read before the Section on Nervous and Mental Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

Excessive diuresis in those who imbibed much water, and scanty diuresis in those who were sweated were in both instances accompanied by a persistence of the hemoglobin percentage at a constant normal level. As the urine is not a mere filtrate, any changes which may have occurred in the blood during these experiments were of an imperceptible degree. Haldane and Priestley concluded that the variations in the diuresis produced by imbibing water and by sweating were not dependent on alterations in the dilution or concentration of the blood.

They next used salt solutions instead of water, and found that when the salt solution was hypotonic or hypertonic before absorption, salts in the economy were added or subtracted by the tissues to produce isotonic solutions. When salts were added by the tissues, the electrical conductivity of the blood was reduced. When subtracted it was increased. The increased diuresis resulted when these changes tended to produce an increase in the blood volume. Diuresis follows only when both water and salt are relatively in excess to the other constituents of the blood. While this excess prevails, the hemoglobin percentage falls; when it ceases to prevail, the hemoglobin percentage returns to normal. So delicate is the mechanism that the first hint of excess brings about diuresis, which continues at a rate that strives to keep the hemoglobin percentage normal. Hence the change in the percentage is so slight as to be difficult to detect.

Schaefer, Matthews, Aschner, Cushing and others have shown that lesions of the posterior portion of the pituitary gland are accompanied by polyuria. Motzfeld, Bab and Maranon have further demonstrated that such polyuria can be checked by administration of the extract of the posterior and intermediate portion of the pituitary gland. This check is exerted independent of blood pressure changes and of intestinal absorption. Motzfeld believes that the check is due to the action of the pituitary substance on the sympathetic, but others, including ourselves, disagree with him.

Dr. W. M. Kraus has undertaken to distinguish a rarity of polyuria in hypopituitary conditions and a frequency in hyperpituitary conditions which we have been unable to confirm. From the physiologic manifestations just mentioned, from the pathologic researches of Maranon and others, and from clinicopathologic reports by Boyd, Newmark, Maranon, Bab and others, including our own cases, there is no doubt that the pituitary gland has a powerful influence on the salt content of the blood and hence on its volume. From our own work we conclude that the results of this action on the blood volume may be three:

1. In cases in which there is no renal insufficiency, polyuria.
2. In cases in which there is renal insufficiency of a mild grade, polyuria and edema.
3. In cases in which there is marked renal insufficiency, hydremia and general edema without polyuria.

CONCLUSIONS

The posterior and middle lobes of the pituitary gland secrete a substance or substances which have, according to our observations, the following among other properties:

1. It does not influence sugar metabolism (sugar tolerance is not a sign characteristic of pituitary disease).
2. It controls the salt content on which the electrical conductivity of the blood depends.

3. This control is not exercised through the nervous system.

4. Disease of the posterior and intermediate portion of the pituitary gland disturbs the fixed ratio of the salt content of the blood which the secretion or secretions of that gland normally maintain.

5. Slight disturbance in the control induces alteration in the salt content of the blood and leads to polyuria, if there is renal sufficiency, or to a water logging of the tissues, if there is renal insufficiency.

129 East Sixty-Ninth Street—252 East Broadway.

ABSTRACT OF DISCUSSION

DR. WALTER TIMME, New York: Dr. Abrahamson endeavors to simplify the pituitary abnormalities by dividing pituitary diseases into two great classes—hypopituitarism and hyperpituitarism. However praiseworthy such an attempt may be, it is not in accordance with the conditions. A pituitary gland may have an enlarged anterior lobe with corresponding small posterior lobe; therefore neither term, hypopituitarism nor hyperpituitarism, is applicable without expressing the limitation to the particular lobe in question. Again, hyperplasia of the posterior lobe, for instance, may be actually the cause of deficiency in function of the posterior lobe; the terms, therefore, hypopituitary and hyperpituitary, if not qualified, ought to be eliminated from discussion of the pituitary body.

As far as Dr. Abrahamson's remarks regarding polyuria are concerned, they are beyond criticism when applied to hyperfunction of the posterior lobe. One additional statement may not be amiss, however. It is that the effect of suprarenal gland on the blood plasma is to diminish its water content, which secondarily also produces a somewhat increased urinary output. It is difficult to distinguish always, therefore, whether the underlying cause of polyuria is pituitary or suprarenal in origin. That there is no interdependence of glycosuria and pituitary disease, I question seriously. One must distinguish the various types of glycosuria. Those dependent on real, acute pancreatic disease—pancreatitis or pancreatic new growths—show no involvement of the pituitary; but other types do show such changes. Fry, in the *Quarterly Journal of Medicine* (London) reported changes in the pituitary gland in diabetes. One clinical fact alone stands out to controvert the position of Dr. Abrahamson. It is that where pituitary gland is administered directly after meals in some sugar-free individuals, sugar appears in the urine; and if sugar had originally been present, it is increased thereby. It is therefore important to give pituitary gland at least one hour after meals. The reason assigned for this fact is that pituitary and pancreas are mutually antagonistic. The physiologists have never been able to prove this. A proper classification of pituitary disturbances must embrace each lobe individually.

DR. D. I. WOLFSTEIN, Cincinnati: The relation of the pituitary glands to polyuria, as brought out by the essayist, interests me. I have lately been treating one of the most marked cases of so-called diabetes insipidus. I know the term is rather obsolete. The patient was carefully studied, and the salt excretion and intake regulated. The only agent that had the slightest effect was pituitary extract given twice daily, under the skin; this did influence the amount of urine voided very materially. Will the essayist please try to throw some light on the treatment of this affection?

DR. I. ABRAHAMSON, New York: The point raised by Dr. Wolfstein has been definitely settled by Bab. Patients suffering from polyuria were used to standardize the effectiveness of pituitary extracts. Polyuria was a better term than diabetes insipidus. A constant effect on the polyuria due to any cause could be expected after the administration, by hypodermic especially, of the extract of the posterior and intermediate lobes of the hypophysis. Confusion was the necessary result when we sought to explain contradictory results or phenomena by assuming two distinct and opposite morbid processes in the same case. One case cannot be held to be hyperpituitary with a dash of hypopituitary disease and

another the converse, simply because we could not explain certain manifestations except by some such stretch of imagination.

We must think along physiologic lines whenever possible, and explanations, to be convincing, must not be too strained. I therefore cannot agree with Dr. Timme's objections.

Clinical Notes, Suggestions, and New Instruments

GALLBLADDER BAND

ROBERT J. JAMES, M.D., SEATTLE

In the accompanying illustration is shown a gallbladder band which I devised, and which we have used in the hospital for the past two years with great satisfaction. The patient



Gallbladder band.

can turn and lie on either side without leakage of bile, and the bottle can be changed quickly and cleanly. These bands are washed and sterilized and kept ready for use. A small piece of tape is sewed on the edge of the pocket and tied around the neck of the bottle to keep it steady.

REPORT OF A CASE OF EXTREME FECAL IMPACTION

E. ARTHUR WATSON, M.D., GRAND ISLAND, NEB.

This case, I believe, is out of the ordinary and, as far as the literature to which I have access reveals, and in view of the age of the subject, unparalleled. The etiology I cannot explain without considering the possibility of congenital defects and lack of tone due to the condition of the bowel at birth.

History.—A girl, aged 13, American, born with an imperforate anus, the feces draining through the vagina, was operated on five years before I saw her, and the anus established at the normal location. In the absence of a sphincter, there had been incontinence. The anus was dilated several times in the two years following the operation, but there had been no trouble since that time. At one of the dilations the ampulla of the rectum was found loaded, and was cleaned out. The patient had not had the usual diseases of children. She had a severe attack of rheumatism last fall, and a fibrillated heart muscle since that time. Last fall the physician in attendance noticed a well defined mass in the abdomen, but did not have an opportunity of watching the patient, and did not see her again until two weeks before I did. At that time he advised that the patient be brought to the hospital, and he referred her to me.

Examination.—April 6, 1917, a tumor completely filled the abdomen. It was wedged between the ileum and behind the pubes so tightly that it was immovable. The fundus was well up in the epigastrium with another smaller mass extending from the fundus to the ensiform cartilage. Extreme constipation and tenesmus were complained of. A stool was

procured daily, but was fluid or semifluid. The bladder could be felt well up on the anterior surface of the mass. There were albumin and an occasional cast in the urine, with an abundance of colon bacilli and some pus. The pulse was from 130 to 140, weak and intermittent. Attempts to pass the colon tube resulted in extreme pain and tenesmus. There was no fecal odor to the patient, nor was she troubled with gas. She was markedly cachectic. The leukocytes numbered 22,000. No red cell count was made, as a slide was negative. The appetite was poor.

Operation and Result.—A diagnosis of probable uterine fibroid was made, but operation was discouraged on account of the physical condition of the patient. After observing the patient for six days and watching the suffering, which had to be controlled constantly with opiates, I volunteered to operate if the parents so wished. The following morning the abdomen was opened and the tumor presented itself in the wound. The intestine was not visible, and the omentum lay over the anterior surface of the tumor. It was very frail, all the fat having been absorbed. The exploring fingers could not be forced around the mass in the pelvis on account of the tightness with which it was wedged. Exploration of the fundus revealed the colon entering the mass with a hard, well formed mass of impacted feces lying directly over the larger mass, and in the colon just before it entered the tumor. The smaller mass was about the size of a large lemon, and was the smaller mass which could be felt in the epigastrium before exploration. There were numerous blood vessels of large caliber over the entire mass. When the incision was enlarged, the mass could be slightly rotated, and the mesentery could be felt at the vertebral attachment. I then thought it was a tumor of the mesentery. The mass was hard and smooth, and not at all puttylike. An incision was made along the anterior surface of the mass, and an extremely thickened colonic wall was incised. The discovery was then made that the extremely distended descending colon was filled with hard, dry fecal matter. The intestine was incised for about 12 inches, and the contents lifted out. There were also present about 3 pounds of semisolid fecal material and the smaller mass already described. The entire descending colon from the splenic flexure to the second portion of the sigmoid was involved in the dilatation. The large, dry, mother mass weighed, one hour later, 5¾ pounds, and at least 3 pounds of smaller lumps and semisolid material were removed in all. The channel through which the stools had passed



Fecal impactions and section of intestine.

was along the posterior wall of the sac. The intestine was completely severed and both ends brought out on the abdominal wall, and an artificial anus established. About 5 inches of redundant intestine were dissected away from the lower extremity. We procured free purgation three days later, and the patient regained some of her appetite, but succumbed on the seventeenth day from exhaustion and emaciation. The heart did much better after operation than previously, but the kidneys continued to give trouble until the end, and were a factor in the termination of life.

The accompanying illustration gives an idea of the firmness and contour of the mass. This was not a diverticulum in any sense of the word, and showed a simple dilatation. The section of intestine shows to some extent the extreme thickening of the wall which had taken place.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address . . . "Medic, Chicago"

Subscription price Five dollars per annum in advance

*Contributors, subscribers and readers will find important information
on the second advertising page following the reading matter*

SATURDAY, JULY 28, 1917

ADEQUATE RANK AND AUTHORITY FOR ARMY MEDICAL OFFICERS

No intelligent person, inside or outside the profession, is ignorant of the importance of medicine, both preventive and curative, in the world war now raging, on the final result of which depends the fate of many nations, including that of our own. In all the European countries engaged in this conflict, the value of the medical officer and his functions, with a few notable exceptions, seem to be fully appreciated. One of the most striking exceptions is fully discussed in a recent report on the causes of the failure of the British expedition in Mesopotamia. This report, made by a board of nonmedical men, shows that lack of coordination between the chief of staff and the medical officers was an important factor in the failure of the expedition. Medical officers were not sufficiently informed of the extra demands likely to be made on their department, and when the stress came they were not equal to it.¹ The report shows that a medical officer made urgent representations in regard to the actual conditions obtaining, which in his opinion needed prompt action, and for this he was threatened with arrest and removal from his post; but when defeat came, the blame was thrown on the medical department, and the medical officers were censured and told that they should have protested more vigorously.

This is a repetition of our own experience in 1898. Our medical officers at that time were criticized because they did not distinguish between malaria and typhoid fever, and still in none of our army camps until the middle of August, 1898, were there the facilities necessary to distinguish between these diseases. They were criticized for the insanitary condition at Chickamauga and elsewhere, although they had protested against these conditions to line officers without effect. The whole story is told voluminously and in detail in the congressional report on the conduct of the War Department in the war with Spain, generally known as the Dodge report.²

Our medical officer is going into this war much better equipped than he was in 1898, and consequently

with heavier responsibilities. But there is no increase in authority! The line officer who will receive sanitary and other professional recommendations will, it is believed, be more intelligent and more appreciative than were his predecessors in 1898. This is the most hopeful view of the situation; but is the situation fully met? Are the health of our soldiers and the care of the sick and wounded to be threatened by this sword of Damocles—suspended by so fine a thread?

Our medical officers should have higher rank and the increased authority which is secured in military life only through rank. A request to this effect has been made of the War College, with no prospect, up to the present time, of its being granted. It may be worth noting here that the Surgeon-General of the Army is not a member of the War College; neither is the Surgeon-General's office represented in that body.

In 1904 the British War Office was reorganized under Lord Esher, who was requested to provide for medical representation in this office. He replied:

The Army Council is not and cannot be a representative body as regards the several arms and departments. The Royal Army Medical Corps exists to serve the army in a most important capacity, but the first object must be to create and maintain an army, and this is the function of the Army Council.

This was the opinion of Lord Esher in 1904. Recently³ the same man writes:

How much of the suffering undergone by our soldiers since the war began has been due to the short-sightedness of my committee, and notably of myself, will never be known. Certainly the control of the Adjutant-General's branch over the Royal Army Medical Corps was and is responsible not only for the early failure to grip the medical factors of the war, but they hampered conditions under which the Surgeon-General has worked. His triumphs and those of the Royal Army Medical Corps have been achieved in spite of obstacles that the subordination of science to ignorance and of elasticity to military discipline explains but cannot justify.

Having failed to secure elsewhere authority adequate to give force to the recommendations of the medical officer, the profession has appealed to the court of last resort, the Congress of the United States. The medical profession believes not only that it has the right to make this appeal, but that this is its duty. The appeal has taken the form of an amendment which is quoted on page 292. The passage of this amendment would give to the medical officers in the Army the same rank that is already bestowed on their fellows in the Medical Corps of the Navy. In the British Army Medical Corps there are three officers with the rank of Lieutenant-General, and twenty-five with the rank of Major-General. This does not include the Indian Medical Service. In the French Army the proportion of general officers in the Medical Corps is quite as high. At present there is only one officer in our entire Medical Corps with the rank of General: Surgeon-General Gorgas. The rank that goes ordinarily with the post of the Surgeon-General of our Army is that of Brigadier-General; Surgeon-

1. Lessons of the Mesopotamia Tragedy, editorial, this issue, p. 287.
2. See Medical Mobilization and the War, this issue, p. 292.

3. London Times, Feb. 3, 1917.

General Gorgas has the rank of Major-General, specially granted in recognition of his distinguished service in the Canal Zone.

The Medical Corps of our Regular Army has rendered the nation service of which we have a right to be proud. It has freed Cuba and other lands of yellow fever, has made the building of the Panama Canal an accomplished fact, and has opened up the tropics as fit habitations for the white man and his civilization.

It must be evident that the relatively low rank under which medical officers serve handicaps their work both individually and collectively. It would appear to indicate that the nation places a low estimate on its Army Medical Service—which we are sure is not intended. In his civilian work, the advice of the medical man is measured by his personal and professional reputation. When he becomes an Army officer and puts on his uniform, the worth of his opinion is measured by his rank, the insignia of which he wears; and his opinion is of no more value than the appraisal set on him by his government. When he makes a sanitary or other professional recommendation to a superior line officer, the superior grants to the expressed opinion attention corresponding to the rank of the petitioner. Higher rank should be awarded to the medical officer, not primarily to increase his pay, stimulate his patriotism or satisfy his pride, but that he may not be handicapped in rendering his best service. Let him be in a position to demand, not request, what he knows to be for the good of the Army and of the Nation.

THE SPREAD OF INFECTION AS A WAR MEASURE

We have no means of knowing to what extent the reports of the use of bacterial cultures among civilian populations as a war measure are founded on fact. Some of the alleged activities of this sort, such as the supposed application of tetanus spores to court plaster, are not likely even if true to be anything more than the vagaries of irresponsible individuals, and can hardly be believed by any one to have official sanction, much less instigation. On the other hand, definite charges have been made from authoritative sources that, contrary to the terms of the Fourth Hague Convention, pathogenic bacteria have been employed by official agencies to spread disease among men and animals. In the note from the Roumanian Ministry of Foreign Affairs to the governments of neutral states, such specific charges are made in detail and are supported by documentary evidence.

Whatever credence one gives to statements of this character, one may question whether any degree of justification exists for such measures. It is sometimes said that war is war, that it is all wanton and cruel, and that death by infection is no worse than death by shot and shell. Why, it is asked, should any means of crippling the enemy be taboo? Are belligerents to

be debarred from use of the most effective methods of warfare because weak-minded people consider such methods unnecessarily brutal? Is not war always brutal, and does not the injury produced by war always spread in widening circles?

To all this the answer is that even in conducting war a choice exists between more brutal and less brutal methods. The complete extermination of a conquered populace and its replacement by the victors is not today deliberately advocated by any one, although our savage forebears often adopted such a procedure with complacency. While, in this bitterest of wars for many generations, much suffering has been inflicted on noncombatants under the plea of military necessity, it has not occurred that the whole population of a city—Liège, for example—was put at once to the sword as punishment for the temerarious resistance of its forts. There are certain limits, albeit not too well defined, to present day ruthlessness. Some degree of humanity and forbearance is possible even in war.

One of the heaviest blows at civilization in the present contest has been the willingness of some of the combatants to disregard all the restrictions agreed on during the last few centuries for diminishing the brutality of war. Military necessity or military advantage has been held to excuse practically every form of violence. In calmer times, however, almost all men belonging to the civilized and semicivilized nations have been willing to admit that there are some forms of destruction of life and property that are not justified even under the stress of armed conflict. In this class we must certainly place the utilization of pathogenic microbes for spreading infection. It does not need much imagination or even knowledge of what such practices may lead to to see in them a serious menace for the future of the world. No high explosives or artificial engine of battle can equal in catastrophic possibilities the work of the pathogenic bacteria. It is almost inconceivable that responsible men could authorize the employment of such illegitimate weapons of warfare.

One of the most tragic features of the present contest, however, is the readiness with which the world opposed to the German government accepts, as true, stories of cruel, ruthless and barbarous behavior. Whether or not bacterial cultures were used at Bucharest and other places, many people today believe that they were. The way in which the Imperial German Government has made war has caused many people all over the world to lend a ready ear to reports that would under other conditions be classed as idle rumors. Nothing is too bad or too impossible to believe. In how many strata of society will incredible stories of German warfare run from mouth to mouth for decades! This is one penalty to be paid for the acknowledged facts of German war methods, the invasion of Belgium, the sinking of the *Lusitania* and the

devastation of northern France. Military advantage is not the only thing of moment to a proud nation. It is the great misfortune of the German people that they will be charged for all time with forms of savagery which revolt most of them, and this because their rulers have authorized and carried out a plan of destructive warfare hardly paralleled in the world's history. The rest of the civilized world is now in a frame of mind about German war methods such that the attempt to spread infection by bacteria is by many persons no longer considered the incredible thing it would have appeared a short time ago. For the sake of civilization, we hope all alleged instances of this sort will be fully investigated.

THE TREATMENT OF INFECTED WAR WOUNDS

In a recent lecture,¹ Sir Almroth Wright discusses at length the development of infection in wounds with special reference to treatment, particularly of wounds received in battle. He starts on the basis that the defense against infection of the body is due in part to the bactericidal action of the liquid of the blood, in part to phagocytosis by leukocytes. The bactericidal action of the blood fluid is dependent largely on its maintaining an antitryptic condition or property — if the serum of an exudate is not antitryptic it is not bactericidal. One of the ways in which the antitryptic quality may be reduced or lost is the death or breaking up of leukocytes so that their tryptic ferments are set free and neutralize antitryptic action. Under the natural conditions in a wound, and particularly a war wound, in which case there is much injury to tissue, and infectious materials are driven deeply into the parts, situations quickly arise which are altogether unfavorable to the successful operation of the physiologic defensive mechanisms. Thus if there are dead spaces or lack of adequate drainage, there cannot be a continuous flow of fresh lymph and a steady reinforcement of leukocytes, the result being accumulation of tryptic fluid — pus — in which bacteria multiply and later pass into the surrounding tissues. Under other circumstances the wound surfaces may dry up, thereby preventing outflow of lymph as well as emigration of leukocytes and presenting what Sir Almroth Wright calls a desiccated slough-covered wound in which the infection again finds favorable conditions for rapid headway.

These unfortunate events are of course especially to be feared when the wounded lie untreated for a long time on the field or treatment cannot be applied properly because of long transport. We know that prolonged suppuration, gas gangrene, general intoxication and infection, ending in death or a more or less incomplete recovery, often only after months of suffer-

ing, have been altogether too frequent consequences of wounds received in modern warfare. The great problem is to prevent infection altogether, or if it has developed, to restrain and reduce it to such a negligible degree that prompt healing takes place nevertheless. Sir Almroth Wright emphasizes on a theoretical basis the value that hypertonic sodium chlorid solution would have under certain conditions, especially during transport when it is not possible to apply with success methods of chemical disinfection. After having removed all foreign materials in the wound and after having opened up all potential dead spaces, he would cover the wound with several layers of lint thoroughly soaked in 5 per cent. sodium chlorid solution, and on top he would place other layers of lint soaked in saturated sodium chlorid solution, the whole dressing being covered with some suitable impermeable material. By virtue of its hypertonicity, the sodium chlorid solution would induce free exudation of serum into the wound and on its surfaces, which would thus, so to speak, be cleansed and protected by the continuous action of a physiologic disinfectant. The emigration of leukocytes would be prevented, however, and under some conditions that might be an advantage, under others a disadvantage. In desiccated wounds leukocytic emigration is desirable in order to hasten the removal of sloughs; hence in this case a physiologic sodium chlorid solution would be indicated.

Sir Almroth Wright's presentation is stimulating, his experiments are ingenious although they do not reproduce the natural conditions of infected war wounds, and he undoubtedly promotes our understanding of the points to be considered in the treatment of infected wounds according to what he calls physiologic principles; but we note with some surprise that we are not informed at all as to any particular results obtained by the method he has outlined. The method consequently must be regarded at present as merely an interesting suggestion. At this moment the most successful method for the reduction of infection in wounds appears to be that of Carrel. Sir Almroth Wright himself says that he regards Carrel's method as "far the most important contribution made to surgical technic since the beginning of the war." The method is now so well known that it is not necessary to go into details. After the most painstaking cleansing of the wound and adjacent surfaces, during which every bit of bruised and otherwise injured or unhealthy tissue, all clots and foreign bodies are removed, the entire wound is subjected to a continuous flushing with neutral solution of chlorinated soda — Dakin-Carrel solution — in such a manner that no pain is caused or harm to the tissues, accompanied with frequent change of dressings. The basic principle is to reduce the infection to the point that healing proceeds without delay after approximation of the edges by suture and otherwise.

1. Wright, Sir Almroth: *The Treatment of War Wounds*, Lancet, London, 1917, 1, 939; abstr., *THE JOURNAL*, this issue, p. 308.

Incidentally, what Sir Almroth Wright describes as the Carrel method is not, we believe, altogether correct. As we understand it, the method does not consist simply of flushing a wound with an antiseptic; it is a combination of procedures by which a chemical substance is used under specific conditions of contact, concentration and duration, and under microscopic control. It is this that sterilization would attain, making an easy closing of the wound possible.

According to reports by Carrel and others, it is possible to secure by this method complete sterilization of infected war wounds. In other words, what seems like chemical sterilization of infected wounds may be accomplished. Sir Almroth Wright seems inclined to question whether Dakin-Carrel solution is the best for this purpose; while superior fluids may be discovered, Carrel settled on the use of Dakin-Carrel solution after having tried several other disinfectants because it gave the most satisfactory results. Whether the action of this fluid is to be explained as due solely to its direct disinfecting powers or to its favoring the physiologic processes discussed by Sir Almroth Wright may be an open question which could be studied with profit; but there can be no question that Carrel's method marks a long step in advance in the practical treatment of local infections.

LESSONS OF THE MESOPOTAMIA TRAGEDY

Blunders due to incompetence and inefficiency among men of high rank seem to be unavoidable accompaniments of all wars. The interest of students of our Civil War has largely centered around such controversies. Even in the Spanish-American War, short as it was, there was abundant time for incompetence in high places and mismanagement on the part of those responsible to manifest itself. England is today in the midst of a discussion of the Mesopotamia campaign and its consequent horrors. A tendency has manifested itself in some quarters, as Sir Victor Horsley, just before he died, predicted would be the case, to make a scapegoat of the medical service. Making all allowance for difficult conditions, it must be admitted that the superior medical officers responsible for conditions in this campaign do not make out a brilliant case for themselves. While regarded as a "small sideshow" by the British War Office, the mistakes and blunders in Mesopotamia are well worth careful consideration, especially by those responsible for the administration of medical affairs in our own Army. Originally planned for the protection of the oil fields above Basrah on the Tigris River, the military expedition which reached Mesopotamia in November, 1914, was ordered by the Indian government to advance up the valley of the Euphrates toward Bagdad, the terminus of the proposed Constantinople-Bagdad Railroad. The campaign was for a time remarkably successful, and on Sept. 29, 1915, the

British troops occupied Kut-el-Amara, 140 miles above Basrah. Although the medical equipment of the expedition had at no time been up to its proper strength, there was no complaint during the first part of the campaign. In November, 1915, the advance on Bagdad was begun, and at the battle of Ctesiphon a greatly superior Turkish force was encountered and 690 men were killed and 3,800 wounded out of a force of 11,000 British soldiers. The troops fell back to Kut-el-Amara, where they were besieged by the Turks until April 29, 1916, a siege of 147 days. The collapse of the campaign led to the appointment last August of a special parliamentary commission to inquire into the conduct of the campaign and especially into the provisions which were made for the care of the sick and wounded. The report of this commission to Parliament has just been made public. While obscured by a mass of official details, the main facts appear to be that medical provisions for the Mesopotamia campaign were from the beginning wholly insufficient, and that from the battle of Ctesiphon to the conclusion of the campaign, there was a complete breakdown of the medical service, with the inevitable result that the sick and wounded were deprived of proper care, lay for days on the battlefield without attention, suffered intolerably through lack of proper transportation facilities, and even when transported to the hospital ships, on account of overcrowding and lack of equipment, were left in conditions of indescribable neglect and filthiness.¹ There has been the usual effort to shift responsibility and to attribute the inadequate equipment to "the policy of limiting the general military preparations of India in the interests of retrenchment pursued for many years by the home government and the government of India." Yet in spite of all these generalizations, the parliamentary commission says that Surgeon-General Hathaway, the senior medical officer of the expedition, "did not represent with sufficient promptitude and force the needs of the service for which he was responsible and failed to urge the necessity for adequate and suitable transportation for the sick and wounded." The commission also reports that the officer directly responsible for medical shortcomings is Surg.-Gen. Sir William Babbie, Director of Medical Services of India, who "accepted obviously insufficient medical provision without protestation and without any adequate effort to improve it." General Babbie was succeeded by Surg.-Gen. J. G. MacNeece, July 8, 1915. The change did not improve conditions. Surgeon-General MacNeece, the commission says, was "an officer thoroughly desirous of fulfilling the duties assigned to him, but he was a man of advancing years and diminishing strength unequal to the position he was called upon to fill and showing no signs of the vigor and efficiency that were required." The one bright spot in the whole tragedy, according to the

1. See London Letter, this issue, p. 301.

Medical Press and Circular, is the behavior of Major, now Lieut.-Col. Robert M. Carter of the Indian Medical Service, who risked the displeasure of his superior officers by insisting on telling the facts and endeavoring to better conditions. All of his criticisms and suggestions were met with active intolerance on the part of his superior officers, and he himself was treated with great rudeness. In fact, General Cowper threatened to put him under arrest as a "meddlesome, interfering faddist." One is irresistibly reminded of our own General Brooke who, at a time when there were 10,000 cases of typhoid fever in his division at Chattanooga, was "annoyed" by the persistence of the medical officers in calling his attention to the infected water supply.

In endeavoring to sift out the essential facts from the mass of conflicting testimony and to locate the responsibility definitely, the commission finds that there was too little coordination between the medical staff and the military officers, that the director of medical services was hampered by being excluded from the staff conferences, that there was lack of coordination and cooperation between the different branches of the staff, especially between the inspector-general of communications and the medical service, that the military authorities treated the medical service without consideration, that the medical personnel and staff were deficient in numbers, and that the breakdown of the medical organization had a material effect on the morale of the troops. These specifications can all be condensed into two main criticisms, inherent in the organization of most armies, namely, the medical service has not been given the rank or authority which its importance deserves, and the work of the medical department and the views and opinions of medical officers have not been given sufficient weight by military men.

The remedy for such situations as the Mesopotamia muddle lies in giving the medical service rank and authority equal to the line officers, and making them, so far as is possible in war time, independent in all matters relating to the health of troops and especially to the care of the sick and wounded. To permit an officer with military training alone, no matter how high his rank or how brilliant his attainments as a soldier, to dictate conditions regarding the hygiene and sanitation of troops and the management of hospitals is as ridiculous as it would be to give a surgeon authority over the artillery or the aviation corps. Subject always to the necessities of warfare, the military and the medical services must be on an equality. Each line of activity requires highly specialized, technical training. To permit either one to encroach on the field of the other is not only absurd, but is often suicidal. Especially should there be the closest coordination and cooperation between the military and medical officers in order that the Medical Corps may be of the greatest

assistance. This is the lesson which Japan learned in Manchuria and which the English have demonstrated on the western front.

The report of the committee on the Mesopotamia campaign should be given the widest possible publicity in this country on account of the lessons which it contains. Old, incompetent and bureaucratically trained officers were given responsibilities which they were unable to carry. Younger and more efficient men were threatened with court martial and degradation for telling the facts. Sick and wounded men were compelled to live through horrors unspeakable on account of the failure of high officials to understand the conditions under which the campaign was being carried on. Medical men were excluded from conferences and not consulted as to plans. The one man who told the truth and tried to remedy conditions was regarded as a "pest" and was threatened with court martial. Doubtless in the next year or two our country will have its own trials and perhaps scandals of mismanagement and inefficiency, but it is devoutly to be hoped that our Army officials will profit by the mistakes of our allies and that the burden of such mistakes as may be made will not fall on the helpless sick and wounded.

Current Comment

POLIOMYELITIS THIS SUMMER

Last year there were much fear and pessimistic prognosis that the summer of 1917 would witness a widespread extension of the epidemic of poliomyelitis which terrorized the country during 1916. And even this year the prognosis is being repeated. Thus, Dr. Simon Flexner in an introduction to a book on poliomyelitis by Draper, says, 'Just what the coming summer and autumn may have in store cannot be predicted, but it is altogether too much to hope that the epidemic will not prevail in some degree in this country.' The reason for these prognoses is probably the history and epidemiology of the disease; it is transmitted by contact with cases and carriers, and tends to appear along the main routes of communication; one of the important epidemiologic features of poliomyelitis is its seasonal occurrence, namely, that it occurs most intensely during the months of July, August and September, although winter epidemics have occurred in Sweden, Norway and West Virginia. While this is perhaps a good basis for endeavoring by improvement in sanitation and hygiene and other methods to prevent a recurrence of the disease, it seems hardly sufficient for regarding with pessimism the outlook for the immediate future. So far there is reason to believe that the visitation of this disease during 1917 will be little more than the ordinary incidence. According to figures just made public by Health Commissioner Emerson, only seventy-seven cases have been reported to the Department of Health of New York City since Jan. 1, 1917. At the same

time last year 1,900 cases had been reported. Less than one third of the cases reported to the department of health this year as possible poliomyelitis were true cases of the disease, and the condition in New York City is much the same as that of the whole country. During the first week in July there had been four cases reported in Illinois, six cases in Massachusetts, twenty-nine cases in Montpelier, Vt., and thirteen cases in the balance of the state, four cases in Minnesota and eleven cases in Ohio, with scattering cases elsewhere.

ANOTHER WORD ABOUT MILK

The inevitable desire to help our allies by sharing our food supplies with them has led to a nation-wide speeding-up of food production in certain directions. Gardening has unquestionably received a great impetus in a popular way. Certain highly valued crops, like the potato, have been planted to the utmost limit of availability of seed resources. Many of these efforts will undoubtedly bring a substantial return in the course of the coming season. The development of a productive animal, such as the dairy cow, on the other hand, is a slow, seemingly laborious and expensive procedure. Quick returns somehow find greater favor than slower results; and thus with threats of the exclusion of suitable dairy feeds from the market, with prospects of increasing costs of feedingstuffs and labor, and with a growing demand for meat, the future of the dairy cow does not always look especially secure. How can the milk supply be conserved better than by advertising its sterling worth? Milk is well nigh indispensable, not only because it furnishes an ideal and incomparable combination of food materials, some of which are scarcely obtainable from any other readily available sources, but also because it has become a necessary part of the cuisine from a culinary standpoint. Cooking without milk would bring about a little anticipated rebellion both in the kitchen and at the meal service. If the physician is willing, as he surely must be, to endorse the slogan, "A quart of milk a day for every child," he should be equally prepared to render advice in respect to some of the pending questions regarding milk products. We recommend a few passages from a timely paper on milk in its relation to public health by the bacteriologist Rettger¹ of Yale University. The sour milk therapy is thus conceived:

Sour milk is not beneficial on account of the acid or acid-producing bacteria which it contains, but, like sweet milk, tends to encourage the development of an intestinal flora from which the putrefying bacteria are greatly reduced or absent. This property milk seems to owe to the sugar which it contains. Skim milk exerts the same influence.

We have already paid our tribute² to the advantage that is certain to accrue from repeal of ordinances like those that have until recently been enforced in New York State which have prevented the use of this valuable food for human consumption. What skimmed milk means in actual nutrients is best understood from

the report that the annual output of this inexpensive wholesome food which has hitherto been banished both by law and misguided public opinion amounts in this country to 30,000,000,000 pounds.³ If any opponents to the pasteurization of milk still remain, they will find little consolation in Rettger's conclusions:

Pasteurizing or boiling for a short period does not destroy the nutritional value, as numerous experiments have without doubt demonstrated, although physicians have from time to time claimed that heated milk as a diet for small children is conducive to scurvy. Where any doubt concerning this point has existed the feeding of small amounts of orange juice has been sufficient to allay fear.

So long as raw milk from tuberculous cows still continues to be used by thousands of consumers daily, this statement cannot be reiterated too often.

PHYSICIANS WHO ARE CONSCRIPTED

Some weeks ago we estimated that approximately 20,000 physicians would be subject to conscription.⁴ A large number at this time find themselves subject to the first call.⁵ Evidently there is considerable anxiety on the part of many of these physicians as to what disposition will be made of them. Judging from the letters we receive, some think they will be put into the "line." Just what position they will occupy in the Medical Corps we have not been informed, but they certainly will not be put into the "line." Presumably they will be detailed to the Medical Department of the Army. In fact, it is generally understood that physicians who are accepted by the Exemption Board on the call will be placed at the disposal of the Surgeon-General's Office. It has been suggested by those in authority that physicians who are called, or who are subject to call, should make application for membership in the Reserve Corps.⁶ It will be merely repetition if we again urge that all who are of conscription age, unless they are subject to exemption under the law, should offer themselves as members of the Medical Reserve Corps. In this group of men—we may again repeat—come those who are eligible for membership in the Medical Corps which still needs some seven or eight hundred officers.⁶

ACCEPTING COMMISSION IN THE MEDICAL RESERVE CORPS

A large number of physicians who have received their commissions as officers of the Medical Reserve Corps have not returned their acceptance papers. The War Department is now requesting, in some instances by telegram, that these papers be returned. Those receiving such a telegram must not construe it to mean that they will be ordered into active service at once; rather, it means that the Government wants to know—must know—the available numerical strength of the

3. Street, J. P.: Skim Milk—A Valuable and Unappreciated Food-stuff, *the Forecast*, February, 1917, p. 127.

4. Editorial, *THE JOURNAL*, July 14, 1917, p. 125.

5. Physicians called now probably will not have to report until between the first and the fifteenth of September, giving ample time to make an honest effort to enter the Reserve Corps voluntarily.

6. It has been announced that no one can volunteer as a soldier after passing the exemption board, but we doubt if this applies to physicians. In any event, no harm will be done by taking the suggested action.

1. Rettger, L. F.: Some of the Newer Conceptions of Milk in Its Relation to Health, *Scient. Month.*, 1917, 5, 64.

2. The Effect of War on Dietary Prejudices, editorial, *THE JOURNAL* A. M. A., June 23, 1917, p. 1912.

Medical Reserve Corps. Until a physician has returned his acceptance papers with his oath of allegiance, he cannot be counted. To refuse to carry out an implied agreement is not altogether an honorable action. When a physician makes application for commission in the Medical Reserve Corps, signs and acknowledges under oath this act and then presents himself for and passes the required examination, by each of these actions he agrees to undertake service. He brings disgrace not only on himself, but also on his profession when he neglects or refuses to carry out his contract. In past crises the good name of the medical profession has always been maintained by its members. They have ever been ready to sacrifice themselves for their country. Loyalty to one's calling and love for one's country demand the prompt acceptance of a commission when it is received. Few physicians, when they appreciate their responsibility, will refuse to accept the trust which a commission imposes.

CONSCRIPTED MEDICAL STUDENTS

We regret to say that up to this time no definite arrangement has been made regarding the disposal of medical students who may be drafted and ordered into active service. There is no doubt, however, that a ruling will be made whereby they will be enabled to complete their medical education. It is important, in presenting the matter to the government for action, that definite information shall be at hand as to the actual number of medical students who are included in the first call, as well as the total number of medical students registered under the selective conscription act. It is requested, therefore, that every undergraduate medical student who is subject to conscription, now or in the future, send in his name, the name of the medical college he attended during 1916-1917, the class in which he was enrolled, his age, etc., including his serial and the numerical order of his draft. This information should be sent to the Council on Medical Education of the American Medical Association, 535 North Dearborn Street, Chicago, *at once*. A direct appeal by mail is being made to each student, in the hope that a complete list may be obtained promptly, and be available for use when the time comes. As this paragraph will not come to the attention of all medical students, physicians are asked to cooperate by bringing the matter to the attention of medical students with whom they may be in contact. IMMEDIATE ACTION IS IMPERATIVE.

Kidney Lesions from Lead Poisoning.—The transient appearance in the urine of albumin, tube casts and sometimes of kidney cells may be the first sign to call attention to the lead poisoning, or it may accompany lead colic although not directly connected with the latter. When these kidney symptoms become more persistent and tend to chronicity, a change of occupation must be insisted on as otherwise the patient is on the road to serious kidney lesions. They are not altogether the consequence of sclerosis of the vessels; the lead has a direct toxic action on the parenchyma, even before it injures the vessels permanently. The above are the conclusions drawn by Gigliolo from study of 274 cases of lead poisoning. All but ninety-six presented pronounced symptoms of kidney disturbance.—*Ramazzini*, 1915, 9, 201.

Medical Mobilization and the War

SPECIAL ARTICLES

WAR WASTAGE: A NOTE OF WARNING TO EXAMINERS OF RECRUITS*

SIR WILLIAM OSLER, BART.

OXFORD, ENGLAND

In the grim game of war bullets and bacilli put men out of action, and the best general is the one who has the lowest percentage of wastage by the former with as little as possible from the latter. An outstanding feature of the present war has been a reversal of the usual proportion of killed and wounded to those who have died from disease. But there is another group, the unfit, who should be checked at the recruiting office, as they furnish a large contingent in our hospitals and add a needless burden of transport, care and pension.

What I desire to urge in a few words is the necessity of stopping at its source, this group. It is impossible to deal with all types of unfit men, but let me briefly indicate those who should be kept at home.

First, the Mouth Breather. "Shut your mouth and save your life" is the title of Kit Catlin's famous pamphlet, which should be reprinted every few years for distribution. The original title of the pamphlet just referred to was "The Breath of Life" and Nature meant this to pass through the nose, an organ which medically speaking reaches to the diaphragm. Blocked nostrils mean: (1) weakened tonsils and pharyngeal resistance; (2) enormously increased liability to bronchitis and catarrhal troubles of all sorts, and (3) lowered defense against the pneumococcus group. The hospitals have had to bear the strain of caring for hundreds of these men who should never have passed the examining board. No matter how good his chest, or how keen he is to go, or how good his muscles, be merciful to the Army and keep the mouth breather at home. Campaigning is not for him.

Second, the Neurasthenic, who is not so easy to catch, as the signs are deceptive, and he may come up in good form. Moreover, he is keen and alert and usually anxious to go. The history is all important. Has he had a break down? There are many groups, the worst coming from men of sedentary occupations. A great many get into the army, a few pull through all right; but what I would urge is, try out the doubtful cases in the home camps. The trenches is no place for a man with unstable vasomotors. In the strain of war they break like dry twigs and become a heavy burden in the hospitals and convalescent homes. In any case when in doubt give the country the benefit.

Third, the Hippocratic Chest, as it may be called, long, narrow, thin and with, as so often happens, the vertically placed low heart. Cut out unsparingly the owners of these. If lungs and heart are not in a good "case" the head is of no use in war.

It may seem very saucy for a man who has never been trained to examine recruits to venture to give advice to his superiors, but this brief note of warning is sent to my colleagues in the United States in the hope that they may profit by the experience of one whose work has been largely with the wastage of the recruiting office.

* With this communication Sir William Osler sends a personal note which is here passed on to "all old friends":

Congratulations on *THE JOURNAL*, which keeps up splendidly and is more and more read over here. We have been thrilled by the arrival of the American Hospital units, and still more by the safe arrival of the troops. I wish you could realize how much it is felt by all classes here. There is extraordinary enthusiasm and it was a great sight yesterday to see the Stars and Stripes floating over the Houses of Parliament. The American Orthopedic draft of 20, brought over by Goldthwaite, has been distributed in various hospitals and is doing splendid work.

Greetings to all old friends.

Sincerely yours,

WILLIAM OSLER.

The Athenaeum, London.

STANDARDIZATION OF THE PRACTICE OF MILITARY SURGERY—THE CLINICAL SURGEON IN MILITARY SERVICE *

GEORGE W. CRILE, M.D.

Major, M. R. C., U. S. A., Director Base Hospital No. 4
FRANCE

A study of the actual working of the French and British systems of military surgery reveals one important defect—a defect recognized by the French and British military surgeons themselves: There is a lack of continuity in the surgical treatment as the patient is passed from one hospital to another from the front. For instance, a patient at the regimental station may get a Wright salt pack; at the field hospital, eusol;¹ at the evacuation hospital, a bismuth-iodoform-paraffin dressing; at the base hospital, neutral solution of chlorinated soda, Carrel-Dakin. As to appliances, he may start with a Thomas splint; get plaster at the next station; Blake's splint at the third, and at the last, go back to a Thomas. The British surgeons are splendid; the British consultants are distinguished; but the system is illogical in this respect: One consultant correlates the work at the casualty clearing station for a given zone (U. S. evacuation hospital) and has no supervision over the work either in advance of this zone or behind it; another consultant correlates the surgery of a group of base hospitals, but has no supervision over the work either in advance of this zone or behind it; that is to say, as far as continuity of treatment is concerned, the line of transportation is broken transversely, correlation, if it exists at all, being accidental, not planned.

ORGANIZATION OF AN ARMY CORPS

It is obvious that a common training, a common experience, alone will give a necessary military and professional cohesion which will lead to the achievement of standardization. To this end, the organization of an army corps should include:

(a) A professional and nursing staff, the majority consisting of medical officers and nurses who have had similar training, that is, members and graduates of the same medical school, teaching hospital and nursing training school. The clinical director of the surgical service of an army corps should be the surgical chief of the hospital and the head of the surgical division of the medical school.

(b) The establishment for each army corps of a temporary field training school for surgeons, nurses and orderlies at a large base hospital in active operation from the personnel of the following teaching organizations.

(c) The training of surgeons, nurses and orderlies in the wards of the teaching hospital before assignment to duty.

INSTRUCTION IN MILITARY MEDICINE

During time of peace, the students in the medical school would receive a certain amount of instruction in military surgery. The house staff of the hospital would receive special military instruction. With perhaps only minor changes, the hospital would use the same methods and appliances in time of peace as would be employed in time of war. For example, I am using in my work abroad the same methods, appliances, and anesthetics and the same organization I use in Lakeside Hospital.

In this way, the leading medical schools and the teaching hospitals could in time of peace cooperate under the direction of the surgeon-general in a permanent preparedness, the same organization in time of war establishing field training schools for surgeons, nurses, orderlies, and others.

A field base hospital would be the proper place in which to establish a field training school. Since the most important surgical work is at the casualty clearing or evacuation hospitals, the staffs of the evacuation and of the field hospitals should be drawn from the best surgeons and nurses who have been trained in the base hospital. If possible, a civilian surgeon should be given no post until he has received some prac-

tical experience and training in the base hospital. The regimental medical officers also should have seen duty in the base hospital. By such an arrangement there would be approximated a continuity of treatment.

The base hospital would act not only as a training school and clearing house for the professional staff, but also as a center for the prosecution of research and a testing station and clearing house for methods of treatment, instruments and appliances.

The directors would constitute a clinical medical board, whose duty it would be to coordinate the clinical and scientific experience of the whole service. An army medical corps thus prepared would be completely standardized as to methods, surgical conceptions, instruments and appliances, and continuity of treatment from the time of injury to discharge would be established.

THE CIVILIAN PHYSICIAN IN THE ARMY

This war has shown (a) that rarely do surgeons—especially surgeons distinguished as practitioners, as teachers, or in research—become good executives or administrators, and (b) that equally rarely do good executives or administrators become clinicians.

In the organization of the Field Service of the American Army, therefore, the clinical and executive functions should be clearly differentiated, as follows:

1. The regimental surgeon must combine maximum clinical with minimum administrative function.

(a) For the paper work, transport, etc., the clinician should be guided and relieved by the administrative and executive organization; and

(b) For the treatment of wounds, he should be responsible to the clinicians at the Casualty Clearing Station and Base Hospital.

2. At the Field Dressings Station, also, the surgeon should combine maximum clinical with minimum administrative function.

3. At the Casualty Clearing Stations (U. S. evacuation hospitals) and the base hospitals, the clinical and the administrative organizations should be clearly differentiated but obviously they should work in complete harmony.

Here the commanding officers as a rule are members of the regular army. Clinicians are usually drawn from civil practice. By the separation but correlation of their functions each group is occupied along natural lines, and the best results are achieved for the service and for the greatest development of the individual.

ORGANIZATION OF ADMINISTRATIVE WORK

The work and the organization of the administrative side is obvious—not so obvious is the work and the organization of the clinical side, for certain important changes have been brought about by the experience of this war. Of first importance among these changes is the fact that, while we have organized most highly for surgery at the base hospital—and at the beginning of the war the base hospital was the place where the most important surgical work was done—now the most important work is done at the casualty clearing stations (U. S. evacuation hospitals). Our best operating teams, therefore, should not be held at the base hospital, but the ablest and freshest should be assigned to the advanced posts.

Colonel Kean's base hospital organization is excellent, but his organization should include the casualty clearing station (evacuation hospital) and beyond that the field and regimental stations—a complete sector. From the base hospital teams of clinicians in succession should go to the casualty station and further stations for terms of duty, and when fatigued should return to the base hospital. Base hospitals are now serving as quiescent evacuation hospitals, where cases come whose fate has been more or less established at the casualty clearing stations.

The work at the base hospital is interesting—is important; but less interesting, less important from the surgical standpoint than the work at the casualty clearing station.

If the scope of Colonel Kean's organization were to be augmented so as to include the complete group described above, and instead of organizing base hospitals alone, he

* Mailed June 6, received July 16.

1. Eusol is a nondescriptive name applied to a solution of hypochlorous acid.

were to organize clinical groups for a complete sector, to assure continuity of treatment from the field to recovery or return home, there would result more efficient treatment for the wounded, and greater interest and development for the clinician.

HOSPITAL CAPACITY IN THE FIELD OF WAR

The French and British have found by experience that the hospital capacity planned for at the beginning of the war was wholly inadequate. The following points are drawn from their experience:

1. On account of the remarkably wide and sudden fluctuations in the number of casualties, hospitals should be so constructed and their personnel so organized as to provide for a large crisis expansion.
2. The newer base hospitals here have a capacity of from 2,000 to 3,000 beds. The capacity of the Casualty Clearing Stations (U. S. Evacuation Hospitals) varies from 500 to 1,000 beds. The larger size has the following advantages: (a) economy in operation; (b) development of a strong professional staff; (c) large convoys can be cared for—the sick and wounded must be considered on a wholesale and not a retail basis.
3. The hospital grounds should be in excess of present needs to allow for rapid expansion for crisis needs.
4. The hospitals should be so planned that patients may be conveyed to all parts on wheels. If patients must be carried, there is always the chance, in the strain of a crisis, that the bearers may become exhausted and the whole system break down. It is very difficult to plan for receiving and caring for say 800 patients in a day, yet there have been times in the experience of every active hospital when more than half of its entire capacity was thrown upon it in a day. There is feast or famine. Nothing could be more regrettable than to fail to provide sufficient capacity for emergencies.
5. *Crisis Expansion* is splendidly provided for in British hospitals by tents containing closely placed rows of board cots. These are not used during quiescent periods but are filled in crises. Emergencies are further planned for in advance by the continual evacuation of patients to the home stationary hospitals.
6. The receiving organizations also must provide for crisis expansion: (a) It should be so arranged that the entire hospital can be filled within twenty-four hours. (b) To avoid blockade, the point of exit for the ambulances should be opposite the point of entrance. (c) The space should be so arranged and the reception personnel—stretcher-bearers, etc.—so organized that a number of ambulances can unload simultaneously, and the patients be distributed to their cots with no confusion and with minimum delay.
7. The casualty clearing hospital is the bag for the field hospitals; the base hospital for the casualty clearing hospitals. Crises must be planned for in advance by constant evacuation all along the line.

GIVING THE MEDICAL OFFICER THE RANK TO WHICH HE IS ENTITLED

On July 20, Senator Owen introduced an amendment to Senate Bill 1786, which is of considerable importance at the present time. It is as follows:

“On page 7, line 20, insert the following at the end of section 10:
“Provided, That hereafter the commissioned officers of the Medical Corps of the Regular Army shall be distributed in the several grades as follows:

	Per Cent.
Major generals .....	.25
Brigadier generals .....	.25
Colonels	4.00
Lieutenant colonels	8.00
Majors	23.5
Captains	32.0
Lieutenants	32.0
	87.5
	100.00

“Provided, That when called into service the numbers of the officers of the Medical Reserve Corps shall be seven to the thousand of men in the National Guard and National Army and the relative grades of the officers of the Medical Reserve Corps shall be the same as the grades of the Regular Army.

“The President shall have authority to appoint officers of either corps as ‘consultants,’ with the duty of acting in an advisory capacity, making inspections and reports on medical, surgical, or sanitary questions, and such other duties as may be required by the chief of the Medical Department.”

In introducing the above amendment Senator Owen submitted arguments in the form of a memorandum furnished by Dr. Victor C. Vaughan, a part of which memorandum we reproduce:

ARE WE TO FORGET THE LESSONS OF 1898?

This is a question now being asked by medical men all over this country. We have no desire to recall the sad story of typhoid fever epidemic among our soldiers in 1898 unless we may profit by doing so. It may be well for us to remember that out of a total of 200,000 enlisted men in that war, more than 20,000 developed this disease. But, says one, vaccination now prevents altogether or greatly lessens the chances of developing typhoid fever, and such an epidemic can never again occur. This may be true, and is undoubtedly partly true, at least of typhoid fever; but there are other diseases for which, unfortunately, we have no protective vaccination. Some of these diseases are diarrhea, dysentery—both bacillary and amebic—scarlet fever, measles, various forms of meningitis, poliomyelitis, pneumonia, tuberculosis, etc. All infections have not yet been conquered. Among the causes of the fearful diseases of 1898—and the causes were many—was the lack of authority on the part of the medical officer. There is abundant evidence of this in various government documents. In the “Report on typhoid fever in United States military camps in 1898” the evidence that the superior authority of the line officer was responsible in many instances for the insanitary condition of the camps is abundant. This report tells us that many commands were unwisely located, and often this was done in the face of remonstrances on the part of the medical officer. Medical officers of the Seventh Army Corps generally condemned the location at Miami, and yet regiments were kept on this site until they were much reduced by illness, and at Chickamauga some regiments were placed on ground so rocky that the construction of latrines of proper depth and width was impossible. Other camp sites received the surface washings from adjacent commands. Some were contracted into half the regulation space. Many regiments were compelled to remain on the same site until the soil became badly polluted, notwithstanding the fact that there were many broad acres around about, and no hostile army was nearer than Habana. From this report we make the following quotation: “There were regiments at Chickamauga that did not move a tenth of an inch from the time of arrival in May to that of departure late in August. Requests for change in location made by medical officers were not always granted. As an illustration under this head, we may call attention to the official records of the Fifth Pennsylvania. This command reached Chickamauga Park, May 20, and was, unfortunately, located on low ground. Requests for a change in location were repeatedly sent in during June and July. The soil became muddy, the camp received the washings from camps above, the sinks rapidly filled with water and overflowed, and still requests for change in location were not heeded until August 12. As we have seen, some of the regiments were improperly located from a sanitary standpoint. This was done by superior line officers, and sometimes in the face of protests from the medical officers.”

This report advised that greater authority be given medical officers in all questions relating to the hygiene and sanitation of camps, and now, as we are going into another war, the line has one general officer for every 167 commissioned officers, while the Medical Corps has but one, whatever the number of commissioned officers may be, and in an army of 1,000,000, the number of commissioned medical officers will be not less than 7,000.

The medical profession requests that one-half of 1 per cent. of commissioned officers in its corps have the rank of general officers. This seems a modest request and is allowed in the Navy; but, for some unknown reason, has so far been denied the Army. One who has served in the Medical Corps can understand and thoroughly appreciate the hesitancy with which a lieutenant in that corps may recommend to a colonel of the line that a camp site be changed or that some other sanitary improvement is desirable; and one who served in the Medical Corps in 1898 knows full well the reception such a recommendation frequently met at that time, and he can guess at the reception it is likely to receive in the future under similar conditions. If any one has doubt concerning

the attitude of many line officers of high rank in 1898 toward the recommendations of medical officers, he should read the testimony of Major-Gen. Brooke and other officers in command in the camps in 1898. This testimony may be found in the volumes of the congressional inquiry into the "Conduct of the War Department in the War with Spain," generally known as the Dodge report.

The commanding line officer at Chickamauga took no pains in his testimony to show his contempt for the advice of his own medical officers, and this contempt and disregard constituted large factors in filling the hospitals and graves with typhoid cases. We have not place here to quote largely from his testimony, but a few sentences of the testimony of General Brooke may be given:

"Q. Had any of the wells, General, been condemned by the Medical Department prior to your leaving [Chickamauga]?
—A. By alleged Medical Departments. Two of them were erroneous, I believe, after investigation made by myself. The one in front of a South Carolina regiment, which, I believe, really to have been perfectly pure water. There was afterwards discovered a surface well which had been walled up and water slipped in from which this regiment—this was reported to me—used the water. That well was not far from a large sink, and possibly on lower ground. I never could understand from my knowledge of rocky strata how that well could have been contaminated. Another well lying on the road between Alexander House and Jay's mill was also condemned. I drank of that well water every time I passed it until somebody broke the pump to pieces. I suppose it was some of our energetic medical fraternity who had spent their time in finding that there was a suspicion of these two wells, and then I did not bother further about it." (Conduct of War Department in War with Spain, vi, 3080.)

In this camp there were about 10,000 of General Brooke's troops affected with typhoid fever, about 700 of whom died. This was 25 per cent. of his command.

It probably took a large part of the remaining troops to take care of those who were sick. This excellent general of the line could not understand the folly of medical officers who pointed out that the water was infected and himself drank from infected water, and notwithstanding this, by the providence of God he escaped, because he had had a previous attack of typhoid fever and was himself immune. God bless the line officer and God save the soldiers of the United States from his ignorance of sanitary law.

On the following page there is a statement of the insanitary condition of Camp Thomas made by the medical officer of the Twelfth New York Infantry. The commanding line officer was so incensed at this report that he said: "If you will give me a copy of that report, I will see that that young man goes before a court-martial for the sort of statement he has made there, if he is not protected by this commission."

This reminds me of the case of Lieutenant Edger, in the Philippines, who stamped out an attack of cholera in an adjacent village near Santa Cruz, where eighty cases occurred the first day and where half the people in the town died in less than sixty days, approximately 1,000 in number. This young medical officer so far protected the American soldiers adjacent that not one of them was lost with cholera, but in his vigilance and strenuous effort to protect them he was court-martialed by the officer of the line in charge and punished on the ground of insubordination when he insisted on taking what he deemed necessary sanitary precaution.

This young lieutenant is now in the Medical Department, and is available as a witness if any statesman desires to summon him.

On July 17, 1898, the chief medical officer at Chickamauga addressed a letter to the Adjutant-General containing recommendations concerning the improvements of sanitary conditions. In brief, the letter contained the following recommendations:

1. That the Signal Corps, which had occupied the same site for several months and which was crowded, should be moved.
2. That selected places should be designated as dumping grounds and all the waste should be collected and deposited on these places instead of being scattered through the camp.
3. That so far as possible all camp sites should be changed.
4. That the hospital of the first division of the corps be moved from the insanitary position they occupied to a more healthful location.

5. That the village of Lytle, which was a sanitary menace to the troops, should be cleansed.

6. That all condemned sources of water supply should be effectually closed.

7. That only filtered or boiled water should be used by the soldiers.

8. That all hucksters selling doubtful food or drink should be expelled from the camp.

9. That there should be careful supervision of all food and drink sold in the canteens.

These recommendations made in July were unheeded at the time.

In his testimony, General Brooke spoke of the letter containing the above recommendations as follows: "I did not regard his letter in a very serious sense. I do not know how he came to write it. There was much complaint in that camp from men of his own profession as to his action. He caused me more trouble and annoyance than any one ever did."

Had the recommendations contained in this letter which annoyed the senior line officer been taken seriously in July the fearful harvest of sickness and death in August might have been averted.

Nineteen years have passed since our little war with Spain, and we have crossed the threshold of a great war with Germany, Austria, Bulgaria and Turkey. This war begins with the medical officer possessed of no more authority than he had in 1898. Will his recommendations be as futile as they were then? The medical profession has always been responsive to its country's demands, whether in war, in pestilence, in flood, or in famine. Conscription has never been necessary to fill its quota. Medical officers will do their best and will present their recommendations to superior line officers, but they realize that these recommendations are likely to receive scant attention, and that the medical officer will be compelled to work under a heavy handicap. The government stamp placed on the medical officer indicates the opinion that the government has of the value of his services, and that his recommendations will receive from line officers any different consideration from that accorded them in 1898 is not probable. At present the Army Medical Corps has no representation on the general staff or in the war college.

Will it be possible that camp sites, both small and great, will be selected as they were in 1898, without consultation with the Medical Corps? And are we justified in feeling that we may have some reminders of the experiences of 1898? According to the testimony of the Surgeon-General recently, given before a medical committee, the relative number of trained medical officers is not as great now as it was at the beginning of the Spanish War. We had then seven per thousand. We have now about five per thousand.

THE ENGLISH RECOGNIZE THE IMPORTANCE OF GIVING AUTHORITY TO MEDICAL OFFICERS

In 1904 the English war office was reorganized by a committee, the chairman of which was Lord Esher. In this reorganization no provision was made for a representative of the medical army corps on the general staff, or what corresponds to our war college. At the time the surgeon-general complained of this action. In reply to this complaint Lord Esher's committee stated that while too much importance could not be attached to the sanitary service of the army in peace or in war, the committee could not accept the views of the surgeon-general. Lord Esher's committee continued: "The army council is not and cannot be a representative body as regards the several arms and departments. The Royal Army Medical Corps exists to serve the army in a most important capacity, but the first object must be to create and maintain an army, and this is the function of the army council. To admit the principle of representation would destroy the character of the council."

This was the opinion of Lord Esher in 1904. Recently (London Times, Feb. 3, 1917) Lord Esher writes as follows: "How much of the suffering undergone by our soldiers since the war began has been due to the shortsightedness of my committee, and notably of myself, will never be known. Certainly the control of the adjutant-general's branch over the Royal Army Medical Corps was and is responsible not only for the early failure to grip the medical factors of the war, but they hampered conditions under which the surgeon-general has worked. His triumphs and those of the Royal Army Medical Corps have been achieved in spite of obstacles that the subordination of science to ignorance and of elasticity to military discipline explains but can not justify."

THE RANK AND AUTHORITY OF THE MEDICAL OFFICER

When Stanton was Secretary of War and Hammond Surgeon-General early in the Civil War, the latter made a request of the former for advanced rank for medical officers. The great Secretary of War replied with a question: "Will increased rank make your medical men better doctors?" The Surgeon-General replied with another question: "Does increased rank make line officers, quartermasters, and those in other corps more proficient?"

There are two important considerations in regard to the rank and authority of Army medical officers. In the first place, the higher the rank obtainable the better the class of young physicians attracted to the corps. When a young man knows that whatever he may do, however skilful and energetic he may be, whatever discoveries he may make, whatever sacrifices he may undergo, the rank of colonel, with a pay of about \$5,000, is the best that he can possibly look forward to in his old age, it must be acknowledged that the temptation to enter the Army medical service is not great.

In the second place, and this is of more importance, rank in the Army necessarily means much. A request or a recommendation from a colonel or a general will receive more consideration than when it comes from a lieutenant. Much of the disgrace of 1898 and the disregard shown their recommendations by superior line officers was due to the lack of rank and authority among medical men.

Specialists Wanted for Medical Service in Cantonments

The Surgeon-General of the Army wishes the names of men who are willing to accept active service and who have had training in bacteriology, serology, pathology, dermatology and venereal disease. Such men are asked to send their names at once to the Surgeon-General. The service immediately contemplated is in the cantonments where troops will soon be mobilized.

As we understand it, the men asked for by the Surgeon-General in this notice are those who have had special training and experience in the fields mentioned. Men are wanted, (1) who are competent to take charge of hospital services in these specialties, and (2) younger men who have had special laboratory or clinical training, and who can carry out scientific methods of diagnosis and treatment. These men will be needed for immediate service. In making application a statement should be given of experience and training. These positions will offer unusual opportunities for usefulness.

Red Cross Sends Commission to Roumania for Relief Work

As a further step in its program for basing American relief work abroad on accurate surveys of conditions, the Red Cross war council announces the dispatch of a Red Cross commission to Roumania. The commission is headed by Henry Watkins Anderson, a lawyer of Richmond, Va. It will undertake at once, in addition to its investigation of sanitary and health conditions, actual relief work among the Roumanian refugees. Twelve doctors and twelve nurses accompany the commission. Quantities of medical supplies, serums, vaccines and foodstuffs urgently needed in Roumania are being sent with the commission by the war council. A special emergency appropriation of \$200,000 has been voted for Roumanian relief.

MEMBERS OF COMMISSION

In addition to Mr. Anderson, the chairman, the members of the commission to Roumania, as announced by Mr. Davison, are: Arthur Graham Glasgow, an engineer, Washington, D. C.; Dr. Francis W. Peabody, Boston, who represented the Rockefeller Foundation in its medical investigations in China; Bernard Flexner, Chicago, a lawyer, who has taken a prominent part in many sociological movements in the Middle West; Dr. H. Gideon Wells, Chicago, professor of pathology in the University of Chicago; Dr. Roger Griswold Perkins, Cleveland, professor of hygiene, Western Reserve University, and Dr. Robert C. Bryan, Richmond, Va. Doctors and nurses of the medical unit accompanying the commission are: Dr. W. D. Kirkpatrick, Bellingham, Wash.; Dr. Richard Penn Smith, Fort Loudon, Pa.; Dr. D. J. McCarthy, Davenport, Iowa; Dr. George Y. Massenberg, Macon, Ga.; Dr. R. H. Rulison, Syracuse, N. Y.; Dr. B. C. Hamilton, Syracuse, N. Y.; Dr. Benjamin Earl LeMaster, Macomb, Ill.; Dr. Louis H. Limauro, Lynn, Mass.; Dr. E. F. Hird, Bound Brook, N. J.; Dr. W. T. Lowe, Pine Bluff, Ark.;

Dr. Joseph P. H. Grener, Chicago; Dr. Feo. Duro Guca, Chicago; Dr. William J. Kucera, New Prague, Minn.; Florence Patterson, head nurse, Washington, D. C.; Rachel C. Torrance, New York; Katherine Olmstead, Milwaukee, Wis.; Alma Forester, Chicago; Alice Gilborne, Chicago, and Anna T. Pederson, New York.

Enlargement of Training Camps for Medical Reserve Officers

Authority has been issued to increase the training camps for medical reserve officers at Fort Riley, Fort Oglethorpe and Fort Benjamin Harrison to 1,000 medical officers each. In addition to the other formations previously authorized for purposes of training and preparation, an evacuation hospital will be organized in each camp.

Training Camp for Ambulance Service at Allentown, Pa.

A training camp for special ambulance work has been organized at Allentown, Pa. At this camp the Medical Department of the Army has at present 4,700 officers and men. Major E. E. Persons is in command of the camp. About 75 per cent. of the enlisted personnel are college and university students.

Training School for Colored Medical Officers

In connection with the training camp for colored soldiers at Fort Des Moines, Iowa, there will be organized a training school for colored medical officers with ten regimental sanitary detachments.

Additions to Medical Corps

About ninety candidates qualified in the June examination for appointment to commissions in the Medical Corps of the Army.—About 235 candidates qualified in the June examination for appointment as assistant surgeons in the U. S. Navy.

Emergency Hospital Buildings

The Secretary of the Navy has submitted to Congress a supplemental estimate for the appropriation of \$2,200,000, which is urgently required for the construction of emergency hospitals at New York, Annapolis, Md.; Quantico, Va.; Key West, Fla.; Great Lakes, Ill.; Mare Island, Calif., and Puget Sound, and additional buildings needed at Newport, R. I., and Norfolk, Va.

Physicians at Fort Benjamin Harrison

To the Editor:—Careful search of the list of medical officers given in special article about this camp in issue of July 21 of THE JOURNAL fails to show the names of Charles E. Cook, Jr., in the list of doctors from Maine and Charles H. Merrill of Michigan. Charles E. Cook, Jr., and Charles H. Merrill have both been in the camp continuously from the first week of the course and we see no reason why our names should be omitted.

CHARLES E. COOK, JR.,
C. H. MERRILL,

Fort Benj. Harrison, Ind., Co. 4, M. O. T. C.

The Salary of Medical Reserve Officers

A physician asks: 1. Do medical officers receive full salary while in training? 2. What are the necessary expenses? 3. How often is the salary paid? 4. Could a medical officer have part of his salary paid to his wife in the United States while he is in France?

1. A medical officer assigned to active duty in a training camp receives the salary of his grade while undergoing training. 2. His necessary expenses include outlay for uniform and equipment and sufficient capital to pay expenses during the first month prior to receiving his pay. These expenses include "mess" and incidentals, and will probably amount to a minimum of \$35 per month. The cost of a minimum equipment averages about \$65. 3. Medical officers are paid monthly. 4. Yes; by special arrangement; consult the quartermaster in charge.

Orders to Officers of the Medical Corps

Sick leave of one month to Lieut. Col. Henry D. Snyder, M. C.
Capt. George B. Foster, Jr., M. C., with his enlisted personnel and all equipment to Atlanta, Ga., for establishing a department laboratory at that place.
Capt. Edward G. Huber, M. C., to Chicago for duty.
Capt. Frederick S. Wright, M. C., to Fort Adams, R. I., and report in person to the commander of the provisional brigade, C. A., for duty.
First Lieut. Arden Freer, M. C., to Camp Wilson, Fort Sam Houston, Texas, Provisional Ambulance Co. B, for duty.
Capt. Luther R. Pouset, M. C., to Louisville, Ky., and Capt. Kerwin W. Kinard, M. C., to Chillicothe, Ohio, as camp sanitary inspectors during the period of construction of cantonments.
Capt. William K. Bartlett, M. C., to duty and station at Des Moines.
Master Hospital Sergt. Edgar T. Hitch, Med. Dept., Fort Bayard, N. M., to the Army and Navy General Hospital, Hot Springs, for duty.
Sergt. 1st Class Walter H. Bailey, Med. Dept., Fort Constitution, N. H., to Fort Andrews, Mass.
Sergt. 1st Class Oscar V. Everett, Med. Dept., to Regan Barracks, Albany, for duty.
Hospital Sergt. Francis J. Eiseman, Med. Dept., Manila, will be relieved and sent to Chicago for duty.
Sergt. 1st Class Joseph Schneider, Med. Dept., to medical supply depot, Atlanta, Ga., for duty.

Orders to Officers of Medical Reserve Corps

ALABAMA

To Army Medical School, Washington, D. C., for instruction, Lieuts. Henry Wiley Grady and Karl Frederick Kesmodel, Birmingham.
To Camp Wilson, Ft. Sam Houston, 7th Field Art., Lieut. William T. Weissinger, Uniontown.
To Ft. Benjamin Harrison for instruction, Lieut. C. R. Palmer, Tusculumbia.

ARIZONA

To Provisional Ambulance Co. B, Camp Wilson, Ft. Sam Houston, Lieut. Bascom F. Morris, Tucson.

ARKANSAS

To Army Medical School, Washington, D. C., for instruction, Lieut. Horace F. Villars, Little Rock.

CALIFORNIA

To Army Medical School, Washington, D. C., for instruction, Lieuts. Oral Bevaley Bolibaugh, Reedley; John Jay Moore, Soldiers Home, and James Archibald Orbison, Whittier.
To Ft. Benjamin Harrison for instruction, Lieut. H. M. Hawkins, San Francisco.
To San Francisco, Capt. James G. Cumming, Berkeley.
To report by telegraph to commanding general, Western Dept., for assignment to duty, Capt. Joseph G. Evans, Los Angeles.

CANAL ZONE

To Army Medical School, Washington, D. C., for instruction, Lieut. Tom Sperring Mebane, Panama City.

COLORADO

To Ft. Riley for instruction, Lieuts. G. W. Bancroft, Colorado Springs; B. C. Dorset, Denver; A. W. Rew, Ft. Collins, and E. G. Edwards, La Junta.

CONNECTICUT

To Army Medical School, Washington, D. C., for instruction, Lieuts. John Joseph Carden, Bridgeport, and Donald Gardner Russell, Wallingford.

DELAWARE

To Ft. Benjamin Harrison for instruction, Lieut. B. A. Jenkin, Wilmington.

DISTRICT OF COLUMBIA

To Washington, D. C., to Army Medical Museum, Major F. H. Garrison, Washington. To Army Medical School, Lieuts. Burgh Smith Burnet, John Marion Stanley and Ernest Kenneth Stratton, Washington.
To Baltimore for instruction in military roentgenology, Lieut. Walter Van Sweringen, Washington.
To Camp Wilson, Fort Sam Houston, Lieut. Herbert C. Neblett, Washington.
To Fort Benjamin Harrison for instruction, Capt. J. L. Norris, Washington.
To Fort Riley for instruction, Lieut. Louis A. LaGarde, Washington.
To Walter Reed Hospital, Takoma Park, Capt. John H. Selby, Washington.
To duty with Sixth Engineers, Washington, D. C., Capt. Edward B. Jones, Washington.

FLORIDA

To Army Medical School, Washington, D. C., for instruction, Lieut. Bascom Headen Palmer, Tampa.
To Fort Benjamin Harrison, Lieut. Charles S. Cooper, St. Cloud.
To Fort Oglethorpe for instruction, Lieut. Fay A. Cameron, Tampa.
To Richmond, Va., for instruction in military roentgenology, and then to Fort Oglethorpe training camp for duty, Lieut. John P. Long, Lake City.

GEORGIA

To Ambulance Co. No. 5, Camp Funston, Leon Springs, Lieut. Edward L. Moore, Statesboro.
To Fort Oglethorpe training camp for instruction, Lieut. F. X. Mulherin, Augusta.

IDAHO

To Fort Benjamin Harrison, Lieut. Fred R. Patton, Roselake.

ILLINOIS

To Army Medical School, Washington, D. C., for instruction, Lieuts. John Edwin Robinson and Leonard Webster Weaver, Chicago.

To Champaign, Ill., as post surgeon at Ground School, Av. Sec., S. C., Lieut. James H. Finch, Champaign.

To Fort Benjamin Harrison for instruction, Lieuts. F. E. Browning, Chicago, and Tom Kirkwood, Lawrenceville.

To examine National Guard and then to Fort Benjamin Harrison for instruction, Capt. Charles H. Parkes, Chicago; William J. Uppendahl, Peoria; Lieuts. Grover C. Otrich, Belleville; Wilbur G. Little, Irving Perrill, Frederick J. Riley, Harry Robenstein, Chicago; Hiram E. Ross, Danville; William H. Maley, Galesburg; Robert D. Luster, Granite City; Harry B. Roberts, Highland Park; Winfield G. McDeed, Monticello, and Orvel A. Suttle, Mount Vernon.

To Fort Riley for instruction, Lieuts. L. D. Applewhite and L. G. Harney, East St. Louis.

To Washington, D. C., for instruction, Lieut. Walter J. Sullivan, Chicago.

To home, Capt. J. R. Hollowbush, Rock Island.

To Army Medical School, Washington, D. C., for instruction, Lieut. Frederick Arthur Blesse, Chicago.

INDIANA

To Army Medical School, Washington, D. C., for instruction, Lieuts. Chester A. Stayton, Arlie John Ullrich, Indianapolis, and Brown Shirk McClintic, Peru.

To Fort Benjamin Harrison for instruction, Lieuts. Frank A. King, Garrett, and Ulysses G. Goodwin, Monticello.

To examine National Guard and then to Fort Benjamin Harrison for instruction, Lieuts. Henry W. Gante, Anderson, C. W. Ashley, Bicknell; Charles C. Crampton, Delphi; Joseph R. Dillinger, French Lick; Daniel R. Benninghof, Edgar N. Mendenhall, Fort Wayne; Clarence C. Bassett, Goodland; Fred L. Hosman, Clifford H. Mayfield, Indianapolis; Clarence E. Barcus, Logansport; Hubert P. Butts, Pierceville; David E. Reed, Russellville; Ernest E. Leeson, Sharpsville; Arvine E. Mozingo, Tipton.

To Cornell Medical College, New York, for instruction in military roentgenology, Capt. James W. Squire, Fort Wayne.

IOWA

To Army Medical School, Washington, D. C., for instruction, Lieut. Ward Stanley Wells, Nashua.

To Fort Riley for instruction, Lieuts. B. L. Gilfillan, Keokuk; E. B. Fulliam, Jr., Muscatine; E. D. McClean, Oskaloosa, and J. A. Matson, Purdy.

To Fort Myer, Va., for duty, Lieut. S. A. O'Brien, Mason City.

To Rockefeller Institute, New York, for instruction in laboratory work, Lieut. Daniel J. Glomset, Des Moines.

KANSAS

To Fort Riley for instruction, Lieuts. E. H. Gist, Beattie; S. A. McCool, Neosho Falls, and W. C. Bundrant, Partridge.

To Fort Benjamin Harrison for instruction, Lieut. S. H. Martin, Cambridge.

To Fort Riley for instruction, Lieut. S. Adams, National Military Home.

KENTUCKY

To Army Medical School, Washington, D. C., for instruction, Lieut. James White Bruce, Louisville.

To Fort Riley for instruction, Lieut. C. P. Price, Harrodsburg.

LOUISIANA

To Fort Oglethorpe for instruction, Capt. Frederick T. Brown, New Orleans.

MAINE

To Fort Benjamin Harrison for instruction, Lieut. H. J. Everett, Portland.

MARYLAND

To Army Medical School, Washington, D. C., for instruction, Lieuts. Arthur Maynard Backon and Arthur Lee Hichew, Baltimore.

To Fort Benjamin Harrison, Lieuts. John F. Byrne, Baltimore, and L. G. Taylor, Perryville.

To Provisional Ambulance Co. B, Camp Wilson, Fort Sam Houston, Lieut. Herbert L. Quickel, Takoma Park.

To Fort Oglethorpe for instruction, Capt. H. C. Knapp and Lieut. E. E. Mayer, Baltimore.

MASSACHUSETTS

To Army Medical School, Washington, D. C., for instruction, Lieuts. Ross Golden, James Blaine Montgomery and Norman Scott, Boston.

To Boston for instruction in military roentgenology, Lieut. Arthur J. Horrigan, Springfield.

To Eagle Pass, Ambulance Co. No. 7, Lieut. Thomas P. Jones, Boston.

To Fort Benjamin Harrison for instruction, Capt. Frederick R. Hsley, Medford; J. H. Wyman, Medway; E. B. Bigelow, Worcester; Lieuts. J. K. Stoddard, Boston; E. H. Hughes, Holyoke; Raoul G. Provost, New Bedford; H. A. Clark, North Andover, and W. E. Denning and M. Lincoln, Worcester.

To Motor Truck Group, Fort Sam Houston, for duty, Lieut. Abram L. Van Meter, Boston.

To report to the commanding general N. E. Department, for duty, Lieut. Frank Piper, Boston.

MEXICO

To Army Medical School, Washington, D. C., for instruction, Lieut. Otto Richard Brown, Tampico Tamps.

MICHIGAN

To Army Medical School, Washington, D. C., for instruction, Lieut. Robert Alexander Hale, Ann Arbor.

To Fort Benjamin Harrison for instruction, Lieut. Hugh W. Dicken, East Jordan.

To examine National Guard and then to Fort Benjamin Harrison for instruction, Major David B. Downing, Detroit; Capt. Walter Rob-

ert T. Sharpe, Romeo; Lieuts. Milton A. Darling, Ann Arbor; Edward J. Agnelly, Lanes I. Condit, Philip Isard Froude, George Hoffmeister, Eugene Smith, Jr., Detroit; Edward A. Florentine, Ewen; George R. Goering, Flint; Ansel B. Smith, Grand Rapids; Albert V. Braden, Ishpeming; Burns R. Eastman, Muskegon, and Floyd W. Lockwood, South Lyon.

To Fort Riley for instruction, Lieut. James L. Walsh, Iron River.

To Mount Clemens, Mich., flying school for duty as post surgeon, Lieut. Alpheus F. Jennings, Detroit.

To Fort Benjamin Harrison for instruction, Capt. O. H. Clark, Kalamazoo, and Lieut. Harry C. Miller, Hillsdale.

MINNESOTA

To Army Medical School, Washington, D. C., for instruction, Lieuts. Edward Spender Murphy, Brainerd, and Cleon Joseph Gentzow, Minneiska.

To examine National Guard and then to Fort Benjamin Harrison for instruction, Lieut. Richard R. Cranmer, Minneapolis.

To Fort Riley for instruction, Lieuts. C. F. McCusker, Minneapolis, and F. M. Manson, Worthington.

To Fort Riley for instruction, Capt. J. Butler, Minneapolis.

MISSISSIPPI

To Army Medical School, Washington, D. C., for instruction, Lieuts. John Robin DeVelling, Laurel, and Egbert Hayes Wesson, New Albany.

To Fort Oglethorpe for instruction, Capt. B. J. Marshall, Agricultural College, and Lieut. J. L. Parks, Carthage.

To Rockefeller Institute for Medical Research, New York, for instruction in laboratory work, Lieut. R. Richardson, Pheba.

MISSOURI

To Army Medical School, Washington, D. C., for instruction, Lieuts. Francis V. Frazier, Alta Mont; Frank LaRue, Dexter, and Noble DuBois McCormack, St. Louis.

To Fort Benjamin Harrison for instruction, Lieut. J. M. Brown, Maysville.

To examine National Guard and then to Fort Benjamin Harrison for instruction, Lieuts. Curtis A. Hunsaker, Kansas City, and Franz H. Harms, St. Louis.

To Fort Riley for instruction, Capt. R. D. Alexander, St. Louis; Lieuts. C. A. Abramopoulos and H. M. La Rue, Kansas City; L. E. Toney, Piedmont; Albert S. J. Smith, St. Joseph; T. R. Ayars, H. L. Bremser and S. D. Fox, St. Louis.

To report by telegraph to commanding general, S. D. Fort Sam Houston, for assignment, Capt. Harold P. Kuhn, Kansas City.

To Washington, D. C., for instruction, Lieut. Montague M. Meyers, St. Louis.

To Fort Riley for instruction, Lieut. W. H. Hill, St. Joseph.

MONTANA

To Fort Riley for instruction, Lieut. F. W. Loring, Whitehall.

NEBRASKA

To Fort Riley for instruction, Capts. H. S. Andrews, Mindon; S. C. Clements, Neligh, and Lieut. Clifford L. Hooper, Lewellen.

To Fort Riley for instruction, Lieut. C. C. Johnson, Creighton.

NEVADA

To Fort Riley for instruction, Lieut. D. A. Turner, Goldfield.

NEW HAMPSHIRE

To Fort Benjamin Harrison for instruction, Lieut. D. R. Chase, Lchanon.

To Examine National Guard and then to Fort Benjamin Harrison for instruction, Lieut. Robert O. Blood, Concord.

To Washington, D. C., for instruction, Lieut. Guy D. Tibbetts, Bennington.

NEW JERSEY

To Fort Benjamin Harrison for instruction, Capt. L. F. Donohoe, Bayonne; Lieuts. S. E. Weiner, Atlantic City; J. G. Coleman, Ham-burg; L. H. Sparks, Lakewood; J. B. Winterseen, Moorestown; G. Blackburne, Newark; L. M. Suchoff, Paterson; S. B. Kaufmann and M. H. Leaver, Quakertown; F. W. Sell, Rahway; L. Ely, Somerville; C. J. Slack, Trenton, and S. Campbell, Woodbury.

To Fort Oglethorpe for instruction, Lieut. L. C. Russell, Newark.

To Fort Benjamin Harrison for instruction, Lieuts. S. Stern, Atlantic City, and H. G. Smith, Cedar Grove.

Relieved from further active duty, Capt. William J. Condon, New Brunswick.

NEW YORK

To Army Medical School, Washington, D. C., for instruction, Lieuts. Roland Albert Davison, Brooklyn; John William McKeever, Newburgh; Cornelius A. Denehy, Paul Barrus Johnson, Laurent Liscelles La Roche and Virginius Minervini, New York City.

To examine National Guard and then to Fort Benjamin Harrison for instruction, Lieuts. Raymond C. Hill, Bath; William Edward Skidmore, Brooklyn; John R. Evers, Elmsford, and Henry W. Jackson, New York.

To Fort Benjamin Harrison for instruction, Major D. A. Sinclair, New York; Capts. Arthur S. Moore, Middletown; R. H. Halsey, H. M. James, C. Philips, R. M. Taylor, New York; F. A. Hunt, Pompey; J. N. Boyce, Stanfordville; D. C. Wiggin, Staten Island; Lieuts. E. D. Gordon, J. J. Hauff, E. L. Hergert, F. G. Reed, A. A. Scouler and M. I. Strahl, Brooklyn; F. M. Neuendorf, Johnstown; L. W. Blake, A. J. Ellis, W. Goldstein, G. F. Gracey, J. Grosner, M. G. Herzfeld, D. Kramer, J. Leo, A. Lustgarten, P. J. Manheims, B. F. Morowitz, L. A. Newfield, S. V. Rosenkranz, Alfred A. Schwartz, R. E. Seibels, V. C. Von Unruh, M. R. Walter and M. Warren, New York; L. M.

Simonson, Pelham; T. G. Tousey, Rochester, and F. J. Herbig, Staten Island.

To Fort Myer, Va., examining men on duty for tuberculosis, Lieut. H. C. Drew.

To Fort Oglethorpe for instruction, Lieut. T. R. Barry, Ossining.

To Rockefeller Institute, New York, for instruction in laboratory work, Lieut. Russell LaF. Cecil, New York.

To Field Hospital Co. No. 7, Eagle Pass, Lieut. Emanuel Kline, New York.

To home, Lieut. Robert Malcolm, Yonkers.

To Army Medical School, Washington, D. C., for instruction, Lieut. Richard Samuel Moynan, New York.

To Fort Benjamin Harrison for instruction, Lieuts. H. Gross, C. F. Howland, H. Katz, W. G. Noe and W. H. Sanford, New York.

OHIO

To Army Medical School, Washington, D. C., for instruction, Lieuts. Stanley Gibson Odom and Raymond Albert Tomassene, Cincinnati.

To Fort Benjamin Harrison for instruction, Lieuts. I. I. Yodar, Cleveland; W. H. Henry, Hamden, and L. Shields, Xenia.

To examine National Guard and then to Fort Benjamin Harrison for instruction, Capt. James B. Dougherty, New Berlin; Lieuts. Homer G. Scranton, Alliance; Merrick F. McCarthy and Marcellus L. Peterson, Cincinnati; Albert J. Brainard, Frederick S. Cooper, David R. Kline, William Frederick Rohland and Richard E. Stifey, Cleveland; Samuel D. Edelman and Walter H. McKay, Columbus; William H. Henry, Hamden; Robert C. Rind, Springfield; James K. Biddle, Steubenville; William A. Deerhake, St. Marys; James Alonzo Belyea, Toledo, and Delbert E. Hoover, Warren.

To Fort Benjamin Harrison, Lieut. Charles H. Bailey, East Liverpool.

OKLAHOMA

To examine National Guard and then to Fort Benjamin Harrison for instruction, Lieut. Edgar A. Johnson, Hugo.

To Fort Riley for instruction, Lieut. George Edward, Oklahoma City.

OREGON

To Fort Riley for instruction, Capt. P. Rockey, Portland; Lieuts. W. T. Gullion, Eugene, and P. J. Keizer, North Bend.

PENNSYLVANIA

To Allentown, Lieuts. T. M. Armstrong and Furman R. Suits, Philadelphia.

To Army Medical School, Washington, D. C., for instruction, Lieuts. Arhut Raymond Gaines, Altoona; Andrew Jackson Griest, Harrisburg; Jay DeRue Mings, Laquin; Henry Cheesman Dooling, Norwood Station; Philip Jefferson Lukens, Jr., Philadelphia; Daniel Clyde Hankey, Paul Maxwell and Neuman Kyle, Pittsburgh, and Harold Dana Rogers, Westchester.

To Cornell Medical College for instruction in military roentgenology, Capt. Francis F. Borzell, Philadelphia.

To Fort Benjamin Harrison for instruction, Major J. H. Jopson, Philadelphia; Capts. H. J. Repman, Charleroi; D. J. Donnelly, Philadelphia; Lieuts. R. McK. Alexander, Bolivar; C. S. Abbott, Bristol; J. L. Junk, Connellsville; E. F. Corson, Cynwynd; F. A. Rupp, Lewistown; A. L. Hickok, Meshoppen; A. V. Carl, Numidia; S. Jaffe, Norristown; E. H. Erney, J. E. Hume, F. J. Kelly and P. A. Trau, Philadelphia.

To Fort Oglethorpe for instruction, Major William E. Ashton, Philadelphia; Capt. H. Winsor, Haverford; Lieuts. E. R. Plank, Carlisle; F. D. Thomas, Dorranceton; F. T. Romberger, Elizabethville; J. L. Lenker, Harrisburg; C. R. Snyder, Maryville; W. D. Hunter, Monessen; J. F. M. Snyder, New Kensington; W. H. McKeever, C. E. G. Shannon, H. M. Shannon, J. Speese, C. J. Stamm, F. A. Stiles and A. C. Strop, Philadelphia; D. R. Kunkelman, M. Spiro and G. W. Van Gorder, Pittsburgh; J. F. Zychowicz, Scranton, and C. K. Wagener, Swissvale.

To Washington, D. C., for instruction, Lieuts. Harvey C. Updegrove, Easton; Morris A. Slocum, Etna; Edgar T. Chatham, Pittsburgh, and William J. McGregor, Wilkinsburg.

To Fort Benjamin Harrison for instruction, Lieuts. W. E. Grove, Johnstown; H. Cooper, E. R. Sibley and Charles H. Wells, Philadelphia.

To Fort Oglethorpe for instruction, Lieuts. J. F. Wagner, Bristol, and H. Schmid, Pittsburgh.

To Fort Riley for instruction, Lieut. W. F. Howard, Pocatelle.

PORTO RICO

To report in person to commanding general, Eastern Department, for assignment, Capt. Emmett I. Vaughn, Central Aguirre.

RHODE ISLAND

To Fort Benjamin Harrison for instruction, Lieut. Peter L. Keough, Pawtucket.

To examine National Guard and then to Fort Benjamin Harrison for instruction, Lieut. Edward E. Fitzpatrick, Woonsocket.

SOUTH CAROLINA

To Allentown, Pa., Lieut. John R. Boling, Columbia.

To Army Medical School, Washington, D. C., for instruction, Lieuts. Albert Berchmans Pavy, Charleston, and Marion Rudolph Mobley, Florence.

To Fort Benjamin Harrison for instruction, Lieut. G. W. Hill, Catawba.

SOUTH DAKOTA

To Army Medical School, Washington, D. C., for instruction, Lieut. Earle Douglass Quinnell, Sisseton.

To Fort Riley for instruction, Lieut. James C. Walton, Isabel.

TENNESSEE

To Army Medical School, Washington, D. C., for instruction, Lieuts. James Walsh McClaran, Jackson; Paul Edgar McNabb and James

Monroe Trout, Knoxville; Henry Earl Fraser, Nashville; Glenn Holway Reams, Winchester, and Manton Leonard Shelby, Woodlawn.

To Fort Oglethorpe for instruction, Lieut. Edwin Dial Watkins, Memphis.

To Fort Oglethorpe, S. H. Long, Chattanooga.

TEXAS

To Army Medical School, Washington, D. C., for instruction, Lieuts. Douglas Hamilton Mebane, Edmund Dumas Mills, Robert Keith Simpson and Paul Henry Streit, Galveston; William Love Starnes, San Antonio; James Winn Sherrill, Temple, and Frank McAlphin Moose, Weatherford.

To Sparta, Wis., for temporary duty, Capt. Edward G. Huber, Fort Bliss.

VERMONT

To Fort Benjamin Harrison for instruction, Lieut. A. J. Greenwood, Springfield.

VIRGINIA

To Army Medical School, Washington, D. C., for instruction, Lieut. Percy Elisha Duggins, Norfolk.

To Fort Oglethorpe training camp, Lieut. J. A. Rollings, Roda.

To Richmond, Va., for instruction in military roentgenology, Lieut. H. S. Stern, Richmond.

To Walter Reed Hospital, Takoma Park, Lieut. Charles V. Carrington, Richmond.

WASHINGTON

To Fort Riley for instruction, Lieut. R. S. Stryker, Ridgefield.

So much of Par. 8, S. O. 155, July 6, 1917, War D., as relates to Lieut. F. L. Horsfall, Seattle, revoked.

Honorably discharged, Lieut. F. L. Horsfall, Seattle.

WEST VIRGINIA

To Fort Oglethorpe for instruction, Capt. R. H. Powell, Fairmont.

WISCONSIN

To examine National Guard and then to Fort Benjamin Harrison for instruction, Lieut. Edward W. Hanson, Thrice Lakes.

To Fort Riley for instruction, Capt. F. W. Vankirk, Janesville, and Lieut. F. R. Borden, Plainfield.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ILLINOIS

Personal.—Dr. Eugen Cohn, assistant superintendent of the Chicago State Hospital, has been appointed superintendent of the Kankakee State Hospital, and will take charge of the Institution, August 15.—Dr. Cyrus H. Anderson, McLeansboro, has been appointed superintendent of the Anna State Hospital, succeeding Dr. Joseph A. Campbell (resigned).—Dr. Henry B. Carriel, Jacksonville, has been appointed state superintendent of the Dixon School and Colony for epileptics.—Dr. George A. Zeller, Peoria, has been appointed superintendent of the Alton State Hospital.—Dr. S. Victor Balderston, Evanston, director of the Northwestern Ambulance Company, No. 9, has been commissioned captain, M. O. R. C., U. S. Army.

Chicago

Typhoid at State Hospital.—July 16, four cases of suspected typhoid fever were reported at the Chicago Hospital for the Insane. An investigation is under way.

Personal.—Dr. Allen B. Kanavel delivered a lecture before the City and County Medical Society, Portland, Ore., July 16, on "Infections of the Hand."—Dr. Hugh McGuigan recently lectured before the faculty and students of the Graduate Summer Quarter in Medicine of the University of Illinois on "Blood-Sugar in Relation to Diabetes."

Increase in Sanitary Troops.—Illinois Field Hospital Company No. 4, commanded by Major James J. McKinley, was mustered into the federal service, July 21, by Capt. Edward G. Huber, M. C., U. S. Army.—Illinois Field Ambulance Company No. 1 was mustered into service, July 22, by Lieut.-Col. Jacob Frank, chief surgeon, Ill. N. G. The company is under the command of Capt. George U. Lipshulch.

The Chicago Lying-In Hospital Opens New Building.—The new building of the Chicago Lying-In Hospital was opened this week. The hospital will have 120 beds and will be "open," i. e., any reputable physician may treat patients in the hospital. It has ample facilities for teaching both in

the amphitheater and at the bedside. It is proposed to affiliate the institution with the Otho S. A. Sprague Memorial Institute for Medical Research so that the hospital may take an active part in the teaching of obstetrics.

INDIANA

Trachoma Quarantine Threatened.—Dr. John H. Hewitt, Terre Haute, a member of the state board of health, is reported to have asked the Vigo County Commissioners to condemn the town of Taylorville, and to order the 800 people who live there to move away, because of the prevalence of trachoma. In case the commissioners refuse to act, a permanent quarantine, it is said, will be ordered.

Personal.—Dr. C. Edward Harris, Bloomington, who was injured by the overturning of his automobile recently, is under treatment at the Methodist Hospital in Indianapolis.—Dr. Harry S. Hatch has been appointed superintendent of the Sunnyside Sanatorium, established by Marion County for the treatment of patients suffering from tuberculosis.—Dr. Donald C. McClelland, La Fayette, has been placed in command of Ambulance Company No. 3, Ind. N. G.—Dr. Edson K. Westhafer, New Castle, has been commissioned captain, M. C., Ind. N. G., and assigned to duty with the First Infantry.—Dr. Arett C. Arnatt, La Fayette, has been commissioned captain, M. C., Ind. N. G., and assigned to duty with the First Indiana Field Artillery.—Capt. Fletcher Gardner, Bloomington, has been commissioned major, M. C., Ind. N. G., succeeding Major George W. Tuomey, New Albany (resigned).

KENTUCKY

Hospital Burns.—The division hospital of the Illinois Central system, at Paducah, was burned, July 10, causing a loss of \$175,000. One patient and one nurse were injured. The hospital will be rebuilt immediately.

Fayette County Against Tuberculosis.—Fayette County has initiated an energetic campaign against tuberculosis, and is working to secure \$55,000 for a sanatorium. Contracts have already been awarded for the equipment of a building, which will be used pending the completion of the sanatorium.

Kentucky Valley Physicians Meet.—The annual meeting of the Kentucky Valley Medical Association was held in Jackson, July 6 and 7. The society was entertained with a luncheon at the Trachoma Hospital, Jackson, by Surg. John McMullen, U. S. P. H. S. Torrent was selected as the next place of meeting, and the following officers were elected: Dr. Thomas C. Holloway, Hazard, president; Dr. George F. Doyle, Winchester, vice president, and Dr. Luther Bach, Jackson, secretary-treasurer.

Personal.—Dr. Ralph DuCasse, city bacteriologist of Paducah, has resigned to accept an appointment as assistant on the dermatologic staff of the Cincinnati General Hospital.—Dr. Charles G. Daugherty, Paris, was severely burned by an explosion of natural gas at his house.—Dr. Robert T. Hocker, Arlington, has been made historian for life of the Southwestern Kentucky Medical Association.—Dr. Jesse M. Moore, Princeton, has been appointed district surgeon of the Illinois Central system, succeeding Dr. Joseph A. H. Miller, deceased.

Health Board Loses Suit.—The court of appeals of Kentucky, in an opinion handed down by Judge Hart, reversed the decision of the lower court in the suit of Dr. Louis Frank, Louisville, and Miss Margaret Hatfield, nurse, against the state board of health. The lower court had held that Miss Hatfield could not administer an anesthetic without having first passed the examination before the state board of health and without possessing a certificate to practice medicine. The crux of the case was whether the administration of anesthetics constitutes the practice of medicine within the meaning of the Kentucky statutes regulating the practice of medicine. The court held that "giving the medicine prescribed by the physician in charge, who diagnosed the case and directed the time and manner and character of the medicine to be administered" is not practicing medicine. The board insisted that, in administering anesthetics, the person must exercise judgment in the amount given, and must watch the condition of the patient to determine the effect of the anesthetic, and that this comes within the definition of practice of medicine. The higher court held that such a view would necessitate that every trained nurse should possess a license to practice medicine.

LOUISIANA

License Revoked.—An official communication states that, by judgment rendered by the courts of Louisiana on May 2,

the license of Dr. Eustus D. Robbins of Baton Rouge was revoked, on conviction of felony.

Personal.—Dr. Cosimo Noto, New Orleans, is at present serving with the Italian army on the Austrian frontier as a captain in a field hospital.—Dr. Thomas E. Wright, Monroe, has been appointed a member of the state board of medical examiners.

Anthrax Investigation.—The state board of health is making an investigation to determine whether a shaving brush, purchased from a New Orleans mail-order house, and supposed to be infected with anthrax bacilli, was responsible for the infection and death of a telegraph operator at Pass Christian, Miss.

Physician Wins Suit.—Dr. Clarence Pierson, Jackson, superintendent of the State Insane Hospital, who sued the New Orleans *Times-Picayune* for \$100,000 damages, on account of the publication of articles describing alleged conditions at the institution, was awarded a judgment of \$7,500 and court costs, July 16, by the Civil District Court, New Orleans.

MAINE

Personal.—Dr. Leverett D. Bristol has been appointed state health commissioner of Maine.—Dr. Harrison J. Hunt, Bangor, surgeon of the Crocker Land Expedition, arrived in New York, June 20.—Majors Clarence F. Kendall, Biddeford, John G. Towne, Waterville, and Capt. Delbert M. Stewart, South Paris, have been appointed a board of officers for the examination of candidates to fill five vacancies for the grade of first lieutenant in the Maine Medical Corps.

State Association Meeting.—At the annual meeting of the Maine Medical Association, held in Portland, June 13 and 15, under the presidency of Dr. Willis F. Hart, Camden, a resolution was adopted favoring national prohibition during the continuance of the war. The following officers were elected: president, Dr. James A. Spalding, Portland; vice presidents, Drs. George H. Coombs, Waldoboro, and Delbert M. Stewart, South Paris, and secretary-treasurer, Dr. John B. Thompson, Bangor (reelected).

MARYLAND

Inspection of Hospital Train.—Maryland's first hospital train was sent to Washington, July 21, to be inspected by members of the Medical Corps of the Army and of the War College. The train was completed under the direction of the Maryland Preparedness and Survey Commission, according to plans prepared by Dr. Daniel Z. Dunott, chief surgeon of the Western Maryland Railroad, and with the cooperation of the Western Maryland, Baltimore and Ohio, and Pennsylvania railroads. One car is fitted up as an operating room and the other cars as wards.

To Study Soldiers' Needs.—To prepare Baltimore to cope with social problems arising from the war and to cooperate with any federal movement of like nature, a public meeting was held, July 17, under the auspices of the Alliance of Social and Charitable Agencies. An outline of relief work in Canada was presented by George L. Jones, secretary of the Henry Watson Children's Aid Society of Baltimore. A committee of five was named to formulate plans of mobilization for Baltimore. In the absence of the president of the alliance, Dr. J. H. Mason Knox, Jr., presided.—Dr. Archibald C. Harrison, Baltimore, has been appointed director of the Maryland University Base Hospital Unit.

MINNESOTA

Poliomyelitis Clinic.—The free poliomyelitis clinic established in Minneapolis last month has cared for 112 patients. A similar clinic opened in St. Paul, July 9.

Personal.—Dr. Francis G. Blake has been appointed professor of medicine in the Minnesota Medical School of the University of Minnesota, and has begun work.

Ambulance Company Organizes.—An ambulance company has been organized in St. Paul, to complete the quota of the state troops. The officers assigned to this company are Drs. Nels G. Mortensen, Andrew Christiansen, Joseph L. Martineau and John Sibert of St. Paul, and Dr. Harold W. Stone of Wayzata.

Hospital Items.—The Sanford Drew Hospital, Farmington, was destroyed by fire, June 14. The patients were removed without casualty.—St. Anne's Home for Aged People, Duluth, has been remodeled and converted into a hospital at a cost of about \$30,000. The institution will accommodate 100 patients.

Sanatorium Association Meeting.—The second semiannual meeting of the Minnesota Sanatorium Association was held in St. Paul, July 10. To meet a request from the War Department for twelve tuberculosis experts to assist the regular staff at Forts Snelling, Oglethorpe and Riley, the following committee was designated: Drs. Arthur T. Laird, Duluth; George W. Beach, State Sanatorium, and Ignatius J. Murphy, St. Paul.

Assessments for Sanatorium Maintenance.—The board of commissioners of the Southwestern Minnesota Tuberculosis Association has passed resolutions levying a total of \$25,000 against the counties of the district for the maintenance of the sanatorium during 1918. The following are the assessments: Jackson County, \$3,641.66; Pipestone County, \$2,400.75; Rock County, \$2,568.88; Nobles County, \$3,833.35; Murray County, \$2,954.60; Lincoln County, \$2,481.40; Lyon County, \$3,951.10, and Cottonwood County, \$3,179.26.

Higher Degrees in Medicine.—The University of Minnesota has just granted higher degrees in clinical medicine to three physicians, as follows: Dr. Golder Louis McWhorter, doctor of philosophy (surgery); Dr. Henry William F. Woltmann, doctor of science (neurology), and Dr. Hood Taylor, doctor of science (pediatrics). Degrees of master of science in surgery were granted to Drs. Egerton Lafayette Crispin and Francis Bartholomew McMahon. Also the degree of master of science in pathology was granted to Della Gay Drips and Dorothy Foster Pettibone.

MONTANA

State Health Officers Meeting.—The annual meeting of the Montana State Health Officers Association was held in Kalispell, July 9 and 10, under the presidency of Dr. Joseph C. Denney, Clydepark. The association adopted resolutions favoring selective draft. Dr. Lawrence Stevens, Laurel, was elected president, and Dr. Patrick H. McCarthy, Butte, vice president.

State Medical Society Meeting.—The thirty-ninth annual meeting of the Montana State Medical Association was held in Kalispell, July 11 and 12, under the presidency of Dr. John A. Donovan, Butte. One of the principal topics of discussion was "What Is the State of Montana Going to Do In Supplying Doctors for the Army?" Twelve members of the association answered this question by taking the examination for admission to the Medical Officers Reserve Corps of the Army. A resolution was adopted calling on Congress to pass a selective conscription law for physicians. The following officers were elected: Dr. Arthur Morrow, Kalispell, president; Harry B. Farnsworth, Missoula; Willoughby G. Dye, Great Falls, and Albert R. Varco, Miles City, vice presidents; Dr. Elmer G. Balsam, Billings, secretary-treasurer (reelected); Dr. Rudolph Horsky, Helena, delegate to American Medical Association, and Dr. George M. Crabb, Deer Lodge, alternate. Butte was selected as the next place of meeting.

NEW HAMPSHIRE

Personal.—Dr. Charles H. Dolloff, assistant surgeon of the New Hampshire State Hospital, Concord, assumed his duties as superintendent, July 1, succeeding Dr. Charles P. Bancroft, whose resignation took effect on that date.—In the case of Mrs. Margaret Winn, who sued Dr. Julia A. Chase, Portsmouth, to recover \$10,000 for alleged malpractice, the jury, June 25, returned a verdict in favor of Dr. Chase.

State Society Officers.—At the one hundred and twenty-sixth annual meeting of the New Hampshire Medical Society, held in Concord under the presidency of Dr. Emdon Fritz, Manchester, the following officers were elected: Dr. Fred S. Towle, Portsmouth, president; Dr. Charles P. Bancroft, Concord, vice president; Dr. Dennis E. Sullivan, Concord, secretary; Dr. David M. Currier, Newport, treasurer, and Drs. Charles S. Walker, Keene; Emery M. Fitch, Claremont; Robert J. Graves, Concord; Frank E. Kittredge, Nashua; Abram W. Mitchell, Epping; Forest L. Keay, Rochester; Richard E. Wilder, Whitefield; Frederick E. Clow, Wolfeboro; Alpha H. Harriman, Laconia, and Frederic von Tobel, Lebanon, councilors. The society adopted resolutions on the retirement of Dr. Charles P. Bancroft from the superintendency of the New Hampshire State Hospital, after thirty-five years of service, and also favored an immediate tuberculosis survey of the state. The president appointed as a committee on the control of cancer Drs. Frederick E. Clow, Wolfeboro; Howard N. Kingsford, Hanover, and John C. O'Connor, Manchester.

NEW YORK

Personal.—Dr. Clifford R. Hervey, Oswego, of the state department of health has been appointed sanitary supervisor of the territory, including Jefferson, St. Lawrence and Franklin counties.

College of Physicians and Surgeons Remodeled.—The old building, at the northwest corner of Fourth Avenue and Twenty-Third Street, historic as the original home of the College of Physicians and Surgeons, is being remodeled into a training school to receive war cripples and to educate and develop them. The school is organized under the War Council of the American Red Cross, and is temporarily under the direction of Dr. Edward T. Devine, head of the New York School of Philanthropy. It has been endowed by a donation of \$50,000 and the use of the building by Mr. Jeremiah Milbank.

New York City

Personal.—Dr. Winthrop T. Talbot, Flushing, has been appointed advisor in Alien Industrial Education to the New York State Bureau of Industries and Immigration.

Low Death Rate for City.—For the week ending July 14, the death rate for this city was the lowest yet recorded, being 10.36 per thousand of population. The death rate among babies under 1 year of age was 85 for each thousand births for the period since January 1; for last year it was 93.

Demonstration War Hospital Now Ready.—The demonstration war hospital on the grounds of the Rockefeller Institute at Sixty-Fourth Street and Avenue A is almost ready for service in instructing surgeons and nurses as to the advanced methods of surgery and caring for the wounded, in preparation for the work abroad.

"Patent Medicine" Men Win Lawsuit.—The manufacturers of "patent medicines" have won an important decision over the department of health before the Appellate Division of the Supreme Court, which declares invalid the ordinance requiring the manufacturers of all "patent medicines" to register all the ingredients of such remedies with the department of health. The court considered the ordinance unreasonable, since it had not been ratified by the state legislature.

Pier for Red Cross.—The dock commissioner has turned over to the American Red Cross the pier at Fifty-Seventh Street and North River for the exclusive use of the organization in the handling of supplies for the Army. Two large buildings will be erected at the pier for the use of the society. Supplies will be received and distributed through this station.

Bellevue Hospital to Be Enlarged.—The demands of the city as well as the needs that will arise from the war have made further hospital expansion necessary. To meet these needs the board of estimate has arranged for the purchase of the block to the north of the present hospital grounds, on which an addition to the present Bellevue Hospital will be erected.

Infantile Paralysis.—By the middle of July, 1916, 1,900 cases of poliomyelitis had been reported to the department of health, while thus far this year but seventy-seven cases have been reported. Attention has been called by a number of writers to the fact that an increased prevalence of poliomyelitis is frequently associated with or followed by an increase in the prevalence of epidemic cerebrospinal meningitis. The figures of the health department show that the amount of cerebrospinal meningitis occurring in this city at the present time is about normal.

PENNSYLVANIA

Smallpox at Hazleton.—Ten cases of smallpox are reported at Hazleton. The patients are in the municipal hospital, and tents have been erected for convalescents.

Society to Hear About War Surgery.—The annual meeting of the Lehigh Valley Medical Society will be held in Buckwood Inn, Shawnee-on-Delaware, July 31. The program has been arranged on war surgery.

Personal.—Major Herbert Alonzo Arnold, M. C., Pa. N. G., Ardmore, has been commissioned lieutenant-colonel.—A commission as major has been given Dr. Jonathan C. Biddle, M. C., Pa. N. G., Fountain Springs.—Major Scott M. Huff, Milesburg, has been assigned to the First Cavalry, succeeding Major Allen W. Urmson, Newcastle.—Dr. Chapin Carpenter, Pottsville, has been appointed a member of the staff of Base Hospital Unit No. 34, Philadelphia.

Philadelphia

Death from Yellow Fever.—The Danish steamer *Bryssel* from Antilla, Cuba, for Philadelphia, was held at quarantine

at Reedy Island, because of the death from yellow fever of a member of the crew. No other case has occurred on the steamer.

Money for Base Hospital.—The Hahnemann Hospital and College campaign to raise \$50,000 with which to equip its hospital unit has passed the half way mark. The teams soliciting subscriptions or contributions reported, July 20, that \$28,300 had been subscribed.

Red Cross Nurse Dies.—Miss Lydia D. Shrope, former head nurse at the Philadelphia General Hospital, who has been active in Red Cross work in France since 1914, and who was connected with the base hospital at LaPanne, Belgium, died from tuberculosis at Fort Bayard, N. M., recently.

Two Thirds for Physicians in Military Service.—The president of the Philadelphia County Medical Society writes that the statement made in *THE JOURNAL*, July 7, regarding the Philadelphia County Medical Society is incorrect. The society will give two thirds of all money collected by its members from patients of members who are in the military service, retaining one third to cover expenses.

Senior Physicians Elect Officers.—Physicians of Philadelphia above the age of 55 years held a meeting in the College of Physicians and Surgeons of Philadelphia, June 27, and organized the Senior Medical Men for Special War Service. The purposes of the organization were described by Drs. Hobart A. Hare, J. Chalmers DaCosta, and others. The following officers were elected: president, Dr. William W. Keen; vice presidents, Drs. John B. Deaver and James M. Anders, and secretary-treasurer, Dr. Christian B. Longenecker.

Army Physical Examinations.—The medical examinations of the National Guard mustered in the regular army showed a high standard of men. In the first physical examination only one man was rejected and this rejection was provisional on the result of a Roentgen examination. Those who passed the physical test included the line officers, the men of the battalion of the Sixth Infantry, the line officers and troops of the cavalry, and the officers and troopers of the E. A. D. and G. The officers attribute the high standard of the men to the training they received on the Texas border last summer, and also to the fact that no one is accepted who does not meet the requirements of the physical examination prescribed by the Army.

Base Hospital Unit Completed.—The final list of those selected for Base Hospital No. 20 of the University of Pennsylvania was announced by the examining board, July 20. The corps includes the commissioned personnel, regular nurses, nurses' aids and medical reserves. The commissioned personnel includes:

Majors J. B. Carnett, director; E. L. Eliason, chief of surgical section, and G. M. Piersol, chief of medical section; Capts. J. D. Zulick, chief of Roentgen-ray and laboratory section; D. P. Pfeiffer, surgeon; D. P. Willard, orthopedic surgeon; B. F. Baer, Jr., ophthalmologist; F. E. Keene, surgeon; J. H. Austin, physician; J. H. Musser, Jr., physician; F. H. Leavitt, neurologist, and T. Edwards, registrar, and First Lieuts., S. A. Brumm, laryngologist; A. Randall, genito-urinary surgeon; E. B. Piper, surgeon; W. Bates, surgeon; B. M. McIntire, physician; E. D. Hopkinson, physician; H. Goldsmith, physician; L. L. Clemens, physician; P. F. Williams, pathologist; A. C. Woods, bacteriologist; J. D. Owens, dental surgeon, and F. P. K. Barker, dental surgeon.

WASHINGTON

New State Society Officers.—In addition to the list of officers of the Washington State Medical Society, appearing in *THE JOURNAL*, July 7, p. 51, the following were elected: president, Dr. George M. Horton, Seattle; secretary, Dr. C. H. Thomson, Seattle, and assistant secretary, Dr. John H. O'Shea, Spokane.

Personal.—Dr. William D. Kirkpatrick, Bellingham, has been appointed director of a Red Cross hospital unit, and expects to be sent to the Roumanian front.—Drs. John R. Brown, Tacoma, and Henry H. McCarthy, Spokane, have been appointed members of the state board of health, succeeding Drs. Elmer E. Heg, Seattle, and Wilson R. Johnston, Colfax, respectively.

State Medical Aid Board.—The state medical aid board is districting the state for the operation of the new law which provides for the payment of physicians' bills, hospital fees and surgeons' expenses for injuries of workmen, and has issued a call for the election by workmen and employers of joint boards to handle the detail of aid extension. Each board will consist of one workman and one employer, and will be selected by the contributors' fund, which the state administers.

WEST VIRGINIA

Smallpox.—Four cases of smallpox have been discovered at Wheeling. Three of the patients are negroes.—Smallpox was reported, July 3, from Everson, Carolina, Ida May and Farmington. All of the patients are negro miners.

Trachoma in Two Counties.—The state department of health was notified, June 26, that there were a number of virulent cases of trachoma in Mingo, Wyoming County, and that the affected persons had refused to go to the Trachoma Hospital at Welch for treatment.

Personal.—Drs. Vincent T. Churchman, Charleston; Luther H. Clark, Kyle, and Hubert E. Gaynor, Parkersburg, have been appointed members of the state health council to succeed Drs. William W. Golden, Elkins; Will J. Davidson, Parkersburg, and Joseph E. Robins, Charleston, terms expired.

Sanatorium Overcrowded.—The state board of control is flooded with applications for admission of patients to the State Tuberculosis Sanatorium, Terre Alta. The present capacity of the institution is 120 patients, and a new building is under construction, which will accommodate fifty more.

CANADA

Hospital News.—A memorial hospital for soldiers who have gone to the war from Orillia, Ont., is to be erected in that town. It is proposed to raise \$50,000 by subscription, and the building will be erected on the present hospital site as soon as the war closes.—The Brant House, a summer hotel at Burlington Beach, near Hamilton, Ont., has been commandeered by the Canadian Hospitals Commission as a hospital for returned soldiers.

Personal.—Capt. E. Fielden Nivin, C. A. M. C., who was attached to the Royal Army Medical Corps in France a year ago, has returned, and is now attached to the A. D. M. S. staff, Calgary, Alta.—Dr. William J. Wanless is home in Toronto from India on short furlough.—Lieut.-Col. Thomas B. Richardson, formerly in command of the Toronto Military Base Hospital, and latterly A. D. M. S., Sudbury, Ont., is now medical officer, British War Mission, Chicago.—Capt. W. Gerald Cosbie, Toronto, has been awarded the Military Cross for bravery at Vimy Ridge. Captain Cosbie is attached to the Eighth Canadian Field Ambulance.

Treatment of Returned Soldiers.—The special parliamentary committee which, for three or four months, has been investigating the subject of the care and treatment of returned soldiers, has reported to Parliament. As to the supervision of returned soldiers, two suggestions are made: A majority of the committee recommends the creation of a new department of the government, or a subdepartment under a minister of the crown, directly charged with the oversight of all measures dealing with the returned soldiers' problem. Three other members of the committee take the view that the militia authorities should have full charge. If neither of these recommendations finds favor with parliament, the committee advises that the medical treatment of returned men shall remain entirely under the control of the Army Medical Corps. The committee further advises that prompt measures be immediately taken by the federal and provincial authorities to deal effectively with the tuberculosis problems arising out of the war; that hopelessly insane soldiers be cared for at the expense of the federal government in provincial institutions; that any returned soldiers likely to transmit venereal disease should be quarantined at the port of entry until cured, and that orthopedic hospitals be provided at suitable centers throughout Canada, in addition to the one established in Toronto, and that such hospitals supply needed limbs free of cost, and renewals from time to time, at the expense of the state.

GENERAL

Tuberculosis Conference.—The fifth annual Mississippi Valley Conference on Tuberculosis will be held in Minneapolis and St. Paul, October 8 and 10, under the presidency of Mr. James Minnick, Chicago. The sessions of the first day will be held at the Hotel Radisson, Minneapolis, those of the second day at the State University, and those of the third day at the Hotel St. Paul.

Book for Mothers.—The Kansas State Board of Health has issued a book for mothers which is sent out as one of the bulletins of the board. The pamphlet, which was prepared by the Division of Child Hygiene, contains registration and health examination blanks, tables of weights and measures for different ages, chapters on prenatal hygiene, care of the

new-born, directions and formulas for infant feeding, data on child development and lists of reference books and pamphlets.

United States Department of Justice Warns Against Court-Plaster.—When the newspapers reported last week that apparently an effort had been made in Kansas to disable and to kill through the distribution of court-plaster carrying tetanus germs, and attributed the undertaking to German agents, the story seemed so impossible that few serious minded people gave it credence. It seemed so diabolical and to be so remote from any military end as to be beyond belief. Further, from a medical point of view, such a method of transmitting disease is so impossible, at least so impractical, that few physicians would give it the slightest credence. Now, however, that the United States Department of Justice has thought it worth while to issue a warning against the use of court-plaster from sources not known to be thoroughly reliable, the matter has taken on a more serious aspect and physicians and people generally will do well to take no unnecessary risk. If infected court-plaster is on the market, it will make little difference to the user whether the contamination was due to the machinations of German agents or to purely accidental infection, and heed should be paid to the government's warnings. The statement given out by the United States Department of Justice on July 21 was as follows:

"While the Department of Justice does not take a sensational view of the reports indicating a possible enemy activity in the dissemination of poisoned sticking, or court-plaster, there has been enough officially reported on the subject to warrant thorough investigation, both as to the manner of distribution and the germs in the plasters.

"Consequently, the samples in hand are being analytically examined in Washington and in a Western city. Pending further information, it would be well for the consuming public to use no remedies of this kind, except those obtained from approved sources of supply."

FOREIGN

Advanced Surgical Station in the Italian Campaign.—The Italian Red Cross has fallen into line and established complete stations close to the firing line. Marro, Delaini and Cassano were in charge of the first one thus carried far forward during the recent offensive.

Prize for Pfaundler.—Our Netherlands exchange states that the O. Heubner prize, given in Germany for the best work on some phase of pediatrics published in the last four years, has been awarded to Professor von Pfaundler of Munich for his publications on the physical measurements of children.

Sanatoriums for Brazil.—A group of Brazilian physicians is forming a stock company, under the name of *Emprezas Sanatorios do Brazil*, to establish and operate sanatoriums in different parts of the country. The first institution is to be located half way up the Itatiaya Mountain, near Rio de Janeiro.

Ascoli Appointed to Succeed Baccelli.—Prof. V. Ascoli of the chair of medical pathology of the University of Pavia has been appointed professor of clinical medicine at Rome to succeed Baccelli. Ascoli is editor in chief of the leading Italian weekly, the *Policlinico*, founded by Baccelli and Durante twenty-four years ago.

Exchange of War Prisoners.—The *Riforma medica* comments on the touching scenes at the border when the Swiss Red Cross train brought into Italy 646 Italian and Serbian incapacitated prisoners of war. They included forty-eight officers. The same train took back an equal number of Austrian prisoners of war incapacitated by wounds or disease.

Medal for Public Health Services.—The Harben gold medal of the Royal Institute of Public Health, England, given every third year for eminent services rendered to the public health, has been awarded this year to Surg.-Gen. Sir Alfred Keogh, G. C. B. director-general A. M. S., and the gold medal for conspicuous services rendered to the cause of preventive medicine to Dr. E. W. Hope, M. O. H., for the city and town of Liverpool and professor of public health in the university.

Calmette Succeeds Metchnikoff.—Albert Calmette, director of the Pasteur Institute at Lille, is 54 years old. He founded the Pasteur Institute in Indo-China and discovered there a ferment with which alcohol can be extracted from rice, but it was at Lille that he perfected the antivenom serum for snake bites. In the campaign against tuberculosis he was one of the pioneers, his preventorium being one among, if not the very first established. He has remained at Lille during the war, but has now been called to Metchnikoff's vacant place in the Pasteur Institute at Paris.

LONDON LETTER

LONDON, July 11, 1917.

The War

THE MEDICAL BREAKDOWN IN THE MESOPOTAMIA EXPEDITION

In previous letters to THE JOURNAL I have stated that, in marked contrast to the army medical service in France, that of the Mesopotamia expedition was defective. A sensation has been produced by the report of the commission appointed by the government to inquire into the operations in Mesopotamia, which has just been published. The expedition was under the direction of the government of India, and therefore Sir Alfred Keogh who, as director-general of the Army Medical Service has won unstinted praise, had no responsibility in this matter. The root of the failure was underrating the magnitude and difficulties of the expedition and in regard to the medical service in particular the providing of insufficient transport. The whole military outlook in India seems to have been confined to frontier warfare with savage tribes. When confronted with this new and greater problem, the authorities did not rise to the situation. The Mesopotamia expedition was not equipped in a manner suitable for campaigning in an unhealthy tropical climate against an enemy that was in alliance with and supported by the foremost exponents of modern warfare. The medical personnel was short even of the authorized scale, which in itself was insufficient. Each division was supplied with only twelve sections of field ambulance instead of the proper complement of twenty. This was due to personnel being retained in India for forces which might be required to meet internal disturbances or frontier warfare. No river hospital steamers were provided for what it was known must be largely a river campaign. Consequently until 1916 the sick and wounded had to use ordinary river transport steamers. These were always overburdened with ordinary transport work, were not infrequently used for carrying animals, and it was not always possible to clear them of their accumulation of filth before they were used for the wounded. No wheeled ambulance transport was provided. Ordinary army transport cars were the only vehicles for the sick and wounded, and their use for the latter involved inhumanity. A striking example of medical breakdown occurred after the battle of Ctesiphon, when over 3,500 wounded had to be removed from the battlefield to the river bank, in some cases a distance of 10 miles, without proper ambulance transport and with an insufficient medical personnel, food and comforts, so that a large proportion of the wounded had to make their way on foot in spite of their injuries. When they arrived at the river, the available steamer accommodation was gravely inadequate. They were crowded into steamers and barges without sufficient medical attention, appliances or conveniences. The majority went down to Basra, a journey from the battlefield which in some cases took as much as fourteen days. The discomforts of the wounded were aggravated by the presence on board of many patients with dysentery and other sicknesses. Major Carter, medical officer in charge of an ocean hospital ship, describes the arrival of a steamer packed with men thus: "When she was about 300 yards off, it looked as if she was festooned with ropes. The stench when she was close was quite definite, and I found that what I mistook for ropes were dried stalactites of human feces. The patients were so huddled and crowded that they could not perform the offices of nature clear of the edge of the ship, and the whole of the ship's side was covered with stalactites of human feces. A mass of men huddled up anyhow, some with blankets, some without, were lying in a pool of dysentery about 30 feet square. They were covered with dysentery and dejecta from head to foot." As I stated before, everything has now been changed in Mesopotamia, and with the turning of the military failure into a great success the medical arrangements have undergone a parallel improvement.

THE MEDICAL EXAMINATION OF RECRUITS

Before a committee of the House of Commons appointed to investigate the administration of the Military Service Act, Sir Alfred Keogh, director-general of the Army Medical Service, gave evidence which should be of interest now in America which is confronted by the same problem as we were three years ago—the rapid expansion of a small army never intended for the purpose of engaging in a great European war. Naturally, many mistakes are made. In the early days of the war, when public enthusiasm was at its height, it was not possible to establish any organized system

for medical examination, and it was not until the Derby scheme that one was set up. In peace time we endeavored to employ regular officers in the work of examination, but such a course was not possible under the conditions, and, therefore, civilian medical officers were appointed. When war broke out men were taken for medical examination to local physicians, who could not possibly know the requirements of the service. The consequence was that a large number of men were recruited whom in peace time the authorities would not have thought of considering. This arose from want of knowledge of the army and of the duties of a soldier, and also from differences of opinion which, quite legitimately, were found among the physicians. Something, too, must be allowed for a certain amount of negligence or fatigue. Sir A. Keogh thinks that no physician can possibly examine more than forty recruits a day without doing himself and the service an injustice. When the war broke out every expert in the medical service had to be mobilized, and the system which had been instituted, under which medical inspectors of recruits were sent to centers at different times to see that individual physicians should endeavor to attain a common standard fell into abeyance. When Sir Alfred Keogh was recalled to the War Office he restored the medical inspectors of recruits and sent them all round the country, and by issuing instructions to every recruiting authority he endeavored to keep in check the disorder which existed. When Lord Derby suggested his group system of recruiting Sir Alfred Keogh adopted a system of boards for examining recruits.

Col. J. Galloway, who before the war was senior physician of Charing Cross Hospital, and is now inspector of medical recruiting boards, also gave important evidence. He considered that the keystone of a board is its president. At a time when the medical profession was being denuded of its members by reason of the war it was thought well that the president should be an officer, especially one who had served abroad and knew what soldiers had to do in the field. The predominating element of the boards consisted of civilian physicians acting generally from patriotic motives, doing very arduous and difficult work for pay quite inadequate, the maximum rate being \$10 for a full day and \$5 for a half day. Two methods of examining recruits are in vogue. In one a single medical examiner conducts the examination throughout, except in respect of such matters as those about which the advice of a specialist might be taken, and the examiner and the president then settle the man's classification. Frequent consultations between the examiners are encouraged and take place. A fuller and better type of examination is that in which, assuming that a board consisted of a president and four examiners, one examines the recruit's head and neck, a second his heart and lungs, and so on until, having passed before four examiners, the recruit goes before the president, who collates the opinions of the examiners and after consultation with one or more of them settles the classification. A large proportion of the difficulties are due to the medical profession having been asked to undertake an impossible task. In the old days of recruiting the examiner's task was simply that of passing picked men for service and rejecting all others. Now an examiner is burdened with the duty of placing men in at least seven categories and two unfit categories, besides certain subsidiary classes. Difficulties arise owing to the action of men who wish not to serve leads to "doping." In some cases the sputum has been infected from outside sources.

CASUALTIES OF THE AIR RAID

In consequence of the deaths of a number of persons previously reported as injured, and the discovery of additional bodies in clearing away débris, it is possible to give now a complete record of the casualties in the aeroplane raid on London, June 13. They are:

	Killed	Injured
Men	91	222
Women	24	110
Children	42	100
Total.....	157	432

UNITED STATES HOSPITAL UNITS ON THE BRITISH FRONT

Nearly 2,000 officers and other ranks of the United States Army Medical Service have now settled down to work in the British war zone. Six big British base hospitals have already been taken over in their entirety by as many units. The administrative staff of the average hospital unit consists of a major in chief command; an adjutant with the rank of captain, and a quartermaster who is also a captain. These are all officers of the regular army. The commissioned branch

of the professional staff consists of three majors, five captains, sixteen first lieutenants and a chaplain. The other ranks number sixteen sergeants, mainly drawn from the regular army, and 200 of the medically enlisted reserve, comprising corporals, cooks and privates of the first class. There are also sixty-four reserve nurses drawn from the great city hospitals of the United States. As the hospitals taken over were in full working order there was no necessity for them to bring equipment, although most of the medical officers have come provided with their instruments. They are unanimous in praise of the establishments handed over to them.

PARIS LETTER

PARIS, July 5, 1917.

Personal

In the meeting held, June 19, the Académie de médecine proceeded to elect two foreign associate members. On the first secret ballot Dr. Soca, professor at the University of Montevideo, former president of the republic of Uruguay; was chosen by thirty-seven votes as against eleven for Professor Roux of Lausanne. On the second ballot Dr. Couto, professor of internal medicine at the Faculté de Rio-de-Janeiro, the former president of the Academy of Medicine of Brazil, was chosen by thirty-two votes as against eighteen for Professor Roux.

The administrative council of the Pasteur Institute of Paris met recently to name two new subdirectors in place of M. Chamberland, who died in 1908, and of Prof. Élie Metchnikoff, who died in 1916. On motion of Dr. Roux, director of the Pasteur Institute, the council unanimously appointed as subdirectors of the institute Dr. Albert Calmette, director of the Pasteur Institute of Lille, and Dr. Louis Martin, director of the Pasteur Hospital.

Sale of Alcoholic Beverages

The prefect of police of the department of the Seine has just signed a decree in accordance with which the sale at retail of alcoholic beverages to be consumed on the premises is prohibited in all cafés, restaurants or other drinking places wheresoever located, except within the hours corresponding to the two principal meals, which are fixed as follows, on the basis of two hours for each meal: from 12 noon to 2 p. m., and from 7 to 9 p. m. So far as women and minors under 18 years of age are concerned, the prohibition will be applicable during the whole time that such establishments are open. All liquor venders are prohibited from selling at retail alcoholic beverages to take along, of whatsoever nature, in quantities of less than 2 quarts of any given kind. The prohibition outlined above does not apply to: (1) wine, beer, cider, perry (pear cider) and hydromel; (2) liqueurs and artificial wines, as well as aromatic wines prepared without maceration with or distillation from substances containing essences or essential oils, provided they do not assay more than 18 per cent.; (3) sweetened liqueurs prepared from fresh fruits, provided they do not assay more than 23 per cent. Violators of this decree will be rigorously prosecuted in conformity with the law.

Ether Anesthesia

At one of the recent meetings of the Académie de médecine, Dr. Mériel, professor of the surgical clinic at the Faculté de médecine de Toulouse, presented a communication on this subject. The main point that he claimed to establish was that the pulmonary complications frequently brought on by ether anesthesia are avoidable if a careful technic is employed during and after anesthesia. Julliard had already published statistics on nearly 10,000 etherizations without untoward effects of this kind. Mériel declared that since 1909 out of 4,880 etherizations he had not noted a single grave complication; only occasionally in winter there had been a few benign cases of trachitis, which only rarely degenerated into bronchitis. As the result of long experience, Mériel was able to state that, if certain precautions are taken, ether anesthesia is not only easy to accomplish, but is also without any real danger, and is contraindicated only in the case of emphysematous and tuberculous patients, and can be employed even in operations about the face and neck.

Filiform Drainage

A report on filiform drainage was recently handed in by Dr. Mercadé to the Société de chirurgie de Paris. All ten patients to whom he had occasion to apply this drainage

recovered rapidly and without cicatrices. His observations may be classified thus: three acute abscesses of the neck, cured in eight or ten days; three cases of tuberculous, suppurative adenitis, cured one in eight days, the second in twenty, and the third in thirty days; one hematoma of the leg, cured in twenty days; one fistula, supported by a drain, cured in nine days, and two abscesses, developed in the course of a suppurative arthritis of the knee, cured in ten days. Following these observations, Mercadé presented some general statements on the filiform drain, on the good results from the use of which I have already commented (*THE JOURNAL*, May 5, 1917, p. 1335). According to Mercadé, this method effects a continuous drainage of an abscess without the introduction of a voluminous foreign body and without a large incision. The natural curative process is consequently not interrupted, and when the flow of pus has stopped, the walls of the abscess unite in a few days without a scar, whereas the large incision made in connection with tubular drainage lengthens the time required for healing, and leaves conspicuous scars. The filiform drain acts, as it were, as a permanent evacuator puncture. It allows the pus to escape and prevents the air and the dirt from entering; in short, it works like an ordinary check valve. On the other hand, the tubular drain evacuates poorly the thick pus. It lets air in, and it works like a check valve reversed. The evacuation of pus without air being permitted to penetrate into the pocket is of great importance, especially in the case of abscesses which an incision causes to become fistulous; whereas the evacuator puncture, if properly done, generally cures them without fistulization. The principal advantages of filiform drainage, according to Mercadé, are the avoidance of the necessity of anesthesia, the simplicity and the rapidity with which the operative procedure is accomplished, the rapidity of the healing process and the absence of cicatrices.

In support of this communication, Dr. Chaput, surgeon of the Hôpitaux de Paris, declared that for several years past he had definitely renounced tubular drainage; that he had employed filiform drainage exclusively, and that this form of drainage had always given him results much superior to the results obtained from tubular drainage.

The War

THE AMERICAN RED CROSS

A generous American has just placed at the free disposal of the American Red Cross the old Coislin palace, situated in Paris, at the corner of la place de la Concorde and la rue Royale, to serve as general headquarters. The commission will be installed here as soon as the apartments can be made adaptable to their new use, and the work that has been undertaken with this end in view will be pushed as fast as possible. The Commission of the American Red Cross owes it to the generosity of its friends that it is able to meet with its own funds all obligations imposed on it. It is now financially so situated that whatever money is raised in the United States by the collections during "Red Cross Week" and by the subscriptions and gifts which the commission may receive during the course of the war, it will be in a position to use entirely for the alleviation of suffering. Acting in harmony with the general headquarters of the American Army, it will provide the best of care and the highest degree of comfort possible for the troops that the United States shall send to France.

AMERICANS ENROLLED IN THE LEGION OF HONOR

On the occasion of the celebration of American independence, the president of the republic, adopting the proposal of the president of the Council and the minister of foreign affairs, bestowed the cross of the Legion of Honor on several Americans of note, namely: To Mr. Whitney Warren, associate member of l'Académie française, and member of the American Relief Clearing House, was given the rank of "officer," and to Mr. Pratt, director of the American Relief Clearing House, and to Mr. Fitch, chief surgeon of the Franco-American Hospital of Saint-Valéry-en-Caux, was accorded the title of "knight."

REINJECTIONS OF ANTITETANIC SERUM BEFORE OPERATIONS

At two recent meetings, the Société de chirurgie de Paris discussed at length the question of giving reinjections of antitetanic serum to the war wounded before undergoing surgical operations. This discussion was taken up in connection with the communication from Dr. Silhol of Marseilles. Silhol has given in his service reinjections of antitetanic serum to eighty-five patients. All received, between 9 and

11 a. m., a first injection of 1 c.c. of the serum, and if there was no reaction a second injection of 10 c.c. was given between 2 and 4 p. m. Out of these eighty-five patients, nineteen developed more or less serious symptoms (itching, nausea, vomiting, weak pulse, headache, syncope, etc.). Silhol concludes from this that it would appear advisable not to attempt to treat patients indiscriminately with antitetanic serum at times of surgical intervention and application of dressings unless good and sufficient reasons exist which will compensate for the inconvenience and dangers of the antitetanic serotherapy, and that no one should consider himself either culpable or blamable if a case of tetanus occurs, after an operation, important or otherwise, on a patient who was not reinjected.

Dr. Riche, a surgeon of the hospitals of Paris, has called attention to the fact that the problem of the preventive efficacy of antitetanic serum has not been scientifically demonstrated. There are believers, disbelievers and skeptics. He places himself in the ranks of the skeptics, for, to his notion, the inefficacy has not been proved either.

Dr. Proust expressed profound surprise to hear Silhol still raise doubts as to the efficacy of the serum, and to note that Riche stated that its efficacy had not been scientifically demonstrated. Proust thinks it has been—at least empirically. All those who were witnesses of the frightfully numerous cases of tetanus at the beginning of the war, and who now view its almost complete disappearance, will likely proclaim their absolute faith in the serum. As regards secondary infections, after what he has seen as head of a surgical section, Proust believes he can safely say that when it is a question of the secondary removal of projectiles from an infected area, the reinjection of antitetanic serum is indicated. It is, it seems to him, practically a question of good judgment, since inoculation accompanied by reactivation is evidently almost always fatal. The importance of the result to be obtained must be regarded as greater than the inconvenience imposed by the at times unfavorable effects of the serum.

Dr. Delbet has observed two cases of tetanus resulting after the injection of antitetanic serum. One of these patients had received only one injection; the other had received two. The tetanus appeared several weeks after the injections. In both cases there were singular manifestations which one is not in the habit of observing in man, and to which Lumière has already called attention; the muscles with bulbar innervation were only slightly, and that tardily, affected. The contractions began in the member which was the seat of injury, and remained confined to this member for a long time, as if the toxin had mounted along the nerve fibers without extending throughout the whole system. Both patients recovered after receiving daily from 30 to 40 c.c. of antitetanic serum and from 1 to 1.2 gm. of phenol. The impression made on Delbet by these two cases is that the injections of antitetanic serum, although they were of old origin, modified the progress of the tetanus. Evidently, these patients were no longer sufficiently immunized, as is shown by the fact that they had tetanic symptoms; but it seems probable that they had preserved a partial immunity which modified the progress of the tetanus. As for the unfavorable symptoms resulting from antitetanic serum, they must not cause the abandonment of serotherapy, although the after-effects are certainly troublesome at times, and it would be desirable to be able to avoid them, or at least to lessen the chance of their occurrence; this, perhaps, will prove to be possible.

Dr. Fredet, surgeon of the hospitals of Paris, thinks that in order to solve this question it is indispensable to ascertain: (1) how frequent and how serious these cases of tetanus are which spring up in belated fashion, in spite of injection or a series of injections of antitetanic serum; (2) how frequent and how serious the after-effects resulting from reinjections of serum are. As for the first point, Fredet states that out of more than 1,000 surgical operations which he performed on the war wounded, after the lapse of considerable space of time since the first and only antitetanic injection, or since the series of injections, he had observed only one case of tetanus, and the progress of even this case was benign. On the other hand, since October, 1916, Fredet has subjected about fifty patients to reinjections before operating on them. He has not, however, observed any unfavorable results, not even Arthus' phenomenon, but he remembers a case of hypersusceptibility which he saw before the war. The patient was a young girl who had received two years previously, an injection of antidiphtheritic serum, and who,

after being subjected to a new injection of antitetanic serum by reason of a foot injury, showed anaphylactic symptoms of a rather serious nature.

Dr. L. Bazy, chief of the surgical clinic of the Faculté de médecine de Paris, lost recently one of his patients, who succumbed to tetanus in spite of three prophylactic injections; but he does not consider this fact an argument against the efficacy of antitetanic serum. The most evident cause of the effects of antitetanic serotherapy in checking the disease is the persistence of the tetanic focus. The above-mentioned patient had, besides war wounds, serious frost bites on both feet, and bacteriologic tests showed that the tetanic focus was localized on the surface of the frost bite on the left foot, from which the dead tissue was just beginning to slough off at the time the first symptoms of tetanus appeared. It is probable that the quantity of tetanus toxin secreted on the surface of this wound was considerably out of proportion to the doses of serum injected; and here, according to Lumière, is the principal cause of the examples of precocious tetanus (if they may be so termed), as the result of antitetanic injections. Another reason which would explain the prophylactic effects of serotherapy in general, and of antitetanic serotherapy in particular, is that the serum used is horse serum, and therefore a heterogenous serum; consequently, the protection which it confers on man is of infinitely shorter duration than the protection it gives to a horse, for the simple reason that its introduction into the human system has the effect of bringing about immediately the production of an antibody (horse antialbumin), the efficacy of which increases in proportion as the injections are renewed. Since the immunity conferred by the prophylactic injection is easily exhausted, it becomes possible to understand the delayed appearance of tetanus, long after injections of antitetanic serum have been given, and also why it appears at the very moment when tetanic inoculation occurs on the surface of wounds of more or less old origin, scarred over or otherwise, as the result of surgical intervention or some traumatism which liberates the spores confined in the encysted foreign bodies.

Dr. Thiéry notes the fact that the clash between the theory of insufficiency of the antitetanic serum as against too strong doses of toxin elaborated at the focus of infection, and the belief in the insufficient duration of the immunization due to the heterogenous nature of the serum with which we are dealing, gives rise to two modes of practice as applied by the supporters of antitetanic serotherapy: while Lumière asserts that the doses of serum should be increased considerably so as to give in two or three days up to from 190 to 200 c.c. and even more, Bazy thinks that, on the contrary, we can reduce the dosage more and more until we need inject only from 2 to 4 c.c. On the other hand, in order to be logical, knowing that the serum acts only on the circulating toxin and has no effect on the germs elaborating this toxin unceasingly at the focus of infection, why do these supporters of serotherapy not recommend the suppression of these germs by amputation of the member, an old mode of practice which at present seems to have fallen completely into disuse?

Dr. Potherat, surgeon of the hospitals of Paris, declares himself to be an ardent believer in antitetanic serotherapy, but that does not signify that he has a blind faith in it. There are cases, indeed, in which the serum appears to be entirely inefficacious. But, independent of whatever particular influence the fact that the serum is horse serum may have, is not the same thing happening here which happens in the case of antidiphtheritic serum? All powerful though the latter may be against pure diphtheritic pharyngitis or laryngitis, it is inefficacious against angina due, for example, to a streptococcus. In war surgery, when there are so many different micro-organisms invading the wounds and when conditions manifestly favor the development of the *Bacillus tetani*, may there not be some which would be an obstacle to the action instituted by the antitetanic serum? Potherat emphasizes the fact that the surgical intervention has an evident, even preponderant, tendency to bring about the manifestation of tetanus. Its appearance, even though delayed, in cases of persistence of foreign bodies, and its cure, by even the secondary removal of such foreign bodies, furnish a proof of this. From this we may conclude that when giving prophylactic injections and reinjections to patients, we must act subsequently as if we put no reliance in this medication, and must treat the wounds as soon as possible by the incision of recesses, the excision of dead tissue and the extraction of foreign bodies; in short, the bringing to bear of all means possible to rid the infected focus of the *Bacilli tetani*.

Marriages

WILBUR H. MINFORD, M.D., Hazleton, Pa., and King George Military Hospital, London, England, to Miss Mildred Brightmore, in London, England, June 2.

LIEUT. WILLIAM AMORY TAYLOR, M. O. R. C., U. S. Army, Portage, Wis., to Miss Zelia Cooper of Terre Haute, Ind., at Wheaton, Ill., May 27, 1916.

LIEUT. LEROY DILMORE SOPER, M. O. R. C., U. S. Army, Smyrna, N. Y., to Miss Valentine Evelyn Johnson, of Burlington, Vt., June 20.

VERNON WALKER LE MASTER, M.D., Sidney, Ohio, to Miss Helene Garmhousen of Lock Two, Ohio, at New Bremen, Ohio, recently.

LIEUT. DEXTER HATHAWAY WITTE, M. O. R. C., U. S. Army, Hartford, Wis., to Miss Margaret Habegger of Watertown, Wis., July 7.

LIEUT. JOHN STEPHEN MCATEE, M. O. R. C., U. S. Army, Councils Bluffs, Iowa, to Miss Marie Callahan of Omaha, July 10.

LIEUT. HENRY STANLEY ROGERS, M. C., Kan. N. G., Topeka, to Miss Jean Frances De Hart of Bartlesville, Okla., July 9.

CAPT. ROBERT SKELTON, M. C., U. S. Army, Douglas, Ariz., to Miss Evangeline Bovard of Nogales, Ariz., July 12.

ANTHONY BASSLER, M.D., New York, to Miss Harriet M. Seeley of Renfrew, Conn., in Kingston, Ont., July 14.

CHARLES WADHAMS STEVENS, M.D., New York, to Miss Marion Duncan Paine, at Scarsdale, N. Y., June 30.

LIEUT. GEORGE MCLEAN, M. O. R. C., U. S. Army, to Miss Margaret A. Gunther, both of Baltimore, July 7.

FRED XENOPHON LILLY, M.D., Dawson, W. Va., to Miss Anna Helen Young of Hinton, W. Va., July 6.

GORDON WOOD HIGGINBOTHAM, M.D., to Miss Faye Adams, both of Liberal, Kan., at Hooker, Okla., July 5.

JAMES FRANCIS BRADY, M.D., Boston, to Miss Ethel Gertrude Costello of Cambridge, Mass., June 26.

JARRETT JEFFERY BILLINGTON, M.D., to Miss Cecile Harriet Nott, both of Enterprise, Okla., July 10.

CAPT. ELBERT CLARK, M. O. R. C., U. S. Army, to Miss Helen Johnson, both of Chicago, July 11.

LOUIS ALBERT PACKARD, M.D., Hibbing, Minn., to Miss Mildred Mandeville of Denver, June 19.

JACOB FRANK FRIESEN, M.D., Los Angeles, to Miss Florence Adora Huntingdon of St. Paul, recently.

Deaths

George Edward Walton, M.D., Daytona, Fla.; Bellevue Hospital Medical College, 1864; aged 77; assistant surgeon in the Army during the Civil War; lecturer on physiology in the Medical College of Ohio, Cincinnati, 1867; lecturer on materia medica in Miami Medical College, Cincinnati, in 1868; professor of principles and practice of medicine in the Cincinnati College of Medicine and Surgery, in 1869; president of the Cincinnati Academy of Medicine, in 1880, and president of the Volusia County Medical Society, in 1904; died at the home of his son, in Terre Haute, Ind., June 26.

Henry H. Doan, M.D., Philadelphia; University of Pennsylvania, Philadelphia, 1890; aged 49; a member of the Medical Society of the State of Pennsylvania and of the Association of Military Surgeons of the United States; Major, Medical Corps, N. G., Pa.; assistant medical inspector of the Philadelphia Bureau of Health from 1904 to 1915, and thereafter chief of the division of child hygiene and chief of the division of hygiene; died at his home, July 5, from nephritis.

James Walton Wood, M.D., Long Beach, Calif.; College of Physicians and Surgeons, Chicago, 1883; aged 61; formerly a Fellow of the American Medical Association; health officer of Long Beach from 1887 to 1898; a member of the local school board for nine years; director of the National Bank of Long Beach, and local surgeon of the Southern Pacific, Salt Lake and Pacific Electric railways; died at his home, July 5.

William Stone Woods, M.D., Kansas City, Mo.; Jefferson Medical College, 1864; aged 76; a practitioner of Middle

Grove, Mo., from 1863 to 1867, and thereafter a merchant and later a banker; president of the National Bank of Commerce, Kansas City; one of the most successful and prominent business men and bankers of Kansas City; died in Excelsior Springs, Mo., July 5, from cerebral hemorrhage.

Francis M. Ridley, M.D., La Grange, Ga.; Tulane University, New Orleans, 1880; aged 59; a member and once president of the Medical Association of Georgia; president of the state board of medical examiners; once president of the Troup County Medical Society; chief surgeon of the Atlanta and West Point, and Macon and Birmingham railroads; died at his home, July 7.

Louis G. Armendt, M.D., Owensboro, Ky.; University of Louisville, Ky., 1886; aged 66; a member of the Kentucky State Medical Association; a member of the staff of the Owensboro Hospital; health officer of Daviess County, and a member of the Daviess County Draft Exemption Board; died at his home, July 8, from cerebral hemorrhage.

Lycurgus S. Null, M.D., New Haven, Ind.; Eclectic Medical Institute, Cincinnati, 1866; aged 77; formerly a member of the Indiana State Medical Association; a veteran of the Civil War; in 1880 a member of the state legislature, and two years later elected state senator for four years; died at his home, July 8, from organic heart disease.

Leonidas Strickland Ebright, M.D., Sharon Center, Ohio; Wooster (Ohio) Medical College, 1869; aged 72; a veteran of the Civil War; formerly a member of the Ohio State Medical Association; a member of the legislature from 1880 to 1882; died at his home, June 10, from cerebral hemorrhage.

William Keating Bauduy, M.D., Little Rock, Ark.; Missouri Medical College, St. Louis, 1886; aged 51; formerly a member of the Arkansas Medical Society; emeritus professor of psychologic medicine and diseases of the nervous system in Washington University, St. Louis; died at his home, July 1.

James Ambrose Jones, M.D., Lynn, Mass.; University of Vermont, Burlington, 1906; aged 52; formerly a Fellow of the American Medical Association; a member of the Massachusetts Medical Society; for ten years assistant city physician of Lynn; died at his home, July 3, from heart disease.

William Schmoeller, Houston, Texas; Memphis (Tenn.) Hospital Medical College, 1893; aged 61; formerly a Fellow of the American Medical Association; a member of the State Medical Association of Texas; a member of the sanitary corps during the Turko-Russian War; died at his home, July 6.

Wilbur Alden Hunt, M.D., Kettlersville, Ohio; University of Cincinnati, 1912; aged 29; died at his home in Kennedy Heights, Cincinnati, July 8, from rheumatism, resulting from exposure while on duty as a sergeant, Hospitals Corps, Ohio N. G., during the floods in Hamilton in 1913.

Joseph Miller Kells, M.D., Columbus, Ohio; Medical College of Ohio, Cincinnati, 1880; aged 59; in charge of the relief department of the Pennsylvania system, Columbus district, since 1893; died at his home, July 1, from pernicious anemia.

Charles Bush James, M.D., Denver; Kentucky School of Medicine, Louisville, 1891; aged 51; city physician and police surgeon of Denver; for ten years physician of Denver County; died in St. Luke's Hospital, Denver, July 9, from asthma.

Ulysses G. Senour, M.D., Cincinnati; University of Louisville, Ky., 1889; aged 52; formerly a district physician of the Cincinnati Health Department, and mayor of Pleasant Ridge; died at his home, July 7, from cerebral hemorrhage.

Edwin D. Farrow, M.D., Visalia, Calif.; University of Pennsylvania, Philadelphia, 1864; a member of the Medical Society of the State of California; for many years physician of Tulare County; died at his home, July 6.

Christopher Turner, M.D., Butte, Mont.; National University of Ireland, Dublin, 1897; aged 56; formerly a Fellow of the American Medical Association; surgeon to St. James' Hospital, Butte; died in Brooklyn, June 23.

Edgar Jehial Meacham, M.D., Richmond Beach, Wash.; Rush Medical College, 1879; for the last year physician on the steamer *Protesilaus*, in the British service; died in the Providence Hospital, Seattle, June 28.

Samuel D. Tobey, M.D., Council Bluffs, Iowa; University of Michigan, Ann Arbor, 1860; aged 80; a veteran of the Civil War; formerly a member of the Iowa State Medical Society; died at his home, July 8.

Homer F. Fort, M.D., Diekens, Neb.; Omaha Medical College, 1888; aged 61; for several years local surgeon for the Union Pacific System; died in a hospital in Omaha, about June 30, from arteriosclerosis.

Isaac F. Sweeney, M.D., Milton, Ind.; Medical College of Ohio, Cincinnati, 1866; aged 72; a member of the Indiana State Medical Association; a veteran of the Civil War; died at his home, about June 29.

Warren Joseph O'Hara, M.D., Hastings, Neb.; Rush Medical College, 1891; aged 50; a Fellow of the American Medical Association; died in St. Catherine's Hospital, Omaha, July 3, after an operation.

Louis Baumann, M.D., Jersey City, N. J.; New York University, New York, 1884; aged 54; a member of the Medical Society of the State of New Jersey; died at his home, July 10, from heart disease.

John Wesley Saucerman, M.D., Winslow, Ill.; Rush Medical College, 1863; aged 79; formerly a member of the Illinois State Medical Society; died at his home, July 2, from cerebral hemorrhage.

Francis W. Johnson, M.D., Utica, Ind.; Kentucky University, Louisville, 1904; aged 47; a member of the Indiana State Medical Association; died at his home, July 3, from heart disease.

George Henry McKeehan, M.D., Washington, D. C.; Washington (D. C.) Homeopathic Medical College, 1896; for many years a manufacturing pharmacist; died at his home, July 3.

Alison B. Bush, M.D., Weston, W. Va.; College of Physicians and Surgeons, Baltimore, 1893; aged 51; a Fellow of the American Medical Association; died at his home, June 30.

George W. Veach, M.D., Wilmette, Ill.; Western Reserve University, Cleveland; aged 93; for more than forty years a practitioner of New Castle, Pa.; died at his home, June 2.

William Harrison, M.D., Port Angeles, Wash.; College of Physicians and Surgeons in the City of New York, 1850; aged 97; died at his home, May 11, from senile debility.

John South Drake, M.D., Santa Fe, Mo.; Miami Medical College, Cincinnati, 1871; aged 76; a Confederate veteran; died at his home, July 10, from cerebral hemorrhage.

James A. Thomas, M.D., Owensville, Ind.; Louisville (Ky.) Medical College, 1884; aged 55; a Fellow of the American Medical Association; died at his home, July 2.

Michael Arthur Young, M.D., Indianapolis; Medical College of Indiana, Indianapolis, 1891; aged 58; was struck and killed by an interurban car in Indianapolis, July 10.

Edgar T. Cook, M.D., Hot Springs, Ark.; University of Louisville, Ky., 1884; aged 64; died in his office in Hot Springs, July 11, from cerebral hemorrhage.

Stephen Arthur Allen, M.D., Plymouth, Mass.; New York University, New York, 1879; for many years a practitioner of New Bedford; died at his home, June 22.

James P. McMillan, Medora, Ind. (license, Indiana, 1897); aged 74; for many years a practitioner and druggist of Jackson County; died at his home, July 7.

Robert S. McCray, M.D., Morristown, Ind.; Medical College of Indiana, Indianapolis, 1884; aged 59; died at his home, July 7, from kidney disease.

John J. Kane, M.D., St. Louis; Homeopathic Medical College of Missouri, St. Louis, 1871; aged 71; died at his home, July 3, from acute uremia.

W. L. Marshall, Longview, Texas (license, years of practice, Texas, 1907); aged 89; a Confederate veteran; died at his home, June 23.

Abram Milton Powers, M.D., Rootstown, Ohio; Eclectic Medical Institute, Cincinnati, 1869; aged 80; died at his home, June 23.

Edward M. Manning, M.D., St. Joseph, Mo.; Northwestern Medical College, St. Joseph, Mo., 1882; aged 78; died at his home, June 24.

George B. Moore, M.D., Strawtown, Ind.; Medical College of Indiana, Indianapolis, 1870; aged 75; died at his home, June 28.

Frank G. Jones, M.D., Cleveland; Homeopathic Hospital College, Cleveland, 1888; aged 50; died at his home, June 22.

Duncan McKellar, M.D., Hillsdale, Mich.; University of Michigan, Ann Arbor, 1876; aged 65; died at his home, July 7.

William L. Busby, M.D., Delta, Iowa; Bennett Medical College, Chicago, 1888; aged 58; died at his home, July 7.

Daniel W. Humfreville, M.D., Los Angeles; Medical College of Ohio, 1864; aged 74; died at his home, June 23.

William B. Ezell, M.D., Ezell, Va.; Atlanta, Ga., Medical College, 1861; aged 80; died at his home, June 29.

Correspondence

END MONOPOLY ON SALVARSAN

[Last week we commented on the fact that the Adamson bill had passed the House of Representatives and would, quite likely, soon pass the Senate; that it included a clause authorizing the Federal Trade Commission to grant licenses to citizens of this country to manufacture products controlled, through patents, by enemy aliens. Bearing on this subject is a letter to the Chairman of the Federal Trade Commission, which is of such importance, in that it states concisely certain facts, that we gladly give space to it.—ED.]

NEW YORK, July 19, 1917.

Hon. William J. Harris,
Chairman, Federal Trade Commission,
Washington, D. C.

Sir:—In view of the possibility of the enactment of the Adamson bill, providing for the licensing of foreign patents to American citizens, I beg to present a few considerations bearing on the subject of salvarsan. As a former president of the American Dermatological Association, a member of the Executive Council of the American Society for the Control of Syphilis, and one moreover whose life has been spent in the treatment of this disease, I venture to express the belief that I speak with a certain authority.

I need not dwell on the enormous prevalence of syphilis among all classes of the community, or on the inestimable value of salvarsan in its treatment. Nor need I refer to the great increase in this already prevalent disease that, according to universal experience, may be expected among the soldiers of the great army, whom we are about to enroll. The use of salvarsan has today become a vital necessity.

When it comes to the question of licensing this or that individual or corporation to manufacture this drug, it is important to bear in mind the fact that we are not dealing with wagon-wheels or tomato-cans. The ordinary dose of salvarsan contains enough arsenic to kill several people, and in its manufacture several arsenical compounds of extraordinary toxicity are likely to be produced, and must be guarded against or eliminated. In short, salvarsan, improperly made, may be a poison of tremendous virulence. It seems obvious, therefore, that the licensing of the manufacture of this drug should be granted only under the strictest precautions, under such security that the possibility of killing our patients with it is excluded. The individual practitioner cannot make the necessary tests. I venture to suggest that no salvarsan be permitted to be sold that does not bear the imprimatur of some such authority as the Public Health Service of the government.

Your commission is, of course, aware of the fact that for some time past the Dermatological Research Laboratories of Philadelphia have manufactured salvarsan and have rendered the country a service of incomparable value in supplying the drug at a time when the foreign supply was unobtainable. The Philadelphia salvarsan has commended itself to the profession, who have learned to value its therapeutic efficacy and its freedom from poisonous by-products. In point of fact, in regard to its freedom from poisonous admixtures, it has shown itself to be superior to the imported drug. It would be a distinct loss to the public if this laboratory were deprived of the right to continue to supply the drug, the more as the laboratory in question has notoriously not engaged in the manufacture of the drug from motives of gain, but mainly from the altruistic desire to conserve the use of this valuable drug for the American public.

The foreign owners of the patent rights and their agents in this country, on the other hand, have exploited the drug to the utmost; they have made the public "pay all the traffic would bear." There is an ethical side to this question which cannot be ignored in the midst of its legal and commercial aspects. The experimental work which resulted in the elaboration of salvarsan was done in the Speyer Haus of Frankfurt—a scientific foundation established by a philanthropist of Frankfurt for the benefit of humanity, very much like the Rockefeller Institute for Medical Research in the city of New York, though on a much smaller scale. Conceive for a moment the possibility of a discovery like salvarsan having been made in the Rockefeller Institute and then patented by Dr. Flexner and the profits of its sale devoted to private ends! But more, sir! Not only has this drug, discovered in a laboratory founded for the benefit of humanity, been used for private gain, but the gains which the patentees had made have been exorbitant and outrageous. They have abused their

monopoly; they have exacted blood-money from the poor for a product which on ethical grounds should belong to the poor without profit to the patentees. For a drug whose sole cost practically depends on the overhead charges of the laboratory and factory, into whose manufacture the chemicals that enter cost normally only a few dollars per pound, they have charged the public at the rate of more than \$3,000 per pound!

It would be a calamity to grant to this same group of people, who have so shamelessly abused their legal privileges, the sole right to manufacture the drug. Since the war, under the plea of increased expenses for freight, etc., they have audaciously added over \$700 per pound to the already high cost of the drug. The public has no assurance that, with their monopoly secured, this rapacious group will not even still further add to the burden which the sick poor has to bear.

Let the manufacture of salvarsan be thrown to any one competent to make it and let only that product be sold which passes the tests of a recognized authority. In this way, the price of this inestimable drug will be kept within reason and its therapeutic reliability assured.

A patent on this drug should never have been asked for, nor granted if asked. It is interesting to recall the fact that two of the greatest life-saving discoveries in the history of civilization, Jenner's vaccination against smallpox and Sir Humphry Davy's safety lamp for miners, were given to the world without thought of profit to the discoverers. On the other hand, von Behring, a German idealist who despises the "Dollar Amerikaner" patented his diphtheria antitoxin in Germany and was prevented from patenting it in this country only because Roux, a Frenchman, who had simultaneously worked out the same product, had given it freely to humanity before von Behring applied for exclusive rights. *Salus populi suprema lex!* Let it be shown, now that the war has created an opportunity, that salvarsan can be profitably sold for a dollar a dose or less, and the price is likely to remain reasonable thereafter.

I have the honor to remain

Respectfully yours,

S. POLLITZER.

QUALIFICATIONS FOR MEDICAL OFFICERS AND THE DRAFT

To the Editor:—May I say, though not in approval, that you show great restraint in answering the series of questions propounded by "a physician of Colorado" (*THE JOURNAL*, July 14, 1917, p. 128). Question 3 asks, "Is it possible for Seventh Day Adventists to get relief from duty, such as examining troops and such other work except caring for the sick, on Saturday?" How can you have patience with any man, presuming that he is in his right mind, who exalts petty denominationalism above patriotism and service at such a time as this? It sounds suspiciously as though your correspondent were at heart a pacifist. "Our denomination is planning," etc. What have *denominations* to do with this grim business of war? For myself, I wish you had answered the questions a little more vigorously.

G. ALDER BLUMER, M.D., Providence, R. I.

An Ode to Health.—Health of itself makes life a perpetual joy. Nothing daunts, nothing overawes, nothing discourages and nothing overpowers the man and woman possessed of health. Health means not only vigor and energy of body, but also clarity and strength of mind; purity and beauty of soul. The healthy person dominates life instead of allowing life to dominate him. He scarcely thinks of his body as consisting of parts or as performing separate functions. To him the body is but one harmonious whole. He is a unit, a being, a man; complete, vigorous, perfect. To such a man work is a joy. He regards obstacles as but opportunities for testing his strength. He hardly knows what weariness is. He never experiences exhaustion. Merely to grasp his hand is a pleasure. To gaze into his eyes is a joy. To hear his voice is to feel a thrill pass over one. To peer into his mind serves as a stimulus to higher achievement. Health supplies the courage, the aggressiveness in life. Without health one is bankrupt regardless of what his financial capital may be. He becomes a cipher in the world of real men and women. If you have health, then, friends, cherish it, guard it and treasure it as you treasure life, for out of it are the issues of life.—Adapted from Sigmund Beldegreen.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

ANTIDOTE FOR PETROLEUM POISONING

To the Editor:—I would like to know the best antidote for coal oil poisoning.

JOSEPH CERNY, M.D., Wilber, Neb.

ANSWER.—Sollmann (*Manual of Pharmacology*, 1917 edition, p. 108) states that "when petroleum is swallowed, it produces narcotic effects similar to those of alcohol, with strong gastro-enteritis." It is toxic in proportion to the content of the more volatile products. The treatment recommended by Peterson and Haines (*A Textbook of Legal Medicine and Toxicology*, 1904 edition, 2, 533) consists in washing out the stomach or administering emetics and the use of purgatives. In cases of collapse, warm baths with cold affusions are recommended; the usual respiratory and cardiac stimulants are also indicated.

Kerosene is not so toxic as benzin (gasoline) which is more volatile. The symptoms and treatment of benzin poisoning were discussed in *THE JOURNAL*, Nov. 15, 1913, p. 1832.

REDINTOL

To the Editor:—I have just received a circular in which some bombastic claims are made concerning Redintol. What is it?

J. E. D., Columbus, Ohio.

ANSWER.—Redintol is a paraffin mixture for the hot wax treatment for burns. It is one of the products of Johnson and Johnson, New Brunswick. The composition, as given in the circular, is "Paraffines 95 per cent. combined with Resina Palaquium and Oleum Picis Liquid," which means little, and, if we presume correctly, was so intended. Ordinary paraffin would be an effective and much cheaper dressing. Although many physicians would not readily recognize "Oleum Picis Liquid" as oil of tar, yet we venture that not one in ten thousand would know that "Resina Palaquium" is simply gutta percha. That a respectable firm such as Johnson and Johnson would stoop to such "patent medicine" methods of exploiting their wares is to be deprecated.

REPORT OF BRITISH COMMISSION ON VENEREAL DISEASES

To the Editor:—Can you tell me where I may buy, or who publishes the report of the British Commission on Venereal Diseases, parts of which you commented on in *THE JOURNAL* a few weeks ago?

HERMAN L. KRETSCHMER, M.D., Chicago.

ANSWER.—It may be obtained from Wyman and Sons, Ltd., 29 Breems Building, Fetter-Lane, E. C., London; price 1s. 1ld.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

HAWAII: Honolulu, Sept. 10-13. Chairman, Dr. R. W. Benz, 1141 Alakea St., Honolulu.

Utah January Examination

Dr. G. F. Harding, secretary of the Utah State Board of Medical Examiners, reports the written examination held at Salt Lake City, Jan. 5, 1917. The examination covered 18 subjects and included 100 questions. The percentage required to pass was 75. Two candidates were examined, both of whom passed. Three candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
College of Phys. and Surgs., Baltimore	(1915)	*
University of Oklahoma	(1916)	*
* No grade given.			
College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Rush Medical College	(1903)	Illinois
University of Nebraska	(1912)	Iowa
University of Pennsylvania	(1910)	Penna.

Porto Rico April Examination

Dr. Quevedo Baez, secretary of the Porto Rico Board of Medical Examiners, reports the written examination, held at San Juan, April 2, 1917. The examination covered 10 subjects, and 100 questions were asked. The percentage required to pass was 75. Twelve candidates were examined, of whom 8 passed and 4 failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
George Washington University	(1916)	83
Atlanta Medical College	(1916)	75
Loyola University	(1916)	75, 75
University of Illinois	(1916)	79
University of Maryland	(1916)	84
Vanderbilt University	(1915)	75
Medical College of Virginia	(1916)	84.4
FAILED			
Chicago College of Medicine and Surgery	(1915)	62
Bennett Medical College	(1915)	68.5
Loyola University	(1916)	65, 66

Iowa Reciprocity Report

Dr. G. H. Sumner, secretary of the Iowa State Board of Medical Examiners, reports that seven candidates were licensed through reciprocity at the meeting held at Des Moines, May 29, 1917. The following colleges were represented:

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Bennett Medical College	(1913)	Illinois
Rush Medical College	(1914)	Illinois
University of Michigan Medical School	(1916)	Michigan
John A. Creighton Medical College	(1906) (1913) (1915)	Nebraska
University of Nashville	(1907)	Missouri

Georgia April Examination

Dr. C. T. Nolan, secretary of the State Board of Medical Examiners of Georgia, reports that nine candidates were licensed by a special examination, held at Augusta, April 11, 1917. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Atlanta Medical College	(1917) 90.7, 92.5, 92.8, 93.7, 94.5.		
University of Georgia	(1917) 90, 90.4, 90.4, 93.6.		

Georgia May-June Examination

Dr. C. T. Nolan, secretary of the State Board of Medical Examiners of Georgia, reports the written examination held at Atlanta and Augusta, May 31-June 1, 1917. The examination covered 10 subjects and included 100 questions. The percentage required to pass was 80. The total number of candidates examined was 83, of whom 81 passed, and 2 failed. Twelve candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Birmingham Medical College	(1913) 80.7; (1915)	85.9
University of Alabama	(1911)	87.6
Atlanta Medical College	(1916) 84.5; (1917) 80, 83.5, 84.1, 85, 85.6, 85.7, 85.9, 86.2, 86.2, 86.3, 86.3, 86.4, 86.6, 86.7, 86.7, 86.8, 86.8, 87.1, 87.3, 87.4, 87.6, 87.8, 87.8, 87.8, 87.8, 88.1, 88.2, 88.3, 88.3, 88.4, 88.4, 88.5, 88.5, 88.7, 88.7, 88.8, 89, 89.1, 89.5, 89.7, 89.7, 89.9, 90, 90.4, 90.4, 90.5, 90.5, 90.5, 90.7, 91.1, 91.4, 91.7, 94.1.		
University of Georgia	(1917) 87.8, 88.1, 88.4, 90.2, 91.6, 92, 92.9.		
Chicago College of Medicine and Surgery	(1916)	83.6, 87.5
Loyola University	(1916)	81.3
Baltimore Medical College	(1897)	83.8
Tufts College Medical School	(1916)	85.7
Chattanooga Medical College	(1904)	87.9
Knoxville Medical College	(1908)	80
Meharry Medical College	(1915) 85.2; (1916) 81.9; (1917) 80, 83, 83.2, 83.2, 83.5, 84.5, 87, 89.8.		
FAILED			
Southern College of Medicine and Surgery	(1913)	72.3
Meharry Medical College	(1916)	75
College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Rush Medical College	(1892)	Missouri
Hospital College of Medicine	(1898)	Minnesota
Johns Hopkins University	(1912) (1915)	Maryland
University of Maryland	(1915)	Maryland
University of Michigan Medical School	(1915)	Michigan
Meharry Medical College	(1913)	Tennessee

Tennessee Medical College	.....	(1909)	W. Virginia
University of the South	.....	(1900) Tennessee; (1906)	Louisiana
Vanderbilt University	.....	(1915)	Tennessee
Medical College of Virginia	.....	(1908)	Virginia

Book Notices

THE OFFENDER AND HIS RELATIONS TO LAW AND SOCIETY. By Budette G. Lewis, A.B., Commissioner of Correction, City of New York. Cloth. Price, \$2 net. Pp. 382, with illustrations. New York: Harper & Brothers, 1917.

In this book, Mr. Lewis utilizes his large experience as Commissioner of Correction in the City of New York as the basis for a serious discussion of the best method of handling this problem. As there is no one cause for criminal delinquency so no one method of treating the offender will result in his rehabilitation. Especially suggestive is the author's comparison of our treatment of the insane and the criminal. In former years, he says, the insane were treated largely by confinement, practically all afflicted persons being treated alike. Gradually special treatment for different classes was provided and special institutions were established, with the result that from 20 to 30 per cent. of those committed to the best hospitals for the insane are now either released as cured or put under the supervision of friends or relatives. With further study of delinquency, he anticipates the development of special treatment for different classes of cases and of remedial and corrective measures which will fit the individual either for release and the resumption of normal activities in society or for supervision and guidance by properly selected persons. Influenced by the present day emphasis of prevention rather than cure, he urges the inauguration of remedial measures even for children yet unborn, of child welfare stations, proper schools and training, social control during the development period, and other preventive methods. The court and the offender, the inadequacy of existing legal methods, the relative value of the probation and parole system, the indeterminate sentence, the various forms of institutional organization and administration as well as industrial training, and the teaching of trades and occupations in prison are carefully considered. The chapters on police supervision and the rôle of the police in suppression of crime are particularly interesting. The author especially emphasizes the folly of enacting laws simply as moral pronouncements in advance of sustaining public opinion. The appendix contains much interesting matter on self-government in institutions, probation work, state control, etc.

THE NATION'S HEALTH: THE STAMPING OUT OF VENEREAL DISEASE. By Sir Malcolm Morris, K.C.V.O., Member of Royal Commission on Venereal Diseases. Cloth. Price, \$1.25 net. Pp. 152. New York: Funk & Wagnalls Company.

This is an account of the efforts that have been made and of the measures that, in the opinion of the writer, are necessary for the reduction and suppression of venereal diseases in England. While written especially for members of country, urban and rural district health boards and other sanitary authorities, it is equally suitable for general circulation. The problem is set forth without undue exaggeration or sensation. The question is discussed purely as a public health problem and the adoption of remedial measures from the public health rather than the moral or sentimental standpoint. While the statistics quoted are largely drawn from Great Britain, the arguments and conclusions are equally applicable to our own country. Regarding notification of venereal diseases, while admitting that there is a strong prima facie presumption in favor of it, Morris agrees with the royal commission in opposing any system of notification or reporting at the present time, holding that without the accompaniment of compulsory treatment, notification would merely furnish statistics of the incidence of these diseases without necessarily improving conditions. He agrees with the royal commission in feeling that better results may be obtained by education and the increase of facilities for diagnosis and treatment. He is also opposed to regulation, believing that the essential remedy lies in the employment of moral, educational and medical measures.

Social Medicine, Medical Economics and Miscellany

Treatment of War Wounds

Sir Almroth Wright (*Lancet*, 1917, 1, p. 939) points out that the disposition of the microbes in war wounds is fundamentally different from that in ordinary surgical wounds. In war wounds the infection is disposed, in part, on lacerated raw surfaces and in part it is carried deep into the substance of the tissues. Moreover, the infected lacerated surfaces are left denuded of skin and exposed to injurious external influences; and the infection which is carried down into the tissues is left as a buried infection. Every infected dead space must be cut down on and evacuated. As a prophylactic measure, every space which would, if left to itself, become an infected dead space—that means every space occupied by an infected projectile or pieces of infected clothing or infected foreign bodies or devitalized infected tissues—must be similarly laid open and cleaned out.

In the treatment of the surface infection, he says, one must distinguish between the naked tissue surface made by the projectile, or section with a knife, and the granulating defensive surface, which after a time clothes the naked tissues. The former is a nonvascularized surface, and in this is a system of lymph spaces left without mechanical or biologic protection other than that furnished by the emigration of leukocytes and (till that stanches) by the outflow of lymph. And the naked tissue surface is not only ill defended against microbic attack, it is also peculiarly liable to damage and to physiologic deterioration of the kind which opens the door wider to such attack. Such a surface readily dries up; and drying means the closing down of the capillary circulation. Again, seeing that it is nonvascularized, a naked tissue surface will readily take cold, and by that both lymph outflow and emigration are arrested. And lastly, a naked tissue surface, if kept wet, will, as soon as the discharges become tryptic, readily undergo erosive digestion. Against all these forms of physiologic degeneration special provision should be made in the treatment of naked surface infections. A granulating surface offers much greater protection against microbic infection, and is much less subject to damage. The tissues are covered in by many layers of protective cells, the lymph spaces are sealed over, and there has been laid down immediately below the surface in newly formed vessels a very abundant blood supply. All this gives sensible security against massive microbic invasion from the surface, against the wound taking cold, and against erosive digestion.

To start in the case of an open wound with a sterile surface avails nothing. War wounds become heavily infected even when the wounds are drenched at the outset with the strongest antiseptics, such as undiluted phenol and concentrated solutions of iodine. The first item in treatment will be to get a clean surface. For that it will, in the case of the tryptic suppurating wound, suffice to wash away the tryptic pus. In the case of the desiccated slough covered wound one must get rid of the sloughs. The rational way to do that will be by cleansing digestion. Such cleansing digestion can be obtained by treating the wound with hypertonic salt solution. This will break down leukocytes, setting free trypsin, and then the free trypsin will rapidly, and especially rapidly if one lets the hypertonic salt undergo dilution, amputate the dead from the living tissues. The use of hypertonic salt solution achieves more rapidly, and with less risk of infection, what putrefaction and the destruction of leukocytes by microbes would spontaneously effect. The second item of treatment in each case will be to combat the infection which has found a lodgment in the lymph spaces in walls of the wound cavity. To deal with this wash out by an outpouring lymph stream, and this is obtainable by treatment with reinforced hypertonic salt solution. Hypertonic salt solution is required both for preventing the set-back due to interruption of treatment in transport, and also for remedial treatment.

A slight infection of a naked tissue surface may be treated by leaving the wound to heal up from the bottom, limiting oneself to such redressing as would prevent erosive digestion;

or the surgeon may close the wound with the minimum delay. If the anatomic conditions permit, and the bacteriologic examination shows the wound surface to be practically uninfected, or if the wound is only a very few hours old and the implanted microbes cannot yet have grown out, the wound can, after removal of all dead and foreign matter, be closed immediately, the surgeon standing by to reopen the wound if symptoms of buried infection develop. If, on the other hand, bacteriologic examination shows that the wound surface is appreciably infected, or the history of the case makes this practically certain, then closing the wound would be violating all the principles of surgery. Microbic infection may be dealt with by the physiologic procedure. Physiologic salt solution, and zinc sulphate in 0.25 per cent. solution, and no doubt many other heavy metal salts in dilute solution are the sort of agents required. But what is, above all, essential to success in physiologic treatment of a surface infection is to be very assiduous in removing any leukocytes which may break down on the face of the wound. That is a question of maintaining intact the antitryptic power of the discharges.

A second method of procedure, the unreasoning antiseptic procedure, is to employ an antiseptic without laying stress on the assiduous cleansing of the wound surface and the maintenance of good physiologic conditions, without inquiring whether the antiseptic can, when brought into external contact with pus or an infected tissue, penetrate into it; and without asking whether the antiseptic hinders phagocytosis, or destroys the antitryptic power of the blood fluids, or permits or interferes with tryptic action. The third method of procedure is the combined antiseptic and physiologic procedure. The method of Carrel is such a method. The assiduous removal of corrupted and corruptible discharges is the primary desideratum.

Carrel's treatment Wright believes is not a *therapia magna sterilisans*. Regarded as an antiseptic method, it is a method of "fractional sterilization," requiring, say, at the rate of 12 douches a day, a series of 60 to 144 antiseptic douches; superadded to the antiseptic is a series of 60 to 144 physiologic attacks on the microbes—each such attack starting from an atryptic condition. While Carrel's work constitutes a very notable practical achievement, regarded as science, it comes short in the respect that adequate control experiments are lacking. Wright would not have us assume that when we have successfully combated a surface infection by a series of 60 to 144 therapeutic operations we have reached finality. And much less must we, from the fact that a treatment successfully combats surface infections, infer that it is also an effective treatment for infections which penetrate into the deeper tissues. It ought to come home to us instead, he says, that we must never look to find for quite different categories of wound infections, that is, for quite diverse conditions, any one routine (antiseptic or physiologic) treatment.

The Riddle of Life as Seen by the Chemist

The riddle of life has long engaged the interest of philosopher and scientist alike. Living beings are so complex both in function and in structure that few students venture beyond the broadest hypotheses in the attempt to understand the material background of vital phenomena. So far as life can be interpreted in terms of physics and chemistry, it has received considerable attention in the past two or three decades from students of so-called general biology. In an address of unusual vision, presented before the American Association for the Advancement of Science a few months ago, P. A. Levene of the Rockefeller Institute for Medical Research in New York (*The Chemical Individuality of Tissue Elements and Its Biological Significance*, *Jour. Am. Chem. Soc.*, 1917, 39, 828) summarized certain features of chemical structure and chemical dynamics which he believes characterize living organisms or cells. The first of these relates to their permeability. This seems now quite definitely to depend on the behavior of the proteins toward the reagents that come in contact with them. The conclusion that the permeability of a living membrane is a function of its chemical structure is of preeminent importance. As Levene writes,

living organisms or cells maintain their existence owing to the capacity of their outer membranes for absorption from the outside world and for elimination from within. By the first process the cell obtains materials required for the synthesis of its structural and dynamic elements; by the second it relieves its fluids from unnecessary and cumbersome waste products.

Growth—another characteristic of living organisms—also now appears to depend on suitable chemical structure of the available structural products. Levene reminds us that the capacity for synthesis is developed to a different degree in different biologic forms. Plants and some bacteria are capable of synthesizing their body protein from carbon dioxide and ammonia. The higher animal organisms require as starting material for the synthesis of their proteins at least amino-acids. Only a few years ago, Levene adds, no distinction was made between the food value of individual proteins or individual amino-acids. It has often been pointed out in *THE JOURNAL* how the present day point of view has been changed. Recent work of Abderhalden, Hopkins, Osborne, and Mendel and McCollum has established striking relationships between the growth of an animal organism and the structure of the amino-acids available as foodstuff.

Another question arises with respect to what constitutes the specificity or individuality of living organisms. Is this, too, a phenomenon of chemical structure? This leads to a consideration of the chemical make-up of some of the principal tissues. Evidently the compounds which they have in common are not the likely carriers of the unique property of individuality. Levene points out that the conspicuous tissue components are proteins, carbohydrates, fats and their complex derivatives, nucleoproteins, glycoproteins and lipoids. There are also enzymes and, finally, the products of cell activity, hormones and extractives. No differences are as yet known for nucleic acids of individual tissues of animal origin, nor has any significant distinction between the lipoids derived from different tissues or different species been discovered. The carbohydrates and fats are at best to be regarded as stores of ready energy. Evidence of both chemical and biologic nature arguing for the existence of individual differences between protein of different species and of different organs and tissues of the same species has been reviewed in *THE JOURNAL*. For their hormones and enzymes, characteristic differences likewise unquestionably exist.

On the basis of such information to which he and other American workers have contributed in no small degree, Levene has summarized the following tentative conclusion: There is a group of substances, such as nucleic acids, lipoids and conjugated sulphuric acids, which occur in all tissues, all organs of all species, constant, invariable in their structure, present wherever life is present. They are indispensable for life, but carry no individuality, no specificity, and it may be just to accept the conclusion of the biologist that they do not determine species specificity, nor are they carriers of the mendelian characters. The second group of substances is that of hormones and enzymes. These possess an undisputed chemical individuality. They may be present or absent in one or more organs, in one or another species; but when present in organs of various species may preserve their chemical individuality. In other words, their chemical structure is not a function of species variation. Jacques Loeb attributes to them the rôle of carriers of the mendelian characters, such as sex, color and form. This view seems to be quite acceptable from the chemical angle of vision. Finally, Levene adds, a third group of substances comprises proteins. These seem to show differences of chemical structure with variation of species, and because of this, Loeb ascribes to them the rôle of carriers of species specificity.

It requires little critical insight to discover the great gaps in our knowledge in this field. Yet there is something inspiring in the constructive imagination of the chemical basis of life. Despite the discouragement which profound ignorance may harbor for an assiduous investigator, there is some encouragement in the thought, to quote Levene, that "long after the mystery of the electron and of the atom will be solved, there will still remain the riddle of life to puzzle the human mind."

Medicolegal

"Ophthalmologist" and Optometry

(*McNaughton vs. Johnson* (U. S.), 37 Sup. Ct. R. 178)

The Supreme Court of the United States affirms an order denying the complainant an injunction to restrain the enforcement of the California statute regulating the practice of optometry, but which provides that it shall not be construed to prevent duly licensed physicians and surgeons from treating the human eye. The court says that the complainant claimed to be a regularly graduated ophthalmologist, which is a school of scientific learning and practice confined to the treatment of the inflammation of the eye and its membranes and in fitting glasses to the human eye; that she did not employ either medicine, drugs or surgery, nor was there anything in her practice hurtful to the individual or dangerous to society, and that there was no law in the state of California prescribing an examination for and regulating the practice of ophthalmology. She charged that the act regulating the practice of optometry offended the Fourteenth Amendment of the Constitution of the United States in that it deprived her of her property without due process of law and denied her the equal protection of the laws; and as specifications of the last she instanced the exemption from the provisions of the act of licensed physicians and surgeons; the appropriation to the sole use of registered optometrists of the right to employ any means other than the use of drugs in the measurement of the powers or range of vision; the denial to all other schools of scientific learning and practice the right to measure the range of human vision other than by the use of drugs on equal terms with the physician and surgeon; and contended generally that her occupation being a lawful one, not hurtful to the individual or dangerous to the community, the state had no power to impose discriminatory regulations on it. It is established that a state may regulate the practice of medicine, using this word in its most general sense. The complainant tried to escape from the rulings of those cases by which that is established by asserting a discrimination against her. She was an ophthalmologist, she averred, as above stated. She attacked the statute because, to use the language of her counsel, it "arbitrarily discriminates against every other school of scientific knowledge and practice in favor of the school employing drugs in determining the accommodative and refractive states of the human eye." It undoubtedly does, but gives the name of the school that of "optometry" and its practitioners "optometrists." This court cannot suppose that any injury was done her by the difference in names, and yet she gave no other tangible ground of complaint. Whether they are different, and whether the difference is of substantial or unsubstantial degree, she did not inform the court. She practiced one of them in preference to the other, and for the practice of that one the state has declared that its certificate of competency is necessary. The state has such power.

Secretary of Corporation Contracting for Treatment of Injured Employee

(*Wilson vs. St. Louis Envelope & Paper Box Co.* (Mo.), 190 S. W. R. 979)

The St. Louis Court of Appeals affirms a judgment for \$280 in favor of the plaintiff for professional services rendered by him as a physician and surgeon in attending one Brune who was injured while in the employ of the defendant, the part of the plaintiff's bill (\$150) for the first two days or covering the "first aid treatment" having been compromised between the plaintiff and a casualty company at \$100, while the suit was pending before the justice of the peace before whom it was commenced. The court says that the plaintiff testified that a day or two after Brune was under his care in the hospital and after he had given him the emergency treatment, he called up the place of business of the defendant and talked with some one, whom he could not then identify, and as a result of that conversation continued the treatment. As

the plaintiff could not identify the person with whom he had this conversation, he was not permitted to give it. However, it afterward appeared from the testimony introduced by the defendant that the person with whom the plaintiff had had the conversation was the secretary of the defendant company, and the plaintiff was then permitted to give his version of that conversation. His version was, that calling on the telephone a day or two after Brune was injured, he asked for one of the members of the defendant company and was told that he was talking to the secretary. He told the secretary that he was treating Brune for the fracture; that gangrene of the foot and leg had developed; that the chances were the foot would have to come off, and that he would like to have some one who was interested notified, telling the secretary that it was going to be a long drawn out and critical condition and he would like to know to whom he should look for his compensation, etc.; that the secretary then said that they would not be responsible for the treatment and that he (the plaintiff) would have to look to Brune, but finally said, "Go on until you hear from me." Never hearing anything further from the secretary or from any one else connected with the defendant, the plaintiff continued the treatment until a cure had taken place. The secretary, on his part, positively denied making any such statement, and two or three other witnesses, who testified that they were present when this conversation took place over the telephone, testified that they heard the secretary's part of it and that he had not made the statement in that conversation testified to by the plaintiff. The court considers that this presented substantial evidence in favor of the plaintiff. The witnesses being before the court, seen and heard by the latter, it was for the court, trying the case as a jury, to determine their credibility and the weight to be given to their testimony. The secretary of the defendant had authority to make the contract of employment, and having made it, if he did, and so the trial court found, it carried with it an implied promise to pay the reasonable value of the services rendered thereunder. A rehearing was denied.

Society Proceedings

COMING MEETINGS

Michigan State Medical Society, Battle Creek, Sept. 4-6.

AMERICAN PEDIATRIC SOCIETY

*Twenty-Ninth Annual Meeting, held at White Sulphur Springs, W. Va.,
May 28-30, 1917*

(Concluded from page 235)

Accidents in Foreign Protein Administration

DR. CHARLES GILMORE KERLEY, New York: A boy who had suffered from asthma since 2 years of age was sensitized to ragweed, goldenrod, maple and horse serum. His parents fearing the consequences, if it should ever be necessary to give him antitoxin, desired to have him immunized to horse serum. He was given horse serum in one-half minim doses, and these were gradually increased, the treatment being given at intervals of two weeks, until 4 minims were given. This dosage was followed by a violent anaphylactic reaction. Recovery was slow but complete. The second child was sensitized to wheat, oats and barley. One day after receiving treatment she suffered an anaphylactic reaction just after leaving the office. In the third case the child responded to the scratch test for milk. Eight drops of Walker-Gordon milk caused the child to go into collapse. She also made a good recovery.

DISCUSSION

DR. FRITZ B. TALBOT, Boston: The first of these patients was sensitized to horse serum by anaphylaxis. If we want to sensitize a person we inject the foreign protein once in two weeks; if we wish to immunize him we give the injections every third or fourth day. That would explain the reaction in the first case. It is curious that many children

react to the emanations of the horse and not to the serum. The horse serum protein is probably in both the serum and the excreta, while there is probably another protein in the emanations of the horse which is not in the serum. The second case that reacted to wheat, oats and barley brings up the interesting problem of mass reactions. When there is a tendency to react to one group of foreign proteins, particularly in the vegetable world, there is also a tendency to react to the other members of that group. We have found a peculiar thing: if, for instance, wheat produces a reaction and barley does not, if we stop giving wheat and give barley all will go well for two weeks, then the barley will cause a reaction and the wheat will not do so. The feeding of foreign proteins is safer than giving them subcutaneously. We have no fatal cases on record from giving the protein into the gastro-intestinal tract, but in cases in which the proteins have been given under the skin there have been fatalities.

DR. B. RAYMOND HOOBLER, Detroit: I have found that if we give the proteins by the mouth in tablet form, we can obtain desensitization with safety. We have just been making a series of tests. When we have produced desensitization, a little of the protein to which the patient has been immunized must be given daily until immunization is complete. We have been making injections by rectum in that type of patients not able to take cow's milk without developing an erythematous eruption. One may give milk by the mouth, reducing it to a very small quantity and giving it with other foods, and by giving these small quantities and very gradually increasing the amount, one may after three or four months obtain desensitization. In this type of cases one may, by means of a small rubber bulb, introduce an ounce of milk by rectum every day without trouble.

DR. J. P. CROZER GRIFFITH, Philadelphia: Can we regard all the reactions of this kind as protein reactions? For instance, would you regard a reaction to strawberries as a protein reaction?

DR. FRITZ B. TALBOT, Boston: It seems to me that we can explain all these reactions under the one head of protein reactions. There is no proof that there is anything else that causes anaphylaxis. All vegetables contain some pure protein, though in some the amount is very minute.

DR. GODFREY R. PISEK, New York: There is one practical point which should be emphasized, and that is that it takes a longer time than has been mentioned to produce immunity in some instances; sometimes it takes as long as six months.

DR. DAVID M. COWIE, Ann Arbor, Mich.: Attention has been called by Professor Novy to the possibility of overcoming anaphylaxis by rendering the urine alkaline by the administration of potassium acetate. We have had a large number of patients with eczema improve under antianaphylactic treatment.

DR. ALFRED FRIEDLÄNDER, Cincinnati: Among our patients who have received large doses of alkali there has been a greatly diminished incidence of serum disease following the use of the serum treatment.

DR. CHARLES GILMORE KERLEY, New York: The discussion has wandered far from "accidents." Altogether I have treated 107 patients and have had but few accidents. I have merely reported these cases to demonstrate that in the matter of protein therapy and in our experiments with foreign proteins our procedures should be very carefully carried out.

Chylothorax in an Infant

DR. GODFREY R. PISEK, New York: Ten days previous to admission to the hospital this baby had had a convulsion. There was nothing in the history to account for the condition. The child was 2 months and 1 week old. There were no symptoms except rapid and difficult breathing. Except for distinct areas of flatness over the right chest posteriorly with corresponding diminution of breath sounds and slight displacement of the heart, the physical findings were negative. A pleural effusion was suspected. At aspiration, 6 ounces of milky fluid were withdrawn. The laboratory examination showed that this was apparently a true emulsion, composed of fat and seroglobulin. The roentgenogram showed an

effusion in the right thorax with some displacement of the heart and mediastinal contents to the left. There was partial collapse of the right lung. The baby was allowed to go home after twenty-two days, being then in good condition and gaining in weight.

Sarcoma of the Brain Simulating Hydrocephalus

DR. L. EMMETT HOLT, New York: The parents first noticed enlargement of the head when the child was 2 weeks old. At 7 weeks of age the head measured $21\frac{1}{2}$ inches in circumference, while the chest measured 15 inches. The only symptoms were those of ordinary hydrocephalus and hernia cerebri. At necropsy the right hemisphere of the brain was found to be quite normal, but the left was the seat of a large sarcomatous growth. The unusual features of this case were the absence of symptoms other than those of hydrocephalus, and the extraordinary rapidity of growth of the tumor.

DISCUSSION

DR. CHARLES GILMORE KERLEY, New York: I had a similar case in a child 8 or 9 months of age. The symptoms were those of hydrocephalus. An oculist and a neurologist could find nothing else, and the diagnosis of hydrocephalus was made. At operation a sarcoma was found. The child was operated on a second time, and died within twenty-four hours after the operation.

Value of the von Pirquet Test as Controlled by Necropsy Findings

DR. J. H. MASON KNOX, Baltimore: This article is abstracted in *THE JOURNAL*, this issue, p. 311 (see next column).

Effect on Human Milk Production on Diets Containing Various Forms and Quantities of Protein

DR. B. RAYMOND HOOBLER, Detroit: Twelve different diets have been tested. We have found that: 1. A nutritive ratio 1:6 or narrower seems best adapted to the need of nursing mothers. 2. Animal protein is more suitable than vegetable protein in supplying nitrogen for milk and maintenance of the nitrogen balance. 3. The protein when derived from nuts and when fed with other vegetable protein is suitable for supplying milk protein and for maintaining nitrogen balance. 4. A diet composed exclusively of cereals, fruit and vegetables does not supply sufficient protein for elaborating milk protein, and causes a severe drain on the tissues of the mother. 5. Of the various forms of animal protein, that derived from cow's milk seems particularly suitable for the production of human milk protein as well as for the preservation of maternal tissues. A diet that will just maintain the nitrogen equilibrium is in many respects preferable to one which tends to add weight.

Indicanuria in Children

DR. H. M. McCLANAHAN, Omaha: A careful study of the urine of 536 children, varying in age from 4 to 12 years, was made; none of these children had any organic disease. Of this series, 20 were hospital patients, 6 of whom were suffering from empyema. All were subjected to operation. Indican was found in excess in all. In five who recovered, indican either disappeared or there was only a trace when they left the hospital. In the 516 ambulatory cases indican was present in greater or less degree. In 97 there was a trace of indican; in 367 indican was present in excess, and in 52 the urine was loaded with indican. Of the 516 cases, 337 on a second examination showed either a decrease or absence of indican, and in the remaining 179 the indican persisted. Of the 52 cases showing excessive indican, all were cases of constipation. Eleven patients, with the complete cooperation of the mothers, were placed on a diet eliminating entirely meat, eggs and milk for a period of ten days. After this treatment, and a free bowel movement daily, the urine of each child, without exception, showed absence of indican. It may be said that indican is present in the urine of the majority of children. A trace is probably normal: Excessive indican is evidence either of intestinal putrefaction or of some mechanical injury to the mucosa, or to some suppurative process within the body.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago July, XIV, No. 1

- 1 *Focal Lesions Produced in Rabbit by Colon Bacilli Isolated from Pyclocystitis Cases. H. F. Helmholz and C. Beeler, Chicago.—p. 5.
- 2 *Twenty-Four-Hour Metabolism of Two Normal Infants with Special Reference to Total Energy Requirements of Infants. F. B. Talbot, Boston.—p. 25.
- 3 *Some Analyses of Vegetables Showing Effect of Method of Cooking. A. M. Courtney, H. L. Fales and F. H. Bartlett, New York.—p. 34.
- 4 *Enlargement of Thymus Treated by Roentgen Ray. A. Friedländer, Cincinnati.—p. 40.
- 5 *Value of Von Pirquet Test as Controlled by Necropsy Findings. J. H. M. Knox, Jr., Baltimore.—p. 47.
- 6 *Intravenous Glucose Injections in Infancy. C. H. Dunn, Boston.—p. 52.
- 7 *Postoperative Acid Intoxication. J. C. Jeans and M. R. Johnston, St. Louis.—p. 57.
- 8 *Intussusception of Bowel in an Infant. A. Peskind, Cleveland.—p. 63.

1 and 2. Abstracted in *THE JOURNAL*, July 14, pp. 146 and 147.

3. Abstracted in *THE JOURNAL*, July 21, 1917, p. 233.

4. **Thymus Treated by Roentgen Ray.**—Three distinct facts are emphasized by Friedländer with reference to enlargement of the thymus: (1) The condition is much commoner than is ordinarily supposed. (2) The diagnosis can be made definitely by means of simple physical examination and the Roentgen ray. (3) In the Roentgen ray one possesses a therapeutic agent, which, in and of itself, will effect a cure in the vast majority of cases. Quite a few of his cases have occurred in babies suffering from congenital syphilis. A distinct familial tendency has also been noted as well as an apparent relationship of hypertrophic stenosis of the pylorus and enlarged thymus.

5. **Value of Von Pirquet Test as Controlled by Necropsy Findings.**—It may be concluded from the results reported by Knox that the von Pirquet test is a most reliable aid in the detection of tuberculosis in children; that a positive reaction indicates invariably a tuberculous focus in the body; and that a persistently negative reaction establishes the fact that there is no tuberculous lesion, except in those extremely ill patients where the presence of tuberculosis can readily be established by physical examination.

6. Abstracted in *THE JOURNAL*, July 14, p. 145.

7. **Postoperative Acid Intoxication.**—The acetone bodies of the blood were somewhat increased after operation in about two-thirds of the children studied, by Jeans and Johnston the maximum amount being found in most instances about twenty-four hours after operation. The plasma carbonate was reduced in about two thirds of the cases, the greatest reduction occurring in most instances about twenty-four hours after operation. When more closely compared there was found to be no close relation between the increase of acetone bodies and the reduction of plasma carbonate. In most instances, especially in those cases in which the plasma carbonate was much reduced, the acetone bodies were entirely inadequate to account for the degree of reduction of plasma carbonate. The undetermined acid factor was apparently of much greater importance than the acetone bodies in the reduction of reserve alkali. The starvation incident to operation seems to play no part in the production of this undetermined factor.

8. **Intussusception of Bowel in Infant.**—An interesting feature in Peskind's case was the obstruction of the bowel with a second intussusception within three weeks after the first operation.

American Journal of Medical Sciences, Philadelphia July, CLIV, No. 1

- 9 *Results of Deep Roentgen Ray Treatment in Two Hundred and Fifty-Eight Cases of Malignant Tumors. A. F. Holding, New York.—p. 1.

- 10 *Syphilitic Aortitis; Report of Cases. A. R. Elliott, Chicago.—p. 14.
- 11 Congenital Absence of Lung; Report of Case. A. G. Ellis, Philadelphia.—p. 33.
- 12 *Use of Immune Serum in Treatment of Whooping Cough. A. Bleyer, St. Louis.—p. 39.
- 13 *Auricular Fibrillation; Some Clinical Considerations. S. A. Levine, Boston.—p. 43.
- 14 *Typhoid Meningitis; Report of Case. S. Bayne-Jones, Baltimore.—p. 55.
- 15 *Visceral Findings in One Hundred Syphilitics. T. Howard, Brooklyn.—p. 64.
- 16 *Pulsating Spleen in Mitral and Tricuspid Diseases. M. Manges, New York.—p. 72.
- 17 Rate of Excretion of Three Nitrogenous Waste Products, Uric Acid, Urea and Creatinin in Nephritis, as Shown by Comparative Studies of Blood and Urine. C. K. Watanabe, New York.—p. 76.
- 18 Clinical Study of Chlorid Excretory Function. C. C. Wolferth, Philadelphia.—p. 84.
- 19 Familial Epistaxis; Report of Case. H. B. Richardson, Boston.—p. 95.
- 20 Diagnosis of Early Pulmonary Tuberculosis. J. I. Johnston, Pittsburgh.—p. 100.
- 21 Influence of Renal Function on Hyperglycemia and Glycosuria in Diabetes Mellitus. A. A. Epstein, New York.—p. 103.

9. **Roentgen-Ray Treatment in Malignant Tumors.**—From a study of these cases by Holding it is evident that the Roentgen rays give excellent therapeutic results in basal cell epithelioma. They ameliorate cases of carcinoma of the breast, ovary and testis, tumors of lymphatic structures, especially when these tumors are made up of cells of an embryonal type. While one cannot successfully maintain that the Roentgen rays have yet proved to be a cure in cancer, it is worthy of note that these rays, as well as those of radium, applied with removal when possible, produce more uniform improvements in cancer than any other agents heretofore known, and the use of these agents in cancer is established until some effectual constitutional treatment for cancer is found. Pending the discovery of some effectual constitutional treatment, every effort should be made to increase the ameliorating effects of the radioactive methods. Surgery should not ignore the benefits of these methods in the treatment of cancer, particularly in the postoperative raying and treatment against metastases. Most of Holding's improved cases eventually relapsed, and while their lives were prolonged and made more comfortable by the Roentgen-ray treatment, they eventually died of the disease. In some instances these ameliorating effects were very striking and deserve particular attention in the hope that one may eventually discover means of making these ameliorations more lasting and even permanent.

10. **Syphilitic Aortitis.**—Of all the methods of diagnosis to determine the presence of aortic disease, Elliott says the Roentgen ray is the most valuable. By its aid one may detect slight changes in the caliber and shape of the vessel which entirely elude the methods of physical examination. It is obvious that until there is some dilatation, thickening, alteration of curve, or abnormal pulsation in the vessel, Roentgen diagnosis of aortic disease is impossible. In consequence of this fact the Roentgen ray cannot be relied on for its detection in the early stage before mechanical defects begin to make their appearance. Clinical considerations and the Wassermann test must establish the diagnosis at this stage.

12. **Immune Serum in Whooping Cough.**—For the purpose of determining the value of this method, injections of human blood were carried out by Bleyer in the early weeks of this disease in forty-five cases. These were divided into three groups of fifteen cases each. In Group A the blood injected was from persons who were convalescent or who had recovered from whooping cough within three months. In Group B the blood was from persons who had had the disease at more remote periods, and in Group C from persons who, so far as they knew, had never had it. The ages of the children in all groups averaged under 3 years. The stage of the disease at which the treatment was given was about the same in the three groups. Dosage was gaged in a rough way to body weight of donee, from one-tenth to one-fifth of the computed volume of blood of donee was given; this varied between 40 and 125 c.c., divided into two, three or four doses

and injected into muscle (gluteus). Discoloration often followed the injections in very young infants; in a few there was induration for a day or two; there were no infections, and temperature reactions, so far as could be told in this disease, did not occur. The injections in every case were completed within a week in order to avoid hemolytic reactions; reactions to new proteins were not observed. The blood used was from a single donor in ten, from two in four, and from three in one. Blood not used at once was citrated to 1 per cent.

The results of the treatment in the three groups may be summarized: In Group A of fifteen children whose average age was 28 months, who received convalescent's blood during the early weeks of whooping cough, there occurred no deaths and no serious complications; the course of the disease was, however, in no definite way different than is usually seen, and was not appreciably influenced by the treatment except in three. In Group B, in one case, in which the blood used was from the mother who had had pertussis twenty years before, quite as satisfactory improvement occurred as in any case in Group A; in this group there were no pneumonias which recovered. There were also two pneumonias in Group C with one death, and in this group there was one case which seemed to have been very favorably affected by the injections of normal blood.

13. **Auricular Fibrillation.**—A study made by Levine of 128 consecutive cases of auricular fibrillation diagnosed by electrocardiograms, and of 261 consecutive necropsies, showed that the following general conclusions may be drawn. Auricular fibrillation is met with almost as frequently as lobar pneumonia. Syphilis plays an unimportant rôle in the etiology. The transient form is common but frequently overlooked. About one third of the cases of persistent auricular fibrillation have had one or more attacks of rheumatic fever or chorea and show clinical signs of chronic organic mitral endocarditis. Chronic organic mitral endocarditis is quite infrequently found in patients over 50 years of age, either in the living as a result of physical examination, or in the dead by postmortem examination. Most patients with organic mitral diseases develop mitral stenosis and only a small number reach the age of 50 years.

14. **Typhoid Meningitis.**—Bayne-Jones describes a case of purulent cerebrospinal meningitis due to *B. typhosus* occurring in the fourth week of a typical case of typhoid. The outcome was lethal within a few days after the onset of the meningitis. Statistics of the medical clinic of the Johns Hopkins Hospital show that out of 2,768 cases of typhoid there have been five cases of typhoid meningitis. Seventeen case reports of this relatively rare phase of typhoid infection are summarized from the literature on the subject. These, together, with the fifteen cases collected by Cole, and with the case reported by the author make a total of thirty-three proved accounts of the condition in the statistics of typhoid.

15. **Visceral Findings in Syphilitics.**—Howard's study emphasizes the fact that medical wards will be deprived of their present generous supply of syphilitic wrecks only when every syphilitic patient is treated early, thoroughly, persistently, and with painstaking consideration of his individual requirements.

16. **Pulsating Spleen.**—The case cited by Manges differs from those thus far reported. There was no evidence of aortic regurgitation, unless a short diastolic murmur in the third left space might be accepted as evidence of aortic regurgitation, of which, however, there was no other symptom, and there was no Corrigan pulse or double tone in the vessels; the tracings showed no sign of it; the hypertrophy of the left ventricle could easily be explained by the mitral lesion.

American Journal of Orthopedic Surgery, Boston

July, XV, No. 7

- 22 Function of Orthopedic Surgery in Present War. D. Silver, Pittsburgh.—p. 509.
- 23 *Transplantation of Hamstring Muscles for Quadriceps Palsy. S. Kleinberg, New York.—p. 512.
- 24 *Nailing Operation in Ununited Fractures of Neck of Femur. P. P. Swett, Hartford, Conn.—p. 521.

- 25 Treatment of Congenital Club-Foot. C. A. Stone, St. Louis.
—p. 533.
- 26 Low Cost Motor Outfit. M. C. Harding, San Diego, Calif.
—p. 542.

23. Transplantation of Hamstring Muscles.—This report is based on a study of twenty-three cases of infantile paralysis in which the inner or outer hamstring muscles were transplanted to the front of the knee, to supplement a weakened, or to take the place of a paralyzed, quadriceps. Twenty-one of these cases were operated on by Dr. Royal Whitman, and two by Kleinberg. Final results could be studied in only eighteen cases. Sixteen cases were seen one year or more after the operation. The ages of the patients varied from $5\frac{1}{2}$ to 20 years. The time that had elapsed between the appearance of the paralysis and the date of operation varied from four to nineteen years. The results demonstrate that neither the age of the patient nor the length of time since the onset of paralysis has any bearing on the efficacy of the operation. Thirteen of the eighteen cases were biceps transplantations. In all of these there was gain of voluntary extension of the knee, varying from 10 degrees to complete and forcible extension. Of the five cases of inner hamstring transplantation, in three there was no gain in voluntary extension; in one case there was about 5 degrees of extension and that was doubtful, and in the remaining case there was 45 degrees of voluntary extension. From this review it may be concluded that, although the combined power of the inner hamstrings is much stronger than that of the biceps, nevertheless, when transplanted, the biceps acts more forcibly and is the muscle of choice for transplantation.

24. Nailing Operation in Ununited Fractures.—Swett calls attention to the effectiveness of the nailing operation for ununited fractures of the neck of the femur, and records the results obtained in eight such cases operated on by him.

Annals of Surgery, Philadelphia

July, LXVI, No. 1

- 27 Service in French Army Medical Corps. C. Chase, Brooklyn.
—p. 1.
- 28 Roentgen Ray in War Surgery and Its Relation to Removal of Foreign Bodies. J. R. Eastman, Indianapolis, and R. B. Bettman, Chicago.—p. 13.
- 29 Use of Microphone for Removal of Needles in Hand. K. Bulkley, New York.—p. 19.
- 30 Deep Palmar Hand Infections. H. L. Beye, Iowa City, Iowa.
—p. 24.
- 31 *Case of Laceration of Inferior Vena Cava; Repaired by Suture; Recovery. H. P. Cole, Mobile, Ala.—p. 43.
- 32 Two Cases of Intrapericardial Traumatic Hemorrhage. G. B. Rhodes, Cincinnati.—p. 44.
- 33 Subcutaneous Injuries of Liver; Report of Ten Cases. J. M. Hitzrot, New York.—p. 50.
- 34 *Transperitoneal Sigmoidotomy for Removal of Tumors in Mucous Membrane. W. J. Mayo, Rochester, Minn.—p. 64.
- 35 Value of Roentgen Examination in Cholelithiasis. J. T. Case, Battle Creek, Mich.—p. 69.
- 36 Acute Perforation of Gastric and Duodenal Ulcers; Report of Thirty-Six Cases. E. G. Alexander, Philadelphia.—p. 72.
- 37 *Relation of Iliohypogastric Nerve to Radical Cure of Inguinal Hernia. A. V. Moschcowitz and H. Neuhof, New York.—p. 79.
- 38 Some of the Problems of Plastic Surgery. J. S. Davis, Baltimore.
—p. 88.
- 39 Autogenous Bone Graft in Treatment of Fracture of Greater Tuberosity of Humerus. W. T. Davidson, Laredo, Texas.—p. 95.

31. Laceration of Inferior Vena Cava.—While separating dense capsule-like adhesions fixing a tumor to the lower thoracic vertebrae, Cole produced two longitudinal rents in the anterior surface of the inferior vena cava, one about 3.5 cm. and the other about 1 cm. in length. A very profuse hemorrhage was controlled temporarily by a gauze pack. The tumor was removed rapidly as the patient was almost exsanguinated. Both lacerations were quickly whipped over with a single stitch of fine catgut on a fine needle. The patient was pulseless at the end of operation, but was carried through a quite exciting twenty-four hours with intravenous saline, and was discharged from the hospital within three weeks with the abdominal wound practically healed.

34. Transperitoneal Sigmoidotomy.—For removing growths by transperitoneal sigmoidotomy, the abdomen is opened in the midline, suprapubically, and a Balfour self-retaining

speculum adjusted. A moderate Trendelenburg with a pack gives good exposure. Mayo now seldom uses the exaggerated Trendelenburg, and in old and adipose persons he is especially cautious in this respect. The sigmoid is opened on the anterior longitudinal band as nearly opposite the tumor as possible, and the tumor is exposed, drawn through, and double clamped. The growth is removed with the cautery and the defect closed from the mucous side by continuous sutures of chromic catgut after the method devised by Pilcher for the excision of hemorrhoids, and covered on the peritoneal side with a few interrupted silk sutures. The incision in the sigmoid is then closed with continuous catgut and interrupted fine silk. Mayo then passes a red rubber tube up into the sigmoid beyond the line of sutures and fastens it with a catgut suture to the anus; this is left in situ for a few days to prevent gas pressure. Mayo has never applied this procedure to frank malignant growths, but for growths similar to papilloma it has been found most efficient.

37. Iliohypogastric Nerve and Inguinal Hernia.—Two successful experiments performed by Moschcowitz and Neuhof prove that the posterior part of the iliohypogastric nerve is a mixed nerve, that is, both motor and sensory. That part of the iliohypogastric nerve which is exposed in the conventional operation for the radical cure of inguinal hernia is purely sensory. The authors advise that part of the iliohypogastric nerve which is exposed in the conventional hernia operation is to be preserved, because there is no necessity for dividing it, and also because its complete division will be followed by a temporary anesthesia of the hypogastric region. After a while regeneration of the nerve occurs and the anesthesia disappears. The nerve should be protected from a careless inclusion in the suture line. Such a careless inclusion is likely to be followed by a neuralgic pain. A careless division of the nerve is not followed by a local paralysis of the internal oblique muscle and therefore has no bearing on the radical cure.

Boston Medical and Surgical Journal

July 12, CLXXVII, No. 2

- 40 *Analysis of One Hundred and Thirty-three Fractures of Spine Treated at Massachusetts General Hospital. J. B. Hartwell, Boston.—p. 31.
- 41 Classification of Hay Fever Pollens from Biologic Standpoint. W. Scheppegrell, New Orleans.—p. 42.
- 42 Artificial Pneumothorax. P. H. Ringer, Asheville, N. C.—p. 50.
- 43 Case of Pernicious Anemia in Syphilitic Treated with Salvarsan. L. G. Lowrey, Boston.—p. 52.

40. Treatment of Fractures of Spine.—From a study of 133 cases Hartwell believes that laminectomy is absolutely contraindicated (1) in patients in shock or who have received demonstrable injuries in addition to the spinal fracture and the cord injuries accompanying it; (2) in patients with fracture of the cervical spine whose respiration is embarrassed by paralysis of the intercostal muscles; (3) in all patients whose paralysis accompanied the accident, and was noted immediately after accident; (4) before the fourth day of convalescence, because in cases in which improvement takes place, such improvement cannot be expected to manifest itself before the fourth day; (5) in all patients who are improving under conservative treatment, and laminectomy cannot be expected to better conditions if improvement, once shown, comes to a standstill; (6) in patients whose vertebral fracture is unaccompanied by medullary symptoms; (7) in all patients who have received injuries in addition to the spinal fracture, and (8) in all patients with uncomplicated vertebral fracture, whose cord injury accompanied the fracture, until at least four days have passed—the minimum time for spontaneous improvement to manifest itself. Operative treatment in the present series has not shown better results than conservative treatment. Laminectomy is indicated in the rare cases of gradual onset of medullary symptoms, and in patients who, originally free from cord symptoms, begin to develop symptoms referable to the cord. Tenderness over the site of injury is the most frequent and reliable sign of vertebral fracture. Shock is not common in vertebral fracture, regardless of the accompanying cord lesion, and the presence of shock is indicative of complicating injuries. The

presence of priapism is a bad prognostic sign. Injury to the cord, where present, is an accompaniment of the spinal fracture in a very large majority of cases; not secondary to hemorrhage or edema or persisting bone pressure, which are of relatively rare occurrence.

Bulletin of Johns Hopkins Hospital, Baltimore

July, XXVIII, No. 317

- 44 Undergraduate Instruction in Tuberculosis. A. K. Krause, Baltimore.—p. 217.
- 45 *Mineral Metabolism of Experimental Scurvy of Monkey. C. P. Howard and T. Ingvaldsen, Iowa City, Iowa.—p. 222.
- 46 Johns Hopkins and Some of His Contemporaries. H. M. Hurd, Baltimore.—p. 225.

45. **Mineral Metabolism of Experimental Scurvy of Monkey.**—The authors' study of the intake and output of the inorganic elements in human adult scurvy and the experimental scurvy of the guinea-pig and the monkey did not yield sufficiently decisive information to warrant an explanation of the pathogenesis of scurvy.

Journal of Biological Chemistry, Baltimore

July, XXXI, No. 1

- 47 Fate of Inositol Administered to Dogs. I. Greenwald and M. L. Weiss, New York.—p. 1.
- 48 Citric Acid Fermentation of *Aspergillus Niger*. J. N. Currie, Washington, D. C.—p. 15.
- 49 *Uracil-Cytosin Dinucleotide. W. Jones and B. E. Read, Baltimore.—p. 39.
- 50 Guanine Mononucleotide (Guanylic Acid) and Its Preparation from Yeast Nucleic Acid. B. E. Read, Baltimore.—p. 47.
- 51 *Estimation of Chlorids in Body Fluids. V. J. Harding and E. H. Mason, Montreal.—p. 55.
- 52 Intravenous Injections of Beta-Hydroxybutyric and Aceto-Acetic Acids. R. M. Wilder, Chicago.—p. 59.
- 53 *Quantitative Estimation of Dextrose in Muscular Tissue. R. Hoagland, Washington, D. C.—p. 67.
- 54 *Blood Lipoids in Anemia. W. R. Bloor and D. J. MacPherson, Boston.—p. 79.
- 55 Studies on Enzyme Action. Further Experiments on Lipolytic Actions. K. G. Falk, New York.—p. 97.
- 56 Physiologic Behavior of Raffinose. S. Kuriyama and L. B. Mendel, New Haven, Conn.—p. 125.
- 57 *Role of Vitamins in Diet. T. B. Osborne and L. B. Mendel, New Haven, Conn.—p. 149.
- 58 Modifications of Colorimetric Determination of Uric Acid in Urine and in Blood. L. J. Bogert, New Haven, Conn.—p. 165.
- 59 Nutritive Value of Diamino-Acids Occurring in Proteins for Maintenance of Adult Mice. E. M. K. Geiling, Urbana, Ill.—p. 173.
- 60 Studies on Enzyme Action. Factors Influencing Proteolytic Activity of Papain. E. M. Frankel, New York.—p. 201.
- 61 Applications of Gas Analysis. Determination of Carbon Dioxid in Alveolar Air and Blood, and Carbon Dioxid Combining Power of Plasma, and of Whole Blood. Y. Henderson and W. H. Morriss, New Haven, Conn.—p. 217.
- 62 *"Vitamin" Hypothesis and Deficiency Diseases. E. V. McCollum and W. Pitz, Madison, Wis.—p. 229.
- 63 *Influence of Bile on Phenol Production. H. Dubin, Philadelphia.—p. 255.
- 64 Uric Acid Content of Blood of New-Borns. F. B. Kingsbury and J. P. Sedgwick, Minneapolis.—p. 261.
- 65 Hydrogen Ion Concentration of Ileum Content. J. F. McClendon, A. Shedlow and W. Thomson, Minneapolis.—p. 269.

49. **Uracil-Cytosin Dinucleotide.**—When nucleic acid is heated with ammonia it produces epinephrin uracil dinucleotide, evidently by hydrolytic rupture of its central nucleotide linkage. Jones and Read show that when nucleic acid is heated with mineral acid its central nucleotide linkage is not disturbed, but the two terminal nucleotide linkages are broken and uracil cytosin dinucleotide is formed.

51. **Chlorids in Body Fluids.**—An alternative method has been devised by Harding and Mason for the removal of the blood proteins, previous to the estimation of the chlorids, by the method of McLean and Van Slyke, which does not require the use of a highly specialized reagent. The method is said to be just as easy, simple and accurate as the original coagulation method. It is applicable to all the various body fluids. It is described in detail.

53. **Dextrose in Muscular Tissue.**—On account of its reducing action on Fehling's solution, creatinin is an important source of error in the determination of dextrose in muscular tissue. Creatinin is precipitated by an excess of phosphotungstic acid, and since that reagent is also an efficient precipitant for other nitrogenous constituents of muscular tissue as well, the use of phosphotungstic acid in excess has proved to be an excellent method for the clarification of a water extract of muscular tissue for the determination of dextrose by means of Fehling's solution. A method for the determination of dextrose in muscular tissue based on these principles is described by Hoagland. This method has proved to be simple in operation, and has yielded accurate results.

54. **Blood Lipoids in Anemia.**—The blood lipid values in anemia were found by Bloor and MacPherson to be normal, or nearly so, as long as the percentage of blood corpuscles remained above half the normal value. When the percentage was below this level abnormalities appeared which, in the order of their magnitude and also of the frequency of their occurrence were (1) high fat in the plasma, (2) low cholesterol in the plasma and occasionally in the corpuscles, and (3) low lecithin in the plasma. The lipid composition of the corpuscles was found to be normal in almost all cases. There was, therefore, nothing in their composition to indicate abnormal susceptibility to hemolysis. Removal of the spleen resulted in increased total fatty acids and lecithin in the corpuscles and of cholesterol in the plasma. The results were essentially the same whether the patients had anemia or not. The relation between free and bound cholesterol was found to be within normal limits in all cases of anemia except the two cases in which there was carcinoma, thus giving little support to the assumption that an abnormally great combination of cholesterol as ester is a factor in the production of anemia.

The low values for lecithin and the high values for fat, which were generally most marked in these cases in which the blood corpuscle percentages were lowest, are regarded as due to deficient fat assimilation in the blood resulting from the lack of sufficient corpuscles to bring about the change of fat to lecithin which has been found to be one function of the corpuscles. While the results offer no certain evidence that abnormalities in the blood lipoids are responsible for anemia, the low values for cholesterol, which is an anti-hemolytic substance, and the high fat fraction, which may indicate the presence of abnormal amounts of hemolytic lipoids in the blood, are possible causative factors of which further investigation is recommended by the authors.

57. **Vitamins in Diet.**—Experiments done by Osborne and Mendel confirm the presence in yeast of something comparable with the so-called water soluble vitamin. They offer no evidence regarding the presence or absence of the fat soluble one, since a liberal supply of butter fat was used in all of the food mixtures.

62. **"Vitamins" and Deficiency Diseases.**—McCollum and Pitz claim that the extensive experimental data at present available support the belief that the water-soluble B contains but a single substance which is physiologically indispensable, rather than a series of such substances, as is demanded by the "vitamin" hypothesis of Funk. Provisionally they have adopted this view, and predict that further inquiry will establish what is now all but demonstrated; namely, that unfavorable proportions among the well recognized constituents of the diet as well as of the two but recently appreciated ones, together with unsatisfactory physical factors and injury wrought through the agency of micro-organisms inhabiting the alimentary tract, will account for all the observed types of pathologic functioning which are referable to errors in the diet. They believe that there is satisfactory evidence in support of the view that polyneuritis is caused by a deficiency of a specific substance (water-soluble B) in the diet. They have repeatedly observed the curative effects of antineuritic preparations from various sources, when administered to polyneuritic birds or rats, and accept the explanation of Funk as to the etiology of this disease. This is, in their opinion, the only known deficiency disease in the sense in which this term has been employed in recent years.

63. **Bile in Phenol Production.**—It is established by Dubin that in the absence of bile from the intestine, large amounts of phenol are produced, this increase being unaccompanied by an increase in the conjugation. The unchanged conjugation may be due either to impaired liver function, or a

gradual slow production of phenol, or to a combination of both. The increased phenol production in the absence of bile from the intestine is due probably to the increased decomposition of the intestinal contents brought about by the lack of digestive activity, and diminished inhibition of bacterial fermentative secretions.

Journal of Laboratory and Clinical Medicine, St. Louis

July, II, No. 10

- 66 Bacteriology of Poliomyelitis. H. Greeley, Brooklyn.—p. 671.
- 67 Newer Conceptions of Dementia Praecox Based on Unrecognized Work. H. I. Gosline, Trenton, N. J.—p. 691.
- 68 *Possible Derivation of Active Principle of Posterior Lobe of Pituitary Body from Tethelin Produced by Anterior Lobe. C. L. A. Schmidt and E. S. May, Berkeley, Calif.—p. 708.
- 69 *Studies on Properties and Action of Tethelin. C. L. A. Schmidt, Berkeley, Calif.—p. 711.
- 70 Means of Preventing and Treating Typhoid, Particularly in Armies, under Condition of War. F. P. Gay, Berkeley, Calif.—p. 719.
- 71 Preparation of Pure Sodium Phosphite as Antidote for Mercuric Chloride Poisoning. G. A. Linhart, Berkeley, Calif.—p. 722.
- 72 *Traumatic Rupture of Heart; Report of Case with Uninjured Chest Wall. E. Kellert, Albany, N. Y.—p. 726.
- 73 *Acute Tuberculous Parietal Endocarditis. J. R. Stark, Cincinnati.—p. 731.
- 74 Description and Plans for Installation of Blast and Vacuum Pump. W. H. Walker, Chicago.—p. 737.

68. **Posterior Lobe of Pituitary Body.**—Having succeeded in splitting tethelin into products among which is a substance resembling in its action the active substance secreted by the posterior lobe, Schmidt and May believe that the active substance of the posterior lobe of the pituitary body is largely, or in part, derived from a splitting of the substance which is a product of the secretion of the anterior lobe and which contains an iminozoyl radicle.

69. **Studies on Properties and Action of Tethelin.**—The properties and action of tethelin, the active principle of the anterior lobe of the pituitary body, have been studied by Schmidt. It was found that tethelin is nonantigenic and non-toxic; hence its use therapeutically is warranted. It can not be used as the antigen in the Wassermann test, has no effect on the proteins of blood serum, does not cause a specific hyperleukocytosis, can be used as a medium for the growth of certain bacteria, is not split by trypsin or lipase, and does not stimulate contraction of the isolated cat or guinea-pig uterus.

72. **Traumatic Rupture of Heart.**—The case reported by Kellert is of interest since it serves to illustrate that extensive trauma to the heart may occur with little or no injury to the thorax. An Italian, aged 44 years, was engaged in digging in a sand bank. His fellow workmen, a short distance removed, heard him cry out, and on turning about, found that the bank had caved in and the patient was surrounded up to the waist by a large quantity of sand. He was unconscious, but apparently alive. When dug out, he was dead. The anatomic diagnosis was multiple ruptures of the heart; hemopericardium; rupture of the pericardium; hemorrhagic effusion of the left pleural cavity; subpleural hemorrhage; chronic pleuritis; chronic interstitial myocarditis; acute congestion of lungs and kidneys; small rupture of the left kidney; chronic peritonitis; chronic splenitis and perisplenitis; accessory spleen; superficial abrasions.

73. **Acute Tuberculous Parietal Endocarditis.**—The necropsy in Stark's case disclosed a chronic tuberculous spondylitis; psoas abscess; chronic tuberculous nephritis; chronic tuberculosis of the retroperitoneal glands; metastatic tubercles of the liver, spleen, right kidney, suprarenals and possibly cystitis and ureteritis; amyloidosis of the liver and kidney; cardiac dilatation; myocardial fibrosis; hypertrophied thyroid. Although this case, at first glance, might be considered one of generalized miliary tuberculosis, yet it presents many interesting features. The entire absence of any pulmonary or peritoneal involvement is unusual. The kidney lesion was evidently one of extension from the tuberculous spondylitis. Involvement of spleen and liver were minimal. About forty cases of tuberculous endocarditis are described, and only three of true tuberculous parietal endocarditis of which this case is one.

Journal of Nervous and Mental Disease, Lancaster, Pa.

June, XLV, No. 6

- 75 Metastasis of Cancer in Central Nervous System. I. Levin, New York.—p. 481.
- 76 Role of Consciousness in Development of Delusions. R. C. Hamill, Chicago.—p. 523.
- 77 Symptomatic Herpes Zoster. E. P. Boas, New York.—p. 531.
- 78 Wassermann Reaction in One Thousand Two Hundred and Sixty-Six Consecutive Admissions to Elgin State Hospital. E. W. Fell, Elgin, Ill.—p. 536.

Journal of Parasitology, Urbana, Ill.

June, III, No. 4

- 79 Endameba Buccalis. Its Multiplication and Periodicity. N. Nowlin, Lawrence, Kan.—p. 143.
- 80 Sporozoon Parasites of Fishes of Woods Hole and Vicinity. C. W. Hahn.—p. 150.
- 81 Study of Parasitic Protozoa. R. Kudo.—p. 163.
- 82 Occurrence of Bothriocephalus Liguloides Leuckart, with Especial Reference to Its Development. S. Yoshida. Osaka, Japan.—p. 171.
- 83 Life History of Gongylonema Scutatum. B. H. Ransom and M. C. Hall.—p. 177.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

July, X, No. 1

- 84 *Quantitative Experiments on Liberation of Epinephrin from Suprarenals after Section of Their Nerves, with Special Reference to Question of Indispensability of Epinephrin for Organism. G. N. Stewart and J. M. Rogoff, Cleveland.—p. 1.
- 85 *Influence of Asphyxia on Rate of Liberation of Epinephrin from Suprarenals. G. N. Stewart and J. M. Rogoff, Cleveland.—p. 49.
- 86 *Pharmacologic Studies of Ipecac Alkaloids and Some Synthetic Derivatives of Cephalin. A. L. Walters and E. W. Koch, Indianapolis.—p. 73.
- 87 *Agaricin. E. McCartney, London.—p. 83.

84. **Liberation of Epinephrin from Suprarenals.**—Further experiments made by Stewart and Rogoff indicate that the entire liberation of epinephrin from the suprarenals is controlled by nerves. In a number of acute experiments on cats and dogs, the reduction in the output of epinephrin after section of the various possible nerve paths to the suprarenals was studied. In all, epinephrin was still found in detectable amount in the blood coming from the suprarenals although the rate of liberation was reduced to a small fraction of the initial amount.

85. **Liberation of Epinephrin from Suprarenals.**—An attempt was made by Stewart and Rogoff to determine whether asphyxia produces a detectable increase in the rate of liberation of epinephrin from the suprarenals, as determined by testing suprarenal vein blood on rabbit intestine and uterus segments. The result was negative.

86. **Pharmacologic Studies of Ipecac Alkaloids.**—From an analysis of 145 different lots and samples of ipecac, representing in all many thousands of pounds of drug, the authors' records show that commercial ipecac averages 2.17 per cent. of total alkaloids. The lowest assay was 1.83 and the highest 2.84 per cent. The average amount of emetin is to that of cephalin as 63 is to 37. There is little or no difference in alkaloidal strength between Rio and Carthagena ipecac and the partition of the emetin and cephalin in the two species is in general the same. From experiments and case reports it would seem that the toxicity of emetin has generally been overstated. The usual dosage of 0.5 to 1 grain of emetin per day for six or eight days is certainly on the safe side unless the patient shows an unusual susceptibility to the drug. The real danger lies in the too long continued use of therapeutic doses, an entirely unnecessary procedure in the treatment of amebiasis, as the active endamebas will be destroyed by 0.5 or 1 grain doses in six to twelve days, and the encysted forms, if present, will not be destroyed by continued emetin injections.

87. **Agaricin.**—The results obtained by McCartney show that agaricin is a powerful poison for involuntary muscle, producing a marked and long continued rise of tone. It is suggested that this action affecting the muscular tissue surrounding the sweat glands prevents the secretion of the sweat, partly by more or less obstruction and by preventing peristaltic movements, and partly, perhaps, by limiting the blood supply.

Medical Record, New York*July 7, XCII, No. 1*

- 88 History and Analysis of Methods of Resuscitation. S. J. Meltzer, New York.—p. 1.
- 89 Treatment of Hay Fever and Asthma by Pituitary Extract and Epinephrin. E. Zueblin, Cincinnati.—p. 10.
- 90 Recent Literature Pertaining to Vitamins; Their Application in Infant Feeding. L. Fischer, New York.—p. 13.
- 91 Infectious Arthritis. J. W. Torbett, Marlin, Texas.—p. 14.
- 92 Syphilis and Pregnancy. B. P. Thom, New York.—p. 16.
- 93 Complete Thrombosis of Abdominal Aorta; Report of Case. R. A. Keilty.—p. 19.
- 94 Variation in Character of Food Supply as Affected by War. J. M. W. Kitchen, East Orange, N. J.—p. 20.

Medicine and Surgery, St. Louis*June, I, No. 4*

- 95 Advantages of Stereoscopic Method of Roentgenography Over that of Single Roentgenogram. E. G. Beck, Chicago.—p. 337.
- 96 Difficulties in Interpretation of Shadows in Roentgenograms of Kidney and Ureter Region. A. Hyman, New York.—p. 343.
- 97 Roentgen Examination of Chest. M. J. Hubeny, Chicago.—p. 354.
- 98 Roentgenotherapy in Malignant Tumors of Parotid Gland. C. A. Pfender, Washington, D. C.—p. 366.
- 99 Diagnosis of Bone Tumors. A. C. Christie, Washington, D. C.—p. 376.
- 100 Technic of Roentgenography of Kidneys. W. S. Lawrence, Memphis, Tenn.—p. 385.
- 101 Case of Syphilitic Pleurisy with Effusion; Resection of Rib with Drainage; Recovery. P. G. Skillern, Jr., Philadelphia.—p. 392.
- 102 Roentgen Ray Demonstration of Gallstone in Ampulla of Vater with Visualization of Common Duct and Right and Left Hepatic Ducts by Bismuth Injection. S. B. Childs, Denver.—p. 398.
- 103 Treatment of Malignancy by Radium. R. H. Boggs, Pittsburgh.—p. 401.
- 104 Roentgen-Ray and Radium Treatment of Leukemia and Hodgkin's Disease. I. Levin, New York.—p. 411.
- 105 Subphrenic Abscess and Its Treatment. S. S. Berger and M. E. Blahd, Cleveland.—p. 417.

Modern Hospital, St. Louis*June, VIII, No. 6*

- 106 Cook County Tuberculosis Hospital, Oak Forest, Ill. H. L. Bailey, Oak Forest, Ill.—p. 377.
- 107 History of Occupational Therapy. W. R. Dunton, Jr., Towson, Md.—p. 380.
- 108 Remunerative Occupations for Handicapped. H. J. Hall, Marblehead, Mass.—p. 383.
- 109 Occupation and Diversion for Tuberculous Patients. A. T. Laird, Nopeming, Minn.—p. 387.
- 110 Beneficial Effects of Work Therapy for Insane. F. P. Clark, Stockton, Calif.—p. 392.
- 111 Potteries of Arequipa Sanatorium. P. K. Brown, Manor, Calif.—p. 394.
- 112 Occupation and Its Relation to Mental Hygiene. E. E. Thomson, Chicago.—p. 397.
- 113 Inoculation of Bacillus of Work. G. E. Barton, Clifton Springs, N. Y.—p. 399.
- 114 Occupation Therapy in Mental Hospital. A. H. Ruggles, Providence, R. I.—p. 404.
- 115 Work in Treatment of Insane Criminals. P. E. Bowers, Michigan City, Ind.—p. 406.
- 116 Some Principles of Occupational Therapy. E. G. Upham, Milwaukee, Wis.—p. 409.
- 117 Occupational Therapy in New York City Institutions. S. C. Johnson, New York.—p. 414.
- 118 Occupational Therapy at Mirdale. R. Horner, Wauwatosa, Wis.—p. 415.
- 119 Occupational Therapy in Dementia Praecox. E. Mabie, Napa, Calif.—p. 417.

New Jersey Medical Society Journal, Orange*June, XIV, No. 6*

- 120 Gonorrheal Salpingitis; Its Consideration and Treatment. B. Bland, Philadelphia.—p. 217.
- 121 Roentgen Ray as Aid to Surgeon. A. A. Strasser, Arlington.—p. 224.
- 122 Some Gynecologic Problems Met in General Practice. G. E. Shoemaker, Philadelphia.—p. 236.
- 123 Gallbladder Infections. F. M. Donohue, New Brunswick.—p. 240.

New York Medical Journal*July 7, CVI, No. 1*

- 124 Army Medical Service. T. H. Goodwin.—p. 1.
- 125 Function of Military Orthopedic Hospital. F. H. Albee, New York.—p. 2.
- 126 Medicomilitary Facts Developed by Experiences on European Battle Fronts. H. K. Loew, Fort Brown, Texas.—p. 5.
- 127 Distal Osteoporosis of Upper Extremity. D. J. Morton, Chevy Chase, Md.—p. 10.
- 128 Larva Migrans on Mexican Border. C. P. Gray, New York.—p. 15.
- 129 War and Nervous System. S. E. Jelliffe, New York.—p. 17.

New York State Journal of Medicine*June, XVII, No. 6*

- 130 Poliomyelitis as Public Problem. A. Whitman, New York.—p. 259.
- 131 Epidemiology of Poliomyelitis. J. A. Conway, Hornell.—p. 264.
- 132 Epidemic of Poliomyelitis in New York State in 1916. M. Nicoll, Jr., New York.—p. 270.
- 133 Diagnosis of Unparalyzed Cases of Acute Poliomyelitis. A. Bowen, Rochester.—p. 274.
- 134 Treatment of Poliomyelitis with Immune Serum. E. Taylor, Burlington.—p. 279.
- 135 *Cancer of Bladder. J. A. Gardner, Buffalo.—p. 285.
- 136 Alkaline Carbonates in Urine. A. L. Benedict, Buffalo.—p. 289.
- 137 Syphilis of Nose and Throat. J. C. Beck, Chicago.—p. 290.
- 138 Outbreak of Diphtheria in Second Class City. P. B. Brooks, Norwich.—p. 295.
- 139 Soil Pollution Problem. V. G. Heiser, New York.—p. 298.

July, No. 7

- 140 What is Gained by Union of Obstetrics and Gynecology in Teaching Hospital? J. M. Slemmons, New Haven, Conn.—p. 307.
- 141 Training of General Practitioner for Obstetrics. J. E. King, Buffalo.—p. 312.
- 142 Primipara Belongs to Expert and Hospital: Multipara to Family Physician and Home. R. H. Pomeroy, Brooklyn.—p. 314.
- 143 New Plan of Postgraduate Medical Education. W. S. Rankin, Raleigh, N. C.—p. 316.
- 144 Gynecology-Obstetrics as Department in General Hospital. Reasons and Results at New Greenpoint Hospital. E. Bishop, Brooklyn.—p. 323.
- 145 Pain Phenomena in Obstetrics. S. B. Blakely, Binghamton.—p. 328.
- 146 *Sarcoma Complicating Paget's Disease of Bone; Report of Case. L. Heazlit, Auburn.—p. 330.
- 147 *Melanotic Sarcoma of Small Intestine; Report of Case. E. A. Vander Veer and E. Kellert, Albany.—p. 335.
- 148 Some Phases of Present Treatment of Fractures. J. M. Hitzrot, New York.—p. 338.

135 and 146. Abstracted in THE JOURNAL, June 9, p. 1779.

147. **Melanotic Sarcoma of Small Intestine.**—The first symptom in this case was a gradually increasing constipation, which required more and more powerful cathartics to relieve. The second symptom was a feeling of pain in the left upper quadrant, gradually becoming worse. Finally acute obstruction came on, the tumor causing an intussusception, and this intussusception was so severe as to cause the attending physician to consider surgical intervention. Aside from these symptoms (constipation and pain) there were practically none. A tumor practically filled the entire lumen of the ilium. Six inches of intestine was resected and an end-to-end anastomosis made. Patient returned to the ward and made an uneventful, though tedious, recovery. She lived very comfortably for about six months, when there appeared to be an extension of the growth in the lungs, and she succumbed to the latter condition.

Northwest Medicine, Seattle*June, XVI, No. 6*

- 149 Congenital Pyloric Stenosis. D. Lewis and C. G. Grulee, Chicago.—p. 161.
- 150 Treatment of Goiter. B. T. King, Seattle.—p. 168.
- 151 Id. J. C. Moore, Seattle.—p. 172.
- 152 Surgery of Goiter. E. O. Jones, Seattle.—p. 175.
- 153 Belt Pin in Lung. C. A. Smith, Seattle.—p. 178.

Southwest Journal of Medicine and Surgery, El Reno, Okla.*June, XXV, No. 6*

- 154 Duties in Prevention of Deafness. L. A. Newton, Oklahoma City.—p. 140.
- 155 Headache and Eye-Strain. D. R. Dorente, Fort Smith, Ark.—p. 146.
- 156 Differentiation between Upper (Central) and Lower (Peripheral) Motor Neuron Involvement. G. B. Fletcher, Little Rock, Ark.—p. 151.
- 157 Cholecystectomy. T. B. Hinson, Enid.—p. 154.
- 158 Undescribed Physical Sign of Portal Obstruction. E. H. Martin, Hot Springs, Ark.—p. 156.

Texas State Journal of Medicine, Fort Worth*June, XIII, No. 2*

- 159 Relation of Medical Organization to Commonwealth. J. M. Inge, Denton.—p. 44.
- 160 Physician in Politics. M. P. McElhannon, Belton.—p. 47.

Vermont Medicine, Rutland*June, II, No. 6*

- 161 Twenty Years' Practical Experience in Obstetrics. T. Rice, Brattleboro.—p. 145.
- 162 Diabetes and Allen Treatment. W. H. Lane, Brattleboro.—p. 150.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

June 23, I, No. 2947

- 1 Work of British Pathology in Relation to War. F. W. Andrewes.—p. 829.
- 2 Bacteriology at Front. W. P. Herringham.—p. 832.
- 3 Trench Fever and Its Allies. W. P. Herringham.—p. 833.
- 4 Biochemistry and War Problems. H. D. Dakin.—p. 833.
- 5 Adaptation and Disease. J. G. Adami.—p. 837.

Medical Journal of Australia, Sydney

May 26, I, No. 21

- 6 No. 2 Australian Casualty Clearing Station in France. H. S. Stacy.—p. 437. To be continued.
- 7 Anaphylaxis; Its Clinical Significance. H. M. Mayo.—p. 440.
- 8 No. 2 Australian Casualty Clearing Station in France. H. S. Stacy.—p. 457.

June 2, No. 22

- 9 Experiences in British Military Hospital. J. B. Dawson.—p. 479.
- 10 Army Dental Corps Work in Reference to Venereal Disease. B. Thompson.—p. 485.

June 9, No. 23

Sei-I-Kwai Medical Journal, Tokyo

June, XXXVI, No. 6

- 11 Second Report on Action of Urea on Tetanus Toxin. H. Sewaki and Y. Tagami.—p. 39.

Annales de Gynécologie et d'Obstétrique, Paris

May-June, LXXII, pp. 513-576

- 12 *The Rights of the Child. A. Pinard.—p. 513.
- 13 *Indications for Symphyseotomy before Delivery. G. Fieux.—p. 518.
- 14 Determination of Date of Fecundation. P. Ancel and P. Bouin.—p. 527.
- 15 *The Quantity of Blood Lost at the Menses. A. Lahille.—p. 535.
- 16 Functions of the Corpus Luteum. C. Mulon.—p. 545. Continuation.

12. **The Rights of the Child.**—Pinard remarks that the first French Republic took as its standard the Rights of Man, and he pleads that the present republic should go on record as establishing the Rights of the Child. In the early history of man, he recalls, the child was safeguarded solely by the maternal instinct. "Given the mother's milk and maternal care, this ensures the perennity of the human race." As soon as societies developed, the rights of the child were pushed to one side. Ten centuries before Christ, Hesiod counseled against the marrying of slaves, saying pregnancy and the care of the child interfered with the female slave's capacity for work. Pinard declares that the prevailing system (in France) of boarding out foundlings and other infants in the country is on a par with Hesiod's advice. The statistics for a recent week at Paris recorded 398 births and 141 infants boarded out, and 140 of these are to be fed from the bottle. The board paid is 35 francs a month for care with breast nursing, and 25 francs a month for bottle feeding. How many of the 140 will be alive next fall, he asks. The law provides, he continues, a *curateur au ventre*, to be appointed by the court when the unborn child stands in line to inherit property. Pinard urges that a *curateur au ventre* should be appointed for every unborn child that has reached the stage where the movements of its heart can be detected. This would entail compulsory notification of every pregnancy.

13. **Symphyseotomy.**—Fieux insists that the renaissance of cesarean section in recent years has not done away with symphyseotomy. The latter has always proved highly satisfactory in his experience; he has had no mortality in his twenty-one cases. Symphyseotomy enlarges the pelvis permanently while leaving the organs of reproduction intact, both anatomically and functionally. Its advantages over cesarean section are thus manifold in cases of flat pelvis with an obstetric diameter of only 8 or 9 cm. and the fetus not excessively large. His last series of six cases are described in detail, calling attention in particular to one case in which the four previous pregnancies had resulted in children stillborn or too much injured by forceps extraction to survive. In this case the symphyseotomy was done about the middle of the last month of the fifth pregnancy, and delivery at term proceeded spontaneously. The simplicity and ease of the operation thus preceding the childbirth by

two weeks, the absence of hemorrhage back of the symphysis—which occurs almost constantly with symphyseotomy during labor—and the absence at this stage of any danger of infection, all commend, he reiterates, this antepartum symphyseotomy.

15. **Quantity of Blood Lost in Menstruation.**—Lahille describes the minute precautions taken to collect all the menstrual discharge in seven cases. Cotton compresses were used, and the distilled water in which they were soaked was evaporated and the iron in the residue determined. The iron content of the women's circulating blood was compared with this. The authorities mention varying quantities as to the blood lost, from Hippocrates and Galen's 600 and 500 gm. to the 120 or 240 gm. of the recent physiologies. Lahille's conclusions are that the amounts have been much exaggerated. Judging from the research related, 25 per cent. of the women do not lose over 20 gm. of blood in all; 50 per cent. lose from 50 to 55 gm., and 25 per cent. 65 gm. and more. He thinks that a tendency to abnormal conditions is suggested when the loss of blood is over 80 gm. The dry residue of 100 gm. of the menstrual discharge amounts to an average of 21 or 22 gm. Blood stains spread so rapidly that even a small amount of blood may give the impression of a large quantity.

Bulletin de l'Académie de Médecine, Paris

May 29, LXXVII, No. 22, pp. 683-712

- 17 *The Principle of Psychic Isolation in Treatment of "Functional Nervous Troubles." Landau.—701.
- 18 Action of Tin Oxide and Metallic Tin on Staphylococcus Infections. R. Grégoire and A. Frouin.—p. 704.
- 19 Case of Fatal Disease Simulating Acute Articular Rheumatism, Caused by Mycobacillus Synovialis. A. Chantemesse and others.—p. 708.
- 20 Report on Diseases Prevalent during 1915 in French Possessions in Indo-China. Kermorgant.—p. 738.
- 21 *Bullet in Cauda Equina for Seventeen Months. V. Bellot.—p. 749.

17. **Treatment of Functional Nervous Trouble.**—Landau relates the details of three typical cases out of fifty in which he has successfully applied what he calls psychic isolation. He places the man with the functional nervous trouble in a room with men having a similar trouble of organic origin. The man is examined in the presence of the others, and every effort is made to have him see and appreciate the differences between his condition and the organic cases, the difference between the response to various tests, etc., comparing the findings in the various cases with those in his case. The man is thus confronted with himself, as it were, and the remarks of his mates with actual organic trouble, as they watch him, supplement the physician's words until the psychic isolation thus realized soon destroys the illusions he has been cherishing in regard to his case.

21. **Bullet in Cauda Equina.**—The bullet had evidently made its way between the fibers of the cauda equina without damaging them to any extent. The mildness of the symptoms led to the mistaken diagnosis of extradural location, and no attempt was made to remove the bullet. It was tolerated for months without apparent injury but the irritation from it finally set up infection and an operation the seventeenth month was unable to arrest the fatal myelitis. The operation on the cauda equina was done without mishap under local anesthesia, using a 0.5 per cent. solution of one part cocaine to two parts stovain (Couteaud's mixture).

Lyon Chirurgical

March-April, XIV, No. 2, pp. 213-412

- 22 *War Wounds of the Larynx, Trachea and Esophagus. M. Lannois, A. Sargnon and A. d'Auriac.—p. 213.
- 23 Evolution of Traumatic Hemothorax. A. Policard and B. Desplas.—p. 240.
- 24 *Tardy Symptoms after Wounds of the Lung. E. Devic and V. Cordier.—p. 254.
- 25 *Treatment of Penetrating War Wounds of the Lungs. X. Delore and L. Arnaud.—p. 280.
- 26 *Indications for Early Operation for War Wounds of the Chest. V. Combier and J. Murard.—p. 312.
- 27 *Projectiles in the Lungs; Thirty-Nine Cases. (Projectiles du poumon.) L. Desgouttes.—p. 339.
- 28 *Foreign Bodies in the Diaphragm; Twenty-Five Cases. M. Patel and M. Papillon.—p. 356.
- 29 *Visit to Hospital in Charge of Depage. (L'ambulance modèle de la Panne-Océan.) G. Gayet.—p. 395.

22. Wounds of the Larynx Region.—In the experiences reviewed, among 2,830 men wounded in the neck and head, in seventy-six the larynx, trachea or esophagus or all combined were involved in the wound. This small proportion, scarcely 2 per cent., is explained by the high immediate mortality of such wounds. They are mostly shell wounds, and foreign bodies generally have to be removed by an operation from without. Cicatricial stenosis of the pharynx and esophagus can usually be corrected with progressive dilatation, as also slight stenosis of the larynx, but when there is much obstruction an operation from without is preferable. Aphonia from nervous inhibition in consequence of a war wound in the region, without apparent direct injury to nerves, is often extremely rebellious to treatment while hoarseness and other difficulties in speech generally subside under exercise of the vocal cords.

24-26. Wounds of the Chest.—Devic and Cordier were called on to pass judgment on the fitness for duty of ninety-seven men who had been wounded in the chest six months or more before and their wounds had healed. They usually found symptoms indicating pleural adhesions, but these and the functional disturbances seemed to be about the same whether the projectile was still in the lung or not. When the projectile is borne without trouble, they say, there is no need to extract it, as the ultimate findings are practically the same in the cases with and without removal of the projectile. They do not believe that these sequels or presence of a projectile are liable to entail tuberculosis later. However exact the localization and however skilful the surgeon, they would shrink from advising operative removal of a well tolerated projectile.

Delore and Arnaud review the lessons learned from seventy-one cases of war wounds. The outlook is reassuring provided the lungs were sound previous to the wound. The condition usually seems to be progressively improving, but time alone will tell.

Combier and Murard emphasize that the lung is exceptionally tolerant of foreign bodies and relatively resistant to infection. Hence expectant treatment with immobilization and morphin will suffice for small wounds. In fourteen cases they sutured the wound at once after cleaning and conditions rapidly improved in eleven of the cases; three of the patients died, and two required a secondary pleurotomy before final recovery.

27. Projectiles in the Lung.—Desgouttes advocates routine removal of the projectile unless it is in the hilus. All his fifty-two patients in this category recovered. He sometimes resected one or two ribs, and found roentgenoscopy a valuable aid when the projectile was deep in the tissues.

28. Projectiles in the Diaphragm.—On the basis of twenty-five cases, Patel and Papillon conclude that as the projectile generally gives little trouble in this region, its prompt removal is not called for unless the heart or phrenic nerve are menaced. No complications followed in any instance. The projectile can usually be reached between the pleura and the peritoneum.

29. Depage's Model Field Hospital.—The chief of the medical department of the French Army has sent a number of groups of army surgeons to la Panne, Belgium, to study the workings of what is regarded as a "model ambulance." Depage has had plenty of money at his disposal to perfect his equipment and ensure an ample personnel. Gayet gives a detailed description of the whole saying "the abdomens and the shockés" are kept at an advanced post, only 3 kilometers from the enemy. Extreme specialization is the rule, different sections being devoted to fractures, to neurology, to the eyes, ears, teeth, urinary organs and dermatology, wounds of joints, and of abdomen, skull and thorax. There are twenty-four operating tables. Gayet exclaims, "What an abyss between the surgery of 1914, which aimed only to save life and avoid compromising the member too much, and the surgery of 1917 which realizes in a few weeks, sometimes in a few days, the integral repair of the traumatism. For example, here is a fracture of the femur with crushing of the knee. In 1914 this would have meant death, unless possibly averted by a prompt amputation. In 1915 it would have meant resection with a usable ankylosis after about a year. In 1917, at la

Panne, every remotest crevice of the wound is opened up, asepsis is realized in fifteen days or a month; then suture, with possibly bone and skin grafts, and the man is walking in three or four months and can be sent back to the front." . . . "And this triumph of surgery," he adds, "we do not owe to the Germans." The la Panne hospital has accommodations for 1,000 wounded. There are 140 nurses, including 80 English, 53 Belgian, 4 Danish, 2 Canadian and 2 French nurses; 80 orderlies, 7 artisans for making surgical instruments and 12 for artificial limbs, with photographers (including motion picture films and color photography), cooks, etc., to a total of 290 men. The Belgian army is said to pay for the upkeep of the hospital, the Red Cross for construction, etc., and the governments of the French and other Allies wounded pay for the days of care for their wounded. The total expense of the wounded per capita is about \$1.60 per day. Part of the services are in the large hotel and cottages of the little watering place. The nurses are paid 5.50 francs a day, and their lodging costs them 1.50 francs and the table 3 francs, unless they prefer to live outside.

Lyon Médical

June, CXXVI, No. 6, pp. 253-300

- 30 Distribution of Anopheles Mosquitoes in Southeastern France. L. Léger and G. Mouriquand.—p. 253.
- 31 *Intravenous Injection of Colloids and Other Pseudosolutions. H. Busquet.—p. 262.

31. Intravenous Injections of Colloids and Other Pseudosolutions.—Busquet remarks that the list of colloidal metals and other pseudosolutions that have been administered for therapeutic purposes is already a long one. Theoretically, he says, it seems dangerous to inject foreign bodies into the blood, no matter how finely divided they may be, but his research on rabbits has shown that colloidal gold injected into a vein does not lake the blood until an amount has been injected corresponding to 1,400 times the therapeutic dose in man. Small doses, but still considerably larger than the therapeutic doses, do not notably modify the circulation. But crystalline gold, in the dose of 0.005 gm. per kilogram, promptly arrested the heart action in dogs and rabbits. Other experiences by himself and others are related demonstrating among other things that certain pseudosolutions, such as chaulmoogra oil, induce what he calls tachyphylaxis: The blood pressure drops after intravenous injection of 0.0001 gm. per kilogram but repeating the dose a few minutes after the return of the blood pressure to normal fails to modify the blood pressure in any way. A practical point emphasized is that most of the pseudosolutions send the temperature up considerably in about thirty minutes, hence the clinical injection should be made only during a relative intermission of the fever. After this transient temperature reaction, durable defervescence follows, the natural consequence of the anti-infectious action common to all pseudosolutions injected intravenously. Quinin in the form of a pseudosolution seems to have an exceptionally powerful therapeutic action. Busquet is professor of physiology at the University of Nancy, and he has long made a study of intravenous medication. He cites the literature on the subject, mostly by French authors.

Paris Médical

June 2, VII, No. 22, pp. 437-484

- 32 The Coolidge Tube. G. Réchou.—p. 439.
- 33 *The True and Supposed Dangers of Roentgenotherapy. Bécère.—p. 445.
- 34 The Value of Roentgenotherapy. J. Belot.—p. 450.
- 35 *Roentgenotherapy of Tuberculous Processes in Bones. E. Albert-Weil.—p. 455.
- 36 *Roentgen Diagnosis of Stenosis of the Large Intestine. R. Bensaude and G. Guénaux.—p. 467.
- 37 Tardy Sequels of War Wounds of the Thorax. L. Ribadeau-Dumas.—p. 477.

June 16, No. 24, pp. 501-516

- 38 *Simplification of Prescribing. (Diversion sur la posologie.) P. Cornet.—p. 501.
- 39 *Hypertrophy of the Heart and Fitness for Military Service. H. Vaquez and E. Donzelot.—p. 502.
- 40 *Orthopedics at La Panne Hospital. L. Lamy.—p. 505.
- 41 *Clinical Unity of Traumatic Hysteroneuroses. J. Ferrand.—p. 509.
- 42 Localization of Projectiles by Reflected Light. A. Chéron.—p. 512.

33. The True and Assumed Dangers of Roentgenotherapy.

—This entire number of the *Paris Médical* is devoted to radiology in general. Bécclère's long experience, he states, has amply established that the true and only danger with radiotherapy is the excessive dose. Radiotherapy with the dose well calculated never does harm. It is only within the last fifteen years that we have had devices to measure the quality and quantity of the rays, so that scientific radiotherapy is only 15 years old. He insists that even with excessive dosage there is no danger except for the skin, although it might be unwise to push the exposures of spleen and thyroid beyond the point where the desired result has been attained. On the other hand, exposures of uterine fibromas or of the ovaries do not entail any danger for the normal tissue of the uterus or of organs in the vicinity, especially the bladder and intestines. The apprehensions in this respect that have been expressed have nothing to justify them. Over ten years' study of the subject has failed to reveal anything suggesting that a cancer can be aggravated by the exposures or its generalization hastened. The history of the case and present status will usually show when the malignant disease is becoming generalized. If radiotherapy is applied at this moment, the progressing generalization may be unjustly ascribed to the exposures. The repeated acute radiodermatitis on the hands of roentgenologists may entail an epithelioma, just as repeated irritation of the lips and tongue in smokers may bring on cancer which may be called either smokers' cancer or syphilitics' cancer. But if we say that the Roentgen rays breed cancer, then we must say also that traumatism, heat, tobacco, syphilis, tubercle bacilli and gastric juice also breed cancer.

The truth is merely that all irritations of the skin and mucous membranes which interfere with their nutrition, especially persisting ulceration, open the portals to the mysterious agent of cancer. He has encountered a case of epithelioma which had developed on an old ulceration following a burn from scalding water, but it yielded to the actual cautery. The epitheliomas of roentgenologists, like other epitheliomas of the skin, yield to Roentgen and radium treatment just as under other conditions. If radiologists after years of incessant work with the Roentgen rays may be justified in fearing a possible epithelioma on hands suffering from chronic trophic disturbances, their patients have nothing to apprehend unless possibly tardy ulceration may develop. He has never known of malignant degeneration in an ulceration of this kind, and the surgical treatment applied for it obviates this possibility. In conclusion he reiterates that there is absolutely nothing known that would justify the fear that radiotherapy applied to sound skin might generate a cancer in subjacent tissues.

35. Roentgenotherapy of Bone Tuberculosis.—Weil gives thirty-one radiograms of hands or feet before and after systematic roentgenotherapy to emphasize the great value of this mode of treating tuberculous processes in the long and the short bones. The Roentgen rays have a powerful local action, while natural or artificial heliotherapy has a general action, stimulating the natural defensive processes. With bone tuberculous processes, two or three weeks after the first exposure to the Roentgen rays the tissues feel less soft, as if they were drying out; the red and inflamed skin grows brownish and wrinkles, and the ulcerations start to heal from the outside in. The subsidence of the whole process can be followed in a series of radiographs. Weil usually exposes a short bone, from the dorsal and the plantar side, to a dose of 5 or 6 H units of very hard rays filtered through 2 mm. of aluminum. This exposure is repeated monthly for five or six months if necessary. For long bones and those of the metatarsus and metacarpus in young people, he uses a 4 mm. filter and 12 H units counted below the filter, or may even begin with 14 H units. Such doses cause considerable pigmentation or even desquamation, but with filters of this thickness, he says, they are absolutely harmless provided the intervals are not too short or the course kept up too long. Five or six series of irradiations generally completed the cure. The intervals at first were always four weeks, but the last exposures were sometimes delayed for six weeks. Nearly all the children thus treated were cured, and he has had a

wide experience. There is scarcely a day in his service at the Trousseau hospital without a large number of small patients with tuberculous bone lesions. They come for their exposures but live at home in the same environment as before, which renders the success of the Roentgen treatment particularly impressive. "In short," he declares "for bone tuberculosis roentgenotherapy is the best treatment as this alone, without adjuvants, can determine the complete cure. In case of a fluctuating abscess or large sequestrs it may not even be necessary to resort to the bistoury or the curet. Thanks to the Roentgen rays the sequestrs are often spontaneously eliminated. Heliotherapy and sea air are always useful adjuvants, but they are not absolutely indispensable unless there are multiple tuberculous foci." He adds that those who believe that two or three applications of the Roentgen rays form the alpha and omega of radiotherapy must learn that the problem is a little less simple than this, but the solution is more effectual.

36. Radiodiagnosis of Stenosis of the Large Intestine.—Bensaude and Guénaux emphasize the diagnostic importance of the shadows cast by regions containing air or water. They regard them as pathognomonic of stenosis. They give nineteen illustrations of the typical findings with stenosis at different points, saying that they indicate better than anything else the existence of the stenosis and show whether it is probably amenable to operative measures, and which are to be preferred. This is also the only means at our command to control the results of operative intervention.

38. Simplification of Prescribing.—Delage proposes that a list should be published giving for each drug a fixed number indicating the suitable daily dose for an average adult, equally removed from the minimum and the maximum doses. This number thus established may be known as the pharmacologic equivalent or P.E. The tenth of this P.E. may be accepted as the therapeutic unit, T.U. The physician prescribes 1, 4, 8 or 10 T.U. according to the age of his patient. A prescription might read:

Potassium bromid	}	āā	4 T.U.
Sodium bromid			
Ammonium bromid			
Orange flower water	}	āā	Q.S.
Syrup of bitter orange bark			

Three spoonfuls a day. The medicine to be put up for ten days. The pharmacist will see that he must take ten times 4 T.U. = 4 P.E. of each of the active ingredients, dissolve them in 15 spoonfuls of the orange flower water and complete the whole by adding 15 spoonfuls of the syrup. The patient taking 3 spoonfuls a day will use up the whole in ten days.

39. Alleged Hypertrophy of the Heart and Military Service.—Vaquez and Donzelot comment that the lower location of the apex of the heart which is currently accepted as a sign of hypertrophy of the heart does not always mean this. The distance from the nipple is an unreliable measure, and it is not always easy to count the interspaces exactly. The first space below the clavicle may be between the clavicle and a rib or between two ribs. The most accurate procedure is to locate the articulation of the head of the clavicle with the first piece of the sternum, or the junction of this piece with the second, which always corresponds to the second rib. In a long narrow thorax the apex beat is far from the nipple, but the heart as a whole is shown by roentgenoscopy to be rather smaller than usual. And yet these are the cases most often labeled "hypertrophy" on account of the low position of the apex. Men with long narrow thorax are often frail; they grew too fast, and they are subject to dyspnea on exertion and palpitations. Scarcely a week or even a day passes, Vaquez and Donzelot say, that they do not have to rectify errors of this kind, men being sent back from the front on account of "hypertrophy," palpitations and dyspnea on exertion, when roentgenoscopy shows the heart normal and rather inclined to be smaller than usual. They protest against the neglect of roentgenoscopy by physicians; a radiologic equipment is rarely accessible to a physician, but in the matter of hypertrophy of the heart it is indispensable in dubious cases. The latest army regulations state that hypertrophy of the heart is not a cause for exemption. It justifies discharge

only when the area of heart dulness is increased in size and abnormal in outline, the heart rhythm is altered, and symptoms testify to some cardiovascular or kidney lesion.

40. Surgery and Orthopedics at La Panne.—Lamy describes with illustrations several ingenious procedures he noted on a recent visit to Depage's hospital. The "loop graft" is proving particularly useful for the leg. It is taken several inches above the area to be covered. The base of the flap is at the end nearest this area, and this end is not cut across. The upper end of the flap is turned back over and sutured to the skin at the upper end of the area to be covered. The graft thus forms a loop, the inside out. Later, the attached end is cut and the graft turned over again and sutured to the granulating area, bringing the outside outside once more. He saw one case in which a graft was brought in this way down to the leg, looping the loop twice. In treating fractures, Depage sometimes passes a wire to hold the stumps together bringing the ends of the wire out through a perpendicular tube with thumbscrew at the top. This permits tightening the wire, and when the parts are healed, three or six weeks later, the tube with the wire is easily pulled out. Another device is a wire looping around both stumps with traction on the wire through the muscles by a weight and pulley above.

41. Traumatic Hysteroneuroses.—Ferrand rejects the idea recently advanced of "reflex contracture" following a war wound, insisting that all such cases belong in the hysteria class.

Presse Médicale, Paris

May 24, XXV, No. 29, pp. 297-304

43 *Disturbance in Gait with Paralysis of External Popliteal Nerve and Device for Its Correction. J. Privat and J. Belot.—p. 297.

44 *Focusing Sunlight to Cure Warts. E. Vallet.—p. 299.

45 *Autoplastic Graft to Close Gap in Skull. C. Villandre.—p. 300.

May 31, No. 30, pp. 305-312

46 Technic for Intravenous Injection of Quinin. (Faut-il substituer le bichlorhydrate au chlorhydrate basique de quinine?) E. Jeanselme and A. Manaud.—p. 305.

47 *Extraction of Projectiles in the Lungs under Screen Control. E. P. de la Villéon.—p. 306.

43. Correction of Paralysis of Extensor Muscles of the Leg.—The Paris Surgical Society recently discussed the best means for artificial arthrodesis to remedy paralysis of the external popliteal nerve. Privat and Belot here declare that arthrodesis is the wrong treatment for paralysis of the extensor muscles. Operative treatment puts an end to all hope of recovering the normal use of the leg, and it creates an infirmity worse than the original trouble. On the other hand, the paralysis of the extensors can be easily corrected by wearing a strip of metal one end of which fits over a garter while the other end fits under the sole. This suppresses most of the movements of the antagonists and thus balances the muscles of locomotion as in normal conditions. There is no further limping, and conditions favor spontaneous subsidence of the paralysis. The article is illustrated.

44. Focused Heliotherapy for Warts.—Vallet insists that this method of treating warts has proved absolutely effectual in his experience. He used a magnifying glass 7 cm. in diameter, magnifying about 4 diameters, focusing the rays at 9 a. m. The magnifying glass is held at right angles to the sun's rays to focus them in a point on different parts of the wart in turn for three or four seconds each, guided by the patient's experiencing pain. Two typical cases of warts on the fingers are illustrated, showing the prompt subsidence of the warts of several years' standing. The first exposure was for a total of thirty seconds with very bright sunlight. There were a few seconds intermission when the patient felt a smarting. In five days the wart had materially changed its aspect and a second exposure was given at 5 p. m. The smaller wart was then completely cured, but a third exposure was given the larger wart before the cure was complete, the warty tissue being cast off, leaving smooth skin. When the focused rays smart, he brings the magnifying glass closer to the skin, thus reducing the concentration of the rays. After the wart has shrunk from the effect of the first and most intensive exposure, by the fourth or fifth day

he clips off all the mortified parts of the wart with bistoury or razor, not causing any pain. The deep portion of the wart is thus ready to be exposed, and this drops off spontaneously in about a week. The pit left soon grows up to the level of the skin. His constant success with this focused heliotherapy suggests its possible application to superficial epitheliomas, fibromas, nevi—especially raised nevi—and possibly pigmented and hairy nevi.

45. Autoplastic Repair of Gaps in the Skull.—Villandre's experience with 106 patients with cranial defects has demonstrated to his satisfaction that nothing can compare with a bone-periosteum autograft for repairing the gap. In the 32 cases in which he applied this technic it proved a success in 100 per cent. A cartilage autograft succeeded in 96.8 per cent. of 48 cases. A sterilized bone plate from another subject caused trouble later in 18.2 per cent. of 22 cases, and a "bone hash" in 50 per cent. of 4 cases. He expatiates on the constantly good and permanent results with the bone-periosteum graft taken from the tibia.

47. Extraction under Screen Control of Projectiles in the Lungs.—De la Villéon has operated in ninety-seven cases by this technic and knows of its application by others to a total of 200 operations for extraction of 230 projectiles in lung tissue. All but one of the men recovered promptly and resumed their military service. A blunt instrument worked slowly into the parenchyma of the lung does not injure it, provided it keeps to a straight path and does not enter the hilus region. The cottony elasticity of the parenchyma of the lung, the blood vessels and air vessels, enables them to automatically yield the way to the rounded tip of the entering instrument, and allow it to pass without injuring them. The projectile is located beforehand by having the man stand with his arms over his head, and slowly turn around before the screen. The displacement of the shadow during rotation soon locates the projectile with precision. For the operation the anesthetized man lies on a frame that pivots on its longitudinal axis to apply this rotation principle at need. The tube is below. The narrow, blunt tipped forceps must be introduced slanting, through sound tissue. The danger points are the intercostal veins and the hilus. When the projectile is in the hilus, thoracopneumotomy is preferable. He has performed 730 operations for extraction of foreign bodies under screen control, switching on and off the Roentgen rays at will, alternating them with a bright orange-red light. He regards this economical radio-operative technic as a great advance as it avoids all useless mutilation. Its application to the lungs is the highest expression of this.

Progrès Médical, Paris

June 2, XXXII, No. 22, pp. 179-188

48 *The Complete Operation at the Advanced Station. A. Chalier.—p. 179.

49 Autoserotherapy of Pleural and Ascitic Effusions. L. Auguste.—p. 182.

50 The Army Medical Officer. R. Beaumesnil.—p. 185.

June 9, No. 23, pp. 189-198

51 *Loss of Memory of the Injury in the Wounded. R. Oppenheim.—p. 189. To be continued.

52 Statistics of War Wounds of the Eyes. E. Ginestous.—p. 195.

53 Butter Made from the Pellicles Discarded from Boiled Milk. E. Dupraz.—p. 197.

48. The Complete Surgical Intervention at the Advanced Post.—Chalier refers to the cases in which the maximal operation can be done at once, during the pre-infectious stage, and the wound be sutured at once. This treatment can be applied to nearly all the wounds from projectiles except where the tissues have been so crushed that recuperation is out of the question. If a general anesthetic is necessary, he prefers to wait for one, two or three days before attempting the complete operation, unless his hand is forced beforehand. He remarks that he personally has never seen any evidence that any chemical, by its direct action on a wound, is able alone to arrest the development of germs and ward off complications, but the mechanical clearing out of the wound, alone, without any antiseptics, has a long list of recoveries to its credit. The mechanical clearing out, however, exposes to grave danger if the wound is left open, and also if it is not complete, and the wound takes long to heal when left

open. The war is impressing more and more the threefold lesson that every wound should be systematically operated, and the operation should come at once after the injury and be complete, finishing with the repair of the region. He discusses the details of the technic for the preliminary exploration, the mechanical clearing out of the wound and the anatomic reconstitution of the region. By immobilizing the limb with the muscles relaxed he has sometimes been able to repair at once large defects. This method of treatment is applicable only in a comparatively quiet sector and when the surgeon can keep the patient till the end. The primary suture offers no danger if the man is kept under close supervision, the surgeon alert to interfere at the least feeling of pain or tension or fever. Small, shallow and seton wounds generally heal without intervention, and if the loss of substance is too extensive for repair, the primary suture cannot be applied. Primary suture is also out of the question when there is a foreign body in the wound. The only mishap in all his experience was with a deep wound in which an overlooked injury of an artery was responsible for secondary hemorrhage. The early primary suture is done in the first six, twelve or twenty-four hours, but the primary suture may still be possible even as late as the third, fourth or fifth day.

51. Traumatic Amnesia.—Oppenheim cites the opinions and experiences of various neurologists and psychiatrists on traumatic amnesia, and then analyzes 215 cases from his own service. The injury had been to the skull, requiring trephining, in 133 while in 15 there was shell shock without external trauma. The gap in the memory corresponding to the injury itself may suddenly fill up, but this rarely occurs. The lacunar amnesia, as he calls it, generally persists, but retrograde amnesia, extending back to the years before the injury, gradually corrects itself, as a rule, or with a little assistance. A number of examples of war amnesia are related belonging to these types. One young second lieutenant has lost all memory of events since his eighth year; his mind seems to be that of a child of 8. A private suffering from shell shock after a year at the front has no memories later than the shop he left to go to the war. About 50 per cent. of the trephined amnesia cases have retained their remembrance of matters connected with their trade or profession, but only 25 per cent. of the shell-shock amnesia cases so far as can be determined by oral examination.

Revue de Chirurgie, Paris

November-December, XXXV, No. 11-12, pp. 495-738

- 54 *Present Status of Treatment of War Wounds of the Knee. L. Bérard.—p. 495.
55 *War Wounds of the Foot and Ankle. E. Quénu.—p. 541. Continuation.
56 *Treatment at Advanced Station of Wounds of Skull and Brain. P. Mathieu.—p. 666.
57 Treatment at Advanced Station of Wounds and Fractures of Joints. J. Gatellier.—p. 709. Continuation.

54. War Wounds of the Knee.—The revolution in war surgery in the last few months is well shown by Bérard's statement that when the wounded knee is treated correctly the first day, from 80 to 90 per cent. of the wounded recover, and the knee is often solid and sometimes functionally capable. Even those who do not get proper treatment until septic complications have developed, escape most of the dangers which have heretofore rendered wounds of the knees the despair of patients and surgeons. He describes a number of typical cases, with twenty-five illustrations.

55. Wounds of Foot and Ankle.—In this long instalment of his monograph, Quénu summarizes 172 cases separately, bringing the number of illustrations to 266. The only wounds of the ankle which had serious results, under proper treatment, were those complicated with fracture of the heel-bone.

56. Skull Wounds.—Mathieu's seventy-one cases of war wounds of skull and brain gave a mortality of 38 per cent. He reiterates the importance of early shaving and disinfecting the skull and early intervention for every war scalp wound, no matter how trivial it may appear. He comments on the advantages of local anesthesia and of the natural expulsive force of the brain tissue when the patient coughs or strains. If the dura mater is sound it should be respected,

but lumbar puncture is useful. All sequesters should be extracted; wick drainage usually suffices.

Correspondenz-Blatt für Schweizer Aerzte, Basel

June 9, XLVII, No. 23, pp. 721-752

- 58 Ear Disease in the Swiss Army. E. Schlittler.—p. 721. To be continued.
59 Operative Cure of Median Paralysis after Injury of the Elbow. H. Walthard.—p. 734.

Chirurgia degli Organi di Movimento, Bologna

I, No. 1, pp. 1-159

- 60 *Surgical Correction of Stiff Knee. (La mobilizzazione chirurgica delle anghilosi del ginocchio.) V. Putti.—p. 1.
61 *Prosthetic Surgery with Prostheses under Volitional Control. (Progressi attuali della plastica cinemática.) G. Vanghetti.—p. 71.
62 *The Normal and Pathologic Anatomy of the Bony Framework of the Foot, with special regard to Traumatic Lesions. F. Delitala.—p. 95.
63 *Fate of Free Bone Grafts. A. Serra.—p. 130.

Archives of Surgery of Organs of Motion.—This newly founded journal is issued by the director of the Rizzoli Orthopedic Institute of the University of Bologna, V. Putti, professor of orthopedic surgery. This institution was established in 1896, and has proved a leader in corrective surgery and orthopedics.

60. Operative Mobilization of Stiff Knee.—The seventy pages of Putti's comprehensive study of this subject are accompanied with sixty-one illustrations showing the fine outcome in a number of cases treated according to the technic described. He has applied it in a total of ten cases, with excellent results in all but two. In four the knee can be bent to 100, 95, 85 and 80 degrees; in one to 125, and in two to 50 and 40 degrees, when before, the ankylosis was complete. The interval since the plastic reconstruction of the knee is from two to four years in most, the shortest interval being eight months. He opens up the joint extensively, the incision carried high up on the thigh, and separates the joint surfaces. Then a square flap is cut from the fascia lata, high up on the thigh, and this flap is used to make a cap for the upper epiphysis which has been resected to fit. This cap is sutured in place. Sometimes he thus caps both of the epiphyses, but his results have been equally good with one cap. The patella is usually enlarged and has to be resected to normal proportions. He does not approve of complete eversion of the patella which some commend. In obtaining access to the joint, he cuts out the tuberosity of the tibia in order to turn back the patella and ligaments. When the fascia cap is in place, these parts are turned back and the tuberosity is held in place with a nail driven deep into the tibia, through the skin. The nail is made like a thumbtack, with an extension head; this enables greater pressure to be applied to the nail and also facilitates its removal. The tendon of the quadriceps is lengthened by cutting it across in steps and suturing it.

Putti regards it as a fundamental principle that the initial mobilization should be done exclusively by the patient. He illustrates the cord and pulley device with which the new joint can be thus passively exercised by the patient himself. Local electric and hot air baths, transient immobilization in a plaster cast in maximal extension or flexion, and other means to perfect and hasten the functioning of the new joint are applied as indicated. The knee is not used in walking before six weeks are past, and the rule is never forgotten that too much and too early use of the knee often does harm. He was able to dismiss his patients usually in three months with the knee usable. Improvement generally is progressive later.

61. Vitalization of Artificial Limbs.—As long ago as 1898 Vanghetti published articles urging surgeons in amputating to bear in mind the possible utilization of loops of muscles and tendons for direct autocontrol of the artificial limb to be used later, especially the fingers of an artificial hand. He has published a dozen works on the same subject since, calling attention to the possible advantages of such kinematic prostheses, plastic motors, the vitalization of artificial limbs. He here reviews the literature on the subject, and emphasizes

the principles for this kinetic plastics. Given two muscles with the possibility of reciprocal antagonistic action, united to form a loop which can slide on a support communicating with the prosthesis, a dual alternating motion can be imparted to the prosthesis by means of only one point of connection. A loop formed of two smaller alternating loops, interlocking like the links of a chain, may be able to impart three sets of movements to the prosthesis by the four muscles and three points of connection. There has been little practical experience with kinetic plastics to date. The tentative efforts of various surgeons with only a case or two each scarcely permit as yet definite conclusions as to the best mode of preparing the stump for autocontrol, but the feasibility of kineplastic amputations has been abundantly demonstrated, especially in Italy.

62. **The Skeleton of the Foot.**—This illustrated article is the result of study of radiograms of the foot, the accumulations of fifteen years at the Rizzoli Institute. The aim was to learn which exposure of the foot gives the most information as to its bony framework, the normal relations between the different bones and supernumerary bones, and the criteria for pathologic conditions. The most instructive exposures are the dorsoplantar—the compressing tube parallel to the axis of the skeleton of the foot; and with the external margin of the foot lying on the sensitive plate—the sole and compressing tube exactly perpendicular to the plate. Normal radiograms thus obtained show constant points of pseudo-atrophy which must not be confused with true destructive processes.

63. **Bone Grafting.**—Serra reports the microscopic findings later in five cases. Scraps were obtained for examination during a minor operation several months later in the first group and at necropsy over a year later in one case. In this case an interposed flap of fascia tissue in the joint had evidently retained its vitality and answered perfectly the desired purposes. But the implanted bone had lost its vitality and had shrunk and fractured. None of the bone grafts seemed to have retained their vitality.

Gazzetta degli Ospedali e delle Cliniche, Milan

May 6, XXXVIII, No. 36, pp. 553-568

64 Differential Diagnosis of Lymphangioma and Elephantiasis. P. Dagasso.—p. 556.

65 Bilharziosis in Italian Colonies in Africa. F. Mazzone.—p. 566.
May 10, No. 37, pp. 569-576

66 Operative Cure of Purulent Synovitis in Woman of Seventy-Two. N. Federici.—p. 571.

67 Patriotism in Prescribing. (Nazionalismo scientifico.) E. Villa.—p. 575.

May 13, No. 38, pp. 577-592

68 *Sugared Petrolatum for Dressing War Wounds. A. S. d'Emidio.—p. 580.

69 *Tint of Amniotic Fluid as Sign of Fetal Monstrosity. R. Costa.—p. 583.

68. **Treatment of War Wounds.**—In the course of his remarks on the present status of wound treatment, d'Emidio reports excellent results from the use of petrolatum containing 4 per cent. cane sugar, with or without 1 per cent. iodoform. When the tissues seem to be torpid and healing does not progress well, the epithelium-stimulating action of scarlet red may be utilized. He applies it in the form of a salve but only to the edges of the wound, alternating it with physiologic solution. If plastic repair is necessary, he warns that pedunculated flaps always give better results and heal quicker.

69. **Diagnostic Importance of Tint of Amniotic Fluid.**—Costa recalls that a greenish tint indicates fetal suffering and a reddish tint maceration, but it is not generally known that a yellowish tint indicates escape of cerebrospinal fluid. This never occurs with a normal fetus, and when it is discovered it permits several presumptions, among them being that delivery will be spontaneous, as the escape of the fluid reduces the diameter of the head. Another presumption is that the prognosis as to the viability of the fetus must be reserved, as the causal hydrocephalus, encephalocele, spina bifida, meningomyelocele or other monstrosity is scarcely compatible with extra-uterine life.

Pediatrica, Naples

June, XXIV, No. 6, pp. 321-384

70 *Epidemic Cerebrospinal Meningitis. A. Longo.—p. 321.

71 *Vaccine Prophylaxis and Vaccine Treatment of Pertussis. G. Caronia.—p. 358. R. Pastore.—p. 367.

70. **Epidemic Cerebrospinal Meningitis.**—Longo analyzes the experiences at Catania where there were reported 21 cases of this disease in 1915, 113 in 1916 and 13 to date this year. All ages were represented, but 65 per cent. were in children under 15, including 8 less than a year old and 12 under 2. Adenoids were common and seemed to afford a predisposition to the disease. Fully 38 per cent. of the mortality occurred in the younger soldiers. The waves of the epidemic were in winter or spring; colds and sore throats evidently afford a predisposition. In 2 of the cases the meningitis developed immediately after an injury of the head, a fall from a bicycle or a blow on the back of the head. In another case a nursing of 7 months developed convulsions eight hours after its mother had had a severe fright, seeing her son fall from a high wall. The convulsions subsided, but three days later the symptoms of meningitis became apparent.

The bacteriologic findings show, he says, that the morphology and biology of the Weichselbaum diplococcus are far from being definitely known. The uncertainty of agglutination and the extreme efficacy of the antiserum in some cases and its inefficiency in others also demonstrate this. In some cases the onset suggested influenza. Headache was a constant symptom, as also rigidity of the back of the neck although of widely varying degree. Two children complained of pain in the spine and legs, limited to the muscles and skin which were extremely sensitive; pressure on the nerve trunks was not especially painful. The general mortality in 134 cases was 45.1 per cent. but it was only 33.7 per cent. in the cases with thorough serotherapy. In 19 cases in Longo's own practice, given systematic serotherapy, none died and there were no appreciable sequels, while in 12 not given the serum and in 3 given only one or two injections in all, only 2 of the 15 recovered completely; 7 died and the others were left with deafness and mental impairment, generalized spasms or hydrocephalus, the latter plus amaurosis in one case. This difference was the more striking as, except for serotherapy, conditions were much alike in all the cases. Adhesions obstructing the interflow of the cerebrospinal fluid were probably responsible for the cases in which the serotherapy failed. The nephritis which complicated the meningitis in some cases yielded promptly with the other symptoms to the serotherapy. The serotherapy must be begun early and pushed; there are no contraindications, he declares. Many factors conspire to render intraventricular injection ineffectual, and explain the poor results obtained with it to date and also with Bériel's method of injecting the antiserum through the sphenoidal fissure in the orbit. One of his patients presented symptoms of severe anaphylaxis at the third injection and he changed to a silver salt, but later resumed the antiserum without harm.

71. **Vaccine Therapy of Whooping Cough.**—Caronia reports 61.28 per cent. cured, 32.25 per cent. improved and only 6.45 per cent. not influenced out of 155 children with whooping cough given systematic vaccine treatment. The entire data are tabulated. Some required only from three to five injections, others up to ten. In the cases with negative results the Bordet-Gengou bacillus was generally not found in the sputum. All but six of the 155 were out-patients. The injections were made subcutaneously or into a muscle. The pertussis had been under way from five to forty-five days in all but three. A large number of the children were less than a year old.

Policlinico, Rome

June 10, XXIV, No. 24, pp. 757-784

72 *Suggestions to Improve the Ophthalmologic Service in the Army. G. Cirincione.—p. 757.

73 Advantages of Median Longitudinal Incision of the Patella. P. Nigrisoli.—p. 762.

74 Treatment of Malaria in Soldiers. L. Taussig.—p. 763.

72. **The Ophthalmologic Service in the Army.**—Among the suggestions advanced is that each army should have a central

hospital for care and treatment of the eyes, wounded or diseased. At present such cases are scattered through the general hospitals or in small eye infirmaries. Rome has six establishments of the latter kind. Equally good results with great saving in equipment and personnel would be realized by consolidating them into one large institution with separate quarters for the cases of simple ophthalmia, isolating those of gonorrheal origin; other quarters for trachoma cases, others for factitious ophthalmia, and a fourth department for observation and study of cases. In his rounds as inspector he has encountered 200 cases of loss of one or both eyes from purulent conjunctivitis going without specialist care until too late. Out of 50,000 men inspected, 2,000 had induced conjunctivitis, not to mention the others who had succeeded in aggravating an existing eye trouble. Only an experienced specialist can sift out these factitious cases—another argument in favor of a single specialist center with each army. In conclusion he lists a number of eye affections which should bar from military service unless capable of correction. The ten entailing absolute rejection are complete ptosis, covering the cornea; serious deformity of the lids; permanent obstruction of the lacrimal canals; essential blepharospasm; exophthalmos with the cornea protruding not less than 1 cm.; enophthalmos, and also xerosis of the entire conjunctiva; incurable corneal complications of trachoma; detachment of the retina; total opacity of the lens, and vision of less than 3/10 of normal for both eyes or when vision in one eye is below 1/20. These restrictions as to vision apply also when spherical correction or operation for pterygium does not bring vision above these figures. Paralytic and cicatricial lagophthalmos is also a bar to military service if it cannot be corrected by operative measures. Recruits with trachomatous conjunctivitis should be given hospital treatment and segregated in special troops. Hemeralopia and hemianopsia entail temporary or relative incapacity and simple conjunctivitis calls for hospital treatment or temporary incapacity, as also keratitis and blepharitis. Concomitant squint is no cause for exemption, but binocular diplopia and paralytic squint may temporarily incapacitate.

Riforma Medica, Naples

May 26, XXXIII, No. 21, pp. 561-588

- 75 Italian Contributions to the Bacteriology of Typhoid. A. Fer-
raunini.—p. 561.
76 Dysentery from Protozoa. C. Vallardi.—p. 563. To be con-
tinued.
77 *Valvular Lesions in Soldiers on Active Service. G. Galli.—
p. 568.
78 *Mask for Stethoscopy of the Mouth. A. Campani.—p. 573.

77. **Valvular Lesions in Soldiers on Active Service.**—Galli gives the detailed history of fifteen men with a valvular affection serving at the front, discussing their cases from the medical, the medicolegal and the military standpoints. These fifteen are only a fraction of the number actually encountered in his division in a brief period. In some with aortic insufficiency and reflux murmur, the disturbance in the circulation is so slight that the men are able to keep up with most fatiguing work. There is no doubt, he says, that many soldiers with valvular trouble are capable of useful service, not demanding more of them than they can safely render. His idea is that anyone capable of useful work in civilian life should be considered fit for military service of some kind. The medical officer of the regiment, knowing his men, can tell which should be called on only for light duty. This selection by the medical officer is expressly stipulated in the Italian regulations.

78. **The Mouth Stethoscope.**—Campani recalls the work of Cardarelli and Galvagni on the information to be learned from auscultation of the oral cavity in respect to conditions in the chest. He gives an illustrated description of a mask to fit over the open mouth to focus and magnify the auscultation.

Brazil-Medico, Rio de Janeiro

May 26, XXXI, No. 21, pp. 175-183

- 79 *Polyneuritis Following Electric Shock from Live Wire. E.
Tornaghi.—p. 175.
80 Puncture of the Corpus Callosum for Hydrocephalus. C. Wallau.
—p. 177. Continuation.

79. **Polyneuritis from Electric Shock.**—The man of 30 was painting a trolley pole when he came in contact with a live wire carrying 2,200 volts. There was a mild burn of the left hand and forearm, and a month later some weakness and atrophy in this arm were noted. Five months later he met with a similar accident, with a current of 600 volts. He was in contact with the live wire this time for perhaps two minutes, and the right back showed burns of the first degree. They healed in ten days, but there has been persistent paresis during the nearly year and a half to date. At first the paralysis of both legs was complete and the pain in the various main nerve regions was intense and persistent, night and day, for ten days, with but slight relief from sedatives. There was also complete retention of urine at first. The man gradually improved, being able to begin to feed himself in about a month, and a few weeks later to get about with a cane. During eight years of service as physician to the electric supply company, Tornaghi has encountered only ten electric accidents and none of the other patients displayed any tendency to the polyneuritis so pronounced in this case notwithstanding the slight injury of the skin. The man was robust but the electric shock five months before may have predisposed the trunk nerves to the agonizing neuralgia.

Prensa Medica Argentina, Buenos Aires

May 30, III, No. 36, pp. 389-400

- 81 Vaccine Therapy of Diphtheria. (El informe del Instituto Bacteriologico del Departamento Nacional de Higiene sobre la Haptinogenina difterica.) J. Mendez.—p. 389.
82 *Differential Diagnosis of Cancer by Albumin in Stomach Content. C. B. Udaondo.—p. 391.
83 *Toxicity of Normal Beef Serum. A. Sordelli and G. Fischer.—p. 393.
84 Clinical Study of Acute Abdominal Disturbances. R. E. Pasman.—p. 394. Continuation.
85 Chapter from Autobiography. E. R. Coni.—p. 397.

82. **Dissolved Albumin in Stomach Content as Sign of Cancer.**—Udaondo has been applying the Wolff-Junghans quantitative test in thirty cases of various stomach affections, twenty-one of simple achylia and eleven of cancerous achylia. In the cases of simple achylia the amount of dissolved albumin found in the stomach content, one hour after a test breakfast, ranged from 20 to 40 units while in the known cancer cases the range was from 200 to 400. This range was paralleled by the cases with hyperacidity, but under all other conditions the range was only from 10 to 40. The test is simple, merely the addition of 1 c.c. of the reagent to amounts of filtered gastric juice ranging from 0.025 c.c. to 1 c.c., each in 10 c.c. of distilled water. A white opaque zone forms at the line of junction of the two fluids. The amount of dilution in each of the six test tubes is the index. The reagent is a mixture of 0.3 gm. of phosphotungstic acid; 1 gm. pure hydrochloric acid; 20 gm. 96 per cent. alcohol, and distilled water Q.S. to 200 gm.

83. **Toxicity of Normal Beef Serum.**—Guinea-pigs died in from ten minutes to three hours after intravenous injection of 1 or 2 c.c. of fresh normal beef serum, but rabbits and dogs seemed to bear it without harm except possibly transient dyspnea. In other series of experiments, four guinea-pigs bore without harm from 1 to 6 c.c. of beef serum heated to 56 C. for half an hour on two successive days. Two others died in less than three hours, and the seventh had transient dyspnea. Of two others injected with 6 or 8 c.c. of the serum heated four times, the first bore it without disturbance; the other died in three hours. Further trials with fresh serum tested for its hemolytic and agglutinating properties showed that all hemolytic properties could be removed by treating with animal charcoal. Serum thus treated, however, killed guinea-pigs just the same as untreated serum. Heating the serum to 56 C. also annuls the hemolytic property, but does not always render it nontoxic for the guinea-pig.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

May 5, I, No. 18, pp. 1433-1526

- 86 *Spasmophilia a Phenomenon from Loss of Calcium. H. A. Stree-
man.—p. 1436.
87 *Diagnosis and Serotherapy of Epidemic Meningitis. J. Hekman.
—p. 1448.
88 Formation of Creatin from Arginin in Animal Organism. B. C.
P. Jansen.—p. 1457.

89 *Thyrogenous Heart Trouble. P. H. Enthoven.—p. 1462.

90 Varying Action of Scopolamin with Age of the Solutions. H. Bolten.—p. 1466.

91 Painless Delivery; Child Falls in Privy Vault. J. J. T. Doyer.—p. 1469.

86. **Spasmophilia Result of Lack of Calcium.**—Stheeman is physician in chief of the children's hospital at 's-Gravenhage, and his extensive experience has convinced him that an over-excitability weakness of the nervous system is responsible alike for spasmophilia in young children and the spastic constipation, colic pains in the domain of the mesenteric plexus, enuresis and nervous pallor in older children and for asthenia in adults. The signs and symptoms of all these conditions testify to a like cause for all, a constitutional inferiority of the nervous system, of the digestive tract or of the processes of development or all combined—nervous, peptic or trophic asthenia. The asthenic habitus can be plainly detected in the spasmophilic child as well as in the easily fatigued adult. The vegetative and vasomotor spasms in older children are the equivalent for the tetany of the younger children.

Two of the best known facts in the history of tetany are its connection with the parathyroid bodies and with the metabolism of calcium. Abnormally low calcium content of the blood seems to accompany spasmophilia and to be found exceptionally frequent with the nervous peptic and trophic disturbances of older children and adults. He tabulates the findings in fifty-three children from early infancy to 14 years old; in the twenty-three with abnormally low calcium content in the blood, four had pronounced tetany and all the others belonged to the nervous-peptic-vasomotor dystrophic asthenia group or, as he prefers to call it, the group of constitutional spasmophilic asthenia in children of all ages. The Chvostek sign he regards as equally significant with the Erb sign, from this standpoint. The logical deduction is that means to arrest the demineralization of calcium are called for in treatment of this spasmophilic asthenia, and his success with phosphorus has confirmed the correctness of his assumption. Phosphorus-cod liver oil seems to have a specific action on all forms of spasmophilic disturbances. Administration of calcium itself may give transient symptomatic benefit, but the phosphorus-cod liver oil seems to remove the cause. Magnesium and strontium act like calcium; some think they merely deaden the central nervous system so it does not feel stimuli. Phosphorus, on the other hand, seems to restore to the tissues the power to retain calcium. His tabulated data show in every case but one the return toward normal of the calcium content of the blood under phosphorus treatment. The single exception was in a child with pulmonary tuberculosis. Any infection, intestinal trouble, etc., should of course be given proper treatment. With chronic dyspepsia, the diet must be scrupulously individualized, remembering that children with chronic constitutional intestinal disturbances do not thrive on much milk. With rachitis, likewise, a milk-poor diet is very important. In conclusion Stheeman remarks that the glands with an internal secretion probably have much to do with this calcium demineralization. We cannot refer to its consequences as a spasmophilic diathesis. The derangement in the metabolism is the same for all, but the morbid manifestations depend on the eventual diathesis, the constitutional predisposition, in each case.

87. **Epidemic Meningitis.**—Hekman comments on the difficulty of differentiating this disease, especially in children. Neither the clinical phenomena from the meningitis itself or from the meningococci have specific import. Bacteriologic findings alone are conclusive. He reviews recent research and experiences which seem to show that when a distinctly favorable influence from intraspinal injection of antimeningococcus serum is not soon apparent, it is unwise to continue it. In such cases, he continues to withdraw fluid by lumbar puncture but injects the antiserum only intramuscularly. By this means the antiserum becomes so diluted in the blood that there is no danger of injuring the phagocytes which is liable in some patients from the foreign serum in the concentration in the cerebrospinal fluid. This varying effect on the phagocytes may explain the wide differences in the action of serotherapy in different cases.

In 1907, forty-one cases were recorded in the Netherlands, fifty-four in 1915, and 226 in 1916. Hekman has had twenty-one cases in his service at the Rotterdam public hospital in the last two years; 78 per cent. were under 15, and the disease had not been recognized for several days in some of them. Many recovered in a few days under serotherapy; in a few others the disease was of the fulminating type. In some it ran an extremely chronic course, leaving permanent injury of vision and hearing, and emaciation. In some patients the opisthotonos was so extreme that there was fear of decubitus from the pressure of the back of the head on the lumbar region. The resulting clinical picture was like that with syphilitic hydrocephalus.

89. **Thyrogenous Heart Disturbances.**—Enthoven remarks that the subjective and objective heart disturbances induced by uterine myomas and by goiter may in time entail grave conditions, resembling apparently in every respect those with lost compensation. Compression by the goiter, irritability of the nervous system, and abnormal secretory conditions in the thyroid may all contribute to the clinical picture of thyroid origin. He found considerable compression of the trachea in 15 per cent. of 100 operative goiter cases, but in five of them—average age 24—the cardiovascular system seemed normal. The others—the average age 35—had severe circulatory disturbances. A pulse of 160 was not infrequent, and still more frequent were rapid fluctuations in the pulse under slight exertion and emotions. The goiter of the youngest patient, 17 years old, had developed within five months, with much enlargement of the heart outline and tachycardia. The nervous disturbances usually indicate a toxic action on the heart nerves. A low blood pressure and dilatation of the small arteries evidently cooperated in the acceleration of the pulse. The oldest patient, 71, with goiter for thirty years, showed slight heart disturbances. In 42 per cent. of the total 100 cases there was decided cardiovascular disturbance. A pulse of 170 or 180 was not uncommon. In 79 per cent. there was exophthalmic goiter, and in a still larger proportion various nervous disturbances. In the total 100 cases the most serious heart disturbances always accompanied the smaller and more recently growing goiters. Rest of body and mind and various therapeutic measures under which the thyroid subsides in size, affected also favorably the heart disturbances. The pulse grew slower as the first sign of improvement. In three patients the dilatation of the heart was the only sign of cardiovascular trouble and he can suggest no explanation for these cases. A rapid, unstable pulse should always suggest examination of the thyroid before ascribing it exclusively always to heart disease.

Hygiea, Stockholm

May 31, LXXIX, No. 10, pp. 465-512

92 Series of Wassermann Tests Show Characteristic Curves Important for Prognosis. G. Ahman.—p. 465.

93 *Soldier's Right to Refuse Operations. L. Norrlin.—p. 476.

93. **Right of the Soldier to Refuse an Operation.**—Norrlin discusses the conditions and regulations in this respect in Germany and Austria, studying them from both the medico-legal and the military standpoints. The question is important not only for military but for civilian circles and from the standpoint of both sociology and national economics. By persuasion and reasoning it is generally possible to obtain the consent for a needed operation, but if not, there may be conditions, he thinks, in which it is deemed best to perform the operation despite the patient's refusal to consent. There has been considerable literature published on the subject in the last year or two. Von Eiselsberg denounces as an infringement on personal liberty any attempt to compel a man to submit to an operation against his will. Others, on the contrary, insist that the wonderful success of the war surgery of the day should justify the military authorities in relieving the wounded of the decision as to whether they are to be operated on or not. Norrlin regards the obstinate refusal to permit a rational corrective operation as on a par with self-mutilation to avoid military service or to secure an indemnity.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXIX, No. 5

CHICAGO, ILLINOIS

AUGUST 4, 1917

VISCERAL DISTURBANCES IN PATIENTS WITH CUTANEOUS LESIONS OF THE ERYTHEMA GROUP*

HENRY A. CHRISTIAN, M.D.

BOSTON

In several papers under a title similar to the one which I have chosen for the chairman's address to the Section on the Practice of Medicine, Sir William Osler¹ collected a group of cases presenting a variety of symptoms but having in common skin lesions of the erythema group. Much interest attaches to cases of this type. Often diagnostic errors are made in them, especially when the skin lesions do not occur in close relation to the visceral manifestations. Puzzling combinations of symptoms appear, some of an almost fulminant type. Abdominal symptoms may lead to needless exploratory operations. Hematuria may suggest nephritis or renal neoplasm, etc. Renal changes analogous to those seen in the skin may lead to such a diminution of renal function as to cause uremia, or perhaps here there is an actual severe acute nephritis to which the skin lesions are secondary. The skin lesions are protean in type as indicated by the variety of names our dermatologic friends apply, as erythema simplex, erythema multiforme, erythema iris, erythema urticans, erythema nodosum, erythema papulatum, herpes iris, urticaria, urticaria pigmentosa, angioneurotic edema, purpura simplex, purpura hemorrhagica, peliosis rheumatica, etc.

Osler, I think, deserves much credit for grouping these cases together and emphasizing their common basis. To regard them as having a close relationship to each other seems to me much simpler than to regard them as different clinical entities. Perhaps Osler went too far in including some of the cases; that he did so seems to me likely. Synthesis of skin and visceral lesions, however, into an entity in which various combinations of erythema, hemorrhage, edema and exudation occur both in the skin surfaces and within the body, yields a better comprehension of the process than multiple subdivisions with different names according to where the lesion is and what predominates in it. This is particularly evident when one recalls the frequency with which a single patient shows in successive crops of skin lesions wide varia-

tions in form, with the skin lesion now accompanied by abdominal colic, or joint pains, etc., and now without them.

In more recent years with frequent therapeutic use of large amounts of foreign serums, serum sickness has become a well recognized syndrome. Cases of the type which Osler described in his papers bear close resemblance in many phases to these patients with serum sickness, and this gives a further reason for regarding them as being entitled to be grouped together, although in this erythema group very little is known about the etiology.

My justification for bringing this group again to your attention is their very great clinical interest and the not infrequent mistakes made in their diagnosis. I have but little to add to what Osler has so well said of them in his papers, but I can illustrate the condition fairly well by reporting some cases which I have observed recently myself, and in so doing can emphasize again some of their interesting and important features. In reviewing my experience with these patients I will not include the simpler cases in which with the skin lesions there are but few visceral manifestations beyond slight arthralgia or arthritis nor those in which purpura, urticaria, etc., are clearly but incidents or complications in the later course of some such chronic condition as nephritis, cardiac disease, cirrhosis, etc., or part of an acute infection such as tuberculosis, acute endocarditis, etc., although these may properly belong in the group on the basis of similarity of skin lesion and possibly a common, though as yet unknown, cause for the skin lesion.

REPORT OF CASES

CASE 1 (Med. No. 56).—*Urticaria, albuminuria, hyperpermeability of the kidney.*—A year before entering the hospital, a man, aged 22, noticed a rash on his forearm and chest which itched and lasted for one to two hours. From that time a similar rash appeared almost daily, usually in the afternoon, one-half to one hour after the mid-day meal, sometimes not until later in the day. The rash consisted of small white spots with red borders which would appear first on the wrists, then spread upward to the forearms, then to the upper arms, across the chest and finally down to the legs. In one to two hours it would disappear in the order of its appearance. About three months ago he examined his own urine and found albumin. This albumin varied in amount and in some specimens was absent. It was not, however, an orthostatic albuminuria inasmuch as the specimens free from albumin might occur when the patient was up and about and many specimens passed with the patient flat in bed showed albumin. Albumin seemed to appear more constantly in specimens passed two to four hours after a meal containing a considerable amount of protein. There was no relationship between the albuminuria and the occurrence of the urticarial lesions. Urine specimens did not show casts and the renal function as measured by the phenolsulphonephthalein excretion, the excretion of lactose and potassium iodid seemed to be quite

* From the Medical Service of the Peter Bent Brigham Hospital.

* Chairman's address, read before the Section on Practice of Medicine at the Sixty-Eight Annual Session of the American Medical Association, New York, June, 1917.

1. Osler: On the Visceral Complications of Erythema Exudativum Multiforme, *Am. Jour. Med. Sc.*, 1893, **110**, 629; Visceral Lesions of the Erythema Group, *Brit. Jour. of Dermatol.*, 1900, **12**, 227; On the Visceral Manifestations of the Erythema Group of Skin Diseases, *Am. Jour. Med. Sc.*, 1904, **127**, 1; On the Surgical Importance of the Visceral Crises in the Erythema Group of Skin Diseases, *Am. Jour. Med. Sc.*, 1904, **127**, 751.

normal. The total nonprotein nitrogen of the blood was normal, so that there seemed to be no definite evidence of a nephritis.

CASE 2 (Med. No. 1016).—*Purpura, abdominal pain, blood in the stools.*—A woman, aged 45, two weeks before admission, noticed red spots on the legs below the knee and then they appeared on the hands, forearms and lower abdomen. Those on the arms itched slightly. They varied in size from a pinhead to 0.5 cm. in diameter, at first bright red and then turning a darker red. On the day of admission a slight swelling which was red and quite tender appeared on the left instep and two days later a slightly painful lump appeared in the middle of the forehead about 3 cm. in diameter which was raised about 0.5 cm. above the level of the forehead. At this time pain began to develop in her legs. The next day her left knee was painful on motion and her left ring finger was swollen at the second phalangeal joint. The left shoulder joint was tender on palpation. The patient had a very slight fever. A day or two later the patient had an attack of vomiting at night and the next day there was a new crop of skin lesions more papular than previously and more numerous on the face. The joint pains persisted for four to five days, varying in intensity. Two weeks after admission she complained of extreme pain in the lower portion of the abdomen. The abdomen was markedly distended, more or less rigid and was tympanitic throughout. The pulse became smaller, the heart sounds were weak, but she had no fever at this time. She was given several high enemas and the pain gradually disappeared, though the distention persisted somewhat longer. Two days later, however, the abdomen felt perfectly normal and the pain had entirely disappeared from the abdomen. A number of stools examined from the time of admission up to this period of abdominal pain showed strongly guaiac tests. Then the stools became negative for blood tests and thereafter for a period of nearly a month the guaiac tests were sometimes positive, sometimes negative. During this period the patient's condition greatly improved, and she left the hospital feeling comparatively well. During her stay in the hospital albumin was occasionally found in her urine and an occasional cast was seen, but there was no hematuria.

CASE 3 (Med. No. 1143).—*Purpura, abdominal pain, pain and swelling of the ankles, hematuria.*—A boy, aged 13, about six weeks before admission, was suddenly seized with sharp cramp-like pain in the abdomen, more severe about the region of the umbilicus. This pain did not radiate and it lasted for about ten minutes. Since then there have been many recurrences of similar paroxysms of abdominal pain and he has never been free from the sensation of discomfort in the abdomen during this time. When the pain is severe he occasionally vomits a small amount. This vomiting is not preceded by any nausea. The first two urine specimens examined in the hospital showed numerous red blood cells, subsequently none were found. The patient was distinctly emaciated; his abdomen had a doughy feel. Bismuth Roentgen-ray studies of his gastro-intestinal tract showed distinct irregularities in the pyloric and prepyloric region. The stomach emptied rather slowly. When the bismuth reached the small intestine the loops looked wide and atonic. While in the hospital the patient frequently had attacks of very intense abdominal pain which would double him up and sometimes he would vomit. At times food taken several hours previously was found in the vomitus. Ten days after the first bismuth Roentgen-ray examination a repetition showed again irregularity in the prepyloric region with a slow emptying time for the stomach. After two weeks' stay in the hospital the patient began to improve, his colic-like pains decreased, his appetite improved and he looked very much better. After nearly a month in the hospital there was a recurrence of pain in the abdomen, followed the next day by pain and swelling in the right ankle. A day later several purpuric spots appeared on the legs. These gradually faded away not to recur. During the latter part of his stay in the hospital a small amount of blood reappeared in the urine and albumin was present with an occasional cast.

CASE 4 (Med. No. 1069).—*Purpura, diarrhea, blood in the stools, abdominal pain, painful swollen joints.*—Three and one-half weeks before the patient, a girl, aged 11, came to the hospital, a rash appeared on the back of the calves and over her lower legs which gradually went up the legs and a few appeared on the trunk. Finally a rash appeared on her face. The rash was red in color and consisted of discrete, sharply defined macules. During the first three days after the rash appeared the patient vomited frequently yellow greenish material, free from visible blood. During this time her stools were dark colored. One week after the rash appeared her ankles became swollen, and two days later swelling appeared in her hands. This swelling in the hands and feet disappeared but recurred again later. When the patient came to the hospital there was slight abdominal tenderness, there was a marked macular and papular rash over the legs, feet and arms, in places dark red, in others paler, purplish or yellow in color. On one ankle there was a bleb about the size of a dime. At this time there was no obvious involvement of any joint. After two days in the hospital the patient had a stool in which there was bright red blood and a little later she involuntarily passed about 4 c.c. of blood. The next day there was diarrhea with several watery stools, most of which showed blood. On this day the right hand and arm as high as the elbow were distinctly swollen, but not very tender. Several days later there was a recurrence of the diarrhea, there being very numerous stools most of which contained blood. This persisted for several days and then diarrhea gradually decreased, though positive guaiac tests continued to be obtained in her stools for a long time. After being in the hospital for a month a new crop of purpuric spots appeared on her feet. Four days later another crop appeared on her thighs. Six days later a new crop came on her legs. A week later she again had pain in her abdomen and vomited. Shortly afterward she passed a large tarry stool. She remained in the hospital for nearly four months with frequent recurrences of what has already been outlined and then left in good condition. She was seen a year later and reported that she had had a few purpuric spots in the interval but no recurrence of the diarrhea and abdominal pain.

CASE 5 (Med. No. 3599).—*Purpura, painful joints, hematuria.*—A man, aged 25, about two weeks before admission, developed a sore throat. Five days ago his knees became a little painful on motion and after resting would feel stiff. For two days his feet have been a little swollen. Nine days ago his feet became tender and were painful when he walked about. On yesterday he had a little trouble pulling on his boots and later in the day noticed that there was a red rash about his ankles. When he came into the hospital on both ankles and over the calves of both legs there were many dark red, hemorrhagic areas from 0.5 to 8 mm. in size. A few of these were covered with fine crusts. Both tonsils were enlarged, red and slightly ragged. The urine contained a moderate amount of albumin, and numerous hyaline and granular casts. A specimen passed nearly two weeks after admission was smoky and contained many red blood cells. This was at a time when the throat had cleared up and the purpura had disappeared. After about three weeks in the hospital and when the patient had been up out of bed for three days, purpura returned over the ankles with slight pain and swelling in the ankles. The blood was very slight in amount and his urine at this time up to ten days later became more abundant. This patient had a positive Wassermann reaction and there was an ulceration in his palate. Renal function was slightly impaired as shown by the blood urea nitrogen which was 25 mg. per 100 c.c. of blood, with an index of urea excretion according to McLean's formula, of 40.5 per cent. Some time later the blood urea nitrogen was 21 mg. with an index of urea excretion of 49 per cent. The phenolsulphonephthalein test at about this time gave an excretion in two observations of 67 per cent. and 50 per cent. respectively and the urine always contained a considerable amount of albumin and numerous casts, hyaline and granular in character, so that the diagnosis of acute nephritis was also made.

CASE 6 (Med. No. 5372).—*Erythema nodosum, abdominal pain, vomiting, slight diarrhea*.—A woman, aged 27, for about four weeks had had grumbling pains in the left upper quadrant of the abdomen. On two occasions she vomited and for several periods of about a week there was slight diarrhea. Nothing abnormal was noted about the vomitus; no blood was observed in the stools. A few days ago the patient felt rather chilly and went to bed. The following morning after walking down stairs she noticed a soreness in both legs from the knee to the ankle. That night she noticed what she called "mosquito-bite like" areas over both lower legs. Two mornings ago these seemed to be fading but by today had become larger and felt lumpy. During this period there has been slight sore throat. When she came to the hospital there were numerous discrete lesions over both legs. These lesions were slightly raised, reddish-blue, or slightly yellow in color, with ill defined edges, measuring from 1 to 4 cm. in diameter. On palpation they give a distinctly nodular feel. On pressure most of the color disappears from the lesions. When she came in there was slight fever which quickly disappeared. All the gastro-intestinal symptoms likewise disappeared. Her urine examination was normal.

CASE 7 (Med. No. 5543).—*Erythema multiforme bullosum, gastric disturbance*.—A boy, aged 13, for the past five years every August has had a gastric upset with an erythema on the right side of his lower jaw. This unusually lasts five to six days. Eating strawberries often produces a little urticaria and on one occasion he had urticaria from eating fish. About a month ago the same appearance as usual occurred on his jaw. Then red spots appeared on his legs and arms. Soon a blister would form over these red spots which would break in about twenty-four hours, leaving a red area with a little black speck in the center. About five days ago blisters appeared in the mucous membrane of his mouth. On admission he showed over the mid-portion of his right lower jaw an irregular area of yellow crusts. Irregularly scattered over the arms and legs there are small areas of erythema with blackish brown spots in their centers. Over the back of his thighs there are a number of red areas, some almost entirely covered with blebs containing a serous fluid. The edges of these areas are sharply demarcated. Over the palms of the hands and the soles of the feet are a large number of blebs varying in size from a 10 cent piece to a 25 cent piece. When the blebs break it is seen that the lesion as far as ulceration is concerned is very superficial. On the lips there are similar blebs, and apparently they have occurred also on the gums, appearing here as erythematous areas slightly ulcerated. These lesions rapidly cleared during about ten days' stay in the hospital. The patient's urine was normal and there was no blood in the stools.

CASE 8 (Med. No. 5661).—*Erythema multiforme vesiculosum, abdominal pain*.—Eleven days before admission of the patient, a woman, aged 29, generalized pain in the abdomen developed. This began in the morning and got worse in the afternoon. During the night it was severe enough to prevent sleep. Her local physician saw her the next day and diagnosed the condition as salpingitis. He prescribed a vaginal douche and after a few days the pain subsided. Then the pain recurred and she went to a dispensary where she was diagnosed as having gallstones. With this attack she vomited and continued to vomit until she was sent to the hospital where she was first admitted on the surgical side. There it was found that she had an irregular, blotchy erythematous eruption over her face and almost the entire body. These erythematous areas did not seem to be elevated and they faded on pressure. The abdomen showed generalized tenderness. Her feet and ankles were swollen and tender. In twenty-four hours the skin rash had largely disappeared, leaving a slight puffiness of the face, hands and feet. The rash reappeared and a week later a different type of rash appeared on the arms and legs, consisting of small, irregular, dusky red areas, 2 to 6 mm. in diameter, which did not disappear on pressure. On the tops of many of these, small vesicles appeared which subsequently became slightly pustular. The patient now complained of abdominal tenderness and there was slight diarrhea. The urine showed a slight amount of

albumin, numerous casts and a phtalein output of 15 per cent. in two hours which in two or three days had increased to 24 per cent. and a week later to 34 per cent. The patient had a moderate degree of irregular fever. At times the pain in her elbow and wrists became more severe and kept her awake. After being in the hospital for nearly a month she had a recurrence of the pain in her abdomen and her left arm from the elbow to the shoulder became swollen, tender and felt hot but it was not red. This swelling gradually subsided and the tenderness disappeared. From time to time the patient had a severe headache. She gradually improved and left the hospital feeling quite well after a stay of about two months. Before she left her phenolsulphonephthalein excretion had risen to 55 per cent.

CASE 9 (Med. No. 5908).—*Urticaria, intestinal obstruction*.—The patient, a man, aged 58, had had a large number of attacks of localized swelling in the right hand and other manifestations of urticaria. On the day before coming to the hospital he was in his usual health until the afternoon. While having tea his abdomen became distended, there was some belching of gas, he felt rather uncomfortable and went to bed. He began to have pain in his abdomen chiefly in the epigastrium and along the right costovertebral angle. His abdomen was generally distended. There was a fair bowel movement about 9 p. m. Later an enema was given and returned with very little fecal material. The distention and discomfort continued so that he slept poorly. The next morning, January 7, he came to the hospital, and his abdomen was found to be distended and diffusely painful and slightly tender. The abdomen and the character of the pain suggested distinctly intestinal obstruction. For twenty-four hours very little result was obtained from enemas or rectal tube. Then a good fecal result was obtained and the patient passed a considerable amount of gas. Forty-eight hours after admission his abdomen was much less distended and the patient was much more comfortable. Four days after admission scattered patches of erythema and edema appeared over his hands, arms and feet, which he said were similar to those that he had repeatedly had after eating fish, shellfish or canned goods that were possibly not quite good. He recalls having eaten sardines on the day that his abdominal distention and discomfort developed. These findings suggested that possibly the intestinal obstruction was due to a similar type of lesion in the intestinal wall and on the next day, January 12, bismuth Roentgen rays of his gastro-intestinal tract showed five hours after the taking of the bismuth meal in one of the upper loops of the ileum a dilatation producing a sausage-shaped shadow, the distal end of which was narrow. After this all symptoms of intestinal obstruction disappeared, a repetition of the Roentgen-ray study three days later showed no signs of a dilated loop and a repetition ten days later again gave no evidence of obstruction.

CASE 10 (Med. No. 5823).—*Purpura, arthritis, abdominal pain, hematuria, blood in the stools*.—A man, aged 20, six years ago had an attack of rheumatism in which both knees were slightly swollen and quite painful, particularly at night. Since then he has had a similar attack about once a year. About nine weeks ago another attack of rheumatism developed in which his right knee became sore. A little bit later his left knee became very painful and slightly swollen. The right knee cleared up but the left knee continued and is still swollen and painful. For a year the patient has had an ulcerated tooth in the right lower jaw with a swelling nearby from which pus exudes on pressure. Six days before he came to the hospital he began to have a sensation of pressure in the epigastrium giving him enough distress to keep him awake during the night. He raises a good deal of gas. Four days ago he began to have hiccups and to vomit about once or twice an hour. There was very little nausea. The vomitus was bitter, greenish in color, and never contained anything like blood. On admission numerous small purpuric spots were found over both elbows and over the lower part of the sacrum, which he says had been present for three to four days. A carious tooth was found as described. The left knee was somewhat larger than the right, somewhat painful, not hot, and did not appear to contain fluid. His left leg

was slightly flexed at the knee and held in that position. He had a moderate fever. During his first few days in the hospital the urine contained a very slight amount of albumin with a few hyaline casts. The phenolsulphone-phthalein elimination was 42 per cent. in two hours. In his stools a strongly positive benzidin test for blood was found. The pain in his knee decreased and then after four to five days increased and at this time there appeared on the forearms, wrists, legs, ankles and feet many small slightly indurated erythematous plaques, definitely elevated and about 1 cm. in diameter. These gradually disappeared and a week after this crop had come out the patient's temperature suddenly rose to 102 F., and there was marked swelling of the left knee and a reappearance of purpuric spots on the forearms, ankles and feet. Now there were definite signs of fluid in the knee joint. The patient was unable to flex his knee on account of pain. At this time the bad tooth was extracted and pus was found about its root. For the next two weeks the temperature ranged between 99 and 100 F. Then it rose again to 102.5 F. with a fresh crop of purpuric spots on the forearms, ankles and feet. The patient had begun to cough up a considerable amount of blood. During this time a small amount of blood had appeared in his urine and the casts had increased in number. Shortly after this last group of purpuric spots appeared the urine became definitely hemorrhagic in type and thereafter contained practically always a considerable amount of blood, though different specimens might show more or less blood. After a month's stay in the hospital the patient had a definite secondary anemia but he had been free from purpuric attacks for some little time, blood in his stools was no longer found and the blood in his urine had somewhat decreased. Roentgen-ray examination of his knee shortly after this showed bony enlargement and slight irregularity but no evidence of a destructive process. Now the patient's temperature became a maintained temperature first around 101 F. and then increasing to 102 F. and finally rising to about 103 F. with a gradually increasing pulse rate. During this period the left knee has continued swollen and painful with some variations up and down in the activity of the process. After about two and one-half months' stay in the hospital with this continued fever, continued hematuria and continued activity of the process in the left knee, definite signs were made out of a pulmonary process and tubercle bacilli were isolated from the sputum in small numbers. A month prior to this, sputum examinations had shown no tubercle bacilli. A Roentgen-ray plate of the chest showed changes suggesting a diffuse miliary tuberculosis with, in places, conglomerate tuberculosis. There were no further crops of purpura and the patient died about three and one-half months after admission. At necropsy there was an acute miliary and conglomerate tuberculosis of the lungs with areas of caseous pneumonia, apparently an active and recent tubercular process. The kidneys were slightly enlarged and showed small foci of hemorrhage. On microscopic examination of the kidneys there was no nephritis but possibly a slight degenerative change in the tubular epithelium with numerous foci of intertubular and intratubular hemorrhage explaining the persistent hematuria. No tubercular lesions were found in any of the abdominal viscera. The gastro-intestinal tract seemed to be normal. The stools for a period of three months before death gave no test for blood.

COMMENT

To me it seems that the clearest conception of the condition represented by the patients just described can be obtained by regarding the disease as due to some disturbance in the small blood vessels—vessels of the capillary or precapillary and postcapillary group—almost always focal in distribution, which causes dilatation, diapedesis, exudation, singly or in combination. The ultimate cause of this disturbance is completely unknown. The areas of vascular involvement may be either in the skin surfaces, mucous surfaces, serous surfaces, subcutaneous tissues, muscles, or viscera. With this possibility of

distribution symptoms may be extremely various and in recurring attacks, for the condition is usually recurrent; very different symptoms appear in the same individual.

With this in mind the variety of skin lesions is easily understood. The frequent arthritis has its analogy in the arthritis of serum sickness and the chronic joint disturbances with frequent exacerbations in some patients with hemophilia. Diarrhea, blood in the stools and abdominal colic occur as there is serous exudation or hemorrhage into the intestinal wall. Colic is due probably to local changes in the intestinal wall causing spasm. This is suggested in Case 3, where Roentgen-ray study showed evidence of muscle spasm at the pyloric end of the stomach. In the colic of chronic lead poisoning we have seen evidences in the Roentgen ray of spasm in intestine or stomach during the period of colic, which is in support of the view that observed spasm is related to gastro-intestinal disturbance. Such spasm and disturbances in the bowel wall can lead to actual intestinal obstruction, as in Case 9, where we could demonstrate the obstruction by Roentgen ray in an ileal loop.

The exact relation of the renal disturbances is not quite so clear. Hematuria could occur in the same way as blood in the stools from disturbances in renal vessels. That this does happen is well shown by Case 10, where necropsy showed focal hemorrhages in the kidney without signs of nephritis. This patient had pulmonary tuberculosis, but the clinical course and necropsy findings indicated an acute process developing during the later course of the skin and visceral disturbances of the erythema group. His urine during life yielded no tuberculosis by guinea-pig test and at necropsy no tubercular lesions were found in the kidney.

In how far these renal lesions are to be considered as acute nephritis it is difficult to say. In several of our cases functional study showed markedly decreased renal function. Five of Osler's twenty-nine reported patients died with what was termed uremia. That they had severe disturbances in renal function is evident. Whether this was nephritis or suppressed renal function from edema and hemorrhage into the kidney is not certain; there were no necropsy examinations except in one patient referred to by Osler in whom proliferative glomerular nephritis was found. Some of the uremic manifestations might easily have resulted from lesions in the brain of the same nature as those occurring in skin and viscera and not been actually uremic.

The difficulty of placing the renal lesion is well illustrated by a patient of mine at the Carney Hospital not included in the above group of cases. He was a boy of 15 who, September 15, had sudden attacks of severe colicky abdominal pain with some diarrhea. September 22, an appendix normal except for several concretions was removed. October 4, abdominal symptoms as before his appendectomy recurred and he vomited. These abdominal symptoms recurred and he came back to the hospital on October 11. A purpuric rash was found on his legs and crops of these recurred later. Now he had albumin, blood and casts in his urine. He left the hospital again, October 22, and soon developed edema. November 12, he returned in a markedly water logged condition. November 26, following a dietary indiscretion he had a series of convulsions and was stuporous. After a few days this condition cleared up and his edema dis-

appeared so that between November 18 and December 15 he lost thirty-seven pounds in weight. Six months later his urine contained much less albumin and a few casts and he looked very well. One and one half years later and three years later he was seen. The last time his urine showed a very slight trace of albumin and a very rare hyaline cast. His blood pressure was normal and for two years he had been steadily at work in a machine shop running a lathe and feeling perfectly well.

Was this a case of nephritis with a complicating purpura or does it belong to the group I have been discussing? I must confess I do not know. Abdominal pain of various types does occur often in typical chronic nephritis without skin lesions and I usually call my students' attention to this as a type of symptom in chronic nephritis, that often leads to diagnostic errors. On the other hand I am inclined to think that in many patients hematuria, albuminuria, and other renal disturbances occur as part of the disease entity here under consideration and that these renal disturbances are due to kidney lesions similar in nature to those occurring in the skin. In this sense the renal lesions are not truly those of nephritis. This probably explains why in these patients with seemingly so severe a renal lesion progression into a true chronic nephritis is not often seen.

CONCLUSIONS

There is a definite clinical entity in which with skin lesions of the erythema group (purpura, erythema, urticaria, angioneurotic edema) visceral lesions occur as the result of the same type of lesion. The most common of these visceral manifestations are arthritis, gastro-intestinal symptoms, hematuria and various disturbances of renal function. The visceral disturbances occur unaccompanied by the skin lesions. The symptomatology of the group is very complex and without the presence of the skin lesions at a given time the cases present great difficulties in diagnosis.

THE INFLUENCE OF THE HIGH CALORY DIET ON THE COURSE OF TYPHOID FEVER*

WARREN COLEMAN, M.D.

NEW YORK

The various studies concerning the high calory diet which have been carried out in Bellevue Hospital during the last ten years, have established beyond question the value to the individual typhoid patient of the maintenance of an optimal state of nutrition.¹ Contrary to the common belief, it was found that large quantities of selected foods could be taken without disturbance of digestion. Likewise, it was found that food is absorbed by the typhoid patient practically as completely as by healthy men. Under the high calory diet the febrile loss of body protein is reduced to a minimum or altogether prevented. Investigations of the total metabolism of typhoid patients have shown that large amounts of food are consumed with avidity, any excess over the immediate needs being laid by for future use.

None of these studies, however, furnished more than indirect evidence of the influence which the high calory diet might exert on the natural history of typhoid fever. On account of the wide variations in the course of the disease in different seasons, such evidence can be obtained only from the study of a series of cases extending over a number of years.

A statistical study has therefore been undertaken of the course of typhoid fever in patients on the high calory diet and in an equal number of patients on diets (milk, broths, egg albumin water) furnishing not more than from 1,000 to 1,500 calories a day. The number of cases available is not sufficiently large to justify comparison of the frequency of the rarer symptoms and complications; even with respect to the commoner features of the disease, only tentative conclusions are drawn unless the evidence is overwhelming.

Material.—The material consisted of 444 patients, half of them on the high calory diet and the other half on a milk diet. All of the patients were treated on the second medical division of Bellevue Hospital except forty-five of those on the milk diet. The majority of the patients were under my personal care, thus eliminating differences in the course of the disease which might be attributable to different methods of treatment other than diet. The histories cover the years from 1903 to 1914, inclusive. As far as possible, cases in corresponding years have been selected, but the use of the high calory diet became so general throughout the hospital about 1911 that, in order to complete the milk series, it was necessary to utilize 113 histories from 1903 to 1906, inclusive.

The histories were taken from the records seriatim. All patients were classified as high calory cases if the attempt had been made to nourish them liberally, even if it failed or was only partially successful.

A moderate number of histories were unsuitable for analysis, the reasons being doubt as to the diagnosis, entrance into the hospital late in the disease, and death within a week of admission. Of the fatal cases excluded, three were on the high calory diet and twelve on milk. Fifty-five of the high calory cases were mild, 149 were severe, and eighteen were fatal. Forty-four of the milk cases were mild, 104 were severe, and thirty-nine were fatal.

Duration of the Disease.—There is no evidence to indicate that the duration of the febrile period of the disease or the range of temperature is affected by diet except, perhaps, that long recrudescences are rarer in patients who are well nourished.

The total duration of the disease, however, is shortened, in some instances, by months. That is, the long convalescences, formerly so common, have not been observed. The records with respect to convalescence are by no means complete, but a number of patients have reported back to the hospital from time to time. All of them have stated that they felt perfectly well and were physically able to follow their occupations (many of the patients were laborers) even within a short time after their discharge.

Condition of the Mouth.—While it is recognized that the condition of the mouth, including the tongue, in typhoid fever is dependent on the amount of attention bestowed on it by the nurse, it may be stated that the mental condition of patients who are well nourished is so good that they themselves keep their mouths clean. The only histories containing notes to the effect that the lips and tongue were in poor condition were found in the milk group.

* Read before the Section on Practice of Medicine at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. For the bibliography of the papers by Drs. Shaffer and Du Bois, Mr. Gephart, and the author, see Arch. Int. Med., August, 1914, p. 163; May, 1915, pp. 882, 887.

Nausea and Vomiting.—Nausea and vomiting occurred in 19.3 per cent. of the high calory cases and in 22.6 per cent. of the milk cases. The difference is negligible. Nausea and vomiting were more frequent among the earlier high calory cases when the diet was limited to milk, cream, lactose, and eggs; these symptoms became less common as other articles of food were added to the diet. Nausea and vomiting did not always coexist in the same patient. Lactose at times caused vomiting without nausea. Most often nausea and vomiting followed attempts to increase the food too rapidly or when the food mixtures were too rich. Some patients vomited the high calory diet and milk indifferently. A few patients had persistent and uncontrollable vomiting due either to recent excesses in alcohol or to the disease per se.

Tympanites and Diarrhea.—Though often associated, these did not always occur together. Tympanites occurred in 17.6 per cent. of the high calory cases and in 31.5 per cent. of those on milk. Extreme grades of tympanites were rarely observed among the high calory cases. Diarrhea occurred in 16.2 per cent. of the high calory cases and in 48.6 per cent. of those on milk. Temporary diarrheas of one to several days' duration have been included in the percentage for the high calory cases but not in that for the milk cases.

For comparison, the statistics of the Hamburg (2,240), and Leipzig (1,875) cases, as given by Curschmann,² may be cited. Continuous diarrhea occurred in 36.1 per cent. of the cases in the Hamburg epidemic, temporary diarrhea in 29.7 per cent., making a total of 65.8 per cent. In the Leipzig cases, continuous diarrhea occurred in 25.6 per cent. and transient diarrhea in 37 per cent., with a total of 62.6 per cent. Normal stools occurred in 5.2 per cent. of the Hamburg cases and in 4.4 per cent. of the cases in Leipzig.

The practice followed in Bellevue Hospital of giving a daily enema to all typhoid patients has made it impossible to ascertain what proportion of patients would have had spontaneous daily movements of the bowels and what proportion were constipated. With respect to the characters of the stools themselves, those from the high calory cases were notable for their normal color and consistence. A large proportion of the stools of the milk cases contained undigested milk curds.

Tympanites and diarrhea were observed more frequently among the earlier high calory cases. After 1911, only nine of these patients suffered from continuous diarrhea. Many patients entering the hospital with profuse diarrhea developed normal stools in the course of several days under the influence of the high calory diet.

Gradually it was learned that, except in a few patients, tympanites and diarrhea are due to an excess in the diet of one or another of the foodstuffs. Tympanites most frequently results from an excess of lactose; diarrhea most often from an excess of cream. Occasionally, the opposite was true. In one instance, tympanites disappeared when eggs were discontinued. Patients who at first were unable to take the desired amount of food usually could be educated to do so by graduating the increase. In the last few years, it has been found possible to control tympanites and diarrhea, in practically all instances, by rearrangement of the diet. In rare cases, tympanites and diarrhea always

followed the attempt to increase the food beyond 1,000 to 1,500 calories, in spite of frequent alteration of the proportions of protein, fat, and carbohydrate.

Reference may be made in this connection to Torrey's³ study of the intestinal flora of some of the high calory cases of this series and of other cases on a milk diet. Torrey found that patients who were able to take large amounts of food without digestive disturbances possessed a flora dominated by the *Bacillus acidophilus*, and that patients with an initial putrefactive flora were capable of developing a favorable fermentative flora, with disappearance of tympanites or diarrhea, under the influence of the diet. Exceptionally, the putrefactive type of flora persisted in spite of alteration of the diet—these were the patients who could not be liberally nourished. The therapeutic application of these results was at once apparent and at my request Dr. Torrey prepared a pure culture of *Bacillus acidophilus* for administration to typhoid patients. The bacillus was used first for patients entering the hospital with tympanites and diarrhea in order to hasten the transformation of the flora; later it was given more or less as a routine measure. The results have been satisfactory.

Through the investigations of Torrey, and of Hull and Rettger,⁴ it is now known that the beneficial influence of the high calory diet on the intestinal flora is due to its lactose content.

When tympanites and diarrhea occur in typhoid fever (except perhaps in the prodromal stage for which we possess no data), they are the result of an unfavorable flora, which, in nearly all instances, is in turn dependent on an unsuitable diet. Tympanites and diarrhea, therefore, are not due to the specific action of the typhoid bacillus and should not be considered as essential symptoms of the disease.

Nervous Symptoms.—Three and six-tenths per cent. of the high calory cases were described in the histories as stuporous, restless, or toxic, as compared with 10.81 per cent. of the milk cases; 7.65 per cent. of the high calory cases were delirious throughout the greater part of the active period of the disease, 13.5 per cent. of the cases were delirious for one to several nights. Some of the patients with prolonged delirium, though nominally high calory cases, took very little food. In some instances the delirium followed intestinal hemorrhage.

Thirty-eight and three-tenths per cent. of the milk patients had well-marked delirium (20.7 per cent. of them sank into the typhoid state) while 3.60 per cent. were mildly delirious.

Twenty-one of the high calory cases that entered the hospital in a delirious condition, or the typhoid state, gradually cleared as the food was increased. Occasionally patients taking large amounts of food became delirious for short periods. None of the high calory patients who received the desired quantity of food developed the typhoid state. In eight of the fatal cases with severe nervous symptoms, the patients took less food than they required, for the most part under 2,000 calories a day.

The practically complete absence of severe nervous symptoms in patients who were able to take sufficient food and the disappearance of these symptoms with improvement in the patient's nutrition, warrant the conclusion that severe nervous disturbances, including the typhoid state, occur in typhoid fever only when the patients are undernourished. In other words,

2. Curschmann in Notlingel's Encyclopedia of Practical Medicine, volume on typhoid and typhus fevers.

3. Torrey: Jour. Infect. Dis., 1915, 15, 72.

4. Hull and Rettger: Jour. Bacteriol., 1917, 2, 47.

severe nervous disturbances are not due to the specific action of the typhoid bacillus, but rather to the action of the bacillus in the presence of partial starvation. The well known fact that the typhoid state is not peculiar to typhoid fever lends support to this view.

The foregoing conclusions should not be interpreted to mean that typhoid patients, even when well nourished, may not develop delirium. Some persons become delirious whenever the temperature reaches a certain height irrespective of the cause of the fever.

Body Weight.—Loss of weight in typhoid fever was formerly so constant that it was considered a characteristic phenomenon of the disease. While the records of the patients in the milk series contain no reference to weight (the method of weighing patients had not then been devised), it can scarcely be doubted that all of them lost more or less in weight and in general, the severer the fever, the greater was the loss.

A large number of the patients in the high calory group were frequently weighed. The majority of them lost some weight during the active period of the disease, usually only a few pounds. The emaciation which was so common among the milk cases did not occur if the patients took reasonably large amounts of food. In a few instances, there was a gain in weight, even at the height of the fever or during a relapse. In all cases, as the appetite improved and the quantity of food was increased, the lost weight was regained in the later stages of the fever or early in convalescence. In other words, loss of weight is not a symptom of typhoid fever, but an indication that the patient is receiving insufficient food.

Complications.—As stated above, the number of cases in this series is not sufficiently large for comparisons of the rarer complications in the two groups to possess much value. Yet in some instances the results are striking.

There were a total of 110 complications in eighty-one of the high calory cases and 144 complications in ninety-one of the milk cases.

Intestinal Hemorrhage.—This occurred in 9.45 per cent. of the high calory cases. The hemorrhage was moderate in 5.40 per cent. and severe in 4.05 per cent. of the cases.

Among the milk cases, moderate hemorrhage occurred in 5.40 per cent., severe hemorrhage in 9 per cent. making a total of 14.40 per cent.

The difference in the incidence of hemorrhage in the two groups is too small to possess much significance, yet closer analysis brings out an important difference in the mortality from hemorrhage.

Twenty-one of the high calory cases were complicated by hemorrhage. Two of the patients died; one from hemorrhage alone, one from hemorrhage, pneumonia and cholecystitis, giving a mortality from hemorrhage of 9.5 per cent.

Hemorrhage occurred in thirty-two of the milk cases. There were nine deaths; six from hemorrhage alone (18.7 per cent.), and three from hemorrhage with other complications (9.4 per cent). The total mortality from hemorrhage among the milk cases was 28.1 per cent.

The frequency of intestinal hemorrhage, according to Curschmann, varies from 4 to 6 per cent. The mortality among cases with hemorrhage varies from 20 to 44 per cent.

In both groups of the present series, therefore, the incidence of intestinal hemorrhage is greater than

usual, but the mortality from hemorrhage appears to have been lowered by the high calory diet.

With respect to the individual patient, intestinal hemorrhage seems to cause but little, if any more disturbance when the patient is well nourished, than the loss of an equal amount of blood by a healthy man. Occasionally a patient became delirious after a hemorrhage. One patient recovered after the loss of two quarts (estimated) of blood.

Perforation.—This occurred in two of the high calory cases (0.9 per cent.), and in seven of the milk cases (3.15 per cent.). The average incidence of perforation is placed at from 2 to 3 per cent. One of the high calory patients with perforation died. Six of the milk patients with perforation died, namely, 85.7 per cent. Tentatively, the conclusion may be drawn that the high calory diet lessens the liability to perforation.

Recrudescences and Relapses.—Recrudescences occurred in 6.75 per cent. of the high calory cases and in 11.3 per cent. of those patients on a milk diet.

Relapses occurred in 18 per cent. of the high calory cases and in 14.9 per cent. of the milk cases.

From these figures it is probable that diet is without influence on the frequency of recrudescences and relapses. Prolonged recrudescences, however, are apparently less common and relapses are better borne by patients who are well nourished.

Mortality.—Death occurred in 8.10 per cent. of the high calory cases and in 17.6 per cent. of the milk cases. This does not, however, express fairly the reduction in the mortality rate among the high calory cases which includes all deaths (except three who died within a week of admission to hospital) irrespective of circumstances which may have determined the fatal issue. Seven of the eighteen fatal high calory patients were unable, for one reason or another, to take the amount of food they required; thus, one had been on a ten day debauch, one vomited practically everything which was given him, one had status lymphaticus, one had been in the hospital for many weeks with abscess of the prostate before developing typhoid. Another of the fatal cases developed diphtheria. If we deduct these eight cases from the total, there remain ten deaths which are justly chargeable to the high calory group. This gives a mortality rate of 4.50 per cent. as compared with 17.6 per cent. for the patients on the milk diet.

Clinical Picture.—The statistical evidence which I have cited conveys but an imperfect impression of the profound changes which the high calory diet brings about in the natural history of typhoid fever.

While there is, obviously, considerable variation in the course of the disease in different patients, the most striking change in the clinical picture is the practical absence of severe, and, in many cases, of all nervous phenomena. The patients lie in easy positions in bed, such as a healthy man assumes while resting. The severer cases may be somnolent, at intervals flighty, but they are easily aroused. When awake they are alert, their eyes are bright, their facial expressions are natural. The patients lose very little weight and a casual inspection of them gives no hint of the nature or severity of the illness. Many patients read the daily papers and magazines while still running high temperatures. At meal times they turn on their sides, often propping themselves on their elbows, and eat from well filled trays without assistance from the nurse.

If this picture is contrasted with that of the severely toxic, half starved patient, with hollow cheeks, listless expression, staring eyes, and restless, emaciated forms, it is difficult to believe that they portray the same disease.

Influence of High Calory Diet on Treatment.—The use of the high calory diet has greatly simplified the treatment of typhoid fever. The amount of "nursing" is reduced to a minimum. While the preparation of the food undoubtedly demands more time than the administration of a glass of milk every two hours, this additional attention is more than counterbalanced in other directions. The use of drugs has been almost eliminated.

Every patient receives a saline or soap-suds enema in the morning and, as a rule, the bowels require no further attention during the day. If tympanites or diarrhea should develop, it indicates that the diet is improperly arranged and relief is obtained through alteration in the proportions of the foodstuffs.

No attempt whatever is made to control the fever. High temperature is believed to be a potential danger only when patients take insufficient food. Antipyretic drugs are considered dangerous; hydrotherapy, unnecessary. A cleansing bath is given every morning and, if alcohol "sponges" make the patient more comfortable, he receives one or more a day. In my opinion, hydrotherapy owes whatever value it possesses to reduction in total metabolism and not, as has so often been stated, to stimulation of the nervous system. If the increase in total metabolism can be covered by food, the cold bath loses its purpose.

In the absence of delirium, patients do not require constant watching to prevent them from getting out of bed and perhaps out of the window. They are not incontinent of feces and urine, with the consequent frequent changes of the clothing and bed. The tendency to bed sores is thereby lessened.

Fewer patients require cardiac stimulants, though I frequently give strychnin toward the end of the fever, or during convalescence, to restore tone to the musculature of the heart and blood vessels.

SUMMARY

A comparative study of 222 cases of typhoid fever on the high calory diet and of an equal number of cases on a milk diet has brought out the fact that the natural history of the disease, as it has previously been known, is profoundly altered by the maintenance of an optimal state of nutrition. The range of temperature apparently is not affected, but the total duration of the disease is shortened, in some instances by months, through the shortening of convalescence. Certain symptoms which hitherto have been attributed to the specific action of the typhoid bacillus have been discovered to be due to faulty methods of treatment, in particular, to an inadequate or improperly balanced diet. Complications are rendered less formidable, and perhaps less frequent, by maintaining the patient in the best possible state of nutrition. Moreover, the mortality from the disease is reduced by from 50 to 75 per cent.

58 West Fifty-Fifth Street.

ABSTRACT OF DISCUSSION

DR. E. F. DU BOIS, New York: It has been my privilege to be associated with Dr. Coleman for seven years, and I have been able to see almost all of the typhoid patients he has treated during this time. One cannot help being markedly

impressed by the change in typhoid fever as brought about by the Coleman-Schaffer diet. The picture of the patient is changed completely; the typhoid state is seldom seen; extreme apathy is rare; patients require comparatively little attention. Baths do not seem to be necessary. Medication in typhoid fever seems to be almost a thing of the past. As to mortality, the statistics speak for themselves. The general clinical impression of all who have seen a large number of typhoid patients fed on this diet is that the patients are infinitely more comfortable. There is still room for discussion as to the exact number of calories needed by the typhoid patient. The actual number of calories produced by the patient's own body amounts to some 2,000 calories a day. The question is whether one should be satisfied in giving that amount, or should give more. If one wishes to keep the patient in nitrogen balance, one must give about 4,000 calories, but that requires special training on the part of the nurse. Good trained nurses can administer 3,000, but most nurses have difficulty in giving 2,000 calories. At least 3,000 should be given, if possible. Most of the poor results are found in patients who have not been able to take 1,500 calories a day.

I think every one here must have been struck by the contrast between the subjects of the last two papers; that is, diabetes and typhoid fever. In diabetes Dr. Allen and Dr. Joslin have shown the necessity of keeping the calories as low as possible; in typhoid fever Dr. Coleman and Dr. Schaffer have shown the necessity of keeping the calories as high as possible. In modern medicine it is necessary to know the amount of calories in a patient's diet.

DR. DUDLEY ROBERTS, Brooklyn: About four years ago my interest in Dr. Coleman's work led to an examination of his patients in Bellevue Hospital. At that time I was struck with three things: (1) his patients did not look as if they had typhoid fever at all; (2) there was a slight fullness of the abdomen in practically all cases, and (3) there were some difficulties in carrying out the high caloric feeding in private or even hospital practice. Since that time we have had about 100 cases in the wards of the Brooklyn Hospital and these impressions have all been confirmed. When the patient is properly nourished, typhoid fever presents an entirely different picture from the classic one. I have about come to the conclusion that what we have known as typhoid fever is largely the picture of starvation. Slight fullness of the abdomen is usually present and need cause no anxiety. The difficulty of using the high caloric diet we have solved to our satisfaction by the use of food formulas of definite caloric value per given measure, and by insisting that the caloric intake of the patient be known from hour to hour through proper charting.

It is to be feared that Dr. Coleman's work will be damned by too faint praise. We are not dealing with a little more liberality, but with a definite attempt to supply the bodily needs of the patient. An uncorrected mortality of 5 per cent. in our series and no deaths in cases in which high caloric feeding was actually put in practice, make a striking contrast to previous mortality percentages. Fully as important is the amazingly rapid convalescence. This is a monumental work that Dr. Coleman has done, and the plan of treatment should become the generally accepted practice.

DR. C. H. BREIDENBACH, Dayton: Much opposition prevails, and always will, to radical departures from long established practice. I want to supplement Dr. Coleman's work with a report of 137 patients with typhoid fever on high caloric diet.

If we take home Dr. Coleman's message, we will benefit by attendance on these sessions. Some forceful character must arouse us from our lethargy. Here is a preventable disease, exacting, in this country, a toll of 35,000 lives annually—an economic loss of thirty billions in ten years. We have sought too eagerly the spectacular, mysterious and unexplored.

Of our series, seventy-six cases were treated by the high calory diet method from the onset. The results in these cases were gratifying and convincing. The entire aspect of the disease was changed. Noteworthy facts were as follows: absence, or only the slightest suggestion, of the terrifying, distressing, exhausting delirium and the ghastly emaciation which constituted the typhoid picture of the past; 32 patients lost less than 5 per cent. in weight; 20 maintained normal weight;

24 gained from 3 to 5 per cent; 1 died of intestinal hemorrhage.

Sixty-one patients came under observation after the disease had made considerable progress. These patients responded promptly to high calory feeding, delirium began to subside, pulse improved, temperature declined; the benefits of feeding were manifest within forty-eight hours.

Our routine treatment of typhoid will not be regarded as ultrascientific; it is, however, pregnant with gratifying results, although dubbed the C. O. D. treatment—castor oil, opium, and diet. Castor oil every other day will prevent the distention complained of by Dr. Coleman, and is less likely to provoke hemorrhage and perforation than most of us fear. For delirium, opium to the point of narcotism if required to end the coma vigil, tremor, twitching, etc. Narcotism of short duration will restore reason, improve pulse and reduce temperature. One patient died manifesting perforation. Necropsy revealed a thrombosed superior mesenteric artery with necrosis of sections of the small intestine.

Our mortality of 2 per cent. could not be maintained on this or any other treatment, but it is significant. Our policy is, hands off! No meddling treatment, allowing temperatures to run wild; 107 F. is the peak; when this is reached (and it usually is in from three to five days) the hour of improvement has been marked. The next morning, remission will be startling and gratifying, adding weight to Vaughan's suggestion that "In acute infections, high temperatures are perhaps beneficial, in that they may favor the formation of antibodies."

These cases extended over the past three years. We are so well satisfied with results that, until we have a more comprehensive knowledge of the pathologic chemistry of this and other acute infections, we shall not starve our patients, interfere with temperatures, deny them refreshing sleep, or rob them of "Granny's" ever pleasant physic, castor oil.

DR. MAX EINHORN, New York: I rise to substantiate the great value of Dr. Coleman's work in typhoid fever. I had some experience in this line in the German hospital for quite a number of years. I was always in favor of feeding the patients quite well, but I was of the opinion that the diet should be a liquid one, and gave the patients milk and raw eggs; but later, when I became acquainted with Dr. Coleman's work, I started in with the same methods, and in the hospital all my patients were treated according to his methods, with excellent results. I do not want to say that symptoms, with somnolence in typhoid fever are all due to starvation, but I will say that in a patient who is well nourished these symptoms are reduced. A weak patient will become delirious from the toxin of fever, while the well nourished patient will have the same amount of toxins but, with a high diet will not show so many symptoms. While it is not starvation alone that develops these severe phenomena, the symptoms due to the toxins can be greatly reduced by sufficiently raising the standard of nutrition in the body. I think you will find in Leyden's book on dietotherapy that many years ago the problem was raised whether, in typhoid fever in which there is a great expenditure of heat, more so than in health (while a normal healthy person expends 2,400 calories a day, a typhoid fever patient will expend 3,000 to 4,000 calories), it was possible to give enough heat to the body so that the expenditure should be balanced. This was not definitely answered until Dr. Coleman took it up and showed that it was possible to replace the entire amount of calories in typhoid fever when there was a severe disease in the intestines and high fever. Even here the body can be supplied with adequate nutrition, and that is a great advance, for which we should congratulate Dr. Coleman.

DR. E. P. JOSLIN, Boston: Overfeeding during an infectious disease would seem to be an ideal method by which to produce diabetes. I have seen no such case during recent years, but I am sure Dr. Coleman has some information on this point. There is, as we all know, a strong feeling among many physicians that infectious diseases are closely connected with the etiology of diabetes.

DR. A. E. ROUSSEL, Philadelphia: I feel that I should offer some few points of criticism. I wish to report that I have treated over 260 consecutive cases of typhoid fever at the Howard Hospital; 213 of these patients were treated on the

modified diet—neither the milk diet nor the Coleman diet. On forty-nine of them I tried the Coleman diet. It may be that I was not sufficiently enthusiastic in carrying out the Coleman diet in these cases. The number of intestinal hemorrhages was large in the cases on full diet; the abdominal distention was more marked, and diarrhea was more universally present. Now, personally, as a teacher, I believe that probably the truth lies between these two extremes. But no matter what the diet today, the question of leaving temperatures of 107 alone is absurd and dangerous in the extreme. I would not care to treat that way. I repeat the fact that under the modified diet my mortality was 4 and a fraction of 1 per cent.; my mortality on the Coleman diet was over 8 per cent. It is possible that I may not have applied it as well as Dr. Coleman, but it is not difficult to carry out, and I followed his directions carefully. I want to say that we should not be carried away by too much enthusiasm. The intensity of typhoid fever is not as great as it was formerly, with a mortality of about 18 per cent. I think that hydrotherapy, which is bound to stay, has done much to modify its virulence. It appears to me that the cases that I see in consultation in the country and smaller towns are of a more severe type than those in the city. For example, I have knowledge of some cases that originated at a sea shore hotel with a mortality of 100 per cent. This is a degree of virulence that seems to be beyond any form of treatment. *In medio tutissimus ibis*. I think we should not go to extremes one way or the other.

DR. H. A. CHRISTIAN, Boston: Dr. Roussel has touched on one important point in the consideration of statistics in acute infectious diseases, and that is the importance of recognizing that from year to year there is a variation in the curve of mortality. Therefore we must not compare the results of treatment of typhoids or pneumonias of one year with those of another year without making allowance for that variation. I did not catch in Dr. Coleman's paper whether the statistics of the patients on the high calory and low calory diets represent patients in the same or different years. If they represent patients in different years, allowance must be made for variations in the severity of the disease. I think it is important to make that clear. Alternate cases in a given hospital treated, one case in one way and another case in another way, will give more valuable data than taking cases in one year to compare with those in another.

Typhoid fever has changed, as I have seen it in the last five to seven years. Typhoid that is described in the textbooks, typhoid that our students read about, cannot be illustrated at present by the typhoid patients we have in the wards. We have to say to our students that this will impress you of the typhoid you have read about in the books because it is so different. Whether that is due to the feeble virulence of the organism, or to our treatment, is an important thing to know. I have carried out the Coleman treatment in my cases. The results have been satisfactory, but being skeptical, I wonder how much is due to the Providence that determines the pathogenicity of the organism, and how much to our treatment of the disease.

DR. WARREN COLEMAN, New York: In regard to the question of Dr. Joslin, of diabetes and typhoid, in practically the whole series of cases, sugar was present in the urine of only one patient. Of course the urine was not examined every day in all the high calory cases, but I think diabetes could not have been present without our having discovered it. In the case I am speaking of, it was glycosuria; as far as is known, none of the patients developed diabetes during convalescence. The important fact with regard to the patient who had glycosuria was that his sugar tolerance increased at the same time that we increased the carbohydrate intake. That was one of the cases we studied very carefully. The patient was put on the Benedict respiration machine every other day for a long period, so that we knew exactly what was going on with respect to his metabolism, and the sugar tolerance increased in spite of the fact that the carbohydrate intake was raised. One point with regard to Dr. Roussel's remarks is that the more experience I have had, the more important it appears to individualize the feeding. All patients cannot be fed by rule of thumb. It is an individual question entirely. Also, if the patient's intestinal flora is of the putrefactive type at

the beginning, it will take longer to raise his tolerance for the feeding than if he had a favorable fermentative flora. In some cases one can greatly increase the milk sugar and in others not. It is necessary to find out the kind of food the patient requires. With relation to the question of years of the cases in the two groups, raised by Dr. Christian, that is in the paper, I omitted it because I did not wish to take up too much time. As far as possible, the cases were selected in corresponding years. I think the fact that the cases cover a period of ten years to some extent counterbalances the defects in this respect.

THE INFLUENCE OF LABOR ON THE BRAIN DEVELOPMENT OF THE CHILD *

ARTHUR STEIN, M.D.

Fellow of the American College of Surgeons
NEW YORK

The possession of a healthy mind in a healthy body is the first and indispensable condition for survival in the struggle for existence. In view of the far-reaching and disastrous results of mental enfeeblement in the individual, the home and the community, it becomes the duty of the physician to investigate all possible sources of intellectual deficiency and to eliminate all etiologic factors amenable to control. The idiot by heredity, the victim of congenital variation of germ plasm or of embryonic insufficiency of internal secretions, whose brain anomaly dates back to early intra-uterine life, is beyond our help except to the extent that we may benefit him by glandular therapy and educational methods.

Conditions are altogether different in the case of a healthy, well developed child that has traveled safely through the months of fetal evolution and reached the journey's end only to be wrecked during the process of his entry into the world.

Preventable traumatism to the skull and its contents is the subject to be considered in this paper. The rescue of even a single human being from feeble-mindedness incurred through injury at birth is such an important matter that it has occupied my mind for years, ever since in my student days I witnessed an almost incredibly long protracted labor, culminating at last in the spontaneous delivery of a living child. While practically free from external blemishes, it was almost a foregone conclusion that this infantile skull harbored a bruised and congested brain, with hemorrhagic areas and extensive destruction of nerve cells which would in turn lead to arrested brain development and feeble-mindedness.

Instrumental delivery, more particularly by the obstetric forceps, has often been accused of being the cause of birth traumatism, and has undoubtedly caused serious mutilations in the hands of the unskilled; but its action can never be so prolonged or profound as the molding of the soft cranial bones in very narrow or otherwise obstructed pelvic passages.

INJURY TO BRAIN IN DIFFICULT LABOR

Unduly prolonged or otherwise abnormal deliveries may damage the child's brain through three mechanisms: (1) direct contusion of the brain substance; (2) local congestion and rupture of intracranial vessels by the overriding parietal bones, and (3) general

congestion of the venous system caused by an obstruction of the fetal circulation and resulting in capillary rather than in diffuse meningeal hemorrhages.

Prolonged general compression of the child's skull in the birth-passages in difficult unassisted labors is one of the causes of displacement of the cranial bones and a resulting circulatory disturbance in the venous sinuses, according to Kundrat.¹ In a paper on Wormian bones in fontanels and their effect on child-birth, Dr. Grace Peckham Murray² called attention to the possibility of obstetric damage to the infantile cranial contents during the second stage of labor as the time of greatest pressure. Based on personal experience in three lengthy labors with three stillbirths, she points out the detrimental influence on the child in consequence of the unduly prolonged labor. ("Instruments were not used in either instance, as there was a constant expectation that the labors would terminate naturally.")

If the damage to the brain and nerve centers may be sufficient to destroy life, as in the three cases reported by this observer, it is not unreasonable to assume that other infants may survive with irreparably damaged brains. The question also arises whether these Wormian bones in fontanels, especially in the posterior fontanel, by preventing the overlapping of the sutures and normal molding of the child's head, may not contribute their share to the exposure of well developed infants to the danger of idiocy and imbecility through the prolonged compression of the skull in the birth passages.

It is a pity that surviving children born after unaided but unduly prolonged labors have never been systematically studied in their primary school work and later mental development. Equally regrettable is the lack of reliable information regarding the birth conditions of the children in institutions for the feeble-minded. As a rule, there is at best a bald statement to the effect that the birth was natural, without comments on the duration of the labor, or that it was terminated by instrumental delivery, which is often held responsible for the feeble-mindedness. In this manner a prejudice unwarranted by the actual facts is created against the obstetric forceps. Goddard³ states, however, that "since many normal children are delivered by the use of instruments with more or less temporary deformity to the head but without any effect on the mentality, it is unreasonable to conclude in those cases where there is both hereditary feeble-mindedness and a history of instrumental delivery that the latter is the cause of the mental deficiency."

Obstetric clinics, at least so far as I have been able to ascertain, keep no notes on this subject, and I have therefore endeavored to collect some data from institutions for feeble-minded children. I am well aware of the imperfections of these brief statistics, and I offer my figures chiefly in the hope that they may serve to stimulate a needed interest and invite a better study of the subject both in obstetric clinics and in homes for the feeble-minded.

A study of causes of mental defect, active at time of birth in 5,000 cases (from the Pennsylvania Training School for Feeble-Minded Children at Elwyn, Pa.), shows the following results: instrumental deliv-

1. Kundrat: Ueber die intermeningealen Blutungen Neugeborener, Wien. klin. Wchnschr., 1890, **3**, 887.

2. Peckham, G.: Wormian Bones in Fontanelles and Their Effect in Childbirth, Med. Rec., New York, 1888, **33**, 412.

3. Goddard: Feeble-mindedness, Its Causes and Consequences, New York, 1914, 447.

* Read before the joint meeting of the Section on Obstetrics, Gynecology and Abdominal Surgery and the Section on Nervous and Mental Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

ery, 134 cases (2.68 per cent.), and difficult and prolonged labor, but without instruments, seventy-five cases (1.50 per cent.).

In a total of 562 cases recorded at the training school for mentally abnormal children at Vineland, N. J., the history of an unusually difficult or extremely prolonged labor (up to three days) appears 125 times. Special mention is sometimes made of a very large infantile head or one detained for an abnormally long time in the birth passages. Careful investigation of the records results in the discovery that in fifty-four of these protracted births no instruments were employed, which is equivalent to saying that no artificial assistance of any kind was rendered. A systematic review of the clinical material in the asylums on Randall's Island was undertaken in the expectation of securing valuable data for the establishment of the claims made in this paper. Unfortunately, incompletely kept records yielded only meager results.

It appears that on Randall's Island, for example, the first attempts at record-keeping date back less than two years, namely, to August, 1915. Altogether 1,800 histories were investigated, but comparatively few furnished any information on this point; 228 cases recorded since August, 1915, contain no account of the conditions at birth; forty-one case records state that pregnancy and birth were normal, the mental disturbance developing in later childhood as the result of traumatism or infectious disease. Of 308 records which contained statements as to the conditions at the time of birth, eighty-one showed these conditions to have been unfavorable in a variety of ways. Unduly prolonged and difficult noninstrumental deliveries were noted in thirty-four instances.

Some cases taken at random are as follows: Labor occurred at term in a primipara, aged 22 years, and lasted three days; the child was born in convulsions and grew up to a life of feeble-mindedness. Another inmate, a low grade moron idiot, was born after an unassisted labor lasting forty-eight hours. Another child classed as an imbecile is stated as having been born after a very difficult labor in which neither instruments nor chloroform were used. Three cranial operations were performed without benefit and the record adds that they probably did harm.

It is evident that these meager statistics hardly permit one to draw any conclusions. They certainly show that in an appreciable number of cases long delivery did play a part in the birth of the future defective. I feel justified in saying that in more carefully kept records we might find a surprisingly large percentage of feeble-mindedness due to this cause.

PROTRACTED LABOR AND THE OBSTETRIC FORCEPS

Dührssen and his pupil Küntzel,⁴ the only obstetricians who ever took up this subject, claim that an unduly prolonged and difficult birth exerts a far more injurious influence on the child's brain than the skilled application of forceps. Among 450 idiot children, four mental defectives (0.9 per cent.), were found whose idiocy was attributed to instrumental traumatism as compared to a much greater number of difficult unassisted deliveries with twenty-three cases of idiocy. Furthermore, in Küntzel's⁴ compilation there are twenty difficult births with artificial aid, that is, 4.5 per cent. as compared to 0.9 per cent. of idiots brought into the world by means of instruments. Evi-

dently obstetric operations cannot in a general way be accused as causative factors in the production of idiocy, and the application of forceps is decidedly preferable to protracted parturition with its serious danger to the mental integrity of the child.

Whereas the obstetric literature is remarkably poor in material dealing with this important subject, a systematic review of the neurologic literature reveals a startling array of illustrative cases which in the aggregate bear eloquent witness to the necessity of bringing the truth to the attention of obstetricians. Neurologists who have investigated the relation between birth disturbances and epilepsy, for example, are induced to believe that traumatism during the act of parturition predisposes the child's brain to the development of epileptic processes, and that birth disturbances must be held responsible as preparatory causes of epilepsy in a number of the cases.

In the Bicêtre Institute in Paris, the parents of the idiotic, epileptic, and paralytic inmates are carefully interrogated in all respects with a possible bearing on the condition of the child including all the details of delivery, especially as to its length and difficulty. The example could be advantageously followed by our own hospitals. Tissier's⁵ statistics of mentally abnormal children in this institution comprise altogether 900 cases, in 550 of which the patients were living at the time of the report; the remaining 350 cases concerned patients who had died in the same hospital since 1883. Of seventy-six idiotic children, eighteen were born asphyxiated after difficult labors, and eighteen were born after difficult labors, but not asphyxiated.

Shuttleworth and Potts,⁶ on the basis of experience with 2,380 mentally deficient children observed at the Royal Albert and Darenth Asylum, say:

Among causes acting at birth, that to which undoubtedly most importance attaches is prolonged parturition. It has been alleged that the use of forceps is accountable for a considerable amount of cerebral injury and consequent mental impairment. So far from this being the case it would appear from the statistics [of Shuttleworth and Fletcher Beach] that protracted pressure without instrumental interference is a much more potent cause both of mental and nervous defect. It is unquestionable that the asphyxia neonatorum, so often due to protracted unassisted labor, is in some cases followed by birth palsies and enfeeblement more or less severe of the intellectual powers. It is probably accountable for not a few of the milder types of mental feebleness.

The words of Currier⁷ must be quoted in this connection:

A large head in a small pelvis or even a normal head in a nearly normal pelvis may be retained so long that the brain will be dangerously compressed. This is not an infrequent occurrence when the uterine contractions are indefinitely suspended in connection with the uterine inertia. Such cases were far more frequent in the past than now, the labor being allowed to continue for days rather than interfere with what were supposed to be the legitimate efforts of nature. A skull which has been compressed by such prolonged incarceration may resume its proper contour after a longer or briefer period of time and give no outward evidence of injury, but it is quite probable that if the sensitive brain has undergone compression to a considerable degree for many hours, the result will be disastrous to the child, imbecility or idiocy being the consequence. Of course the effects of this injury may not

4. Küntzel: Ueber den Einfluss geburtshülfflicher Operationen auf die geistige Entwicklung der Kinder, Inaug. Diss., Berlin, 1891.

5. Tissier, P.: De l'influence de l'accouchement anormal sur le développement des troubles cérébraux de l'enfant, Thèse de Paris, 1899.

6. Shuttleworth, S. E., and Potts, W. A.: Mentally Deficient Children, Philadelphia, 1910, 88.

7. Currier, A. F.: Injuries of the Head in the New-Born, Med. News, London, 1901, 79, 161.

be apparent for many months or even years. In cases of this character the effects of hemorrhage may also be disastrous, the blood escaping through an opening in the scalp or forming a tumor under the scalp or the pericranium, or effusing and coagulating within the membranes or within the substance of the brain itself. It is largely to the credit of modern obstetrics that these accidents have become less frequent, for by the advocacy of the timely use and proper application of the forceps or other suitable instrumental procedures, it has indicated the way to anticipate and obviate them while it has at the same time brought relief to the troublesome injuries to the maternal soft parts which were so common when the labor remained unassisted for several days.

To let nature take its own course is an especially risky procedure in the case of the many children with a faulty heredity. Any traumatism of the head is here especially significant, for a brain injury which might leave no trace behind it in normal children is extremely apt to induce permanent disturbances followed by idiocy or the milder degrees of mental enfeeblement (Wulff⁸).

Family reports collected by Volland⁹ plainly show the occasional injurious influence of birth traumatism, for in the same family the normally born children may remain well, whereas those born after a difficult labor become epileptic.

Whereas the value attached by certain neurologists and psychiatrists to protracted labor and infantile asphyxia as etiologic factors in later manifestations of mental enfeeblement has been greatly exaggerated according to some writers (Hannes¹⁰), others on the basis of their findings emphasize that birth traumatism possesses an undeniable importance in this respect, and that there are cases of idiocy in which no other etiologic factor is left but an abnormal delivery (Klotz¹¹). Still other writers concede the possibility of irreparable damage to the brain through birth traumatism, without regarding this danger as at all probable.

The reason the sequelae of cranial compression are recovered from in some cases but prove irreparable in others cannot be satisfactorily given at the present state of our knowledge. Strohmeyer¹² comments on the very frequent statements concerning prolonged parturition in the anamnesis of feeble-minded children.

Klotz¹¹ contributes a small but unobjectionable list of 144 cases in boys and girls, admitted in the course of five years to the Schwerin institute for abnormal children. "Abnormal birth" was stated in nineteen cases, including eight protracted labors and eight forceps deliveries. Three children were born asphyxiated. After strict exclusion of all cases with faulty heredity or other complicating or predisposing etiologic factors, there remained five protracted labors as alone responsible for two idiotic and three imbecile children.

Jelliffe and Peterson¹³ point out that parturitional factors, including meningeal hemorrhage from prolonged labor, are active in about 18 per cent. of the

cases, and it is emphasized that forceps traumatism is less injurious to the infant than tedious labor.

Ziehen¹⁴ regards protracted labor as an important etiologic factor in the production of cortical aphasia and retrogressive changes of the brain, as well as of certain cases of nuclear anomalies of development.

Difficult and protracted deliveries are held responsible as the cause of cerebral palsies, in many cases, by Ibrahim¹⁵ who says that although the application of forceps may have a similar effect, skilled instrumental assistance undoubtedly prevents rather than produces the hemorrhage in most of the cases, the circumstances which have led to the application of the forceps being usually responsible for the origin of the trouble.

Peterson and Fisher¹⁶ place prolonged labor first in importance in the etiology of cases of infantile spastic hemiplegia occurring at birth or infancy. They say that a large proportion of children who require resuscitation become imbeciles, meningeal and capillary hemorrhage being produced by pressure in the maternal passages. They say:

It is probable from careful investigation that the use of forceps has little to do with causing these cases; but, on the contrary, its delayed employment or nonuse more often results in danger to the child.

Sachs and Peterson¹⁷ writing on cerebral palsies in early life based on an analysis of 140 cases, point out the moral to be drawn from their table of causes in the congenital cases, namely, that the forceps should be applied if necessary; or delivery hastened by other means if protracted labor can be averted:

A child's brain and skull have a wonderful power of resistance; but do not credit them with greater virtue in this respect than they really possess. The mother's life is by far the more important, but it is well to reflect that, other things being equal, she prefers a child that is neither paralyzed nor idiotic.

All degrees of mental enfeeblement, from slight imbecility to extreme idiocy, may occur in association with the cerebral palsies of young children which are not infrequently the result of birth traumatism. Sachs¹⁸ concludes from the especially common occurrence of idiocy in the paraplegias (60 per cent.) as compared to hemiplegia (13 per cent.) that this congenital spastic paraplegia must be of cerebral rather than of spinal origin, and this view has been amply confirmed by later investigations. He believes that many a paralyzed and idiotic child would lead a normal existence if the child had been properly considered at the time of birth.

To delay the application of the forceps, as is the rule of many obstetricians, until the fetal heart sounds become weak or inaudible, means that irreparable damage has often already been done to the infant's brain. In the interest of the child, unduly protracted births should be terminated by judicious intervention.

One of the illustrative cases under Sachs' observation concerned a boy, aged 3½ years, the second born of a pair of twins after an extraordinarily protracted

8. Wulff: Die geistigen Entwicklungshemmungen durch Schädigung des Kopfes vor, während, und gleich nach der Geburt, Allg. Ztschr. f. Psychiat., 1893, 49, 133.

9. Volland: Geburtsstörungen und Epilepsie, Allg. Ztschr. f. Psychiat., 1906, 63, 725.

10. Hannes, W.: Zur Frage der Beziehungen zwischen asphyktischer und schwerer Geburt und nachhaltigen psychischen und nervösen Störungen, Ztschr. f. Geburtsh. u. Gynäk., 1911, 68, 689.

11. Klotz, M.: Die aetiologische Bedeutung des Geburtstraumas für die geistige und körperliche Entwicklung, Ztschr. f. d. ges. Neurol. u. Psychiat., 1914, 8, 1.

12. Strohmeyer, W.: Vorlesungen über die Psychopathologie des Kindesalters, Tübingen, 1910, 187.

13. Jelliffe, S. E., and Peterson: Idiocy, Imbecility and Feeble-mindedness, Peterson and Haines, Textbook of Legal Medicine and Toxicology, 1903, 1, 668.

14. Ziehen, T., in Bruns-Cramer-Ziehen: Handbuch der Nervenkrankheiten im Kindesalter, 1912.

15. Ibrahim: Curschmann's Lehrbuch der Nervenkrankheiten, p. 657.

16. Peterson, F., and Fisher, E. D.: Cranial Measurements in Twenty Cases of Infantile Cerebral Hemiplegia, New York Med. Jour., 1889, 49, 365.

17. Sachs, B., and Peterson: Cerebral Palsies in Early Life, Based upon an Analysis of 140 Cases, Jour. Nerv. and Ment. Dis., 1890, 15, 295.

18. Sachs, B.: Contributions to the Pathology of Infantile Cerebral Palsies, New York Med. Jour., 1891, 53, 503; Die Hirnlähmungen der Kinder, Volkmann's Samml. klin. Vortr., Nos. 46-47 (Innere Medizin No. 16), 1892, 435.

labor. Aside from spastic paraplegia the child presented an idiotic appearance and cried incessantly. Speech had never developed; the skull was small and unsymmetrical.

Another little boy with congenital spastic paraplegia came under observation when he was 1 year of age. He was born asphyxiated after the hard, dry labor (forty-eight hours) of a primipara. The mental condition so far as could be judged was deficient but not absolutely idiotic. The child did not survive the first year, and the necropsy showed absolute adherence of the pia over both hemispheres and a marked symmetrical atrophy of the frontal halves of both hemispheres. The anatomic diagnosis was clearly that of a chronic meningo-encephalitis. We cannot err in attributing this meningo-encephalitis to a very widespread effusion of the blood between the pia and the cortex at the time of birth. Protracted labor and the marked asphyxia are the clinical conditions which corroborate that view.

The statistics of Fletcher Beach¹⁹ give a ratio of 27.28 per cent. to prolonged parturition as a factor in the production of idiocy. On comparing these figures with Shuttleworth's admittedly imperfect statistics on this point, we obtain a proportion of 17.5 per cent. Of these the much larger number (14.24 per cent.) are attributed to protracted pressure without instrumental interference. Only 3.31 per cent. are attributed to forceps delivery. In comparatively few of the latter, however, were injuries noted due to the use of forceps, and there is no doubt that prolonged parturition is more detrimental than delivery by forceps.

In the experience of Fletcher Beach in the Darenth Asylum for imbecile children, the use of forceps had much less influence than their disuse in the production of idiocy and imbecility, as he points out in another article. Students sent by some of the lecturers on psychologic medicine were taught by him that prolonged and difficult labor is a potent cause of imbecility and that in such conditions it is better to put on the forceps than to run the risk of prolonged compression of the head, resulting in asphyxia, paralysis and other evils. The use of forceps skilfully applied is preferable to prolonged and difficult labor. On careful inquiry it was found that of 810 cases of idiocy in which histories could be obtained, only thirty-four, or 4.3 per cent., were charged to the application of the obstetric forceps, whereas 216 cases, or 26.6 per cent., were apparently due to prolonged and difficult labor. The majority of these infants when born were not only asphyxiated but also in a helpless condition, some having lost the use of their legs, and others becoming subject to convulsions; moreover, the head was often crushed, elongated, discolored and deformed. The table of causes of idiocy and imbecility in 2,380 cases abstracted from the Royal Albert Asylum and Darenth Asylum case books include the records of prolonged parturition, that is, protracted pressure in 339 cases not including the instrumental deliveries.

According to König's²⁰ investigations of the etiology of simple idiocy based on 260 cases, difficult birth with or without asphyxia of the child was noted in thirty-nine cases (5 per cent.), thirty-four of which were spontaneous labors without instrumental assis-

tance. In seventeen of these cases, difficult labor and asphyxia could be assumed with a fair degree of certainty as the true and only etiologic factor, and it is suggestive that in not a single instance could difficult labor be excluded as a cooperative factor.

In France, Wallich²¹ was enabled to trace the meningeal lesions of new-born children to traumatism in twenty of thirty-two cases in which examination was made. Babonneix²² repeatedly observed intellectual disturbances in the form of backwardness, imbecility and idiocy as the result of birth traumatism both in instrumental and in natural but unduly prolonged labors. He emphasizes the necessity of childbirth taking place under as easy and nearly normal conditions as possible, especially in the interest of the child's intelligence.

In this country, Reichard²³ emphasized nearly twenty years ago that the infantile cerebral membranes and tissues are in far greater danger from prolonged and unassisted labor than from any pressure which may be applied to the head by the proper use of the forceps. He maintains that vastly more damage is done to the structures involved in mental and nervous processes by injudicious and incapable delay than by the timely and proper use of the forceps.

Some writers, as Sander²⁴ and Langdon Down,²⁵ go so far as to deny altogether an injurious influence of the obstetric forceps when skilfully handled. In contradistinction to the small number of idiots born in countless forceps deliveries, an incomparably larger number of children actually owe their rescue from the dreary fate of the idiot precisely to the judicious application of the obstetric forceps.

Granting that the most salient causative factors in the production of idiocy are prenatal influences exerted on the fertilized ovum and the embryo, it is apparent that we are powerless to modify the processes of ontogenesis, and it therefore becomes of double importance to preserve intact the brain which has been normally developed to the end of gestation.

Naturally primogeniture plays a part in the etiology of congenital and early acquired mental deficiency, since the labor of a primipara is often slow and difficult, thereby favoring prolonged compression of the head in the birth passages, and asphyxia.

Even in the writings of Vogt²⁶ who protests against exaggerated valuation of injurious parturitional factors as causes of idiocy, the admission is found that in seven of 471 cases of congenital and early acquired cerebral deficiency with the statement of protracted labor, the difficult birth of the child proved to be the only etiologic factor to which its condition could be charged.

We may allow some compression of the infant's head in the interest of speedy extraction, for the cranium of the new-born is so elastic that this small amount of pressure can be borne for a short while without danger of permanent damage from expert application of the blades.

Violent manipulation of obstetric instruments may lay the foundation for mental deficiency of the child.

21. Wallich, N.: *Recherches d'anatomie pathologique chez le nouveau né*, Ann. de gynéc. et d'obst., 1898, **49**, 201.

22. Babonneix, L.: *Les traumatismes obstétricaux dans l'étiologie des encéphalopathies infantiles*, Gaz. d. hôp., 1909, **82**, 1601.

23. Reichard, V. M.: *The Obstetrical Forceps as a Cause of Mental and Nervous Disease*; A Protest, Med. News, 1898, **73**, 199.

24. Sander, in Eulenburg: *Real-Encyclopædie der gesamten Heilkunde*, **6** and **7**.

25. Down, Langdon: *On Some of the Mental Affections of Childhood and of Youth*, Lettsomian Lectures, London, 1887; Wood's Medical and Surgical Monographs, New York, 1891, 307.

26. Vogt-Weygandt: *Handbuch der Erforschung und Fürsorge des jugendlichen Schwachsinnigen*, **1**, 1911.

19. Beach, Fletcher: *Is Instrumental Delivery a Cause of Idiocy?* Lancet, London, 1889, **1**, 97. Tuke, Hack: *Article on Idiocy*, Dictionary of Psychological Medicine, Philadelphia, 1892.

20. König, W.: *Die Aetologie der einfachen Idiotie verglichen mit den cerebralen Kinderlähmungen*, Allg. Ztschr. f. Psychiat., 1904, **61**, 133.

just as prolonged compression between the unyielding walls of a narrow pelvis; but the fact is sometimes overlooked that even in children born after a natural and normal labor the head is necessarily molded (and probably suffers the limit of its tolerance) as a result of its journey through the bony canals.

Cranial compression in a contracted pelvis is enumerated among the causes of mental deficiency by Krafft-Ebing,²⁷ Samuel and other authorities. The reasons for more active obstetric intervention in tedious labors were investigated by Hofmeier²⁸ in the Würzburg clinic on the basis of a material of 168 children who died during or in consequence of the birth process. In ninety-seven cases (58 per cent.) the deaths were referable to complications which were in no way related to the bony pelvis, whereas in seventy-one cases (42 per cent.) the child's death was directly due to a contracted pelvis either alone or in combination with other complications. A moderate increase of forceps deliveries is advocated by him in the interest of the child.

The advance in the art of the obstetrician is strikingly illustrated by twentieth century studies of the internal secretions and the addition of pituitary solution to the means of artificial assistance of childbirth at our disposal. At present it is not only the proper handling of the forceps on which the up-to-date accoucheur relies for the abbreviation of tedious labor and the protection of the infantile cranium. The use of pituitary solution in small doses, that is, from 2 to 3 minims, as an adjuvant in normal labor at term, which I have advocated on the basis of personal experience in a series of cases, represents the latest achievement in practical obstetrics. It is an established fact that the action of this powerful glandular extract will often shorten by many hours the time during which the brain of the child would otherwise be exposed to a dangerous compression between the rigid bony walls of the birth passages. Less than ever, since the introduction of pituitary solution, can the indolence be condoned which formerly permitted a difficult labor to drag on for days before the necessity for interference was finally admitted. Pituitary solution in small physiologic amounts as administered to our patients is probably destined to save many a well developed infant from the dreary fate of idiocy or feeble-mindedness.

In the laudable endeavors recently inaugurated for the obtaining of "better babies," the enthusiastic workers along eugenic lines can no longer afford to overlook the threatened deterioration in the quality of the offspring through traumatism at birth.²⁹

CONCLUSIONS

1. Prolonged, unassisted labor is responsible for much avoidable, harmful compression of the infant's skull in the birth passages during the period of labor.

2. The damage sustained by the child's brain and meninges often affects intellectual growth, resulting in the production of all degrees of mental impairment, from feeble-mindedness and imbecility to absolute idiocy.

3. The connection between obstetric traumatism and nervous disease in the widest sense of the term has not received sufficient consideration in the past, on account of the nonexistence of a systematic cooperation between maternity hospitals and institutions for feeble-minded children.

4. In the interest of more efficient control of preventable idiocy, a better cooperation in the form of more detailed records of the conditions during labor and of the subsequent mental development of the children is urged.

5. A better understanding between obstetricians and neurologists will help to diminish the number of imbeciles and idiots.

6. The obstetric forceps, correctly applied, are a beneficent weapon against the abnormally prolonged passage of the child's head through the pelvic canal.

7. Pituitary solution in small doses (from 2 to 3 minims) hastens the course of labor in many cases, rendering the application of the forceps unnecessary and safeguarding the contents of the infant's skull.

11 East Sixty-Eighth Street.

ABSTRACT OF DISCUSSION

DR. FREDERICK PETERSON, New York: Twenty-five years ago Dr. Sachs and I made a number of studies of the infantile cerebral palsies, finding that the chief cause of palsies occurring during parturition was tedious labor with resulting intracranial hemorrhages, and laid down the dictum at the time that the application of the forceps in tedious labor did less injury than the long continued compression.

While these cases are often catalogued wholly under the heading of cerebral palsies, there are associated conditions such as epilepsy in 45 per cent. of cerebral palsies, and even more common are the three degrees of defective mind, namely, feeble-mindedness, imbecility and idiocy.

There have been studies of hemorrhages in the central nervous system in stillborn children, such as that of 130 cases by H. Spencer, showing the relative distribution of hemorrhage as follows: 4 thrombosis of longitudinal sinus; 1 intracerebral; 7 lateral ventricles; 6 limited to the base of the brain; 30 spinal canal and cord; 53 from pia and arachnoid. Of these last, 29 are bilateral, 10 over the right hemisphere only and 10 over the left hemisphere. Of course the size and depth of the clot must determine the symptoms. For instance, in one case without paralysis there was congenital epilepsy and hemianopsia; in two or three, hemianopsia associated with hemiplegia and feeble-mindedness. There is every reason to believe, as I have often said, that there are many cases of various degrees of mental impairment without either epilepsy or paralysis due to the same cause—intracranial hemorrhage due to tedious labor.

It has been said that about 18 per cent. of all cases of congenital idiocy are due to parturitional causes, chiefly tedious labor, though these statistics may be revised with further study of etiology.

DR. E. B. CRAGIN, New York: The importance of this subject can hardly be estimated. It is said that the general physician has the advantage over the obstetrician or surgeon. The general physician can put his mistakes underground. The obstetrician sees them walk about, and often they go to other members of the profession. Many an obstetrician mourns to see a child whom he has brought into the world

27. Krafft-Ebing: *Lehrbuch der Psychiatrie* Ed. 6, 1897, p. 607.

28. Hofmeier, M.: *Ueber die Berechtigung einer aktiveren Richtung in der geburtshilflichen Therapie*, *Ztschr. f. Geburtsh. u. Gynäk.*, 1907, 59, 205; *Centralbl. f. Gynäk.*, 1907, 31, 774.

29. In addition to the references already given, the following will be found of interest:

Ballantyne, J. W.: *The Head of the Infant at Birth*, *Edinburgh Med. Jour.*, 1890, 36, 97.

Barr, Martin W.: *Mental Defectives, Their History, Treatment and Training*, Philadelphia, 1904, 115.

Bochroch, M. H.: *Birth Palsies*, *Med. News*, London, 1903, 32, 1144; *New York Med. Jour.*, 1903, 78, 546.

Gans, H.: *Früh- und Spätergebnisse der Zangenoperation für Mutter und Kind*, *Monatschr. f. Geburtsh. u. Gynäk.*, 1908, 29, 430.

Koelle: *Ursachen des Schwachsinn, IV Schweizer Konferenz für das Idioten Wesen*, 1903.

Kowitz, H. L.: *Intrakranielle Blutungen und Pachymeningitis haemorrhagica chronica interna bei Neugeborenen und Säuglingen*, *Virchows Arch. f. path. Anat.*, 1914, 215, 233.

Putnam, J. W.: *Prolonged and Tedious Labors and Forceps Deliveries Compared as Causes of Epilepsy, Idiocy and Cerebral Diplegias*, *Buffalo Med. Jour.*, 1909, 64, 353.

Ryerson, E. W.: *Brain Injuries at Birth*, *Internat. Clin.*, 1915, Series 25, 2, 106.

Vogt, H.: *Epilepsie und Schwachsinnzustände im Kindesalter*, *Arch. f. Kinderh.*, 1908, 48, 321.

walking along the street showing mental impairment as the result of the delivery. What can be done during pregnancy to prevent the intracranial hemorrhage and consequent mental impairment? We have to recognize that a breech presentation is followed by more of a tendency to cerebral hemorrhage than a vertex. This means that the obstetrician must carefully study during the pregnancy the presentation of the child, and, if possible, correct it before labor. This also means that we should examine our pregnant patients through the abdomen more frequently than many do, and the accurate diagnosis thus made means a great deal for the child as well as the mother. In the second place, there must be a careful study of the mechanical factors in this mechanical problem. We must know whether the pelvic canal is large enough to let that fetal head pass through; in other words, we must know the relative size of passenger and passage. The knowledge of that is the solution of the problem. When we come to the labor itself, as has been said here, often it is not the use of the forceps, but the delay in the use of the forceps, that has caused an intracranial damage. It means that women must not be left too long in the second stage of labor. After determining that the head is too large to go through the canal, the woman should be subjected to cesarean section and the baby relieved from the danger of the long compression. Only by improved methods of obstetrics shall we meet this problem of intracranial hemorrhage. While we are at present meeting this condition, we must extend this ability by having the obstetrician of small experience so study the problem that he can estimate the relative size of the passenger and the passage and not allow a woman to go into labor who should not. Regarding the application of the forceps, there must be accurate diagnosis of the position and ability to change an occiput posterior into an occiput anterior. With these precautions and a selection of the cases for cesarean section and for the forceps, we shall improve the art of obstetrics and solve the problem which is before us today.

DR. CHARLES K. MILLS, Philadelphia: I shall confine myself to one point, that is, the explanation of the manner in which the result is brought about as regards epilepsy, mental defect, etc. Every body is familiar with instances of gross hemorrhage, but the conditions which result in these cases of cerebral traumatism during delivery of most importance are not of this kind.

Many years ago I became interested in the observations of Duret on cerebral traumatisms, and later also I published one or two papers on cerebral hemorrhage. These observations of Duret on traumatism, my own and those of others, I think, gave the key to the manner in which these conditions of mental defect, epilepsy, etc., may occur. Duret dropped his animal from a certain height. In some instances large hemorrhages took place, and in others not; but in all his experimental cases necropsies were made and certain definite conditions were found, and those conditions were similar to those which I found in my studies of cerebral hemorrhage. A case of cerebral hemorrhage and apoplexy of the usual or unusual type is one in which the brain is hit a blow from within, whereas in the case of the experimental trauma it is hit from without. I found in these cases of cerebral hemorrhage of severe and sudden type, conditions almost identical with those which were found by Duret in his observations on animals which he had subjected to experimental falls. He found what I observed, widely distributed, minute hemorrhages both in the membranes and in the cerebral substance, in certain particular locations there being more marked than elsewhere. The interesting thing is the pathogenesis of these cases. I have always thought that Duret's theory of traumatism was probably correct: that when a blow is struck on the skull from without, the results are due largely to the displacement in a peculiar way of the extraventricular and intraventricular cerebrospinal fluid. Occasionally he found examples of fracture of the floor of the fourth ventricle. The theory was that this fluid, suddenly displaced by a traumatism from within or blow from without, caused sudden extravasations by the withdrawal of the support usually afforded to the walls of the vessels.

Regarding therapeutics, I can say nothing except to endorse what has been said about the importance of concluding labor. There is not only prolonged pressure, but a series of jams and recoveries which play just the part necessary to produce these disseminated hemorrhagic foci. In regard to the examination of these brains by obstetricians, I think too much attention has been paid to large hemorrhages. Examinations should be made with elaborate care to discover all that is present in these children when death results.

DR. G. L. BRODHEAD, New York: One of the sentences in Dr. Stein's paper is open to criticism in a very friendly way, but I know his views are in accord with mine. He said that instrumental delivery can never be so prolonged of so profound as the molding which takes place in protracted labor. We all know that in many cases of contracted pelvis the child gets into the world alive only because of the prolonged molding. In his series of 562 cases at Vineland Dr. Stein mentions 125 difficult labors, in fifty-four of which no instruments were used; and his statement that the statistics in our institutions are defective is borne out in this instance. He says that in fifty-four cases no instruments were used, but we have no idea from the statistics how many breech presentations there were. We know that in breech delivery there is a mortality of from 10 to 15 per cent. Some infants die immediately; some within a week or ten days. If these institutions would only endeavor to ascertain the details of the birth records of these babies, especially when born in a city institution where complete records are obtainable, much valuable information would be obtained. Dr. Stein referred to the employment of forceps being more serious than prolonged labor. In this I do not agree, because if forceps are used as they should be, there is less danger in the operation than in a very prolonged labor. I agree with Dr. Stein in disagreeing with Dr. Harris and others that labor has no influence on the development of the child's brain. It seems to me only rational to say that if pressure causes birth palsy, we certainly may look for brain abnormalities from the same cause. If the nerves are affected, why not the sensitive brain?

Dr. Stein also brought out an important point about delaying the forceps operation until the fetal heart beat was practically inaudible. I think we cannot attribute bad results to forceps when we wait until the child is practically dead and then apply instruments.

I agree with him on the value of pituitary extract in prolonged labor. One point not mentioned was the danger of giving pituitary extract in some of the cases in a protracted second stage, with the cervix dilated and the head right at the outlet. I am sure I have lost several babies by giving pituitary extract when the head was in the pelvis ready to be extracted. Pituitary extract in some of these cases causes such a tonic contraction of the uterus that the child loses its life from asphyxia. I know that Dr. Stein believes with me that cesarean section in selected cases of pelvic contraction is attended with better results than allowing the labor to be unduly prolonged.

DR. E. D. FISHER, New York: A number of years ago I was interested in this subject and wrote a paper at that time in conjunction with Dr. Peterson, including a consideration of the hemiplegias and diplegias. An interesting point was the great destruction of the brain tissue. There was not so often a meningeal as a capillary hemorrhage or vascular disturbance in the cortex of the brain, the symptoms varying according to the area involved. The cases which came to necropsy showed very marked degeneration of the brain structure. Improvement or recovery was almost impossible with such defective conditions. My experience has been that delayed labor is more often the cause of this condition, which is a purely mechanical one, not developmental, than the application of forceps. I agree with the essayist on the importance of this subject and the desirability of an extensive and long continued investigation regarding it. Instead of talking about the protracted labor, we must state what we mean. When is it long? Is it in the first stage or second stage? That is of the utmost importance. As I understand it, the dangers are chiefly from disturbance of the circulation, with direct compression of the child. I think every obstetrician

will admit that the danger of the death of the child is very greatly dependent on the character of the uterine contractions. If the contractions are weak, labor may go on for hours and there is no danger to the child's life. As a matter of fact, most of the lengthened labors are prolonged in the first stage; the contractions are not strong enough to dilate the cervix. The question is largely a mechanical one.

DR. ALFRED B. SPALDING, San Francisco: A median episiotomy in my experience does not add to the dangers of complete laceration and does relieve the child from severe head pressure in primiparous labors. When there is pressure on the head during the perineal stage of labor, oxygen given to the child via the placenta will cause even asphyxia pallida babies quickly to turn pink and rosy. Many children can be saved from injuries due to asphyxia of the cortical centers by giving the mother oxygen under pressure while she is under the influence of an anesthetic.

DR. SAMUEL J. DRUSKIN, New York: I have seen a number of cases of fractured skull in prolonged labors with mechanical deliveries. Under the use of pituitary extract I have seen in the first twenty-four hours some cyanosis in the child, with a mottled appearance of the skin and an eruption somewhat like urticaria. Although these conditions disappear, whether there is a degree of permanent impairment I do not know. I have recommended pituitary extract for a number of years. It is necessary, however, to call attention to some of these incidents.

DR. HUGH T. PATRICK, Chicago: I am glad to know that obstetricians may anticipate these difficult and dangerous labors and thus avoid birth palsies. I would emphasize the fact that a large proportion of these palsies occur in first-born. That is to say, these are the cases in which investigation of the pelvis and the position of the child is of the greatest importance. Another point not yet mentioned is the considerable number of these cases in the prematurely born; that is to say, the child is small and no difficulty is anticipated. I presume that in these children the brain and blood vessels are much more delicate and friable than in the full-term child. Consequently the greatest care should be exercised by the obstetrician. I would also suggest that the obstetrician thoroughly examine the child a few weeks after birth. I do not know how many times I have heard my obstetric friends congratulate themselves and each other after a difficult obstetric procedure that they had a living mother and a living child, it never having seemed to occur to them that this living child might be a very defective child. Now in the case in which the obstetrician congratulates himself on having brought a living child into the world, he should watch that child, or, what is perhaps better, get a competent neurologist to do it. He should be the first to discover the bad effects of the delivery. If, as has been said by one of the leading obstetricians here, occasionally the best of them lose a child, what is a fair proportion between the dead babies and the injured heads of the living babies? I do not know; I presume nobody knows. I should say, however, that for every dead child an obstetrician gets, he gets three with an injured brain. These are the children he ought to know about before the labor begins. Idiocy or imbecility without paralysis is very rarely due to birth injury.

DR. M. ALLEN STARR, New York: Like Dr. Patrick, I have been defending obstetricians all my life and trying to relieve them of the responsibilities of these idiocies and palsies. I would call attention to the fact not brought out that in an analysis of 100 necropsies on idiots, only from 19 to 20 per cent. were really due to hemorrhage in the brain. There are defective conditions of development in the brain—porencephalia, atrophy, and various conditions covering 80 per cent. of the cases of idiocy. Therefore, it seems to me that we cannot in this large number of cases blame the obstetrician, and that we can relieve the self-reproach of the mother by assuring her that in a given case the chances are that the condition of the child is not due to her contracted pelvis, and that is a psychologic element which should not be ignored for the comfort of the mother.

DR. MAX ROSENTHAL, New York: It has always seemed to me that obstetricians might do for this complication what

they have done for ophthalmia neonatorum. We all know that idiocy and spastic conditions follow birth palsies. I do not think we realize, however, how often epilepsy and brain disturbance late in life are the result of a slight injury at birth, a vascular injury occurring perhaps in the silent area of the brain yet which makes itself felt by development of idiocy or of paralysis. We must not forget that the brain at birth is in a developmental period. A great deal of the cellular and glandular development takes place after birth. Therefore, if injury occurs there it not only jeopardizes what is there, but also the possibility of future development. Furthermore, I think that some mention should be made of Dr. Cushing's effort to operate for the hemorrhages in birth palsies. There are not many cases on record but we should all bear the subject in mind, especially the obstetrician. I never see these cases until two or three weeks or a month after injury, when it is too late to consider operation for relief of the clot. Obstetricians should realize the possibility of operation in these severe hemorrhages of the new-born.

DR. ADOLF MEYER, Baltimore: It is obvious from this discussion that if we are to make any progress in the question of the influence of labor on the subsequent mental development of the child, the work will have to be done where there are good obstetric records, early collaboration between obstetrician and neurologist or psychopathologist, and adequate follow-up work. My one time teacher, Pinard, showed in a study of heredity how close the obstetrician stands to the family and to the debatable origins of early defects. An examination of the children with a record of the various types of birth stress or birth accident shortly after birth and again about the age of four or five or the early school years can alone promise dependable statistics.

DR. P. B. SALATICH, New Orleans: We tried operation on the patients with hemorrhage, but so many died that we abandoned the practice. In many cases in the first stage of labor one finds the cervix dilated but that the head remains high. Should such cases terminate normally there is still so much pressure that hemorrhage is likely to occur. If, after vaginal examination, and pressure from above, the head still will not engage, we know that it is either too large or that there is a disproportion between the pelvic brim and the head. Cesarean section should be done in such cases. I do not think we spend enough time on the careful examination of our patients. If all primiparas were examined carefully, and if we found in some cases a diminution of half an inch and advised that about the eighth month something be done, I think we would not have so much trouble at the end of the pregnancy. Of course, the patient may wish to continue the pregnancy, with the possibility of the cesarean section. Many decry pituitary extract because they do not use it in the right way. I now use it when the cervix is slow in dilating, giving 1 or 2 minims. When the cervix is dilated I give about 5 minims. When the head is down on the perineum and the pituitary extract has lost its effect, I give the patient 8 minims. If the perineum offers great resistance, I do an episiotomy. Of course it reads nicely in books, trying to hold the weight of the baby down in the last two months. In some cases you can succeed, but in about 75 per cent. the women are content to have large babies. You do not always have the truth from your patients, and you find that they will not eliminate the carbohydrates or alcohol.

DR. CHARLES R. BALL, St. Paul: I have wondered for some time why this subject has not been given more consideration. It is important to consider every measure for the prevention of these injuries, but after they occur what shall be done and how are they to be recognized in the new-born? What are the symptoms of cerebral injuries occurring during parturition? We may have perhaps a blue baby, which is hard to resuscitate, and for the few days following birth is exceedingly quiet and still. One might feel inclined to say that such a baby was a good baby because it did not cry. This condition of quietude simply means that the baby has received a serious shock and this shock is still continuing. Within a day or two, many of these babies who have received intradural and extradural hemorrhages have convulsions. It seems to me that in cases presenting such symptoms a care-

ful examination should be made to determine as nearly as possible, whether there are any symptoms of brain localization, such as paralysis, etc. If, therefore, we have a blue baby, one difficult to resuscitate, in which one side of the body seems more helpless than the other, and, particularly if there are convulsions, why is an exploratory incision not a rational procedure? Make a very small trephine opening, slit the dura and raise it up in order to see if there is any hemorrhage.

I believe that we ought to pay more attention to such symptoms as I have described in new-born babies and thus endeavor to prevent the subsequent physical, moral and mental defects which such injuries cause.

Several years ago I recommended an operation on a 3-year-old baby which did not develop intellectually or physically. It was found at the operation that along the whole side of the skull on the left side there was a regular dent, which perhaps might best be described as a greenstick fracture of the skull. Under this depression was an immense cyst pressing and flattening the brain. Had this baby been carefully examined after birth, this condition would have been recognized and remedied. I have no doubt but that there are many other symptoms of hemorrhage which will enable us to recognize it in the new-born, and when we are able better to do this why should we not apply the simple surgical principles which we apply to other conditions?

DR. HENRY P. NEWMAN, San Diego, Calif.: If this is a criticism of the obstetrician, to whom does it apply? To the man trained in his profession? No. Unfortunately obstetrics is the privilege of every licentiate in medicine, and a large percentage of the births are presided over by the pseudo-obstetrician. Consequently it would be hardly fair to ascribe to the trained professional man such faulty work. But what is the remedy? It is not the question of the use or nonuse of forceps, cesarean section, etc. It is the personal equation and the individual management of the individual case. The trained obstetrician of today studies the individual case before, during and after delivery, and his success or failure is not written in ten days or ten months, but by the ultimate welfare of both mother and child.

DR. ARTHUR STEIN, New York: Naturally, I fully agree with Dr. Brodhead about the molding of the child's head in a contracted pelvis. I agree with him also that in these cases the forceps should not be put on unless the head is low down. Regarding the use of pituitary extract, I do not agree with Dr. Druskin at all. Judiciously used it is a great help. I do not think that up-to-date obstetricians would like to do without it. We made many experiments with pituitary extract at Dr. Brodhead's division at Harlem Hospital. We standardized the method to some degree; that is, we use as little as possible, employing 2 and 3 minims at hour and hour and a half intervals, thus increasing to some degree the physiologic contraction of the uterus. With 1 c.c. we used to get tetanic contraction. I furthermore do not agree with Dr. Druskin that the drug has ill effects on the children. In the induction of labor at full term we use the small dose.

We are at a great disadvantage in the study of cases coming under the scope of my paper in not having the advice of the neurologist in the cases of babies born in big hospitals. These cases are not systematically studied from the neurologic standpoint after long or difficult labors. Therefore, I fully agree with Dr. Meyer when he says that such studies should be carried out.

THE CUTANEOUS MANIFESTATIONS OF HODGKIN'S DISEASE: LYMPHO- GRANULOMATOSIS *

H. N. COLE, M.D.

CLEVELAND

From a careful study of seventy cases and from a review of the literature, Ziegler,¹ in 1911, felt that one fourth of all cases of Hodgkin's disease, at some time or another in the course of their trouble, showed evidence of skin involvement. Bunting and Yates² quote Westphal as finding 15 per cent of his cases with skin lesions.

To me, these percentages seemed rather high until I began to go deeper into the subject and look more particularly for these manifestations. After about two years of careful observation of such cases, I feel that these writers are probably correct in their figures. It is my belief that all too frequently cutaneous lesions of lymphogranulomatosis are not noted because they have not been sought after, and it is my object to call the attention of the medical profession to this

interesting and as yet not generally recognized series of symptoms.

Osler defines this disease, first described by Hodgkin in 1832, as a "condition characterized by enlargement of the lymph-glands with progressive anemia and a fatal termination. Anatomically, there is an increase in the adenoid tissue of the glands, proliferation of the endothelial cells, formation of mononuclear and multinuclear giant cells, the presence of eosinophils and thickening of the fibrous reticulum."

The cutaneous symptoms of Hodgkin's disease may either precede,

accompany or follow after general manifestations. Ziegler says that in from 5 to 12 per cent. of the cases, the cutaneous symptoms came first. Westphal³ says that in about 10 per cent. of his cases a lichen-like eruption preceded the onset. Again, the skin lesions may accompany the generalized symptoms or what is probably the most common type; they follow other signs of the systemic condition—it may be even one to two years afterward and sometimes longer.

And what, it may be asked, are the symptoms noted? Probably the commonest of these is a pruritus of

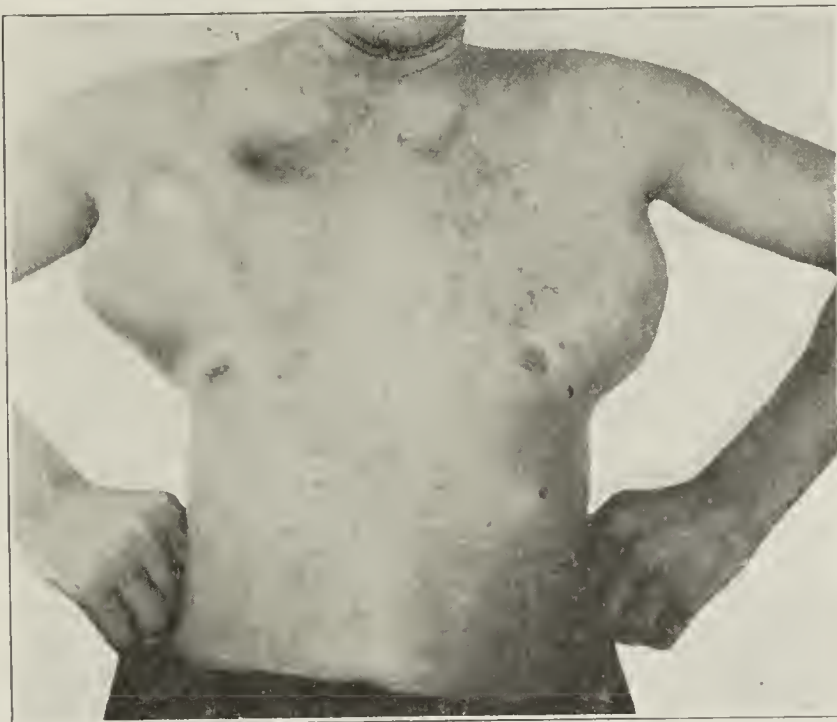


Fig. 1 (Case 6).—Prurigo-like exanthem in Hodgkin's disease; note enlarged glands.

* Read before the Section on Dermatology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

* From the Departments of Dermatology and Syphilis and of Pathology, of the Western Reserve University and of the Cleveland City and Lakeside Hospitals.

* Owing to lack of space this article has been abbreviated in THE JOURNAL by omission of some of the pictures. The complete article will appear in the transactions of the section and in the author's reprints.

1. Ziegler, Kurt: Die Hodgkinsche Krankheit, Jena, Gustav Fischer, 1911. This contains a complete review of the literature.

2. Bunting and Yates: Bull. Johns Hopkins Hosp. April, 1917, p. 151; November, 1915, p. 315.

3. Westphal, quoted by Bunting and Yates: Bull. Johns Hopkins Hosp., April, 1917, p. 151.

greater or lesser intensity. It is quite often the first sign to call the patient's or the physician's attention to the condition. It is sometimes so intense that I have seen large, deep grooves in the skin marking the imprint of each finger-nail; again, there may be a pruritus with absolutely nothing to be found on the skin. It was noted eight times in our series of thirty-four cases, and by Zeigler eight times in his series of seventy cases.

Marani⁴ says that he always notes a close relationship between pruritus and an eosinophilia. I have been unable to corroborate it, finding that these attacks generally come with a fresh glandular "flare-up."

In my opinion the next commonest lesion is a prurigo-like exanthem. These papular lesions, capped often with vesicles which are soon torn off by the scratching, are most often found on the extensor surfaces, but may be all over the body in a severe case. There are always more or less accompanying excoriations, scars and pigmentations. Often these lesions come and go for months. In Blaschko's⁵ case they disappeared when the throat lymphomas were removed, only to return later with recurrence of the latter.

Wechselmann,⁶ Nicolau⁷ and others also report a diffuse exfoliating erythrodermia, though this is rather rare.

Urticaria has been seen in many cases of Hodgkin's disease. Kreibisch⁸ reports a generalized case preceding other evidence of the disease six months.

Edematous swellings also are noted, and may be permanent or transitory in character. Pigmentations are seen frequently in lymphogranulomatosis, and are either spotted or diffuse. The brownish or bronze pigmentation is most often in the folds of the joints

abdomen, neck, face and extremities, and is much like that in Addison's disease, except that the mucous membranes are not involved. We also find pinhead and larger chloasma-like spots on the arms, hands and face. The first type was noted in four of our cases.

It is common to get a history of outbreaks of perspiration due to disturbance of the heat regulating functions. Disturbances in the nutrition of the skin are also common, such as alopecia, dryness of the skin, atrophy of the skin, and hyperkeratosis.

Icterus is noted at times, and purpuric lesions are far from uncommon.

Grosz,⁹ Hecht,¹⁰ Ziegler,¹ Bruusgaard¹¹ and a few others also describe reddish or bluish tumors in the skin which, on being opened, have a bloody serous fluid, and are of a tissue typical histologically for Hodgkin's disease. This has been termed by Grosz⁹ "lymphogranulomatosis cutis." They are rare, to say the least, and we have one such case in our series.

Through the kindness of Drs. G. W. Crile and C. F. Hoover, I have been enabled to go over the records of the surgical and medical services at the Lakeside Hospital from 1902 to date. I find notes of twenty-nine cases, in most of which the diagnosis was made either by gland examination at operation, necropsy or biopsy.

There were twenty-four males and five females. I wish to add four cases of my own, and one seen in consultation with Dr. John Phillips. In age they varied from 18 months to 55, most of the patients coming between the years 15 to 30. In this series of thirty-four cases there were thirteen showing more or less cutaneous symptoms and lesions in connection with their generalized condition.

REPORT OF CASES

CASE 1 (2725).—J. F., man, aged 27, first noted lumps in his neck five years before coming to the hospital, and three years later was first troubled with a pruritus. A note made at this time read, "Generally distributed over the body, but more marked on the extensor surfaces; there are irregular pigmented areas split-pea to lentil size which apparently mark the site of a papillary eruption. In some places crusts may be seen still adherent, while at the periphery there is an augmentation of the pigment. The skin is harsh to the touch and is of a brownish or bronze tint as if the suprarenals were involved."

CASE 2.—D. R., aged 27, had a markedly pigmented skin following some enlarged glands in the neck one year before.

CASE 3.—In M. M., girl, aged 4 years, the trouble started with a slight cold and a gland anterior to the right ear, then with an enlargement of the abdomen. There were petechiae over the abdomen and the scapulae.

CASE 4.—J. H., aged 18, was troubled with pruritus. The pathologic diagnosis was lymphosarcoma.

CASE 5.—A. E., man, aged 43, for sixteen years had a swelling under the right arm; but in the last five months the patient was troubled with a gland in the neck. Two months after their excision he was troubled with pruritus. Blood culture was negative.



Fig. 3 (Case 9).—Closer view of patient.

4. Marani, G.: Arch. f. Dermat. u. Syph., 1914, **120**, 781-869.

5. Blaschko: Arch. f. Dermat. u. Syph., 1908, **89**, 43.

6. Wechselmann: Arch. f. Dermat. u. Syph., 1907, **87**, 205.

7. Nicolau: Ann. de dermat. et de syph., 1904, p. 753.

8. Kreibisch: Arch. f. Dermat. u. Syph., 1908, **89**, 43.

9. Grosz: Beitr. z. path. Anat. u. z. allg. Path., 1906, **39**.

10. Hecht: Arch. f. Dermat. u. Syph., 1909, **98**, 107. Pinkus: Arch. f. Dermat. u. Syph., 1899, **50**, 37, 177.

11. Bruusgaard, E.: Arch. f. Dermat. u. Syph., 1911, **106**, 105.

CASE 6 (3932).—W. G., man, aged 30, was troubled with intense pruritus and a lump in the right axilla and seven months later in the right side of the neck. The skin was of a bronze color and covered with excoriated papules, as shown in Figure 1. He had an alopecia areata of the back of the head, and masses in both axillae and both sides of neck, but especially in the right side. Blood examination revealed: red blood cells, 3,800,000; white blood cells, 10,600; hemoglobin, 67 per cent; Sahli, differential, polymorphonuclears, 53 per cent; small mononuclears, 3 per cent.; large mononuclears, 6.5 per cent.; transitionals, 2.5 per cent.; eosinophils, 35 per cent. A histologic diagnosis of Hodgkin's disease was made from glands removed at operation.

CASE 7.—M. S., man, aged 28, for one year had been troubled with a painless increase in the size of his neck and chest. Lately he had had great difficulty in breathing, and swellings in the axillae which had finally broken down. He was troubled greatly with pruritus. The skin was covered over with numerous prurigo-like papules, some of them having been changed by scratching into small ulcers and scars. The glands under both jaws and in the axillae, as well as the mediastinal glands, were greatly enlarged. In both breasts there was marked edema of the tissues, and masses not connected to the skin were palpable. The liver and the spleen were both enlarged. Blood examination revealed white blood cells, 17,600; polymorphonuclears, 80 per cent.; small mononuclears, 1.9 per cent.; large mononuclears, 15.1 per cent.; transitionals, 2.6 per cent.; mast-cells, 0.2 per cent.

CASE 8.—P. H., boy, aged 14, had had the symptoms of cold, chills, fever, nausea and vomiting followed three months later by a swelling over the left shoulder in the supraclavicular

space. There was a marked bronzelike pigmentation of the axillary skin, folds of the neck, about the eyes, and diffuse over the abdomen, thighs and legs. Some purpuric lesions were also noted over the thighs and legs. Blood examination revealed: white blood cells, 16,200; polymorphonuclears, 92.5 per cent.; transitionals, 4 per cent.; small mononuclears, 2 per cent.; large lymphocytes, 1 per cent.; large mononuclears, 0.5 per cent. Blood culture and culture of glands were negative.

CASE 9.—L. H., man, aged 30, had had weakness and anorexia of one year's duration followed several weeks after the onset by a generalized pruritic eruption. Four months after the trouble began, he had large glands in the groins which were operated on in a local hospital. Afterward the masses recurred, and of late he has had generalized increase in the size of the glands with an intense pruritus of the whole skin (Figs. 2 and 3). The skin was in a generalized

hyperemic and edematous condition, dotted over profusely with papules and deep excoriations which had advanced to an ulcerative condition in spots. There was a marked edema of the scrotum and right leg, while the glands were generally enlarged. This was especially true in the supraclavicular spaces, right and left axillae and groins, while large masses of glands were palpable in the abdomen. The chest showed impaired resonance in the right axillary region. Blood examination revealed: red blood cells, 3,392,000; white blood cells, 14,800; hemoglobin, 65 per cent. The stained smear revealed slight poikilocytosis, increase in the central pole area and enormous increase in the blood platelets. The differential count, 300 cells, revealed: polymorphonuclears, 89.3 per cent.; small mononuclears, 3.6 per cent.; transitionals, 5.3 per cent.; eosinophils, 0.8 per cent.; large mononuclears, 0.5 per cent.; basophils, 0.3 per cent.

The patient was very irritable, sank rapidly, and died in twelve days; we were allowed to remove only an abdominal gland for examination. It showed an extremely marked fibrosis in some places with replacement in part of the germinal centers by endothelial cells, giant cells, large multinucleated cells, lymphocytes and eosinophils, that is, the typical picture of Hodgkin's disease. A piece of apparently normal skin showed practically no change outside of a slight dilatation of the vessels of the dermis and a very slight cellular infiltration. Examination of the diseased tissue, however, revealed signs of a more advanced process (Fig. 4). The epidermis was swollen and edematous, showing a defective keratinization. The papillae also showed a tissue infiltrated with serum and a certain number of small mononuclear elements. Deeper in the dermis there was quite a marked collection of cells around the vessels and



Fig. 4.—First stages in Hodgkin's disease of the skin, showing edema of tissues and small cell infiltrations around the vessels.

glands. These were mononuclear in type, though here and there an endothelial and an eosinophil were to be found.

CASE 10.—H. F., man, aged 25, seen with Dr. J. M. Moore, reported that eighteen months previously the glands of the neck had begun to swell. A few months later the inguinal glands also became larger. Six months after the onset the patient had the cervical glands removed and for six weeks there was relief, after which they recurred again. About this time he first noted an eruption on the skin which gradually became intensely itchy. There was a history also of dizziness and shortness of breath (Figs. 5 and 6). The entire skin was covered with a papular eruption in different stages, the larger lesions having had their tops scratched off and crusted over. The eruption was a little more marked on the extensor surfaces. There was some pigmentation of the skin due to scratching. All the cervical glands were enlarged, especially on the left. The chest showed increased dulness to the right

and left of the sternum in the second interspace, while the axillary and inguinal glands were also involved. The liver was palpable two finger breadths below the costal margin, while the spleen could not be felt. Blood examination

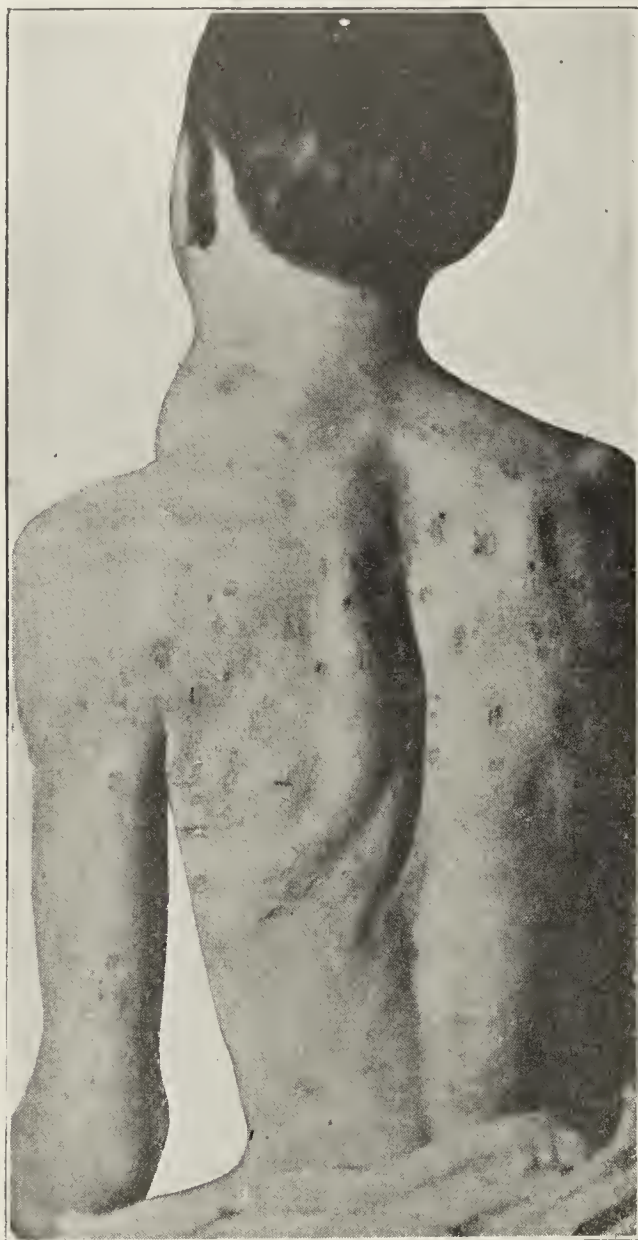


Fig. 6 (Case 10).—Prurigo-like exanthem in Hodgkin's disease.

revealed: red blood cells, 5,280,000; white blood cells, 21,000; polymorphonuclears, 78.4 per cent.; eosinophils, 1.4 per cent.; transitionals, 8.4 per cent.; large mononuclears, 1.2 per cent.; small lymphocytes, 4.0 per cent.; large lymphocytes, 10.6 per cent.; hemoglobin, 70 per cent. An oxydase staining reaction done by Dr. Christie revealed granular cells, 89.1 per cent.; nongranular cells, 10.9 per cent. The patient remained in the hospital only a few days and refused further examination of tissues, glands, etc.

CASE 11.—E. B., man, aged 37, seen with Dr. Samuel Bernstein, had had anal pruritus fifteen years before which was treated off and on until 1914, when the nerves were excised, giving relief. In May, 1915, I was consulted because of a troublesome urticaria which reacted by July to treatment. In March, 1914, he had a swelling in the right supraclavicular region thought to be due to an abscess, which was opened and drained. After this the glands alternately came and went, and finally one was excised and a diagnosis of Hodgkin's disease made by Dr. Warthin of Ann Arbor. The patient has since been treated with the Roentgen ray and radium but with no permanent result, as the glands have continued to grow; several have broken down, and a mass of them has increased rapidly in the left supraclavicular area. The patient has been greatly troubled for months with pruritus and night sweats.

The skin was entirely clear outside of a large irregular rhomboid shaped lesion 3 by 5 cm. in the left supraclavicular region (Fig. 7). The mass showed quite a marked induration and was apparently fused to the glands beneath, while in its center it was broken down. It was a light bluish, and to the distal side several smaller lesions the size of a hickorynut

were noted, one of them being broken down. The glands under the arms were markedly enlarged. All the superficial glands were found markedly enlarged, and there was found an increase in the bronchial glands on percussion and Roentgen examination. The liver and spleen were not enlarged; otherwise nothing important was found. Blood examination revealed: red blood cells, 5,300,000; white blood cells, 16,400; hemoglobin, 70 per cent.; eosinophils, 0; transitionals, 5 per cent. A differential count of 300 cells revealed: polymorphonuclears, 87 per cent.; large mononuclears, 1.6 per cent.; small mononuclears, 6.3 per cent. Platelets were markedly increased. Blood culture was negative, and from a discharging axillary gland a pure culture of staphylococcus was procured. A large section was removed (x , Fig. 7) including both normal and diseased tissue.

The apparently normal skin showed slight small cell infiltration around the vessels of the corium, all of which were somewhat dilated. The mass removed from the edge of the ulcerating tumor showed a densely infiltrated tissue. The epidermis was low, and at one end where the ulceration was situated, the section showed an acute inflammatory reaction (Fig. 8). In the remainder of the section all the vessels showed a more or less marked cellular infiltration of eosinophils, endothelial cells, lymphocytes and a few fibroblasts around them (Fig. 9). Deeper in the tissue and in more or less relation to the vessels and glands were large masses of well defined cellular infiltrates made up of large endothelial cells, large cells with a multinucleated nucleus such as is described by Reed, giant cells, lymphocytes, eosinophils and fibroblasts. In some places the eosinophils were very

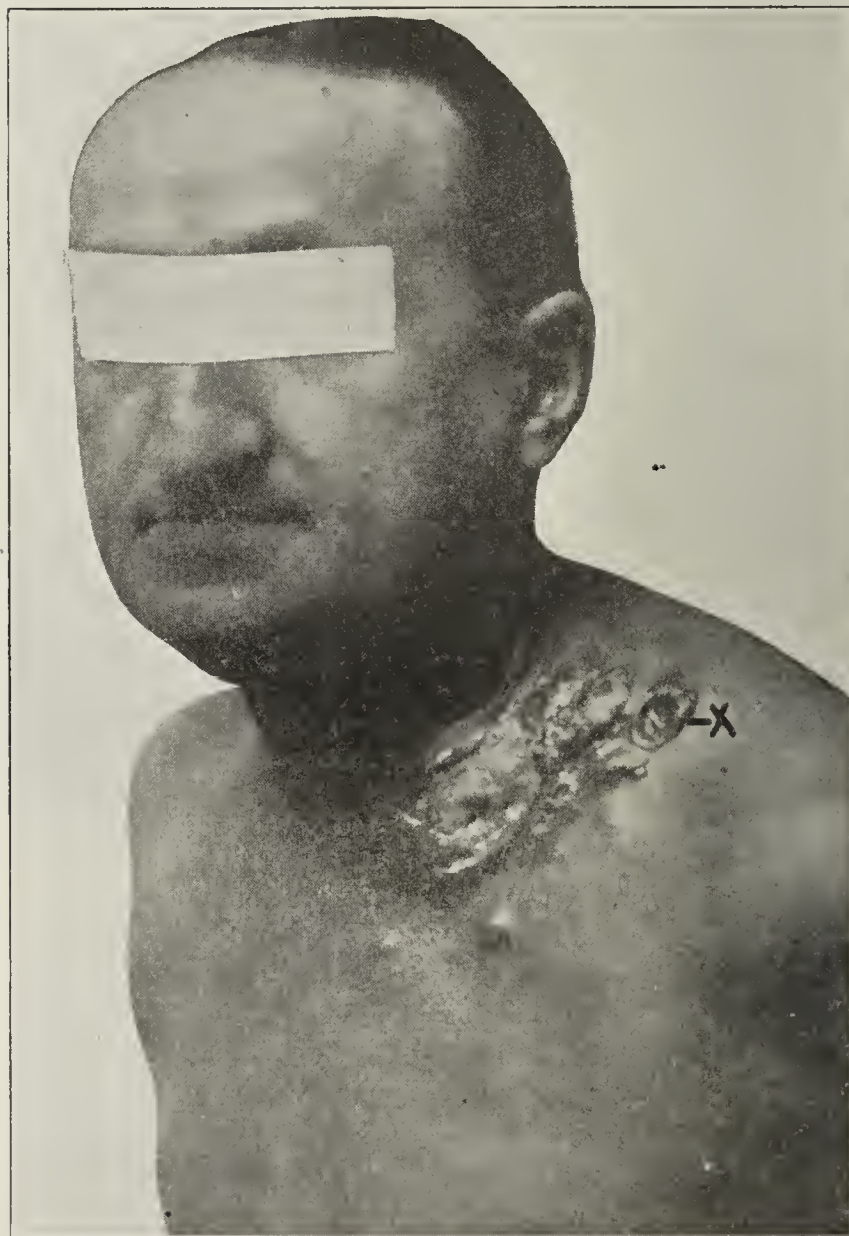


Fig. 7 (Case 11).—Histologically true Hodgkin's tumor in the skin; section removed at x .

numerous. There was little or no normal tissue left in these cellular deposits, and in one portion the cellular masses extended up in long strands toward the epidermis, which was quite edematous.

CASE 12.—J. B., man, aged 44, had had painful swelling of glands in the axillae in August, 1916. The pain subsided soon but then the cervical glands began to increase in size, and shortly all the glands in the body were involved. He entered Lakeside Hospital on Dr. Hoover's service in February, 1917, and took Roentgen-ray treatments, which helped him greatly. At this time the white blood count was 12,000, about 60 per cent. being polymorphonuclear in type. The oxydase reaction showed about 80 per cent. granular cells. Cultures from an excised gland were negative; a diagnosis of lymphosarcoma was made by Dr. H. T. Karsner and Dr. Christie. The patient was discharged, but returned, April 15, with a recurrence of the glandular swellings and the history that three days previously he had noticed an eruption on his arms and chest (Figs. 10 and 11). Examination revealed a macular eruption over the entire body but most marked on the arms, chest, thighs and forehead. All the glands in the body, especially the supraclavicular glands, were markedly enlarged. After a few weeks in the hospital the patient developed edema of the elbows, knee joints, scrotum and penis, while the eruption had become progressively a deeper red, and pruritus had developed on the lower limbs. On the forehead, especially, the eruption had become a diffuse deep bluish, and showed some induration. Petechiae developed in the lower limbs and arms as well.

Blood examination revealed: red blood cells, 4,400,000; white blood cells, 58,000; hemoglobin, 70 per cent. The white count gradually rose to 152,000, and a differential count now revealed: polymorphonuclears, 5.7 per cent.; small lymphocytes, 86.3 per cent.; large lymphocytes, 5.9 per cent.; mast cells, 0.2 per cent.; transitionals, 1.5 per cent.; eosinophils, 0.4 per cent. (Fig. 12). A section removed from one of the bluish macular areas and stained with the ordinary stains showed a tissue with an edema especially marked around the vessels, glands and follicles. There was an intense cellular infiltration around the deeper vessels of the corium made up entirely of a uniform cell type deeply staining and much like a small mononuclear or a little larger. This infiltration was also found around the deep glands, both sebaceous and coil, and around the hair follicles. The areas were sharply defined instead of spreading out into the tissues and between them. In a well developed area there was an almost total loss of all stroma or reticulum.

This was probably a case of lymphosarcoma changing into a leukosarcoma in the short space of a few weeks.

CASE 13.—S. M., man, seen through the courtesy of Drs. John Phillips and S. L. McManigal, had a papular eruption distributed over the entire body and moderate in amount. Some of the lesions had been scratched and were crusted over, while there was more or less pigmentation of the skin. The cervical, bronchial and inguinal glands were all enlarged, while the spleen showed an increased dulness to percussion.

Blood examination revealed: red blood cells, 4,600,000; white blood cells, 26,000; hemoglobin, 80 per cent. The differential revealed: polymorphonuclears, 80 per cent.; small

mononuclears, 3 per cent.; large mononuclears, 9 per cent.; transitionals, 5 per cent.; eosinophils, 2 per cent.; basophils, 1 per cent.

This seemed to be a prurigo-like exanthem in a case of Hodgkin's disease of advanced type.

SUMMARY OF CASES AND COMMENT

Among thirty-three cases of Hodgkin's disease and one questionable case, thirteen involvements of the cutaneous surfaces were noted. Pruritus was the principal complaint eight times, a prurigo-like exanthem was seen six times, a bronzelike pigmentation four times, petechiae twice, urticaria once, and edematous swellings three times. In Case 6 the patient had an alopecia areata, and in Case 10 partially broken-down tumor masses were found in the left supraclavicular space, showing tissue histologically characteristic of lymphogranulomatosis cutis. In Case 12, which was a probable lymphosarcoma, it changed into a leukosarcoma in the short space of a few weeks.

From an analysis of our cases and from the literature, we believe we are justified in drawing several deductions. The skin lesions caused by Hodgkin's disease can probably be classified in two groups: (1) a true lymphogranulomatosis cutis represented by our Case 10, by those of Bruusgaard,¹¹ Grosz,⁹ Hecht,¹⁰ Ziegler¹ and perhaps a few others, and (2) a group of lesions, set up, it is true, by the general infection, and yet not showing the characteristic histologic

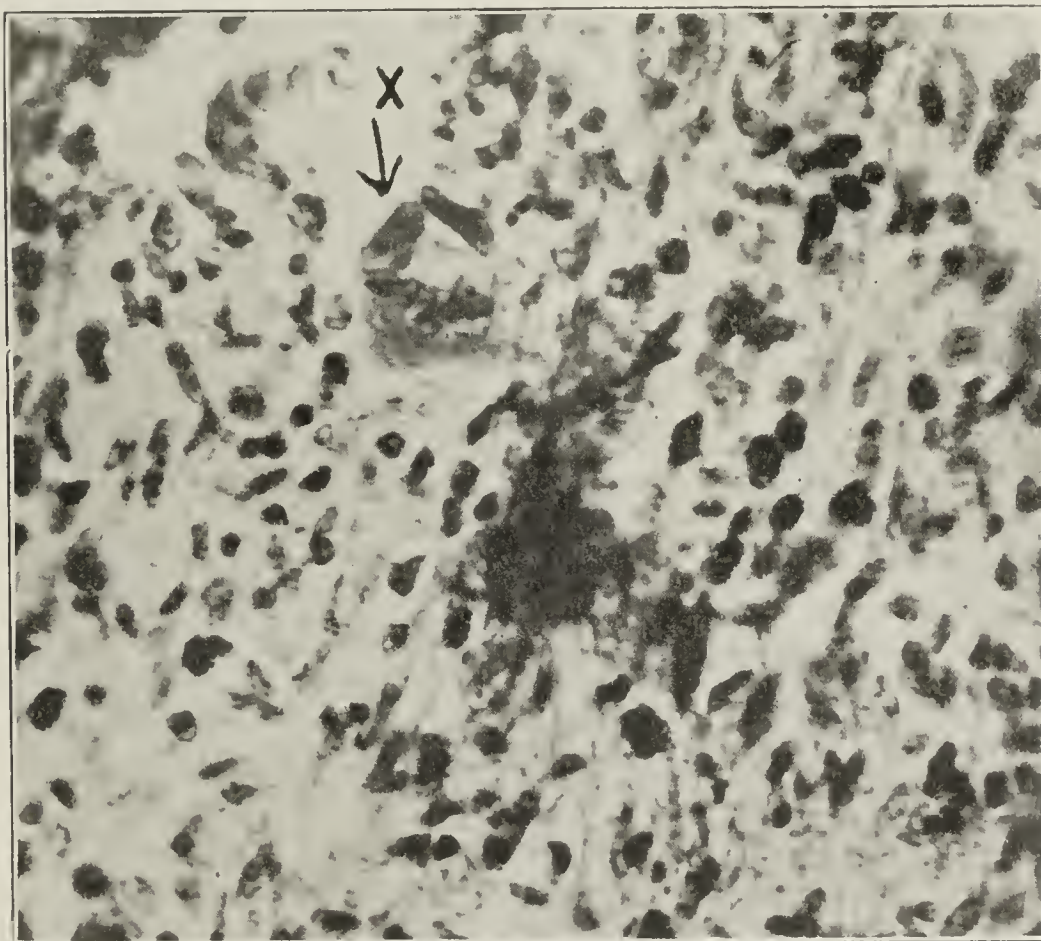


Fig. 8 (Case 11).—Tumor mass of endothelial cells, fibroblasts, deeply staining granular eosinophils, and large giant cells (at \times): \times 1,300.

changes locally. A classification much like that of Audry's and Arndt's may be used for systematizing our findings. Under the "pseudoleukemids" or "pseudolymphadenids" we would place the purpuras, prurigo-like exanthems, pruritides, urticarias, pigmentations, edemas, some of them disturbances of nutrition, as in our case of alopecia areata, and some of them cases of universal exfoliating erythrodermia. These lesions are a general result of the systemic infection, if such it be, on the entire system. Their histologic picture, of course, varies with the condition, but in most cases shows nothing characteristic or possible of a diagnosis of lymphogranulomatosis. In a few words, it probably consists of a peripheral dilatation of the vessels, some edema of the tissues, and a greater or lesser small cell infiltration around the vessels, coil and sebaceous glands. Ziegler puts it well when in substance he says:

The changes in prurigo one should diagnose as granulomatous with caution, and the same is also true in urticaria,

pruritus and other eczematous conditions. They are, however, important in that on these grounds the localized small specific areas of the lymphogranuloma may develop. The mere signs of skin atrophy, loss of lanugo hairs, hyperkeratosis, etc., should not be spoken of as specific, but they speak more for a wanting nutrition of the organism.

To my mind they also speak of a toxemia like the tuberculids in tuberculosis. And as I have said before, in contrast to the latter, I do find in the literature and from my group a small number of cases with quite another skin change.

There is a definite cellular infiltration with lymphocytes, eosinophils, endothelial cells, fibroblasts, giant cells and large multinucleated cells. These areas show quite a marked vascularity with edema of the tissues and more or less destruction of tissue stroma and replacement with fibrous tissue. These cases are true examples of Hodgkin's disease of the skin, and are of a class like Case 10, with definite tumor formation, or perhaps occasionally like the two cases reported by Wechselmann⁶ and Nicolau⁷ with diffuse exfoliating erythrodermia.¹²

As Marani⁴ says, "The same irritating substance may call forth different reactions, and different irritating substances may be the cause of the same or closely related reactions." The French school in general believes mycosis fungoides to be a cutaneous form of Hodgkin's disease. Ziegler,¹ Wechselmann,⁶ Hazen and Strobel,¹³ I believe, and others take the same view. Bunting and Yates² have had three cases of pseudoleukemia with Hodgkin's blood picture occurring for months and in one case over years. In one case seen by them the Hodgkin's blood picture was succeeded before the patient's death by a picture of an acute lymphoblastic leukemia. We are all acquainted with the case of mycosis fungoides reported by Pardee and Zeit¹⁴ which just before death showed the signs of lymphatic leukemia, confirmed also at necropsy. Witness my Case 12 with a change from a possible lymphosarcoma to a leukosarcoma in the short space of a few weeks. Dr. Wende's¹⁵ case of probable

Hodgkin's disease with transformation before death to a leukemia is also brought to mind. Pelagatti¹⁶ has seen clinical mycosis fungoides with leukemia of the blood. Any pathologist knows how often a clinical diagnosis of lymphosarcoma is turned into one of Hodgkin's disease at necropsy and vice versa. Many believe it is impossible from a skin section to distinguish between Hodgkin's disease, mycosis fungoides and some of the other related conditions.

I heartily agree with Bunting and Yates that if all the efforts spent to separate these conditions had been used to correlate them, we should probably be nearer to the solution. It certainly seems to be an infection, and I hope to report my bacteriologic findings and a comparative histologic study more in detail in a later paper.

Suffice it to say that in any case of suspicious, persistent pruritus, urticaria, prurigo-like exanthem,

bronzelike pigmentation, etc., of unexplainable origin, a possible Hodgkin's disease should be kept in mind and suitable examination of blood and glands should be made.

The treatment of the condition is, of course, rather hopeless. External local antipruritics should be used with the Roentgen ray for both the skin involved and the glands.

Bunting and Yates report good results from the total extirpation of the diseased glands, focus of infection and follow-up Roentgen ray. Arsenic internally and good hygiene are also to be recommended.

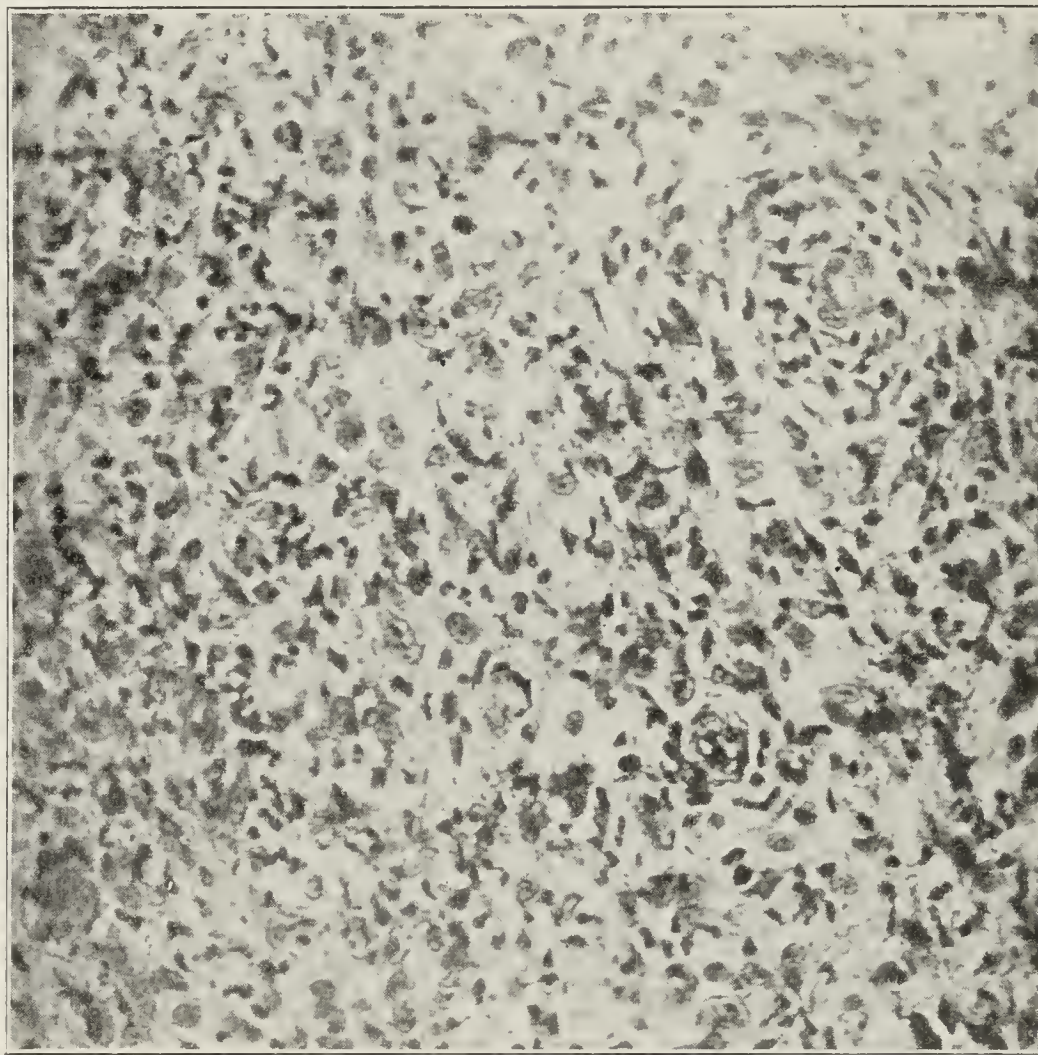


Fig. 9 (Case 11).—Endothelial cells, fibroblasts and multinucleated cells; $\times 310$.

NOTE.—We have since heard from Dr. Yates that the patient in Case 13 has died, necropsy showing very marked involvement of the bronchial and retroperitoneal glands. Specimens were made from all tissues and we hope in a later paper to include this data.

2073 East Ninth Street.

ABSTRACT OF DISCUSSION

DR. HENRY H. HAZEN, Washington, D. C.: The first point I should like to make is whether or not we are justified in absolutely separating neoplastic growths from inflammatory growths. At the present stage of our knowledge I do not believe that we can be too dogmatic on this point. A study of this group of diseases would seem to indicate that there may be a resemblance. As bearing on this point, McDonough's work on the "Evolution of the Sarcoma Cell" should be borne in mind.

16. Pelagatti, quoted by Nanta: *Ann. de dermat. et de syph.*, 1912, Series 5, No. 3, pp. 572, 639, 694.

12. For the relation of Hodgkin's disease of the skin to the leukemias, leukosarcoma, lymphosarcoma, lymphodermia perniciosa of Kaposi, mycosis fungoides, etc., I would refer the reader to the highly suggestive work of Bunting and Yates (Footnote 2). They believe that these diseases are probably all of one general type of infection, but with different manifestations.

13. Hazen and Strobel: *Jour. Cutan. Dis.*, 1911, **29**, 147. This contains a review of the literature.

14. Pardee and Zeit: *Jour. Cutan. Dis.*, 1911, **29**, 7.

15. Wende, Grover: *Am. Jour. Med. Sc.*, 1901, **112**, 826.

In regard to Hodgkin's disease, I think we should be careful not to accept the bacteriologic findings of Bunting and Yates as absolutely final, for similar results have been found



Fig. 10 (Case 12).—Leukosarcoma with skin involvement.

in apparently normal lymph glands. Also, it should be borne in mind that it is frequently difficult for clinicians actually to diagnose this disease, inasmuch as there is considerable discussion both as to the histologic and clinical pictures, as Warthin has shown. Further, I cannot accept the blood picture of the increased relative and actual transitional cell count as being pathognomonic. I was particularly glad to hear Dr. Cole speak of leukosarcoma, for we rarely hear of this condition in American literature.

As regards classification, it is possible that we can make six divisions. First, the group of lymphomatoses, which may be divided into the leukemic, represented by lymphatic leukemia, and aleukemia, in which group mycosis fungoides and Hodgkin's disease should be placed. The second great group is the myelomatoses, the leukemic stages of which are represented by the so-called splenomyelogenous leukemia and the aleukemic stage by multiple myeloma. The third great group are the lymphosarcomas, in which the leukemic stage is represented by leukosarcoma and the aleukemic stage by lymphosarcoma. As to whether or not there are any mixed types, we are uncertain, but it is theoretically possible. It should always be borne in mind that practically all of the aleukemic conditions may become leukemic, and that the leukemic conditions may have aleukemic stages.

DR. SIGMUND POLLITZER, New York: In the development of any science or any special department of knowledge we have first the crude, isolated observations, then more numerous observations and a closer study of details, and finally there comes the genius who groups all the observations, draws general deductions and classifies our knowledge of the subject. In looking over the group of diseases which forms the subject of the admirable papers presented, one is struck with the fact that while the last twenty years have added very greatly to our detailed knowledge of the conditions,

we are as far as ever from a general understanding of the subject as a whole. The Darwin of the lymphatic diseases of the skin has not yet been heard from. What is lacking at present is a knowledge of the etiology of these diseases, and until we have found the causative agent or agents, we shall be groping in the dark. We do not know whether we are dealing with distinct types of disease, or whether all these conditions are merely variants of a single type. In the meanwhile a study of the origin of the different types of cells found in varying degrees in all these conditions is of primary importance, and in this respect an observation of Dr. Wise seems very suggestive. I refer to the group of proliferated endothelial cells shown in the corium in one of his pictures. We have a marked proliferation of endothelial cells in the lymph nodes in many leukemic conditions, and the occurrence of a similar proliferation in the skin seems suggestive of a close connection between the lymphatic endothelial hyperplasia and the disordered white cell balance.

DR. HAROLD N. COLE, Cleveland: In studying the slides of Dr. Fraser I would say that in two of the specimens he showed of glands I am unable to determine between them and a case of Hodgkin's disease, such as I have. They are absolutely identical. Is it not significant that in all these cases we get a history something like this: Following diseased tonsils or diseased teeth, or some other focus, they first notice a swelling of glands in those parts of the body, and later a deeper involvement; the patient becomes exhausted, and finally dies.

I am not here to stand up for Bunting and Yates. In only one of our cases did Dr. Graham get a diphtheroid organism from a gland and later at necropsy; but we should take up and study these cases both clinically and histologically.

DR. J. FRANK FRASER, New York: One point in regard to diagnosis is that in the early or erythematous stage of mycosis fungoides it cannot be differentiated from psoriasis or parapsoriasis on histologic grounds alone.

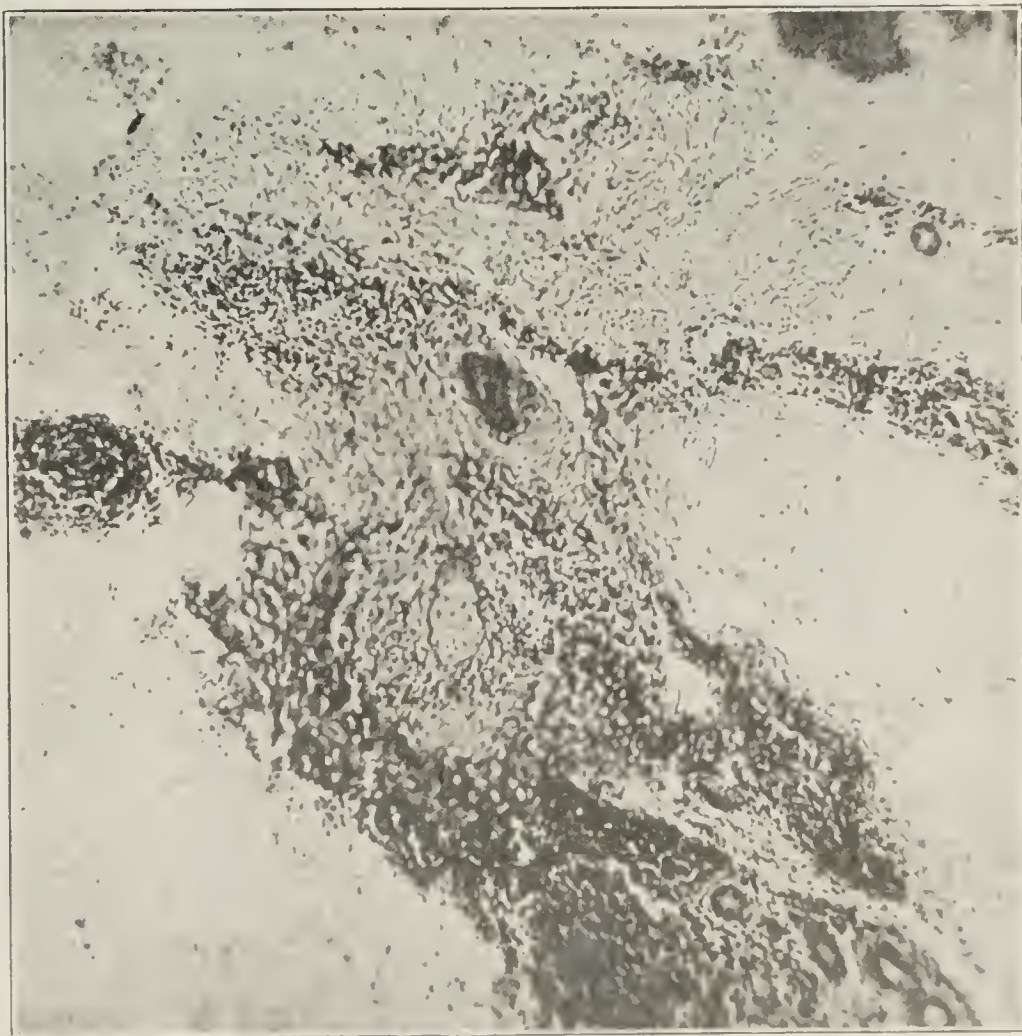


Fig. 12 (Case 12).—Leukosarcoma; $\times 60$; dense cellular infiltration around vessels, glands and hair follicle; cells uniform in size and character.

In regard to the relation of mycosis fungoides to the leukemias, the histologic picture in the lymph nodes may be the same. From a study of the cells in a single section it

may be impossible to differentiate between a leukemia, lymphosarcoma or leukosarcoma, which is an infiltrating lymphoid tumor with a leukemic blood picture. We know little about the nature of the leukemias. Mallory and his followers say the process is neoplastic, the blood picture representing a circulating metastasis.

I consider that dermatologists have been making a mistake in regarding mycosis fungoides as a disease of the skin alone. In all the cases in my study there was general involvement of lymphoid tissue. In two there was involvement of the lungs, and in one of them, thickening of the bronchi was demonstrated by Roentgen-ray examination several months before death. The other patient is now under treatment at Dr. Trimble's clinic, and is suffering from a cough which does not yield to treatment. I think the whole subject offers a great field for further investigation.

DR. FRED WISE, New York: Some of the facts brought out by the papers in this symposium tend to support certain conceptions, in my mind, with regard to diseases of this type. The interpretation of the clinical pictures included in the papers presented is a matter of some importance, especially to those who teach dermatology. Mycosis fungoides, for example, seems to be a disease *sui generis*, presenting clinical features which differ from other, closely related, but not identical dermatoses.

In presenting a patient with mycosis fungoides before a section of students, we are compelled to limit ourselves to an exposition of the clinical features of that disease, without regard to the histopathologic findings, which may not be at hand at that moment, or may never come to light, with respect to that particular case.

If the cutaneous picture is the familiar one recognized as mycosis fungoides, let it be called by that name. Never will I forget the case of a patient brought to the clinic by Dr. Fordyce several years ago, who presented an eruption so typical of mycosis fungoides that the youngest member of the clinic staff made the correct diagnosis at a glance. A few minutes later, examination of the patient's blood revealed a lymphatic leukemia.

The point I want to bring out is, that this patient presented a dermatosis which, before a class of students, should be designated mycosis fungoides on clinical grounds. Speaking before a body of trained dermatologists, the much broader conception of this class of diseases, their inclusion in groups embracing the various diseases of lymphatic origin, may be profitably dismissed.

Dental Education in New Zealand.—Consul General Winslow at Auckland (*Commerce Reports*, July 12, 1917) says that the minister of public health of New Zealand has reported that only fifteen dental students have been fully graduated during the past six years from the only recognized dental college in the dominion. The great majority of the students leave school before graduation and practice under registered dentists. There are 763 registered dentists in New Zealand, of whom only sixteen registered during the five years ending with 1916, and some of them came from outside colleges, some from American dental colleges. The latter are said to stand well. At the meeting of the New Zealand National Dental Association in Wellington in April, 1917, resolutions were passed and forwarded to the government covering the following points: matriculation examination of the University of New Zealand be adopted as the standard entrance examination for the certificate of proficiency in dentistry; a two-year course to be sanctioned at any center where teaching facilities are provided, plus two years at the Dunedin Dental School; the proper authorities to be asked to establish a board of dentists to arrange and conduct the course for the certificate of proficiency in dentistry.

TUMORS OF THE CAROTID BODY*

F. B. LUND, M.D.

BOSTON

Tumors of the carotid body have great surgical and pathologic interest, but are not of so rare occurrence as they were at one time thought to be. Dr. Scudder¹ of Boston described a case in 1903, which I think was the first case reported in this country; Dr. Keen² of Philadelphia, in a comprehensive and extremely interesting article, first called the attention of the American medical profession to the condition. Since then, Drs. DaCosta,³ Callison and McKenty,⁴ Balfour and Wildner,⁵ and others, have reported isolated cases and have written at length on the pathology of the condition. The number of cases described in the literature, which Dr. Scudder stated in 1903 were seven, and which Dr. Keen, by his investigation in 1906, increased to twenty-six, have now increased to about a hundred; and these curious little tumors have been dissected, studied, and described almost *ad nauseam et ad infinitum*.

This case is presented for the reason that it is the only one that I have found in a review of the literature in which operation has been successfully performed for an intercarotid tumor on both sides of the neck; the first operation, on the left side of the neck, at the Boston City Hospital by Dr. George W. Gay in 1887, up to which time, so far as I can find, no cases had been reported in the literature; and the second operation, on the right side, which required the ligation of the common carotid and removal of an inch of the internal carotid having been performed by me in 1916, twenty-nine years later. The patient, now at the age of 54 years, is in perfect health. The fact that Dr. Gay failed to recognize the nature of the tumor does not detract from his skill in removing it, for this was one of the few patients from whom these tumors have been removed without ligating the common



Fig. 1.—Scar from operation by Dr. Gay in 1887.

carotid; and the fact that he was able to do this, probably made it possible for me to remove the tumor on the other side, twenty-nine years later. This tumor had attained considerable size, and its vascular connections were such that I found it quite impossible to remove it without at the same time ligating the common and removing a portion of the internal carotid artery; a serious operation, as the statistics show, in a patient 54 years of age, and one which might have induced either death or hemiplegia had not the vessel on the other side, owing to the skill of Dr. Gay, been left intact.

Reported cases show that the removal of these very vascular tumors has been attended with a noteworthy mortality which Keen found was over 25 per cent.

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Scudder, C. L.: Tumor of the Intercarotid Body: A Report of One Case, together with All Cases in Literature, *Am. Jour. Med. Sc.*, September, 1903.

2. Keen, W. W.: Tumors of the Carotid Gland, *THE JOURNAL A. M. A.*, Aug. 18, 1906, p. 469.

3. DaCosta, J. C.: *Ann. Surg.*, 1913, **58**, 426; Report of a Case of Tumor of the Carotid Body, *Ann. Surg.*, 1906, **44**, 393.

4. Callison and McKenty: *Ann. Surg.* 1913, **58**, 740.

5. Balfour and Wildner: *Surg., Gynec. and Obst.*, February, 1914.

In fifty-four patients reported by Callison and McKenty, they found that forty-two patients recovered and twelve died; but to this number should be added four deaths from recurrence, and six other speedy deaths in prospect from recurrence known to be in existence when the case was reported; a total of twenty-two deaths out of fifty-four cases.

Complications.—Keen stated that only seven of the twenty-seven patients collected by him recovered without complications. The reason for these high mortality and disability percentages is not far to seek, for the tumors are very vascular, they are situated between and behind the carotids, lie against and sometimes invade the internal jugular, and are in relation to and sometimes incorporated with the pneumogastric, glossopharyngeal, hypoglossal and spinal accessory nerves.

In at least six of the cases described in the literature, a portion of the pneumogastric never had to be removed, and in all these cases the patients died of pneumonia.

Keen reported two cases of injury of the sympathetic, four of the hypoglossal, and two of the lingual nerve. In thirteen cases, Keen reported that the internal jugular had to be tied, and most of these patients died of edema of the lungs.

Only fifteen of the fifty-four cases reported by McKenty escaped without ligation of the common carotid. In thirty-two cases, all three carotid arteries had to be tied.

The injury of either of the common carotids, the internal jugular vein, or the pneumogastric nerve is attended with danger, and in undertaking an operation on an intercarotid tumor of any size, we may find it unavoidable to ligate or remove portions of all three of these structures. The tumors sometimes involve the internal carotid as far as its entrance into the base of the skull, as in DaCosta's and McKenty's cases. In McKenty's case the operation had to be abandoned on account of technical difficulties, and this has also been the experience of others who have tried to remove these tumors. In fact, the danger of these operations appeared so great to DaCosta—whose first patient suffered complete hemiplegia on the eighth day—that he advised against operation on these tumors unless recent rapid growth had led to a suspicion that invasion of important neighboring organs had taken place; or, in other words, a semimalignant condition had ensued. These tumors, for many years at least, may be regarded as benign. They are of slow growth, and when small are painless, in fact, causing no symptoms. Often the surgeon is not consulted until the tumors have attained the size of an egg, and are painful, the pain often radiating to the ear and attended by dysphagia (hypoglossal), pupillary contraction (sympathetic), and vasomotor disturbance of the vessels of the neck and face. As they grow, the tumors invade progressively the arteries and veins, and their removal becomes more difficult and dangerous. It seems to me that, whenever possible, they should be removed when small, since they are then often not closely attached to the carotid, are certainly not malignant, and may sometimes be

removed without subjecting the patient to the dangers of carotid ligation. The general rule for the early removal of all tumors should hold in these cases. Gay applied it in 1887 in the case cited, with a result that speaks volumes for the benign character of the tumor in its early stages and emphasizes the difference between the simplicity and safety of his operation and the difficulties and dangers which universal evidence has shown attends late surgical procedures.

The Intercarotid Body.—These tumors are derived from the intercarotid body, which has been studied and theorized on extensively. Certain facts seem to emerge. Normally, it is a little body about the size of a kernel of wheat, and is situated at the bifurcation of the common carotid artery, usually at its inner side. It exists in all embryos, and persists after birth, but usually disappears about puberty. If it persists, it may undergo development into the intercarotid tumor now under consideration.

The best summary of our knowledge of this subject is that given by McKenty.⁴ A careful perusal of his article and also that of Wildner⁵ will show the earnest seeker after truth that since von Waller first dissected these bodies in 1766, they have been regarded as a ganglion, a gland, an epithelial organ, a vascular organ, and a rudimentary organ. They are now regarded as "chromaffin organs" from some peculiarity of their staining qualities, and as connected with the sympathetic nervous system, to which they are remotely related. The most influential member of the chromaffin family seems to be the suprarenal gland, the active principles of which we employ for raising blood pressure and stopping hemorrhage.

In regard to its physiologic activities, we learn that Mulon used a watery extract of the carotid bodies in horses, with which he produced a rise of blood pressure in rabbits. Another investigator, using a glycerin extract, produced a fall of blood pressure in cats. You may apparently take your choice. As Callison says:

"Its small size, and the contradictory results of experimental work, and the lack of clinical observation, indicate that whatever function the gland may have is not important."

Clinical Signs.—When tumors of this little gland occur, the history is somewhat as follows: A small, hard, painless tumor appears in the neck of an adult, between 20 and 50 years of age. It causes no symptoms, and does not induce the patient to consult a physician until its size produces noticeable deformity. It is on a level with the top of the thyroid cartilage, movable laterally but not vertically, and has an appearance of pulsation, which is found on examination not to be expansile, but due to the fact that the internal or common carotid artery is in front of it. If at this favorable stage the tumor be removed, it may be found that it is not as yet attached firmly to the carotids, and may be dissected free and removed, as was done by Dr. Gay in the case described. At this stage, in my belief, the growth is certainly not malignant.

As the tumor enlarges, it progresses in a downward and upward direction, often growing around and surrounding the carotids so as to require their removal;



Fig. 2.—Scar from second operation ten days after removal.

and sometimes, actually involving the internal jugular in the growth. The neighboring veins are involved, and paralysis of the recurrent laryngeal, with loss of voice, and difficulty in swallowing, results. The recurrent laryngeal fibers are caught by the tumor while still in the vagus. Irregularity of the pupil on the affected side, pain and stiffness of the neck and shoulder ensue.

The diagnosis is not often made. McKenty states that it was recognized before operation in only seven of the cases reported by him. In my own patient, I made a probable diagnosis, and should have felt practically certain had I read the case record of Dr. Gay's operation before I did my own.

Pathology.—The tumors are brown, dark red or gray, and all have identical structure; they are very vascular, showing abundance of large and small vessels in the fibrous partition walls surrounding masses of cells, the so-called *Cellballen* of German investigators, or alveoli, as they are more properly called; and may often be much diminished in size by squeezing the blood out of them (Fig. 3). They look in gross and on section like aberrant thyroids, and Balfour removed one during the course of a thyroid operation under the impression that such was its nature. He had to remove 4 inches of the internal jugular vein, and his patient had a hemiplegia, which was permanent and occurred two weeks after the operation. They have been called at various times epithelial, when the tumors were thought to be derived from branchial rests, of endothelial origin, etc. The width of the capillaries is often remarkable, and the surface of the tumor is covered with a large network of veins, which renders removal difficult.

These tumors apparently begin as hypertrophies of the normal organ, and grow five, ten, twenty, or thirty years without causing trouble, and are certainly benign for a long period. My one case is evidence of the benign character in the early stages, for no recurrence had taken place twenty-nine years after removal without tying the carotid. Invasion of the carotid has been noted in one old case, and of the jugular vein also in one case; metastases in the lymph nodes have been noted in a few of the late cases. Metastases in the liver have been observed in one patient dying without operation. It is certain that, after many years, they may grow rapidly, invade surrounding structures, and become, in fact, at least locally malignant. Recurrence, Balfour states, has

been noted in about one fourth of the cases (incomplete removal?).

Regarding my own case: Does the history leave any doubt as to the nature of the tumor? Does the description leave any doubt?

REPORT OF CASE

History.—The patient was a young woman from Martha's Vineyard, a school teacher, who had always been well and had never noticed anything abnormal until a friend called her attention to a little tumor just under the angle of the left jaw, a little below her ear. It did not cause her any pain; in fact, she never noticed it herself. It was about the size of a filbert. Dr. Coffin examined it and suggested an operation. The lump remained about the same for fifteen months, and in the following nine months nearly doubled in size.

On admission to the hospital about two years after the lump was first noticed, the physical examination revealed a little fullness just under the angle of the left jaw. A small tumor or swelling about the size of a walnut was felt, which was probably connected with the artery. It was pulsating and apparently expanding. Bruit was heard over the tumor and there did not seem to be any special pain on pressure. The operation at the Boston City Hospital was performed by Dr. George W. Gay; Dr. J. B. Walker, now of New York, who was then house surgeon, wrote the history.

First Operation.—An incision was made in a line over the carotid from the middle of the clavicle along the front of the sternomastoid up to the angle of the jaw; the tissues were carefully divided and dissected apart by the handle of the knife and director down to sheath of vessels. The nerves were not cut, but carefully pulled to one side. The sheath was opened and vessels laid bare just above the omohyoid muscles. As there was some doubt about the character of the tumor, it was thought best to expose it, hence the incision was prolonged to the apex of the mastoid and dissection was carefully carried down until the tumor was reached. It was found to be enclosed in a distinct smooth capsule and to lie beneath the carotid, rising in front and behind so as to partially embrace it. There was considerable difficulty in removing it on account of its depth and its intimate relation with the vessels. On removal the tumor was found to be of an oval form, the size of a large walnut; on section, dark reddish brown, and of fleshy consistency. The carotid was exposed bare to its sheath for a distance of about $1\frac{1}{2}$ inches. There was quite profuse hemorrhage from the walls of the cavity; one small artery was tied, the remaining hemorrhage being stopped by pressure. The edges of the wound were well approximated with a continuous catgut suture, a drainage tube was inserted at the lower end of incision, and a gauze dressing applied.

Subsequent History.—The patient married and had one son, who was 22 years old when she consulted me, Nov. 10, 1916. The patient herself was now 54 years old. She had

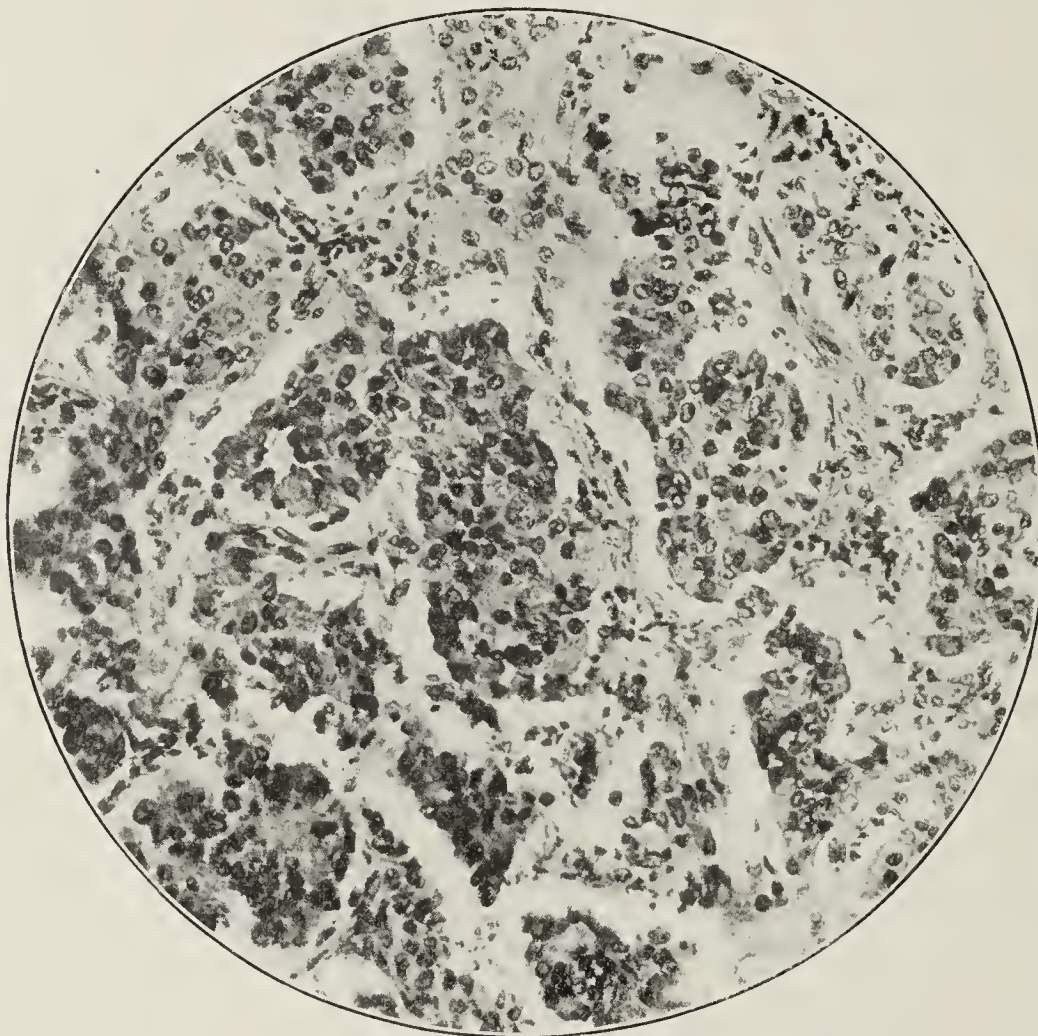


Fig. 3.—Section of tumor showing arrangement of alveoli and blood vessels.

been well until two or three years ago, when she began to have noises in her head, but she had noticed for sixteen years a lump in the right side of her neck.

Present Examination.—A thin woman, with a scar 4 inches long on the left side of the neck, extending from the angle of the jaw nearly to the clavicle, along the anterior border of the sternomastoid muscle. This wound had evidently healed by first intention. In the bottom of the scar could be felt the common carotid artery. In the right side of the neck, there was a tumor the size of a hen's egg, which at first appeared to pulsate, but the pulsation was found to be due to the fact that the common and internal carotid artery ran over the top of the tumor. The tumor was movable from side to side, but not from above downward; part of it lay behind the upper portion of the sternomastoid, and it had extended from the tip of the mastoid down to the top of the thyroid cartilage. The common carotid felt about twice the normal size. The internal carotid could be felt running across the upper part of the tumor.

The pupils were equal and reacted normally to light; kneejerks were normal; and physical examination in other respects was normal. There was no swelling inside the pharynx. A diagnosis was made of tumor of the intercarotid body, and the operation was performed, Nov. 14, 1916.

Second Operation.—An incision 4 inches long was made along the anterior border of the sternomastoid muscle, and the tumor was found to be covered with a network of large veins extending from the external and internal jugular, facial, and other veins in that region. There were several enlarged lymphatic glands on the surface of the tumor. On account of bleeding, it was difficult to expose the tumor, but after clamping a number of veins, the lower end of the tumor, shown in Figure 4, was exposed, and it was found that it could be shelled out with the finger. Passing the finger around it, however, caused profuse venous bleeding. This could be readily stopped by lifting the tumor, which was then found to be held in place by the common, internal, and external carotids, which held it back like a tight band. The common carotid was then divided between the clamps, numerous veins were clamped, and the tumor was lifted out and separated from the veins attached to its under side. About one inch of the internal carotid was removed just above its origin. The innominate, external, and internal jugular veins were exposed for some distance, but did not have to be tied. The spinal accessory nerve was exposed, but the hypoglossal nerve was not seen. After tying numerous bleeding points, the wound was sutured with a small rubber tissue drain at its lower angle. The head was fixed in a stiff pasteboard collar. For a few days she was hoarse and complained of difficulty in swallowing. The drain was removed the following day; on the second day, the dressing was removed. The wound healed by first intention, and she left the hospital in two weeks, in good condition. In June, 1917, she was presented at the meeting of the American Surgical Association in Boston, and was in excellent health.

COMMENT

The case seems to me of great interest as one in which operation was performed at a time when only four other patients had been operated on: Marchand's, by Regnier in 1880, and Paltauf's three patients, operated on by Maydl, Dittel and Gersuny in 1886. Marchand's article was not published until 1891, hence Dr. Gay had no literature to help him in making the diagnosis.

A pathologic examination of the tumor was made by Dr. Coffin, who referred the patient to Dr. Gay

for operation, but he could not find the sections twenty-nine years later, when he referred her to me.

Many of the patients as old as 54 years in whom the carotids have had to be tied in removing the tumors, have died; therefore the outcome of the operation on my patient was fortunate.

The mortality of ligation of the common carotid is about 10 per cent. and 23 per cent. of the patients have cerebral symptoms. It seems evident that, in spite of Keen's advice, these tumors should be, if possible—as it sometimes is in the early cases—dissected off the vessels without ligating, for they are not malignant.

So far as I have been able to determine, this is the only patient in whom these tumors have been operated on successfully on both sides of the neck.

527 Beacon Street.

ABSTRACT OF DISCUSSION

DR. STANLEY STILLMAN, San Francisco: This interesting paper by Dr. Lund, together with papers by Calston and McKenty, which were presented to the New York Academy of Medicine four years ago, and an article by Balfour and

Widener in *Surgery, Gynecology and Obstetrics*, in 1914, leave little to be said on the subject of the nature and pathology of these tumors. I think the point made by these later writers that the intercarotid body is a paraganglion and belongs to the chromaffin group of the sympathetic nervous system is well taken, and that the tumors are not endotheliomas, but are of nerve cell origin, and the finding of the cells in the tumor is conclusive evidence of their nature. I am inclined to think the tumors are much more common than is generally considered to be the case. In 1906 I heard Dr. Keen's paper before this association, and at that time, judging from the admission of a number of prominent surgeons present, hardly any one knew of the existence of these tumors or of the gland itself. Dr. Keen's case was the fourth recorded in this country. Dr. Scudder reported the first in 1903. Dr. Keen collected twenty-nine cases in his paper. In the next seven years the total number of

cases doubled—more than thirty. Dr. Winslow, in a paper presented before the American Surgical Association in 1916, had collected twelve additional cases occurring in the previous three years. In March of this year I prepared a paper on this subject, which was to have been read before this section, but which somehow got sidetracked in this discussion. In this paper I meant to report three cases occurring in San Francisco. These, taken with Dr. Lund's last, make eighty-three. That is, eleven cases reported in the last year only.

Two years after hearing Dr. Keen's paper I had a case in which I had no difficulty, from his description, in recognizing the tumor after I had once cut down on it. My immediate associates, Drs. Rixford and Thorn, were present at that operation. Seven years afterward Dr. Rixford had a case which he had no difficulty in recognizing when he cut down on it. Last year the sister of my patient, operated on in 1908, came to my office in my absence and was seen by Dr. Thorn. He bravely made a diagnosis of tumor of the carotid body and in my absence operated and found such to be the case. He was obliged to ligate the carotid and the patient died within twenty-four hours of softening of the brain.

It seems to me to be absurd that more than 3 per cent. of the total recorded cases should have occurred in San Francisco and in the practice of three men intimately connected with one another. I think it is, to a great extent, due

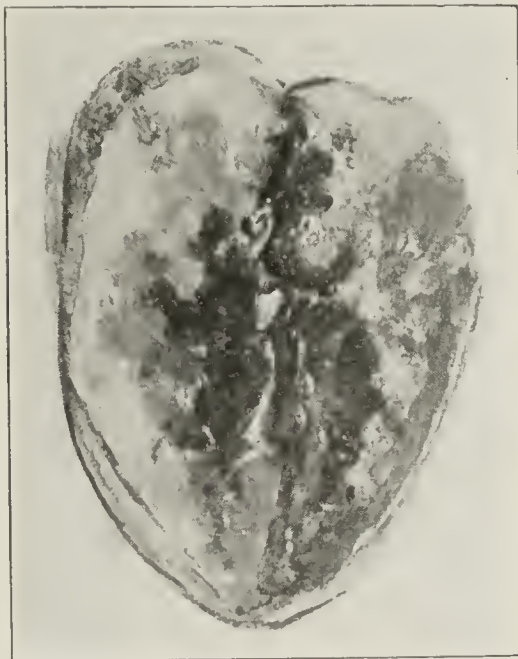


Fig. 4.—Photograph from painting of tumor; natural size.

to lack of knowledge, and that there are cases scattered all over the country undiagnosed and being treated or operated on as sarcoma or something else.

No matter how successfully the operation is done so far as life is concerned, very few of these patients get well without some very unpleasant consequences of the operation. The pressure on the sympathetic nerve and manipulation trying to get out the tumor, result in disturbance. Ligation of the carotid is a serious thing. While the patients do not all die, the percentage of deaths from hemiplegia, persisting for a number of years, is high. Aphonia may be present, as it was in my case. My patient could not speak louder than a hoarse whisper and was most miserable in consequence. At the death of her sister I saw her, and at that time she had accommodated her vocal chords in such a way that she could speak loud enough so that you did not particularly notice the paralysis of the vocal chords.

The gravity of the prognosis should make it obligatory that the knowledge of the nature of these tumors should be widespread. The unexpected operation on one of these tumors, requiring ligation with its consequences, followed by the postoperative disturbances, make it difficult to explain afterward. It is much better to anticipate these things, and say that a tumor in this position may be of such a nature and may be followed by such consequences.

There is unquestionably a long period in my case, nine years, in Dr. Thorn's case of four years, in which the patient knew of the existence of the tumor. In my case I had operated nine years before for a postpharyngeal abscess. At that time I felt the gland about the size of a lemon and supposed it was a tuberculous lymph node, giving rise to a postpharyngeal cold abscess. When I operated on the patient the tumor extended from the base of the skull well down toward the lower part of the neck, and the removal of it was attended with good deal of difficulty.

There is no question that there is a period in which they are benign; afterward they become malignant. In regard to the possibility of removing them without ligation of the carotid, while it looks to be formidable and is formidable, still, with a combination of sharp and blunt dissection it is possible, in many of these cases, in spite of the oozing, which can be controlled by lifting on the tumor, to dissect them out, as mine was. The artery looked like the appendix after having shelled off the thickened peritoneal coat. It looked worm-eaten and I expected she might develop an aneurysm. So that you can practically strip off the sheath of the vessels and not jeopardize it so far as thrombosis or aneurysm is concerned.

DR. FRED B. LUND, Boston: I am glad that Dr. Stillman brought out the importance of making the diagnosis, if you can, in these cases, because the results of operation may be serious. My patient had aphonia for a short time; but it cleared up.

These tumors can sometimes be dissected off from the carotid as Dr. Stillman says, and he is to be congratulated on his success. A friend informed me that he had no difficulty in a similar case in lifting the tumor by a piece of tape and getting it out without ligation.

The definition of conservatism is interesting. It was a conservative procedure to do this operation on a small tumor, as Dr. Gay did. The result has been that the woman has had a long, happy life. If he had been one of the men who say, "Oh, I guess we will wait and see," she would have been dead, and such a procedure would not have been true conservatism.

Relative Values.—One principle in medicine is worth a volume of loose disconnected facts.—Dr. Benjamin Rush.

"SOUP BONE" IMPLANT FOR THE CORRECTION OF DEFECTS OF THE SKULL AND FACE *

W. WAYNE BABCOCK, M.D.

Surgeon to the Samaritan Hospital, American Hospital for Diseases of the Stomach, and Garretson Hospital

PHILADELPHIA

In the five cases here recorded a prosthesis was obtained by embedding under the scalp or the skin of the face, portions of beef or mutton bone removed from the hospital "soup-kettle." The results are interesting as they are apparently contrary in many experiments—indicating that alien or devitalized bone introduced into the living tissue undergoes absorption or expulsion—and that such bone does not serve a useful purpose for the replacement of normal osseous tissue. It is evident, however, that most of the experimental evidence as to the transplantation of bone is based on experiments made on the long bones of the body, and it is quite possible that some of the results obtained in experimenting on bones developed from cartilage may not apply to those bones developed from membrane. We were, in one case, unsuccessful in transplanting a boiled bone from a recently amputated leg for a defect of the tibia, and have observed the rapid absorption of ivory pegs, although Lexer has even used masses of horn in the formation of new joints. At any rate, we can record the interesting clinical observation that large plates of dead foreign bone may show no external evidence of absorption or weakening two years after implantation under the scalp. It is probable that the dead bone serves as a scaffold for the ingrowth of new firm tissue.

CORRECTION OF DEFECTS IN THE SKULL

A defect of the skull may be objectionable on account of the disfigurement, the cortical irritation or epilepsy produced, or other symptoms due to static movements of portions of the brain through the opening. Congenital defects in the skull requiring correction are seen in hydrocephalus and cranial meningocele. Much ingenuity has been expended in the correction of these various defects. The area may be covered by portions taken from the outer table of the skull, used in the form of free transplants, or by an osteoplastic flap transplantation. Such osteoplastic closure has been found useful in small openings, but not so practicable for the larger ones. Alien substances, such as thin plates, often perforated, of silver, gold or other metal, have been used. Celluloid, ivory, hard rubber, horn, paraffin, cork and other materials have been embedded. Plates of sheet mica have been advocated by Kane.¹ Many of these substances are obviously undesirable. Silver filigree we found to be of insufficient strength, while Lane's plates placed in the form of bars across large openings in two instances were useful.² The alien substance may cause such a

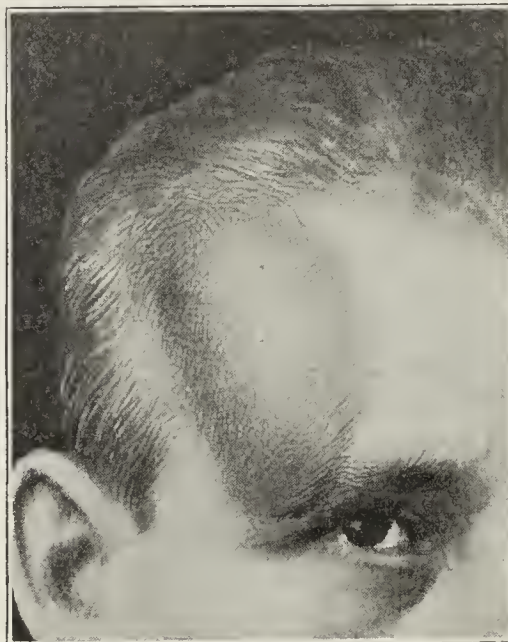


Fig. 1 (Case 1).—Character of skull defect before operation.

* Read before the Section on Stomatology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Kane: *Railway Surg. Jour.*, August, 1913.

2. Babcock, W. W.: *Osteoplastic Surgery of the Face*, *THE JOURNAL A. M. A.*, Jan. 16, 1915, p. 203.

profuse serous secretion in the wound, or tissue irritation, as to necessitate removal. Paraffin and cork certainly should not be used. Autogenous tibial transplants have the advantage of being well tolerated, but require an additional operation with its added risk. Mauclaire³ has filled these defects by transplants taken from the lower angle of the scapula, and by slices from the tubercle of the ilium, or from the great trochanter. Flaps of bone from the sternum were used in two cases by P. Müller.⁴ An autogenous rib graft with attached periosteum was used by Kahle. These various substances are either laid over the defect or wedged into position, fixed by small hooks, which are dropped in drill holes placed in the edge of the adjacent bone or fastened by sutures, wires or screws to the skull, the pericranium or other tissue. The use of fat transplants to fill cranial defects we can hardly commend.

The "soup bone" implant here advocated has not only the advantages of convenient accessibility, mobility and sufficient size, but apparently produces, when embedded, little or no irritation of the adjacent tissue, and seems to give a strong and perhaps permanent closure.

TECHNIC

A bone taken from the soup-kettle has the advantage of having less animal matter than a fresh bone. Care must be taken, however, that it has not been rendered too brittle by prolonged boiling. The scapula, on account of its size, thinness and porous medulla, is preferred. Such a boiled bone of a sheep or ox is selected, rinsed, reboiled for one hour in a large quantity of water, then removed and placed over night in a 1:20 solution of phenol (carbolic acid). Previous to the operation, it is again boiled for a third time for at least one-half hour in plain water. By this time most of the animal matter has been removed, the bone is somewhat softened, and can be readily cut into the required shape by a heavy pair of scissors, by bone-cutting forceps, or a heavy cartilage knife. The spine of the scapula is cut away, ridges and rough surfaces removed, the bone trimmed and contoured to the required shape and perforated by many drill holes placed about one-half inch apart. A flap of the scalp with its margin well beyond the defect is then raised, or a sufficiently long straight incision made over the area, the periosteum separated from the margins of the defect and stripped well back, and the prepared "soup bone" fitted into or over the opening, being contacted with the living bone and wedged or fastened under the margin of the raised periosteum. Fixation may be aided by a few sutures of chromicized catgut. Absolute hemostasis is important, and the skin margins should be accurately sutured in position, no drainage being used. The stitches are removed on the third or fourth day. If later there is a marked serous accumulation, this is removed under strict aseptic precautions by introducing a grooved director through the wound, the opening made being permitted to close at

once, as continued drainage would probably be followed by infection and expulsion of the alien bone. The bone soon becomes fixed in its new position and is probably early permeated by new blood vessels.

CASE 1.—*Epilepsy and cranial deformity following osteotomy and injection of paraffin. Not relieved by removal of paraffin. "Soup bone" implant with relief from convulsions and good cosmetic result.*

A. H., man, aged 33 years, German, laundryman, with negative family and previous history, in 1903, while cleaning a German service revolver, was accidentally shot, the bullet entering the temporal bone about two inches in front of the upper part of the lobe of the ear on the right side and ranging forward and upward. He was taken to a hospital in Bonn, Germany, and a part of the temporal and frontal bones down to and including a part of the right supra-orbital ridge removed. Two weeks later paraffin was injected to fill the large defect. The paraffin softened and gradually became lumpy and irregular. Nine years after injury he began having epileptic convulsions, at first every three months. The paraffin was removed in 1912, in Philadelphia. No relief followed, the convulsions occurring from two or three times a week to two or three times daily. The

convulsions were preceded by formication in the scar, were initiated by retraction of the head to the left, and were followed by troublesome headaches. April 13, 1915, he was operated on at the Samaritan Hospital, a flap being raised along the lines of the two previous operations, dense adhesions separated, and a portion of the perforated scapula of a sheep fitted into the defect. The wound healed without irritation despite the large amount of scar tissue from the previous operations. The patient left the hospital in one week. A marked reduction in the number of convulsions followed the operation. Since December, 1915, or over one year, under small doses of ferrocyanid of iron the patient has had no convulsion, and has been practically free from headaches. In September, 1916, he was struck a violent blow over the implant by a door, without harm. The contour of the frontal region is well restored, and after two years the edge of the "soup bone" can be easily felt and shows no sign of absorption. The implant is firmly fixed, painless, and apparently very strong. Some small overlying nodules of paraffin can be felt in the scalp.



Fig. 2 (Case 1).—Flap of scalp turned back and piece of scapula (drilled) sutured to fit defect in skull.

CASE 2.—*Large cranial defect with vertigo and epilepsy from palpation or movement. "Soup bone" implant with apparent perfect result after nearly two years.*

M. L., man, aged 39 years, Irish, cowboy, was brought to the Samaritan Hospital Jan. 16, 1915, having been picked up unconscious on a trolley car. Examination showed a large defect in the skull, and palpation of the area was followed by a generalized convulsion. On regaining consciousness the patient gave a history of having been kicked in the back of the head some years previously, following which a craniotomy was performed. On standing there was a large cup-shaped depression in the right upper occipitoparietal region, and on bending over, the brain bulged through the opening causing great vertigo, or an epileptic convulsion. Horseback riding (galloping), pressure over the depressed area, or nervous excitement, likewise incited convulsions. The patient therefore was unable to work. There is slight deafness of the right ear, and marked headache and pain near the right ear and back of the neck. Operation was performed Feb. 3, 1915, under local anesthesia. A flap of scalp was raised and the dura and pericranium separated from the edge of the defect. A portion of boiled sheep scapula, perforated and trimmed to size, was fixed in the defect by

3. Mauclaire: Presse méd., July, 1914.

4. Müller, P.: Zentralbl. f. Chir., 1915.

fine chromic gut sutures. The implant was contacted with the living bone, the scalp being replaced and sutured without drainage. A transient hyperpyrexia, without other symptoms, attributed to alien proteins in the dead bone, followed the operation, after which the patient made a perfect recovery. In January, 1917, the patient reported at the hospital as being able to work and free from symptoms.

"Soup bone" prosthesis seems to be deserving of a trial in the correction of osseous deformities of the



Fig. 3 (Case 1).—Photograph after healing had taken place.

face and jaw where fat implantation is not feasible. For the correction of saddle nose, defects in the supra-orbital or infra-orbital ridges, depressions in the malar or supra-maxillary regions, loss of zygoma and for defects or irregularity of the mandible, the alien bone suitably contoured may be tried. In three cases of saddle nose we have introduced this form of dead bone, using

portions of the spine of a scapula. In each case the alien bone was contacted to living bone, the technic being similar to that which I described before this section in June, 1914,² and that later was illustrated by Dr. John B. Murphy.⁵

In inserting implants for saddle nose we have experienced difficulty in securing enough mobility of the skin to raise the bridge of the nose to the required height. For this reason it has seemed desirable in certain cases to do the operation in two stages: at the first operation introducing the largest implant that can be employed without undue tension of the overlying skin, while at the second operation, performed some months later, another implant is superimposed on the first.

CASE 3.—*Soup bone implant for saddle nose. Result maintained after over one year.*

A. K., woman, aged 25 years, single, with negative family and previous history, developed ocular symptoms at 8 years of age and was treated intermittently with inunctions of mercury for three years. At the age of 12 years a perforation developed in the hard palate, and later necrosis of the bones of the nose, leading to saddle nose.

Present Condition.—Saddle nose with perforation of the hard palate and loss of the right tonsillar pillar. The Wassermann test is +. Patient was prepared for operation by the use of mixed treatment internally, and salvarsan and neosalvarsan intravenously and intramuscularly. Operation Feb. 13, 1916, under local anesthesia. A vertical incision to the bone was made through a wrinkle line of the forehead, beginning at the frontonasal junction. Through the incision the skin was thoroughly separated from the underlying nasal bones by a pair of curved Mayo scissors. A portion of the spine of a boiled sheep's scapula was slid down from the forehead under the skin of the nose to correct the defect. The implant was contacted with the frontal and nasal bones. Some transient redness and inflammatory reaction followed the operation, perhaps due in part to the tension of the overlying skin, but primary union was obtained. Fourteen months

after the operation the patient reports that she is married and pregnant, and that the implant has caused no trouble.

CASE 4.—*Syphilitic saddle nose. Implantation of soup bone. Recovery.*

M. L., girl, aged 18 years, with negative family and previous history, fell, six years ago, and broke (?) her nose, which remained sore, and for this she was treated in the Philadelphia Hospital for five weeks. Necrosis occurred which was arrested after one intravenous injection. The deformity—a marked saddle nose—has remained. The patient was admitted to the Samaritan Hospital, Nov. 3, 1915, and on Nov. 9, 1915, a wedge-shaped portion from the spinous process of a beef scapula was inserted through a vertical incision in the forehead, and contacted with the frontal and nasal bone as previously described. The implant caused considerable tension of the overlying skin, and there was some inflammatory reaction, which gradually subsided under antisyphilitic treatment. Primary union was obtained.

CASE 5.—*A syphilitic saddle nose in a child corrected by a soup bone implant. Bone not retained.*

M. R., girl, aged 9 years, white, was admitted to the Samaritan Hospital, Oct. 31, 1916, with a history that she had fallen the previous spring and injured the nose. The injury was followed by necrosis, and falling of the bridge of the nose, producing a marked saddle-nose deformity. Wassermann positive. Operation Nov. 11, 1916; anesthetic, ether. The incision was made in the left wrinkle line of the forehead to the frontal bone, and the skin of the nose raised and separated by blunt dissecting scissors. A bit of soup bone was suitably contoured, inserted, under tension and the wound closed by interrupted horse-hair sutures. Some edema of the nose with redness followed. The patient was discharged Nov. 5, 1916. Later suppuration occurred and the alien bone was removed.

ABSTRACT OF DISCUSSION

DR. GEORGE V. I. BROWN, Milwaukee: I have never used soup bones. There are a number of interesting questions



Fig. 4.—Line of incision for insertion of alien bone in nose.

which arise, however, that I trust Dr. Babcock will speak of when the discussion closes. For example, it has been said that various implants used for saddle noses, have, in the course of time, absorbed. Dr. Babcock did make some reference to that, but I should like him to elaborate a little and say what the experience is in that regard. Albee of New York, who does wonderful bone implantation work, says it is necessary to have autobone grafts to get results; that the same results are not obtained with any animal grafts.

The cases referred to were interesting, inasmuch as there was present a definite factor which could be recognized; but I dare say that two years is hardly a sufficient time on which to

base an estimate of the cure. I should like to know how long Dr. Babcock has had cases in which he has applied this graft, and how long a time his record of cure covers.

DR. T. W. BROPHY, Chicago: In the raising of broken or flat noses, I have found it possible to get enough soft tissue alongside of the nose, in the muscular tissue, to accomplish the work. Even soft tissue will hold out the skin and give the nose a very good appearance.

A colored man came to our clinic with a necrosis of the entire mandible. I nursed the sequestrum along for months,

5. Murphy, John B.: Murphy's Clinics, August, 1914.

cleaning the parts with antiseptics as thoroughly as possible, and there was in time generated a complete new mandible. We kept the skeleton or framework of necrotic bone there about which the new bone was formed, and then we removed the sequestrum piece by piece. We were obliged to remove small pieces of dead bone. An artificial piece, no matter what, put in position so as to hold the soft parts in place until the new bone can be generated, will prevent the collapse of the chin and prevent the intense facial deformity by holding out the parts until cicatrization is complete, even though new bone be not formed. In that way we are able to retain the parts in their proper place and get a very good result. The sequestrum serves the same purpose as an artificial piece.

DR. C. B. CORTRIGHT, Brooklyn: In regard to the lacrimal duct, in overcoming the saddle nose deformity, is there any distortion, and do the tears run down on the face? Is there any marked difference in the cornea?

DR. W. J. YOUNGER, Paris: Morestin of Paris uses a portion of a floating rig to supply noses. I have seen very respectable noses given to the soldiers.

DR. W. WAYNE BABCOCK, Philadelphia: What happens to the implant, as time goes on? We can simply refer to what we have seen in two years. With bits of firm material, like ivory, that have been embedded, we have found, in a few months, signs of marked absorption. We have been able to watch a subcutaneously imposed bone and find in two years no evidences at all of its absorption. Whether it will be absorbed in time we cannot say.

The subject of bone regeneration and transplantation does not seem to be absolutely settled. Some one settles it for a few months and then some one else further experiments and upsets the matter. John B. Murphy felt sure that transplanted bone would be compacted with other living bone, and that there would grow into the canals of the transplanted bone new blood vessels from the bone with which it was placed in contact. Others have claimed that this is not so and have tried to prove it, and yet there is much to indicate that there is a big germ of truth in Murphy's idea. Some believe the periosteum has nothing to do with bone regeneration, and have shown by many experiments, where the periosteum of the lower jaw has been scraped down, that bone does not generate. The periosteum may be a limiting medium, and yet, on the other hand, there is ground for the belief that there is an inner layer of cells which may have something important to do with bone regeneration. Will a dead bone serve as a scaffolding? We do not believe dead bone remains as dead bone in the tissues, but if it can stimulate bone with which it is in contact to send into its porous structure new blood vessels, and can replace this alien bone by living material of an osseous or sufficiently firm nature to give a support and contour to the skull, then we have accomplished all that we wanted to accomplish. It is not that we want to keep the soup bone in the patient's head, but to fill up the defect with something that will take the place of what was lost and correct the deformity. In the skull, evidently conditions are better than in the face, although the skull does not reform bones as do other bones of the body. After fractures of the skull we do not have secondary callus formation, and we do not have in gaps of the skull much regeneration or replacement. A saddle nose, as Brown has suggested, is a different problem. It occurs in a syphilitic, and we know how hard it is sometimes



Fig. 5.—Method of preparing pocket for insertion of alien bone in nose.

to stop the progress of a necrosis which leads to saddle nose, and even with our best treatment we sometimes cannot arrest the process. A patient I know of has had twenty-six injections of salvarsan and yet retains a positive Wassermann. When we put in a dead substance in such patients we tax the tissues and there is considerable chance that the irritation will do harm.

The same condition obtains when we transplant from the rib, from the costal cartilage, or from the tibia. Some transplants are retained, and some are expelled; and we think it likely, in answer to Brown's question, that some of these bits of dead bone that we put in will likewise be absorbed, if they are not expelled; and yet the fact that we have retained, for two years, in one of our patients, a mass which appears to be bone, makes us feel that this is worth trying.

In none of the cases in which we have implanted have we observed any serious trouble. The tissue about the cornea gives us the least trouble. It is relatively elastic; it is the firm tissue over the bridge of the nose that gives us more trouble. We have difficulty in raising it up to the point where it should be, if we separate the tissues from the nose and cheek.

THE RESECTION OF LOBES OF THE LUNG *

SAMUEL ROBINSON, M.D.

Fellow of the American College of Surgeons

ROCHESTER, MINN.

Large portions of the lung may be removed from the normal animal with ease and without danger. This is by no means true in case of the sick man afflicted with chronic pulmonary disease. He is generally septic, his resistance is low, his bronchial tree is flooded with a profuse purulent secretion. He is moderately cyanotic. His blood color is low. The diseased lung lobes are firmly adherent to each other and to the diaphragm and the pericardium. The hilum of each lobe is inaccessible. The main lobe bronchus is generally thickened and diseased and unadapted to the technic of closure so successful in animals. The respiratory function and more particularly the circulatory mechanism are distinctly upset by operations for lung resection. The right heart labors in the early postoperative stage to adapt itself to the added demands on the pulmonary circulation. The sound lung labors to accomplish the work of two. This it cannot do when the embarrassed right ventricle fails to supply it with blood to be oxygenated. At best the convalescence following operation is both hectic and long. There is much suffering. The end-result may be only a partial cure. Later plastic operations are generally necessary to obliterate the pleural cavity and to repair bronchial leakage.

Let no man suppose, therefore, that removal of lobes of the lung is a trivial performance. Those of us who are pretentious enough to disclose our experiences in this regard do so more with apologies for our incompetence than with boasts of our success.

The indications for lobectomy are few, but these must be specific. Chronic, nontuberculous lung abscess and bronchiectasis are at the present writing the only diseases to which such radical procedure should be applied, and then only in selected instances.

One lung must be absolutely sound. The disease must be confined to one lobe, or at least one lobe and the adjacent portion of an adjoining lobe. There must be an absence of active tuberculosis. The heart

* From the Division of Surgery of the Mayo Clinic.

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

must be a normal one. There must be complete absence of any systemic or organic disease. The individual should be under 35 years of age, certainly not over 45. There must be evidence that all nonoperative methods have failed or are obviously bound to fail. There should be ample evidence that the existing pulmonary infection is not one that might be cured or relieved by direct drainage of the lung.

Given a young adult patient with chronic abscess or bronchiectasis confined to one or one and one half lobes of one lung, whose resistance is not too low and in whom palliative treatment or drainage operations would obviously fail, lung resection may be considered. Nor should the patient be kept in ignorance of the dangers and discomfort associated with the procedure which you may propose to undertake. If all indications have been carefully studied and verified, the patient may properly be instructed that he may entertain no hope of cure without operation; that his existence will be a lingering and disgustingly offensive one both to himself and his associates; and that this existence will be of comparatively brief duration. Then it must be explained that the chances of relief or cure by the surgical alternative are between 60 and 70 per cent. If when thus informed the patient decides, after due consideration, to undergo operation, lung resection is justifiable.

I have employed a different technic in lung resection from that which we have all adopted in animals, and different from that employed in man by other surgeons. It consists in a several-stage operation with a multiple rib-resection exposure rather than a single operation with a wide intercostal exposure. I have argued that the division into stages reduces the insult to the respiratory and circulatory systems; that the intrapleural pressure is more gradually altered and the pulmonary circulation less suddenly overworked in the several-stage rib-resection method than in the single operation through an intercostal opening. I have been of the opinion that while these disturbances are equally well cared for during operation, the dangers associated with them in the first twenty-four hours after operation by the one-stage method are obviated by the several-stage operation.

FIRST STAGE

Neither differential pressure nor intratracheal insufflation has been used in this series, nor has their omission been regretted. The incision is crescentic, with its convexity downward, starting at the fifth rib two inches from the vertebral column, crossing the eighth rib in the scapular line, and terminating at the level of the sixth rib in the mammary line.

The skin and fat are dissected upward from the muscle for an inch. Vessels are clamped and tied. The latissimus muscle fibers are separated vertically to admit long-bladed curved muscle clamps, which are applied in series above and below in the direction of the sternum and again toward the vertebral end of the wound. The muscle fibers are then divided transversely between the clamps.

The field thus exposed should permit the subperiosteal resection of the seventh, eighth, and ninth ribs from their angles to the anterior axillary line. The intercostal bundles are then ligated and removed. The skin and muscle flap is then replaced. The wound is closed tight. The thoracic window has been made ready to open. The chest-wall collapse necessary for the subsequent obliteration of the space left after

amputation of the lower lobe is provided. Something has been learned of the individual's resistance to surgical trauma, and of his tolerance of anesthesia.

SECOND STAGE

The interval prior to the second stage should be approximately a week in length. The power of expelling sputum should have been restored; all trace of shock should have disappeared; and the temperature should approach "normal."

The skin stitches are removed, the scapula and flaps retracted, and the pleura again inspected. It will be found that in the upper part of the exposed field there are new pleural adhesions anchoring the upper lobe. The lower lobe is still adherent at various places, now somewhat retracted and purple red in color. The pleura is opened wide at any point whether adherent or not. There will be no particular change in respiration or pulse.

The separating of adhesions necessary to deliver the lower lobe is generally irksome. It is the difficult part of the operation. The lower lobe is generally bound to the diaphragm and costodiaphragmatic angle by tough, unyielding bands which may not yield under digital pressure. If undue force is used in stripping, the lung surface will tear before the adhesion gives way. Some of these should be cut. It is well, therefore, to free the lobe first from all except its diaphragmatic attachments, so that if bleeding occurs during the separation of the latter a clamp may be applied temporarily in the region of the lobe hilum. The interlobar fissure does not always provide a simple cleavage, nor is it advisable to employ too much force in this region lest the light adhesions be parted which by now should be holding the upper or middle lobes to the parietes. The pericardial surface is least troublesome of all.

To stop the operation at the middle of the second stage and to defer the completion of adhesion-stripping and the amputation to a third stage is a conservative measure not to be regretted, and one which in difficult cases may save the patient from undue hemorrhage, shock, and carbon dioxide poisoning.

AMPUTATION

If there has been no occasion to close the second stage prior to the complete delivery of the lower lobe, amputation is promptly performed as follows: A long curved clamp is applied to the root and closed to the last notch. The lobe is then amputated at least a half inch distal to the clamp. The veins, arteries and bronchi are then picked up separately and ligated with No. 2 chromic catgut. A mass ligature of kangaroo tendon or braided silk is then placed just proximal to the clamp and tied as the clamp is slowly released, the ligature being guided into the crushed area evacuated by the clamp. Not infrequently two clamps are necessary safely to include the whole stump. It is apparently an equally satisfactory method to leave the root clamps in situ and to remove them on the seventh day.

Both of these methods of amputation result invariably in subsequent leakage of the bronchial stump. The portion distal to the mass ligature or clamps sloughs away within a week or ten days, leaving one, two or three fistulous openings of small caliber. Experience will prove whether or not it is expedient to attempt any special technic for hermetically closing the bronchus at the time of amputation. The

bronchus at the point of division is generally dilated; its walls are thick, tough, and unyielding. It is probably not amenable to such treatment as invagination and end-suturing, which has been successful in normal animals. If treatment of this kind were attempted it would necessitate the isolation of the bronchus from the vessels in the hilum, the individual double ligation of the vessels before their division, and the crushing, division, cauterization, invagination, and suturing of the bronchus. Neither the clamp nor mass ligation could be employed. In the present period of undeveloped surgery of the diseased lung it would seem more proper not to sacrifice time at the end of a critical operation by any finesse in the treatment of the bronchial stump, which in its pathologic condition would stubbornly resist any technic of closure.

The minute fistulas consequent on the clamp and mass ligation technic in no way complicate the convalescence. The pleural space is rapidly obliterated, the fistulas remaining the only unhealed points in the wound. By local plastic surgery under local anesthesia the fistulas are closed later by the superimposing of a skin-and-fat flap.

The after-treatment of the second operation is simple. Bronchial secretion is no longer a cause of anxiety. Within the first two days the bronchial tree becomes free from the residue emptied into it from the lower lobe just previous to its removal.

With return of consciousness the patient discovers that the promised reward of his long siege of treatment is now a reality. The sudden freedom from a cough of perhaps ten years' duration is a stimulus mentally and a boon physically.

The pack is not disturbed for four days, by which time it is foul. At least two thirds of it can then be removed painlessly. When firmly adherent to the raw surfaces of the parietal pleura, fragments of the gauze should be left till they have sloughed away. Again, precaution is taken at each dressing to repack the persisting pleural space completely lest pocketing occur in the costodiaphragmatic angle or about the pericardium or posteriorly below the lower limits of the neighboring lobe. At no time in the convalescence should drainage-tubes be substituted for gauze. The skin opening has been so designed that it will not close until the cavity is obliterated. Irrigation is never indicated. Granulations may be stimulated with balsam of Peru. The pleural space remaining after excision of the lower lobe, having been already diminished by the shrinkage of fibrosis attendant on the first two stages, may now be obliterated within four months. The patient meanwhile attains a body weight equal to his previous maximum, and this continues to increase rapidly during the months following closure of the wound.

ABSTRACT OF DISCUSSION

DR. HOWARD LILIENTHAL, New York: My operations have not been performed by the method which Dr. Robinson has described, although after a talk with him I was sufficiently convinced of the desirability of the principle of preliminary lung fixation by artificial adhesion to the costal pleura that in three cases I attempted a modification of his method. In only one of the three was I able to carry out both steps, and this patient died of sepsis ten days after the second operation. These cases will all be reported at a later date.

In speaking of the operations for lung abscess, I refer here only to those in which an attempt was made to extirpate the diseased lobe. In my first seven cases, operated on by the

one stage method, four patients were cured and have remained well.

It is conceded that nothing short of resection will actually cure these patients. Drainage operations are usually futile, and at best are followed by more or less improvement, but not by cure. I believe that the one stage method has the great advantage of doing away at once with the pus-forming focus so that the danger of postoperative pneumonia on account of the inability of the patient to cough up the purulent secretion is minimized. By operating between the ribs, with or without additional rib section—but not resection—to gain sufficient room, the contour of the chest is not disturbed and such deformity as exists is invisible without the use of the Roentgen ray, because instead of the filling in of the dead space by collapsed areas of the chest wall, the space is filled in by the rising of the abdominal viscera which push the diaphragm into the thoracic cavity. We therefore have a resulting symmetry of the skeletal parts and the functions of the chest more nearly approach the normal than they can after a multiple rib resection.

The method which I adopted in trying to secure a safe two-stage operation was to make a long intercostal incision, separate the ribs, paint the surfaces of the visceral pleura covering the healthy part of the lung and the adjacent parietal pleura with tincture of iodine. Then expanding the lungs with intrapharyngeal pressure, the chest wound is closed by suture. In one of my cases, the only one in which it was possible to perform the second stage, I found good adhesions, so that on opening the chest for the second stage there was no collapse of the lung. I could then resect the lobe, the right upper one, with very little shock; but unfortunately a serious local infection occurred and the patient finally died of pneumonia of the opposite lung.

In a suitable case I shall be glad to try this plan again. At the same time I must say that my best successes, four cures in seven cases, followed the one-stage operation performed through an intercostal space without rib resection. Two of these patients had their right lower lobes resected and two the middle lobes. Another patient who is convalescent after nearly two months, but who still has a large cavity to be obliterated later on, survives after the extirpation in one stage of the right lower and middle lobes. This patient developed an anaerobic infection after his operation and was near death's door. For forty-eight hours I permitted a slow stream of oxygen gas to flow through his thoracic cavity and the anaerobic infection was overcome.

The principal differences, then, between Dr. Robinson's method and my own are, first, that I prefer not to resect ribs but to operate between them; second, by removing the suppurating focus at the first stage, the cough at once ceases and the danger of pneumonia from that source is overcome.

DR. WILLY MEYER, New York: One of the principal points brought out by Dr. Robinson is the careful selection of these cases for operation. Unilateral bronchiectasis of one lower lobe certainly is the most favorable for extirpation. Among my five cases of attempted lobectomy, only one, the first, had inferior lobe affection (1910); in two, both lobes (left lung) were involved; in two others the upper lobe alone was diseased.

In animal experimentation lobectomy is simple. The lobes are differentiated and easily pedicled. The bronchial stump, after crushing, can be inverted and safely stitched. We saved seventeen of twenty-one dogs thus operated on. The lobes of the inflamed human lung form a unit. One cannot so easily get into the interlobar space. Pathologic conditions render isolation of the bronchus and ligation of the concomitant vessels unsafe and impracticable. We must therefore treat the pedicle of the lung, as, for instance, that of a suppurating kidney, namely ligate it "*en masse*," and provide for the reopening of the bronchus stump in after-treatment.

Dr. Robinson spoke principally of operations in advanced cases. I would say a word on the treatment of earlier cases. Bronchiectasis usually follows pneumonia and aspiration of blood (tonsillectomy, adenoids). In one case of the latter type (girl), all lobes of one side were affected. Regular irrigation of its bronchial system brought great improvement

(Yankauer). In two cases pneumotomy brought permanent relief. After incision we could see the irregular bronchial distention, which the finger tip palpated. Increased ventilation of these cavities can do away with the very foul odor (three observations). Irrigation with oxygen assists.

In advanced cases the stage operation may have advantage. I tried it once, the entire left lung being involved. Aspiration pneumonia took the patient's life on the third day. Surgeons interested in this subject should have a large amount of material to select from. Evolution would then be quicker.

Two methods seem destined to improve results: thoracotomy under regional anesthesia and postoperative drainage. Regarding the latter, Kenyon's method seems best. In one of my cases (two-stage operation), more than two quarts drained off in sixty hours. We are just trying to develop its technic for the various types of intrathoracic operations (six cases).

It seems wise to enter the thorax without a fixed program. Findings must dictate the required operation as in abdominal surgery. Conservative surgery can bring great relief, when radical surgery may take the patient's life.

DR. SAMUEL ROBINSON, Rochester, Minn.: It is a great consolation to find that I am laboring over a subject in harmony with others who are struggling with the same obstacles, and I have been most fortunate in finding both Dr. Willy Meyer and Dr. Lilienthal cordially cooperative in their attitude. They are quite as willing to make certain departures from a fixed intercostal technic as I am ready to abandon any one of the features in the several-stage rib-section technic which I have employed, provided by such compromises we can collectively reduce the mortality in these serious operations.

Dr. Lilienthal has just stated that he has performed nine lung resections with four deaths, a mortality of 45 per cent. My own series includes seven resections with three deaths, a mortality of 43 per cent. From these confessions two things are obvious. First, that the mortality is high, and second, that the technic of either one method or the other must be materially changed before any degree of perfection is reached. In fact, it is my opinion that we shall eventually adopt some entirely new feature in technic.

I am conducting a series of experiments to discover the most suitable method of artificially producing adhesions of that portion of the lung which is not to be removed. I am employing different astringents for this purpose, injecting them at various points through the tissues of the thoracic wall. If one lobe can thus be anchored so that it remains in position during resection of the other lobe or lobes, the chief obstacles to successful lobectomy will be removed.

Diet in Typhoid and Paratyphoid Fevers.—In a recent work on typhoid Vincent and Muratet state that in France milk is the great reliance in feeding typhoid and paratyphoid patients. The milk is always boiled for ten minutes at least, giving up to 2 liters with at least 2 liters of other fluid. The milk can be given hot or cold, and flavored with tea, coffee, brandy or rum, vanilla, orange flower water, or a drop of oil of anise to a cup of milk, or the milk can be made acid or effervescent. In case of absolute intolerance for milk, kefir or koumiss may be substituted, or a strained vegetable broth or gruel. For the latter they use a mixture of a tablespoonful each of barley, wheat, crushed corn and hulled beans, peas and lentils, boiled for three hours in 3 liters of water, salted and strained. Every hour or half hour a glass or half glass should be given of weak tea, coffee, lemonade with or without wine, or weak diuretic decoctions (dandelion, licorice, cherry stems). To avoid fermentation these drinks should not be much sweetened; lactose can be used, on account of its diuretic action, instead of sugar. The patient should drink often, but little at a time and slowly. Robin gives, in addition to the above, a liter of chicken or veal broth in the twenty-four hours. Chantemesse prefers to give two or three tablespoonfuls of meat juice, the amount that can be squeezed from 200 gm. of chopped meat. The first solid food allowed is a light tapioca.

THE POSSIBLE APPLICATION OF THE MACROSCOPIC SLIDE AGGLUTINATION

IN THE SEARCH FOR MENINGOCOCCUS CARRIERS *

CHARLES KRUMWIEDE, JR., M.D.

NEW YORK

The methods at present employed—the streaking of plates to obtain discrete colonies, the subculturing of suspicious colonies and the examination of these cultures in smear with the Gram stain and the determination of their agglutinative properties in one or more serums—as well as further subcultures, as frequently done, to determine the fermentative reaction of suspected strains, makes the examination of many carrier suspects extremely laborious. The removal of the necessity of any one of the latter steps would result in a great saving of time, labor and materials.

In the methods we employ for typhoid-paratyphoid identification of suspected colonies from feces, the use of the macroscopic slide agglutination has been such a time saving procedure that we were led to try this method with meningococcus colonies on plates and with the growth on slant agar mediums. With sufficiently developed colonies or with traces of growth from slant mediums, a prompt agglutination results with the curative serums obtained from the horse, found by previous tests to have a high content of agglutinins, that is, a high titer and a broad range of action on various representative strains.

Two such serums have been tested with a 1:10 dilution of normal horse serum as a control and a 1:10 dilution of the immune serums for agglutination. Both immune serums gave immediate agglutination with over sixty strains, representative of the great majority of strains likely to be encountered. In a few instances out of the total number of cultures, slight clumping was present in the control normal serum; but this was not due to the serum, as the same result was noted with saline solution. In fact, eight other normal horse serums showed no action on six representative strains when used in a dilution of 1:10.

Even in these instances, in which slight clumping occurred in the control, the immune serum result was so marked as to leave no question as to the specific agglutination of the meningococci.

Higher dilutions were employed and fairly good results were obtained with a dilution of 1:25, although with some strains the size of the clumps was lessened and some delay in the reaction resulted. A 1:50 dilution gave in general unsatisfactory results. Naturally the dilution applicable would have to be determined for each serum by testing it against a series of representative strains. The method is to place a row of small drops of the dilution of the normal horse serum and another row of drops of the dilution of the immune serum, on a slide. The growth from the suspected colony or a trace from slant mediums is then taken up with a small loop and rubbed first in the normal and then in the immune serum without burning the loop between, till sufficient growth is rubbed off to give a slight turbidity. The reaction in the immune serum is evidenced by the immediate or prompt development of plain visible clumps.

The method is reported in this unfinished form because of its time and labor saving possibilities. It

*From Bureau of Laboratories, Department of Health, New York City.

has just begun to be used in the actual search for carriers. It seems a most promising method for the rapid survey of suspicious colonies or of subcultures or both.

As to subculture mediums, we have tried various carbohydrate combinations. Of these a serum-water agar containing 1 per cent. of lactose and 1 per cent. of saccharose and 1 per cent. of the Andrade indicator with the reaction set to this indicator seems to be the most promising for exclusion of the mouth cocci, the majority of which ferment one or both of these carbohydrates.

The applicability of the slide reaction as well as its value as a final identification method can be determined only in actual practice. Several factors will have to be determined: first, possible meningococcus strains not influenced by the serums used; second, the possibility of spontaneous agglutination among strains fresh from the human body, and third, false positive reactions due to the action of normal or group agglutinins on bacteria other than meningococci. If the case strains, however, are available and agglutinate well, this would raise a strong presumption that the strains from contacts which do not agglutinate could be excluded from consideration. Should a negative reaction be found reliable, but false positives be found, even then the time and labor saved would be very great. If the method is found to be of value, it is suggested that a central laboratory undertake to reserve for this purpose, serums showing the combination of the highest obtainable agglutinative titer as well as the widest possible strain range and have it available for call, labeled with dilution to be used. The amount required would not be large, as the dilutions need not be freshly made every day, and probably if kept in the refrigerator would remain fully active for a week or longer.

The serum drops with culture added, if allowed to dry, have as far as tried served as satisfactory smears for the Gram stain, thus avoiding the necessity of making extra smears for morphologic examination. It is probable that the agglutination result could be sufficiently checked by finding, on morphologic examination of the smear, typical gram-negative cocci showing the characteristic irregularity in size and intensity of staining ("autolysis") if a check is found necessary to exclude false reactions due to other bacteria.

Besides the application in identification, possibly the slide agglutination may find application as a simple method of testing the serum employed in treating a case against the case strain. This could be done within from eighteen to twenty-four hours of seeing the case and might serve not only as a check on the therapeutic action of the serum but might also give an easy method of determining the incidence of strains acted on by the serum, thus aligning them with the standard strains employed in immunizing the horses. Should a strain not be influenced it might then with further experience indicate the advisability of obtaining other serums to select one showing such activity if procurable. A simple test would be more apt to result in the submission of aberrant strains so that they could be fully studied in relation to the problem of making the curative as effective as possible against the great majority if not all of the strains encountered.

NOTE ON PLATING MEDIUMS

Dr. William H. Park has just returned from Europe, and has brought a note from Gordon on a

simple method for preparing a blood solution to be added to agar for growth enrichment. As this method is not included in the paper of Gordon, Hine and Flack,¹ he suggested that it be noted here. The blood is obtained under aseptic precautions by bleeding a rabbit from the carotid directly into 50 c.c. of 5 per cent. citrate in physiologic sodium chlorid solution. This is then diluted with physiologic sodium chlorid solution to give a content of 5 per cent. of rabbit's blood. Ether (10 per cent.) is then added and the whole shaken and allowed to sediment for twenty-four hours. The clear (hemolyzed blood) fluid is then drawn off and bottled, a little excess of ether being added to each bottle. Four c.c. of this blood is added to each bottle of agar after melting and cooling to 50 C. Each bottle of agar evidently means 200 c.c., as the reference quoted above states that this is the sized container of agar distributed from the central laboratory. Each time the bottle of blood is opened, a few drops of ether should be added before replacing the stopper. Of all the agar preparations used, that prepared from a trypsin broth from fresh ox hearts has been most satisfactory. The method of preparation is given by Gordon, Hine and Flack.¹

SODIUM CITRATE BLOOD TRANSFUSION

A COMPARISON *

BERTRAM M. BERNHEIM, M.D.

BALTIMORE

The subject of blood transfusion has occupied the attention of medical men for a number of years and has been discussed at recent meetings of this association with increasing interest as the therapeutic importance of the procedure has become more generally recognized. Carried out at first only at rare intervals, and with fear and trepidation, because of its formidable operative difficulties, simplification of technic became the order of the day as the desirability of blood transfer from one individual to another became more apparent until, far from being an extraordinary procedure, blood transfusion has gradually become an everyday occurrence in the activities of most large hospitals.

Even so, until recently there remained difficulties in transfusion work of such nature that a high order of skill and a peculiar technical familiarity were required in order to achieve the best and most far-reaching results—and this in spite of the many brilliantly conceived and executed mechanical devices. Chief of these difficulties was the persistent tendency of the blood to clot, so that it came to be generally agreed that no method of transfusion could be finally satisfactory unless this element of coagulation should be entirely eliminated. Until the recent work of Hustin, Lewisohn, Weil and Agote, this desideratum seemed to be far in the future.

These workers, independently of each other, demonstrated that blood could be inhibited from coagulating for many hours, even as long as forty-eight hours, by mixing with it sodium citrate; and by animal experimentation, they further showed that if the dosage of the drug were carefully controlled, citrated

1. Gordon, M. H.; Hine, T. G. M., and Flack, M.: Cultural Requirements of Meningococcus, Brit. Med. Jour., 1916, 2, 678; abstr., The Journal A. M. A., Dec. 23, 1916, p. 1972.

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

blood could safely be used for transfusion purposes. The fact that sodium citrate, and other chemicals, such as the oxalates, had long been known to scientists as possessing the property of retarding blood coagulation, detracts no whit from their work, since the drugs previously had been considered of such toxic nature as to render them unfit for human usage. I dare say that no set of experiments in recent years has been so productive of revolutionary changes in a single procedure and of more far-reaching results than have those of Dr. Lewisohn in which he worked out on animals the exact dose of sodium citrate that might be used with safety in carrying out blood transfusion in the human body.

But it was not sufficient to procure a noncoagulable blood. It was necessary to prove that citrated blood possessed powers of benefit equal to those of whole untreated blood, for by the time this new method had been developed, a sufficient number of successful whole blood transfusions had been recorded to give rise to reasonable demands for favorable results. Unfortunately, certain early misdirected applications of the new method ended disastrously, and cast a doubt on the method that retarded its adoption, but its inherent simplicity and many attractive features were sufficiently apparent to those most familiar with work of this nature to insure its ultimate general use.

To be able to remove blood from the veins of one individual and carry it in a flask to the bedside of another, many miles distant, maybe, and in a leisurely manner to introduce it into his veins with no more disturbance than would be required in giving ordinary intravenous salt solution, is no mean advantage. To be able to relieve the timid patient and the anxious relative from the necessity of going to the operating room and lying side-by-side while the blood of one flows or is syringed into the veins of the other is highly to be desired. What a boon it is to the patient, shocked and bleeding from any one of the various causes of hemorrhage, to receive into his veins life-saving blood without having to be moved from his bed or even turned! Are there any among us who have not seen certain of these unfortunates suddenly expire during transport, even in their beds, to the operating room? And in those instances of transfusion in septic conditions—of which typhoid fever is a type—the citrate method absolutely removes all possibility of infecting the donor. These and other minor advantages give to the method of sodium citrate blood transfusion a degree of elasticity not approached by any other. Even if the action of citrated blood were less beneficial than whole, untreated blood, these advantageous characteristics of the new method would be of important consideration, but we are additionally fortunate in being able to state that there is little if any difference at all. In making this assertion, which will be supported by definite case reports, I may be permitted to say that, having had a certain share in the present day development of blood transfusion and having devised certain instruments for the transfer of whole untreated blood, I have been, in the nature of things, a harsh critic of the sodium citrate method; but so convinced am I of its tremendous superiority over all others, that for the last year it has been my method of choice, and I have used it in practically every case that has come under my care.

If we eliminate errors of technic whereby an inexperienced operator may add too small an amount of citrate to the volume of blood withdrawn, with the result

that coagulation sets in before the blood can be given to the patient, there is only one unpleasant phase of citrate transfusion that is not so frequently encountered in dealing with whole blood; namely, the occurrence of a chill and fever following the blood introduction. In my experience a chill of an intensity varying from a slight sensation of cold to a terrific shivering and shaking occurs about twenty or thirty minutes after the blood introduction in about 22 per cent. of sodium citrate transfusions. During this reaction the temperature may abruptly rise as high as 104 or 105 F., and as abruptly fall to or below normal. The whole phenomenon is over in three or four hours, and the patient shows little or no ill effects from it. A few patients have been rather upset and nervous for a half day, but the majority have only the recollection of a bad hour or two. I have never seen more than a single chill after a transfusion, and I have never noticed the slightest harmful effect on the future course of the illness or the progress of the patient. Never has there been the slightest hemoglobinuria produced as a result of the chill. In practically every one of my cases most careful preliminary tests have been made by men peculiarly skilled in this work and perfectly matched donors have been selected with the purpose of avoiding this chill—all unavailing from this point of view. It occurs in spite of the tests, and, unless it is due to the chemical itself, its etiology is as obscure to me as its occurrence is without significance other than inconvenience to the patient. In this, then, the citrate transfusion differs from the whole blood transfusion, by which method my cases show that only 2 per cent. experience chills. The occurrence of this citrate chill, though, must not be regarded too seriously, since it must be remembered that the same phenomenon may follow the intravenous introduction of the ordinary isotonic salt solution.

The occurrence is unfortunate, especially because it cannot be predicted, and one can readily see good reasons for hesitating to subject a patient, shocked and almost moribund, to the possibility of an added trial of this nature. It has been suggested that an extremely slow introduction of the blood might avoid the chill by allowing the body time and opportunity to take up and eliminate the sodium citrate (the work of Salant and Wise would suggest this) but I have known it to follow after the slowest kind of transfusion, and fail to follow after an introduction of 500 c.c. of blood covering only seven minutes. Others have thought that the temperature of the blood may influence its occurrence but my experience fails to reveal any such cause. After I had watched a very ill patient recover without any untoward effect from the chill and had seen others escape it entirely, my early hesitancy to adopt the method disappeared and I now disregard this feature entirely. I really believe that even the extremely ill patients will not be harmed if it occurs, because it comes practically always after the transfusion is completed, and the dose of blood given will amply fortify them against the shocking effects of a possible chill. I have had only one case of chill during transfusion, and this does not offer a fair example, since it was an emergency of such dire necessity that preliminary tests could not be made. The chill, therefore, might have been due in part or altogether to blood incompatibilities.

My series of sodium citrate transfusions comprises forty-five consecutive cases and embraces a wide variety of conditions. The ages of the patients varied

from an infant of 8 days to a woman of 61 years, and both sexes had full representation, although the majority of patients were women. There were no deaths directly attributable to the transfusion, although death followed ten minutes after the blood introduction in one instance, and about an hour and half later in the two others. Two of the patients were unconscious and moribund at the time, and absolutely beyond the aid of transfusion or anything else, but, as occasionally happens in work of this nature, conditions peculiar to the case demanded measures of last resort even in the face of certain defeat. The first mentioned case was so hurried that blood tests could not be made. The second case was unavoidably delayed and the third patient died of hemorrhage in no way connected with the transfusion. In all other cases the beneficent influence of fresh citrated blood was as obvious as we were wont to experience when using whole untreated blood.

It might be thought that if sodium citrate prevents blood coagulation outside the body, a similar influence might be exerted *in vivo* and with disastrous results, but the contrary is the case. For example, late one night, I was called to see a little baby, 8 days old, who had had a ritual circumcision done some ten hours previously. There was a well-recognized family history of hemophilia, so after making every effort to stop the bleeding by ordinary surgical measures without success, I did a transfusion of 55 c.c. of citrated blood from father to child. In order to make doubly sure, I also dressed the child's penis in a gauze sponge soaked in the same citrated blood. The bleeding ceased immediately and the child made an uninterrupted recovery.

It has been well known, of course, that transfusion of whole blood usually acts as a specific in cases of this sort. It now appears that citrated blood is equally efficacious in the condition. But to illustrate its effectiveness in other states of active bleeding, I might say that in one case of bleeding gastric ulcer, and in another case of bleeding duodenal ulcer, a single citrate transfusion of 500 c.c. of blood in each instance effected a prompt and permanent cessation. Both patients were pouring out tremendous quantities of blood and were rapidly sinking at the time of the transfusion, six doses of horse serum having been administered to the patient with duodenal ulcer without the slightest beneficial effect. In still another form of active bleeding, in a most obscure case of a young girl apparently suffering from an intestinal type of purpura, a citrate transfusion returned to life an all but moribund patient. Her intestinal bleeding did not entirely cease, but the great outpourings of thin, watery blood were checked and a condition of hopefulness supervened on one of despair. Indeed, this case taught many lessons in the art of transfusion and afforded a rare opportunity to study the citrate method and to compare it with the whole blood method. Twelve transfusions in all were carried out on this patient during a period of three months—and with a most happy result. The first one, a citrate transfusion, did a tremendous amount of good, but we thought that subsequent citrate transfusions were not quite so effective. We tried whole untreated blood twice, but the results were no better so far as totally checking the bleeding was concerned, although the absence of chill was an advantage. However, since several of the citrate transfusions had been unaccompanied by this phenomenon, we felt justified in going

back to this method, because of its greater ease of accomplishment.

This case will be reported in detail at another time in collaboration with Drs. Baetjer, Miller and Burnam, but it might be mentioned here that we had occasion to use a certain donor twice, both times by the citrate method, and were surprised to find that his blood gave rise to no reaction at all the first time, while a severe chill followed the second introduction. Equal amounts of blood were used both times, the technic was precisely the same in all details, and the patient's condition was about the same, although one transfusion had intervened between the two from this man, which were twelve days apart.

Aside from cases of actual bleeding, citrate transfusions have been used in several cases of secondary anemia with success equal to that of whole blood. One case was that of a woman, quite anemic from the prolonged gradual ooze of an ulcerated malignant growth of the uterus. Five hundred c.c. of citrated blood permitted her to withstand a radical operation without difficulty. Another instance was that of a man that had undergone a partial resection of the stomach for carcinoma. In bad condition before operation, his postoperative course was stormy, his abdominal wound broke open and showed no tendency to heal, he became progressively weaker, markedly anemic, and two weeks after operation was running a definite septic temperature. Unable to eat, dreadfully pale, his skin cold and clammy, hemoglobin registering but 22 per cent., this man presented the forlorn, despondent picture of one absolutely lost. Two transfusions of citrated blood at eight day intervals brought about a marked improvement, and the man walked out of the ward within three weeks able once again to take up his daily activities. In still another case, a citrate transfusion prior to and during operation permitted the removal of a ruptured kidney from a little boy who had been almost exsanguinated by the torn organ.

Quite recently, an unusual opportunity to compare the efficacy of whole blood and citrated blood presented itself. The case was that of a woman suffering from pernicious anemia, who had undergone early in 1916 three transfusions of whole blood and a splenectomy. She had left the hospital in very good condition and continued to be well for about eight months, when a relapse had set in. Unwilling to take the advice of her physician and have a supportive dose of blood, she gradually lost ground until she had a blood count of 1,331,000 red cells and 25 per cent. hemoglobin, at which time she consented to a transfusion. Having had experience with the whole blood method, she insisted that this should be used. She was given 500 c.c. of blood, and the count made two days later revealed 2,080,000 red cells and 35 per cent. hemoglobin.

I then persuaded her to permit me to use the citrate method for the second transfusion, which was done three days after the first, 500 c.c. of blood being given without the slightest sign of a chill or other discomfort. Three days later her count was 2,450,800 red cells and 45 per cent. hemoglobin, and a few days after this her red cells registered so high (3,700,000 and hemoglobin 55 per cent.) that the resident physician ordered the count verified. This case (and I have had others of a like nature) therefore demonstrates that citrated blood exerts as much influence on the blood forming organs as does whole blood.

I could cite details of other cases, but they would be only a rehearsal of those already mentioned. The upbuilding process in pernicious anemia is just as efficiently started by this method as by the whole blood; the combating of immediate postoperative hemorrhage and shock is likewise successfully carried out, and all cases are handled with surprisingly little discomfort to the patient. It is not even necessary for the patient to know that he is receiving blood (since a towel can be wrapped around the containing flask leaving the impression that the ordinary intravenous salt solution is being given. Finally, I have used citrated blood in amounts exactly corresponding to whole blood transfusions, the exact amount in a given case depending solely on the age of the patient, his condition, the amount of blood lost (if in a hemorrhage) and the purpose of the transfusion. The smallest amount given has been 55 c.c. to an infant 10 days old, the largest 1,000 c.c. to a woman exsanguinated from uncontrollable uterine bleeding. In several instances, with the patient under ether I have slowly injected sufficient blood to carry him through operation. And just recently I gave two transfusions to a little 22-month-old boy who was unconscious and thought to be dying from an anemia consequent on an unusually septic pneumonic process. The transfusions were given two days apart, the dose of the first being 140 c.c. and that of the second, 220 c.c., a tremendous dose for so young a child. No chill or other disturbance resulted from either transfusion, and the child was tided over an unusually critical period of his illness.

I, therefore, feel that a careful consideration of the foregoing pages will convince even the most skeptical that a tremendous advance was made when the method of sodium citrate blood transfusion became a reality. And those workers who had a share in perfecting it—Drs. Hustin, Weil, Argote, and especially Dr. Lewisohn—deserve the thanks and congratulations of us all.

2313 Eutaw Place.

ABSTRACT OF DISCUSSION

DR. GEORGE I. MILLER, Brooklyn: Blood transfusion has passed the stage of infancy. It is of little importance today which method one employs to perform transfusion as long as he is able to perform the operation with ease, with accuracy and with safety to the patient. The physician who is called on to perform transfusion may well use his judgment and determine which method will be more convenient. He will surely be doing justice if he will discard all instruments in existence and resort to anticoagulation drugs for the purpose of preventing coagulation and in the hope of preventing operation. He may also be able to perform a blood transfusion by adding normal saline, equal parts, to any given quantity of blood and thereby prevent coagulation. Circumstances, however, may suggest different methods at different times. While anticoagulation drugs may be procured, prepared and then transfused in an institution, in the operating room or even in the patient's home, instruments for the transfusion can be used at all times and in every emergency, even in the highways in the country, on the farm, on the battlefield, in the trenches, wherever an emergency presents itself. I have performed 133 transfusions on 78 patients. Of these, 34 were for traumatic hemorrhages; from the kidney in 3; ruptured ectopic pregnancy in 2; postpartum hemorrhage in 4; placenta praevia in 3; excessive bleeding from hemorrhoids, 3; postoperative and intestinal hemorrhage, 4; gastric ulcer, 6; ruptured varicose ulcer of the leg, 1; hemophilia, 5; fibroids, 2; pulmonary hemorrhages, 1. Of the chronic cases, I have transfused for recurrent epistaxis, 4; purpura hemorrhagica, 5; psoriasis, 1; carcinoma of the breast, carcinoma of the uterus, preoperative carcinoma of

the stomach, carcinoma of the eye, abdominal carcinomatosis, 1 of each; lymphosarcoma, 2; postpartum sepsis, 4; post-abortive sepsis, 5; ulcerative endocarditis, 1; chronic furunculosis, 3; Banti's splenomegaly, 1; advanced simple anemia, 14; pernicious anemia, 40; postoperative shock, 4; cholemia, 1; melena neonatorum, 1; postoperative sepsis, 1; asthenia, 1; lymphatic leukemia, 2; hydatid mole, 2. I have had favorable results in these 78 cases. Of these there were 15 cases in which the outlook for recovery was poor and transfusion saved the patients' lives; 23 were cured, the lives of 20 were prolonged, and 20 died. I have used my own special method. I have devised two instruments; one is known as a valve and the other as a shuttle. The valve consists of two arms with rubber tubing and a stem. The stem of this instrument I attach to an ordinary record syringe used for salvarsan injections and by means of my special cannula, which I introduce into the vein of the donor, and couple to the arm of the valve, fill the syringe with blood, turn the lever and empty it into the empty vein of the patient. Having emptied the syringe, I come back to the arm of the donor, refill the syringe and take the desired quantity of blood. The second instrument is made on the same principle, except that it has no lever to turn back and forth, but the syringe goes back and forth from one arm to the other. I introduce the arm of the instrument into the vein of the donor, fill the syringe with blood and permit the syringe to move it instead of a lever, and empty it into the vein of the patient. I use a 100 c.c. record syringe. By going back and forth I get the desired quantity of blood. I have transfused 133 times with no bad results, without chill, without exposing the blood to the air, without paraffin, boiling the instrument the same as any other, and have not found it necessary to resort to any other method.

DR. RICHARD LEWISOHN, New York: It is rather surprising that sodium citrate, which has been used extensively as an anticoagulant in laboratory work, had never been made use of before for human blood transfusion. According to the textbooks on pharmacology, it requires at least a 1 per cent. mixture of sodium citrate to prevent coagulation of the blood. My experiments show that 0.2 per cent. is sufficient to prevent clotting, and furthermore, that if a 1 per cent. mixture is used in large transfusions, the clinical results will be most alarming and possibly fatal. These two new observations have put the citrate method of blood transfusion on a safe clinical basis. It should be our aim in surgery to simplify the technic as much as possible, if the simplified methods give us the same clinical results as the more complicated ones. There can be no doubt that the citrate method is technically much simpler than any of the other methods. Furthermore, this new method makes blood transfusion applicable in a number of diseases in which the other methods (vessel anastomosis, syringe and stopcock methods) could not be used on account of the risk for the donor (bacteremia, typhoid, etc.). Extensive experience has shown that citrated blood is clinically as efficient as unmixed blood, even in hemorrhagic diseases. Furthermore, citrated blood, within the limits mentioned above, is absolutely atoxic. I have repeatedly used rather large quantities of citrated blood in new-born infants suffering from melena neonatorum, omphalitis neonatorum, etc. The bleeding stopped immediately and the babies did not show even the slightest reaction. My records include 130 cases; of these, 15 per cent. had a chill following the transfusion. We encountered chills following the infusion of citrated blood somewhat more frequently than with the other methods (Unger about 5 per cent., Lindeman 10 per cent.). I do not think that the addition of sodium citrate to the blood accounts for the chills. They are probably caused by the chilling of the blood during the transfer from donor to recipient. I intend to use a thermos bottle of special construction in place of an ordinary glass jar, and hope thus to reduce the percentage of chills.

DR. J. BION BOGART, Brooklyn: Dr. Miller happens to be my associate at the Jewish Hospital and many of his transfusions have been done in my service and I have been a witness to them. If you hear an operator talk, his method seems easier than when you see it done. Now the Miller

method is just as easy as it looked when Dr. Miller demonstrated it here by drawing water into the syringe and changing from one receptacle to another. I want to take issue with the statement made by Dr. Lewisohn that there is no doubt that the citrate method is the simplest of all methods. I have the greatest admiration for Dr. Lewisohn and his method and I would be the last one to take exception to anything that might be said so long as it was true; but I am satisfied from having seen a large number of these transfusions that the Miller method is quite as simple and I believe I might truthfully say it is simpler than the citrate method. Any one who can introduce the cannula, use a syringe and turn the valve can make the transfusion. You saw the little box which Dr. Miller brought—about 4 inches long, 2 inches wide and 1½ inches deep. That is all you need. The donor has to be examined in the same way in both cases.

This matter of blood transfusion has reached a point at which there is no longer any discussion about its usefulness. Its field is widening all the time. I think it has reached the point as to which is the simplest method—simply a question of which can be done the easiest, and which all may be able to do; and I would advise every one of you before leaving this meeting to take in your hands the Miller valve and make the experiment of transferring water from one vessel to another with it. I think that will convince you that the Lewisohn method is not the easiest. My own judgment is that there are only two methods, the Miller method and the method by the citrated blood.

DR. J. SHELTON HORSLEY, Richmond, Va.: I regard the work of Dr. Lewisohn on transfusion as second in importance only to that of Crile and Carrel. Any surgical operation that is converted from a complicated technic into a simple procedure is the ideal in surgery, and this is what Dr. Lewisohn has done. He has taken an operation that is sometimes urgently necessary, and also a very complicated one as done according to the earlier technic, and converted it into such a simple thing that any one can do it. I confess I was somewhat skeptical about this method when it first appeared, but I have been converted by the results that have been shown.

There are some interesting features connected with the citrate method, however, that have not been explained and may have no practical bearing. We know that, according to Lewisohn, a 0.2 per cent. solution of citrate of soda will prevent blood from coagulating from one to two days, but when this citrated blood is introduced, the coagulation time of the patient's blood is always shortened. This shows that there is some product of injured cells released by the citrate method that formerly was not present. Thrombokinase, or some similar product that results from injured platelets or blood cells, is undoubtedly produced, for otherwise the coagulation time would not be shortened. It would be interesting to know just what happens to cause this phenomenon.

Comparatively little is known about the chemical changes in blood. Physiologic chemists are not agreed about so gross a process as coagulation. It is reasonable to suppose that some other changes that cannot now be detected occur in blood that is not performing its normal physiologic function. The turning loose of cell products by the citrated blood is an evidence that the material introduced is not the same as the blood would be if carried directly along a continuous channel of vascular endothelium, as in the direct suture method of transfusion. Clinically, however, these changes from citrated blood that tend to shorten the time of coagulation of the patient's blood, seem to be of no importance if the technic of Lewisohn is adopted. If the results are practically the same, the simpler method, of course, should be adopted.

DR. BERTRAM M. BERNHEIM, Baltimore: It must be nice to have Dr. Bogart say for one, "If you come down to the Jewish Hospital, we will show you." If you come to Baltimore, if you go to Mt. Sinai, if you go to Chicago, you can see still other methods; and if you go to Brown you will also see an instrument there which works perfectly, but they are all for whole blood and will not do. I sympathize with Dr. Miller because I devised two instruments myself. All

my work is surgical. I hated to see the whole blood method go, because the citrated method introduced a tremendous amount of competition not encountered before. And thereby hangs a tale. The medical men have taken up citrate transfusion. The citrate method is open to all; but few can do a hurried, whole blood, emergency transfusion. I have done transfusing in a blacksmith shop when there was no other way. I have crawled up on the bed and transfused people, but I was pretty skilled in doing that transfusion, and have seen others try to do it and fail, even in a well equipped operating room. If one is going to use these instruments we have heard about, one has to use syringes. Dr. Miller's remarks were beside the point. This is neither the time nor place to demonstrate instruments. The subject under discussion was citrated transfusion, as compared to whole blood transfusion. It cannot be denied, if one considers the matter, that the citrate method is the simpler. One must admit there is a great advantage in dealing with only one patient. In citrate transfusion the blood is taken from the donor and may be administered in New York, Baltimore or Chicago. It can be carried in a flask! Instruments are bad and must be relegated to the scrap heap.

STUDIES ON THE CAUSE AND THE TREATMENT OF BRONCHIAL ASTHMA *

I. CHANDLER WALKER, M.D.

BOSTON

During the past two years at the Peter Bent Brigham Hospital, we have been investigating the cause of bronchial asthma and our study of its causation has led to a consideration also of the treatment of this disease. Because of the close relationship between the symptoms of bronchial asthma in man and those of anaphylaxis in animals, we have been interested chiefly in the part played by protein sensitization as a cause of bronchial asthma. A few words will outline the pioneer observations which have linked together the symptoms of these two conditions.

The earliest observation having direct bearing on protein anaphylaxis is found in the writings of Magendie in 1839. He describes the sudden death of dogs which had been repeatedly injected with egg albumin. The next observation was in 1894 by Flexner, who noted that animals would succumb to a second dose of dog serum if some days or weeks were allowed to elapse between the first and the second injections. Richet in 1902 made a systematic study of this problem and found that the first dose of protein was followed by a condition of markedly greater susceptibility to the protein. He called this phenomenon anaphylaxis to express its antithesis to prophylaxis or protective effects. As a result of many other investigators from this time on we now know that, when a specific antigen (a protein in the case of asthma and anaphylaxis) meets its antibody, the reaction between them gives rise to a toxic product and this causes the characteristic symptoms known as anaphylactic shock. In 1910 Meltzer pointed out that in both bronchial asthma and anaphylaxis the symptoms consist in a tonic stenosis of the small bronchioles and that both conditions are favorably affected by the administration of atropin.

From the work of many investigators we now know a considerable amount about anaphylactic shock in

* Read before the Section on Practice of Medicine at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

animals. In our study of bronchial asthma we have been able to show to a certain extent that a similar type of anaphylactic shock plays a rôle in asthma in man. If a bronchial asthmatic who is sensitive to some protein be injected subcutaneously with a small amount of this protein, he will have shortly an attack of bronchial asthma. He has difficulty in expiring, but at first no difficulty in inspiring. Later, as the lungs become overdistended, there is difficulty also in inspiration. If the patient is examined with the fluoroscope at the time when he is struggling for breath, we find that the lungs do not expand and that the diaphragm is stationary. Immediately following an injection of epinephrin chlorid, however, the lungs are seen to expand, the diaphragm moves up and down with respiration, and the patient's dyspnea abates. Furthermore, an analysis of the patient's alveolar air during the paroxysm of difficult breathing shows that the alveolar air has a low carbon dioxid content, although the blood at the same time shows a normal carbon dioxid content. Following the injection of epinephrin chlorid, which relieves the difficult breathing, the carbon dioxid content of the alveolar air gradually returns to the level of that in the blood. Thus attacks of bronchial asthma and anaphylactic shock are similar, in that both may be caused by proteins, and the symptoms are similar, in that there is labored respiration. Pathologically, the two conditions are alike, in that there is distention of the lungs, and furthermore in animals there is a stenosis of the bronchioles, and in the human body there is evidence of this from the carbon dioxid content of the alveolar air. And lastly both conditions are relieved by injections of epinephrin chlorid.

We have used the cutaneous or skin test to demonstrate what protein might be the cause of bronchial asthma. A number of small cuts, each about an eighth of an inch long, are made on the flexor surfaces of the forearm. These cuts are made with a sharp scalpel, but are not deep enough to draw blood, although they do penetrate the skin. On each cut is placed a protein and to it is added a drop of tenth normal sodium hydroxid solution to dissolve the protein and to permit of its rapid absorption. At the end of a half hour the proteins are washed off and the reactions are noted, always comparing the inoculated cuts with normal controls on which no protein was placed. A positive reaction consists of a raised white elevation or urticarial wheal surrounding the cut. The smallest reaction that we call positive must measure 0.5 cm. in diameter. All larger reactions are noted by a series of plus marks and any smaller reaction is called doubtful. As evidence that the skin test is satisfactory and conservative we have found by treatment with subcutaneous injections of proteins that we cannot inject a patient with a stronger solution of a protein than that which gave a positive reaction without producing an attack of asthma. For the preparation of the proteins that we use in the skin test, I will refer you to the series of papers that have already been published.

In this paper we have limited our study to the first 150 patients, because all of these were studied during one complete year, from May to May. Thus, each season is represented once and a fair series of cases result. Of this series of 150 cases, eighty-three, or 55 per cent., were sensitive to some protein. The horse was chiefly responsible for bronchial asthma in this group in 20 per cent. of the cases, the wheat pro-

teins, *Staphylococcus pyogenes-aureus* and the early pollens were each responsible for asthma in 15 per cent. of the cases, the late pollens in 10 per cent., the cat in 5 per cent., *Staphylococcus pyogenes-albus* in 3 per cent., a group of miscellaneous proteins in 7 per cent., and in the remaining 10 per cent. of these cases several proteins were the cause of asthma. These percentages are not absolutely accurate, because so many patients were sensitive to more than one protein, but the percentages do represent the chief offender as nearly as it is possible to do so. Thus, it is seen that in our cases, the horse was the cause of asthma in the largest number of patients, that the wheat proteins, *Staphylococcus pyogenes-aureus*, and the pollens were close seconds, and that the cat and *Staphylococcus pyogenes-albus* were poor thirds. Of the miscellaneous proteins, one patient was sensitive to casein, one to egg, two to chicken meat, one to feathers and one to flaxseed.

A few words seem necessary in regard to multiple sensitization, or sensitization to more than one protein. We have found that most of the patients that are very sensitive to the proteins in horse dandruff are somewhat sensitive to the proteins in cat and dog hair. The same patient is not equally sensitive to the individual proteins found in the same type of animal hair. Only 20 per cent. of those patients that were sensitive to horse dandruff were also sensitive to the whole horse serum protein, so that a very small percentage of asthmatics are sensitive to horse serum and the danger of injecting an asthmatic with moderate amounts of horse serum, such as antitoxin, is confined to only a rare case. The sensitization of patients to different tissues or fluids of the same animal also varies. Taking for example the beef animals, the same patient may be sensitive to any one alone or to any combination of the following tissues or fluids; namely, meat, milk, serum and hair. The same holds true for the fowl, in regard to feathers, meat and egg, and for the sheep, in regard to wool, meat and serum. The same patient may be sensitive to any one alone or to any combination of the different structures of the plant; namely, to the seed, the pollen, and the leaves. Patients differ in their sensitization to the individual proteins of the same cereal; for instance, the same patient may be sensitive to any one alone or to any combination of the individual proteins of the wheat kernel. Even the amino-acids give a positive skin reaction. The above examples show the specificity of the skin test in separating more or less closely related proteins, and they do not really represent examples of multiple sensitization. I think multiple sensitization should be restricted to sensitization with proteins that are less closely related. For example, we find that the same patient may be sensitive to any combination of the proteins derived from plant, animal, food or bacterial sources; thus we have a combination of widely separated proteins. This type of multiple sensitization is very common and these cases are the most difficult to treat. Thus it is seen that it is necessary to test with an almost unlimited number of proteins before one can say that a patient is not sensitive to proteins. For practical purposes, however, such an outlay of proteins is not necessary, since, as already mentioned, the majority of sensitive patients with bronchial asthma are sensitive to the kinds of proteins that have been mentioned earlier in this paper; namely, horse dandruff, *Staphylococcus pyogenes-aureus*, wheat, the pollens, *Staphylococcus*

pyogenes-albus, cat hair and a few very common foods.

A few words will dismiss the nonsensitive patients. Of the 150 patients in this series, 45 per cent. failed to react to any protein that was tried. It is possible that the intradermal test would change some of these cases from the nonsensitive to the sensitive group, and if this is true, the bacterial proteins would most likely be the ones that would produce this change. This statement will be verified later on.

Besides the skin test, other facts would seem to warrant the division of bronchial asthmatics into two groups. No patient that had onset of asthma after the fortieth year of age has given a positive skin test, and one half of the sensitive patients began to have asthma previous to the age of twenty. Quite opposite to these statements is the fact that 40 per cent. of the nonsensitive patients had onset of asthma after the fortieth year of age and only 15 per cent. had onset of asthma previous to the age of 20. Only 1 per cent. of the sensitive patients had cardiorenal disease; whereas 20 per cent. of the nonsensitive patients had this complication. Chronic bronchitis was a complication in only a small number of the sensitive patients, but it was a complication or cause of asthma in nearly all of the nonsensitive patients. These statistics thus seem not only to separate bronchial asthma into two types, namely a sensitive and a nonsensitive, but they are of value in determining the cause and the treatment of bronchial asthma. For instance, the patient that has onset of bronchial asthma early in life is usually sensitive to some protein, chronic bronchitis is not a usual complication, and cardiorenal disease is a rare complication. Contrary to the above, the patient that has onset of asthma after the age of 40 is not sensitive to proteins, chronic bronchitis is almost always a complication or cause, and cardiorenal disease is frequently a complication or cause of asthma.

With the serum of our sensitive patients we have done complement fixation and precipitin reactions, using the protein to which they were sensitive as an antigen. These tests have proved to be of no help in the diagnosis, prognosis or treatment of the condition. A small number of the sensitive cases do give positive complement fixation and precipitin reactions, but the majority fail to do so, and the positive tests are rendered negative by a few injections of the antigen. Serum agglutination tests have been done with the common types of bacteria in both sensitive and nonsensitive cases. We have found that the serum of many patients that are sensitive to the protein of *Staphylococcus pyogenes-aureus* agglutinates strains of this organism. The serum of a few of the nonsensitive patients also agglutinates this type of organism, and treatment with vaccines of this organism in these nonsensitive cases is followed by relief from asthma. Therefore an agglutination between the serum of a nonsensitive patient and strains of *Staphylococcus pyogenes-aureus* is an indication for treatment with vaccines of this organism.

The treatment of the nonsensitive group of bronchial asthmatics has been disappointing. About one case in every six has been relieved of asthma by vaccines made from a diphtheroid organism. This particular type of organism was selected because it was usually the predominating one in the patient's sputum when the sputum was cultivated on plain agar. It seemed to make no difference whether the patient was

given a stock vaccine of this organism or an autogenous vaccine. The vaccine was given once a week in gradually increasing amounts, over a period of two or three months. Relief from asthma continued for several months after the vaccines were discontinued. The serum of about one in every eight of the nonsensitive patients agglutinated strains of *Staphylococcus pyogenes-aureus*, and these patients have been satisfactorily treated with stock vaccines of this organism. Relief from asthma in these cases has continued for from four to six months after the vaccines were stopped. Those patients who do not come within either of these two groups have been treated without relief with vaccines made from the organisms that are commonly found in the respiratory tract. Likewise those patients who were relieved by diphtheroid and *Staphylococcus pyogenes-aureus* vaccines were also treated with vaccines made from the usual respiratory tract organisms without relief, thus showing a specificity among bacteria in the treatment of bronchial asthma. The nonsensitive patients usually have complicating diseases, such as chronic bronchitis, emphysema and cardiorenal disease, and it is quite possible that these conditions may be the cause of asthma in such patients. At any rate, these conditions must be treated, and it is in such patients that potassium iodid gives more or less relief. In these nonsensitive patients it is possible that the intradermal test would be helpful, and we would expect that bacteria would be found to be the cause of asthma.

The sensitive patients offer a very good prognosis. If the patient is sensitive to the food proteins, omission of these foods from the diet is followed by relief from bronchial asthma, unless the patient has considerable bronchitis, which may require attention, and we find that vaccines made from the predominating organism in the patient's sputum greatly benefits or relieves this condition. We have treated our wheat cases with subcutaneous injections of the wheat proteins, but we have been unable to increase the patient's tolerance for these, and the eczema that is a frequent complication in these cases has been made worse. Therefore omission of the food proteins from the diet seems to be the simplest treatment for this type of bronchial asthma. Treatment with the amino-acids of the food proteins may be of benefit.

Those patients who are sensitive to bacterial proteins are successfully treated with stock vaccines of that particular organism to which they are sensitive. These vaccines have been given at weekly intervals, in gradually increasing amounts, beginning with 200 million the first dose. Relief from attacks of asthma has continued for from four to six months after the vaccines were discontinued, and relapses have yielded to a second series of vaccines more quickly than to the first series. Large doses of vaccines at first or a sudden large increase in the dose is detrimental, and has precipitated attacks of asthma. It is interesting that the serum of asthmatics that agglutinates *Staphylococcus pyogenes-aureus* before treatment fails to agglutinate this organism after treatment; an increase in agglutinins would be expected.

Bronchial asthmatics that are sensitive to the proteins in horse dandruff and cat hair are relieved of attacks during a series of subcutaneous injections with these proteins. Treatment has not been discontinued in a sufficient number of these cases to definitely say how long relief may continue after treatment is omitted. But patients have remained free from

asthma for six and seven months during treatment, and a few patients that have not been treated for four months still continue to be free. Treatment is begun with the dilution of the protein next higher than that to which the patient reacts. Usually the patient gives a positive skin reaction with a dilution of 1:100,000 of these animal hair proteins, so that treatment is begun with a dilution of 1:100,000. The amounts of the dilution must be slowly and gradually increased with each treatment in order not to precipitate an attack of asthma. Horse asthmatics should not be given large amounts of horse serum intravenously without previously testing the patient with horse serum and horse dandruff; this naturally applies to antipneumococcus serum therapy. If the asthmatic is sensitive to horse dandruff proteins and not to horse serum, he may be injected slowly with as much as 60 c.c. or more of horse serum before signs of an asthmatic attack develop, and if the injection is stopped at this time no serious results follow and the asthma is controlled by epinephrin chlorid. If, however, the asthmatic is sensitive to horse serum, a subcutaneous injection of 0.25 c.c. of antipneumococcus serum will produce violent asthma. Such a patient may be desensitized by frequently repeated gradually increasing doses of horse serum given first subcutaneously and later intravenously, so that the patient may be given 60 c.c. or more of antipneumococcus serum intravenously before symptoms of asthma appear. This method of desensitization with horse serum protects against horse serum for many weeks, but it protects against horse dandruff proteins for only a day or two, so that injections of horse serum are of little or no value in the treatment of horse asthma.

Treatment with all of the proteins that have been mentioned reduces the positiveness of the skin test and sufficient treatment renders the skin test negative to these proteins. Treatment with one protein desensitizes against all closely related proteins; for instance, treatment with one of the proteins found in animal hair or wheat desensitizes against the other proteins that are present in the same hair or in wheat. But treatment with a protein does not desensitize against other proteins that are not closely related; treatment with the horse dandruff proteins does not desensitize against cat hair protein, and treatment with the wheat proteins does not desensitize against the protein found in other cereals. Therefore, there is a specificity among proteins in the cause and in the treatment of bronchial asthma.

Patients who are sensitive only to closely related proteins such as already outlined are the simplest to treat and those who are sensitive to several types of proteins which are not closely related are the most difficult to treat. This is because at first one cannot judge which protein is the cause of asthma at the present time and so several proteins may have to be tried before the correct one is used.

Patients with bronchial asthma associate attacks with cold air, dampness, changeable weather, winds, menstruation, indigestion, nervousness, irritability, colds and bronchitis. After treatment with the proper protein these patients become tolerant to such conditions, so that they can be exposed to them without asthma resulting, and they become free from nervousness, irritability and indigestion without the use of drugs and hygienic measures. There seem to be two types of colds and of bronchitis, one of which is anaphylactic, and relief or freedom from this type

follows proper treatment with proteins. The other type is caused by bacteria and frequently vaccines relieve and prevent this type.

We no longer feel that bronchial asthma is a surgical disease. Practically all of our patients have had nose and throat operations with little or no benefit. We do not advocate removal of tonsils, adenoids, spurs, deviated septums, hypertrophied turbinates, etc., for the relief of bronchial asthma. These conditions often need to be remedied for the general health of the patient, but rarely do such operations relieve bronchial asthma. Sensitization tests should first be tried and treatment should be given according to its dictates. If the patient's asthma happens to be caused by bacteria it is quite possible that foci of these bacteria may be present somewhere in the body, and such foci should be looked for in the teeth, tonsils, etc.; such foci should be removed.

In this paper I have outlined our work. For more detail those interested are referred to a series of papers already published or soon to be published in the *Journal of Medical Research*.

697 Huntington Avenue.

ABSTRACT OF DISCUSSION

DR. W. T. LONGCOPE, New York: We have treated some cases of egg asthma. Only a small proportion showed hypersensitiveness to foreign proteins. We think it is possible to differentiate two groups, one which can be artificially sensitized, and the other to which the asthmatics and cases of urticaria belong. Persons who have had large doses of horse serum will react to horse serum if given after a period of twenty-one days; these patients do not have asthma, however. Therefore these artificially sensitized individuals are not sensitive to foreign proteins. It has been well known and it has recently been suggested that this hypersensitiveness is inherited, and there are instances in which the hypersensitiveness comes through the male members of the family.

DR. MARK J. GOTTLIEB, New York: We have found that occasionally a patient may be sensitive to the antigen, and yet, no reaction occurs on exposing the scarified portion of the skin to it. It seems possible and likely that the anaphylactic phenomena occur after applying the antigen in question to the mucous membrane or tissues other than the skin.

In a recent paper by Drs. Erscheimer and Kahn, they pointed out that possibly the poisonous substances floated in the blood stream during the attack of asthma. They treated their patients by injecting large quantities of autogenous defibrinated blood intramuscularly. It occurred to us, that possibly their contention was correct, and we forthwith started out to prove or disprove it. We procured the blood from a patient who was having a severe attack of bronchial asthma. This blood was defibrinated at the bedside. Six-tenths of this blood was injected intravenously into three guinea-pigs. Three others received an equal quantity of blood prepared in the same way from a nonasthmatic. Two of the guinea-pigs that were injected with the asthma blood showed definite anaphylaxis. One died about eighteen hours after the injection. His lungs showed an occlusion of the bronchioles, a marked distention of the alveoli and a round cell infiltration of the vessels. The same experiment was repeated, with comparatively negative results, with blood from another patient who was having severe asthmatic symptoms. The controls were negative.

DR. M. I. KNAPP, New York: My experience with asthma embraces about 300 cases; with few exceptions, all successfully treated. A woman who consulted me about indigestion and who also suffered from asthma, had insufficiency of the pylorus. After a few weeks' treatment she surprised me by telling me that she no more had asthma. I believed this to be a mere accident. This experience has repeated itself in three subsequent cases. Under certain conditions in insufficiency of the pylorus, not in all, there is an increased intra-abdominal

pressure, due to the excessive production of gases. This, I reasoned, in pressing upward against the diaphragm and through it against the lungs, produces in the lungs the condition which we recognize as asthma. All asthmatics suffer from the overproduction of gas. Having come to this conclusion, I could understand why my patients were cured of their asthma; namely, the curing of the intestinal condition ended the gas pressure against the lungs, which were now able to expand normally. In my experience there is only one asthma—bronchial asthma—although heart or kidney disease may complicate it, which does not make it cardiac or renal.

DR. ERNEST ZUEBLIN, Cincinnati: I agree with the author that part of asthmatic symptoms are due to systemic infections, but also quite a number of cases are due to intestinal putrefaction, or at least that symptom is present in a great number of cases, as shown in an interesting paper by Allen Eustis. This author obtained encouraging results with a diet containing only a small amount of histidin, which substance and its split products can produce symptoms resembling asthma. My clinical studies in that disease have always revealed abnormal gastric secretion, besides disturbances in the utilization of proteins. Of further interest in such cases is the frequent presence of low blood pressure, and particularly of a low pulse pressure, which necessarily is unfavorable for the work of the heart, the latter offering, as found by threshold percussion in a number of my cases, a dilatation of the right ventricle. There is not one single cause, but many causes for asthma; the task of the diagnostician must be just to find out the individual cause, which must be duly considered in the management of the treatment. It may seem peculiar that bacterial absorption, as well as intestinal absorption, may lead to asthmatic symptoms. From the chemical standpoint perhaps the split products from either source may act similarly on the cardiovascular and on the sympathetic nervous system as well.

DR. L. F. BISHOP, New York: There is no question that some young people are sensitive to unusual proteins, and I am convinced that a great many older asthmatics are also sensitive to food proteins. Aside from laboratory work by the method of variants, one can take any patient and test his food relations. The question of diet is one of quality and not of quantity. On this ground I have devised a system of diet which I call the "few proteins" diet. I found that it was only when one had eliminated as many proteins as possible from the diet that one obtained results.

I begin with castor oil, and then cut out meats and soups made with meat stock from the diet, also eggs and fish. I had a patient, an asthmatic for fourteen years, who, when put on a very strict diet, got much better. I took away the eggs and fish from his diet and he got so much better that he continued the diet of his own accord. I got a letter from a very prominent physician in Milwaukee a few days ago who told me he had become immensely improved since he had taken eggs out of his diet. Lately he had taken eggs by chance and had a very bad attack. Since then he has cut out eggs.

DR. G. N. JACK, Buffalo: During the last eighteen years, in conjunction with a general practice, I have made a study of 839 cases of asthma and their relation to food and weather conditions. Owing to the instability of the blood of the asthmatic and summer-autumnal coryza subjects, their blood is rendered hypersusceptible and sensitized to numerous metabolic, gas, weather, and food conditions.

DR. S. SOLIS-COHEN, Philadelphia: The causation of asthma is not only protein but protean, and there are many factors which must be studied. It belongs to the group of visceral neuroses dependent on autonomic imbalance. In all of these, there is first an underlying or "constitutional" liability; second, an exciting factor; and third, a local determinant. In asthma this triple nexus is most evident. Usually—translating our ignorance into Greek—we speak of these peculiar reactions to various stimuli as "idiosyncrasies"; to call them "anaphylaxes" is equally unenlightening until we can determine why John should exhibit "wheat anaphylaxis" and Mary "horse anaphylaxis"—and we have not even approached that point. But I have shown that in all these food

and drug "idiosyncrasies," and in the pollen "idiosyncrasy" we call "hay-fever," there exists a fundamental ataxia or imbalance of the vegetative—or, to use Langley's inclusive term, "autonomic"—nerve system. Its cause and its endocrinal associations are "other stories" for which there is not now time. Asthma is one of this group of recurrent syndromes, depending on the incidence of an appropriate exciting factor, which may be a weather condition, an emotion, a chemical or mechanical irritant, food, pollen, microbe, or any one of a thousand things. Then comes the local determinant, which is often a diseased condition of the respiratory mucous membrane. This may have its seat in the tonsils, adenoids, bronchi, nose or anywhere in the respiratory tract. When we have found these three factors—all of them—then we can treat the patient scientifically as well as rationally. When we can't we must treat empirically—but not irrationally.

DR. I. CHANDLER WALKER, Boston: I agree with the first discussant in that proteins may be the cause of asthma in some patients who fail to give positive skin tests and who may not be sensitive to proteins. In regard to pyloric insufficiency, we have not observed such a condition, although we have made bismuth Roentgen-ray studies on many patients; we have frequently found malpositions of the abdominal viscera, such as low stomachs and low transverse colons, fixed colons and fixed cecums, etc., and we feel that such conditions by causing stasis may increase the liability of the absorption of partially digested foods, and these, in turn, may cause asthma. Also such conditions may lead to fermentation and distention of the intestines, and this, in turn, by pressure on the diaphragm, incites asthma. In regard to the autonomic imbalance, if you choose to consider this condition, we might very well consider that the proteins furnish the toxin or irritant that causes the imbalance.

ANESTHESIA IN CURRICULUM AND CLINIC*

W. D. GATCH, M.D.
INDIANAPOLIS

I hope that the critical conditions confronting our profession and medical schools may impart a timely interest in this subject. The teaching forces of the latter are to be reduced. The country needs, as never before, well trained physicians. New subjects, suddenly made important by the war, must be taught. The time demands a critical examination of our program of teaching to avoid waste of energy. We must plan to make each effort count, or the training of our graduates will suffer. Therefore, let us consider briefly the condition of the medical curriculum as a whole before assigning to the subject of anesthesia its position, relative importance, and method of presentation.

With the progress of medical knowledge new subjects are constantly being crowded into the course of study. Despite a gradual increase in the period of instruction up to the present duration of practically seven years, the crowding continues. This process has been carried to a limit at which it threatens to defeat important ends of medical instruction. I lately heard an officer of high rank in the government medical service declare that he does not expect recent graduates in medicine seeking admission to the public service to pass the examinations in anatomy and physiology. Experience, he said, has taught him that graduates from even the best of our schools have nearly always forgotten what they once knew of these subjects. Facing such facts it takes considerable

*Read before the joint meeting of the Section on Surgery, General and Abdominal, and the Section on Pathology and Physiology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

temerity to advocate the introduction of a new subject into the curriculum, or a more extended presentation of subject already there.

Now, if the only possible method of securing any increase in the student's knowledge were to add more hours or more courses to the schedule, then nothing short of grim necessity could at present justify any addition. But such is not the case. In planning our curriculum we have, I fear, lost sight of the fact that the progress of medical science tends as often to simplify instruction therein as to complicate it. Instead of assuming that the increase of knowledge makes it progressively more difficult to turn out a competent physician, with the necessary corollary that a limit must be reached at which no competent practitioner can be produced, we are justified in assuming quite the reverse, or, more properly, that the difficulties will remain about stationary. The curriculum must be constantly modified. As fresh material is added, dead material must be cut away.

But the process of elimination is not the only available means of saving time and energy, thereby increasing the efficiency of our teaching. By a study of the best methods of presenting our subject matter and of making sure that our students master each topic as it is presented, we can do wonders in the same direction. We must consider the relative importance of different subjects, their proper correlation, in what order to present them, how to prevent needless duplication of study, how to direct the student's reading, and how to provide for adequate reviews. If, as teachers of medicine, we apply to our work these common sense efficiency methods, and above all have a clear conception of exactly what we wish to teach, the crowding of the curriculum will no longer trouble us.

The foregoing remarks on the present state of the medical curriculum have been introduced to disarm the prevalent prejudice against making any further demands on the medical student. If the arguments presented are valid, then we need not fear to introduce any instruction which a well trained physician should possess. If our graduates need more than we have been giving them about anesthesia, the fear of overcrowding the curriculum need not deter us from giving them the necessary information. What, then, are the claims of this subject to a place in the course of study?

That the faculties of our medical schools believe that some instruction in anesthesia is desirable is shown by their answers to a questionnaire sent to them by a committee of the American Society of Anesthetists. Through the courtesy of this committee I was permitted to read these answers. They showed that nearly every school gives more or less instruction in anesthesia. It seems to me, however, that they also show a general failure to grasp the basic importance of the subject in modern surgery. Anesthesia is not an isolated topic, to be jammed somewhere into the course, but a fundamental principle, like asepsis, which must be applied to almost every phase of surgical treatment. Let us amplify this statement.

The discovery of anesthesia made modern surgery possible. As surgeons attempted more and more complicated and prolonged operations there had to be a corresponding improvement in the methods of combating pain. Better methods of administering general anesthetics were introduced and local anesthesia with its modifications was discovered and brought into general use. But the development of the subject did

not stop here. It was found necessary in order to increase the safety of operation to study the effects of general and local anesthesia on the various physiologic and psychologic processes of the patient. These investigations in recent years have had the most far-reaching and beneficial effects. Witness the studies of surgical shock, of postoperative lung complications, of chloroform necrosis of the liver, and of the effects of anesthetics on the resistance of the tissues to disease. They have brought about a general realization of the importance of a thorough scientific examination of the patient as a preliminary to operation, in order that he may be given the benefit of that form of anesthesia and of operative technic which will subject him to the least possible risk. Today this knowledge must be part of the equipment of every one who attempts to do surgery, or who has charge of patients who may require surgery. We must, therefore, regard instruction in anesthesia as incomplete if it covers merely the technic of administration, important as this may be. It must be broadened to include all the material which we have briefly outlined.

Objection may be taken to this broad conception of the importance of anesthesia, on the ground that it has been stretched to cover subjects which properly belong elsewhere. If so I have no quarrel with those who would limit what they term anesthesia to instruction in the actual administration of anesthetics. But, I insist that provision should be made somewhere for teaching the subjects I have discussed, and believe that they can be most effectively presented in connection with the subject of anesthesia.

In the first part of this paper I spoke of the simplification of instruction by proper correlation of subjects. It is my contention that no subject should be presented as a separate entity. As a teacher of surgery I have endeavored to apply this principle to the presentation of the subject we are considering. The plan I have adopted and which has worked very well is the following: In the second year a course termed surgical physiology is given. The purpose of this is to impress the students at the beginning of their course in surgery with the fundamental relations of physiology to surgical treatment. In this the physiology of the respiration and circulation as affected by surgical diseases or procedures is studied. Here we discuss surgical shock, hemorrhage, the effects of asphyxia, methods of artificial respiration, etc., and point out the relation of these matters to practical anesthesia. The students are encouraged to regard surgical operations as methods of correcting deranged physiologic processes. General anesthesia is taught with the conception that its fundamental object is to relieve pain and dangerous muscular movements while interfering as little as possible with the normal course of respiration and circulation. This not only makes it easy to impart the essential principles of anesthesia but also gives a valuable review of important parts of physiology. Most medical students have opportunities to administer anesthetics during their third and fourth years. This course enables them to do this with some degree of intelligence and profit. In the clinical work of the third and fourth year the same matters are frequently emphasized at the bedside and in the operating room. By this method we dispense with the necessity of a formal and distinct course in general anesthesia and present the subject in its proper relations to clinical medicine and operative surgery.

The foregoing instruction quite naturally includes such matters as the form of general anesthesia to be employed in different cases and the conditions under which general anesthesia should be replaced or supplemented by local or regional anesthesia. Where the latter methods are employed details as to strength of solutions, manner of injecting and the regional anatomy of the parts operated on are emphasized. The information on regional anatomy required for the intelligent use of local anesthetics is adequately covered by arrangement with the department of anatomy. This correlation furnishes a beautiful illustration of the principle that it is easier to remember two things than one. What medical student ever enjoyed the dissection of the sensory nerves, or ever retained longer than during his examination any definite knowledge of their distribution? If, however, he is told that by injecting drugs at certain places a given area will be made insensitive to pain, how much more interesting will the subject become, and hence how much more likely will he be to retain a knowledge of it. A review of the subject at the operating table will serve to fix it definitely in the student's mind.

The collection of the data on which we form a judgment as to the condition of the patient's circulatory and respiratory apparatus and his general state of health is obviously a matter to be taught by the department of medicine. If before operating on any patient we always insist on the production of adequate information of this kind and point out its bearings on the operative risks involved we make all necessary provision for the training of the student in this phase of anesthesia. Likewise instruction in regard to the purity and effect on tissues of various anesthetic drugs is best introduced by the department of pharmacology, and reviewed and emphasized in the clinical courses.

As to the conditions under which students shall be trained in the actual administration of anesthetics we shall speak in the remainder of this paper, which has to do with anesthesia in the clinic. This is a much mooted topic. That our anesthesia is no better than it sometimes is, is not due to any lack of easily available scientific knowledge, but to a failure of proper organization. We, all know what should be done to safeguard our patients before, during and after the administration of an anesthetic. It is a matter of arranging that under all conditions every necessary safeguard shall be provided. We must see to it that every patient has been properly examined and properly prepared for operation and that the anesthetic is skilfully administered according to the requirements of the operation. In a busy hospital, teaching or otherwise, there is only one way to secure these results. This is by placing an experienced anesthetist with a broad knowledge of general medicine and surgery in charge of the work. The problem consists in securing such a man. It can be done by paying him sufficiently well and by making his position one of sufficient interest and importance to satisfy his professional ambition. To men of this kind and so situated we must look for the advancement of anesthesia.

The anesthetist should be consulted by the operator in regard to the general character of the anesthesia required by each case. He should be familiar with the results of the examination of all patients preliminary to operation. He should instruct the interns and medical students in everything which has to do with the actual administration of the anesthetic. In a

teaching hospital, I believe it a mistake to require him to attend personally to any but the more difficult administrations. Otherwise the interns and medical students will be deprived of a highly important part of their training, and the anesthetist will have no time to carry on scientific investigations in his specialty. With this plan of organization there will be no difficulty in securing good anesthesia together with excellent instruction in anesthesia for every medical student.

This subject has taken on a new importance since we entered the war. Many, possibly all, of our graduates will have to administer anesthetics, whether they wish it or not. That the necessary theoretical instruction in anesthesia can be presented without deranging or upsetting the curriculum I have attempted to show in this paper. I close with the recommendation that to insure a minimum of practice to every student in the actual administration of anesthetics, our medical schools adopt the requirement that every student be obliged to give, under suitable supervision, a definite number of anesthetics.

ABSTRACT OF DISCUSSION

DR. ARTHUR DEAN BEVAN, Chicago: I think Dr. Gatch's conclusions, in the main, are correct and that they will be helpful to the medical schools of this country in reorganizing their medical curriculums to include a course on anesthesia. There can be no doubt that anesthesia is such an important part of our work that it should be made a compulsory, not an elective, course in the medical curriculum. We have, in our own school, maintained that position for some time and have required a certain number of lectures and demonstrations in anesthesia, the course being given once in the fall and once in the spring term; and then each student is required to give a certain number of anesthetics under instruction. Certainly that should be carried out in every school. The subject, of course, touches a great many departments, as Dr. Gatch has pointed out, and comes up in physiology and pharmacology, and should be attacked from a number of different angles. At the same time I think the instruction in anesthesia proper should be a subtopic of the surgical course, and it should be so associated with the surgical work that it is not entirely separate, but that it be given a certain amount of independence. In this department there should be some head of the subdepartment, if I may call it so, who is thoroughly competent to do three things: first, to give the students proper instruction; second, to do research work in that line. It is not sufficient simply to have a trained nurse give an anesthetic and give it well. Let me draw a parallel of that situation: I have an attendant in my pathologic laboratory who can mount and cut and prepare microscopie and gross sections as well or better than any other man in my department, I have no doubt; but where would that laboratory be as far as scientific research work is concerned if we relied entirely on that attendant? That is where the surgical department stands when the anesthetic end is entirely in the hands of a trained nurse. No matter how well trained she may be, she is not prepared to give the proper instruction, nor is she prepared to add to the sum of existing knowledge in that subject by properly carried on research. Nor is she prepared to develop the third principal function that the head of that department on anesthesia should be able to do, and that is to give advanced instruction—to prepare experts in anesthesia—to give to a certain limited number of individuals that sort of expert knowledge that will make them experts in that particular subject. I am in sympathy with Dr. Gatch's position, and I want to emphasize that I think we should today place anesthesia in exactly the same position that we do many other of our subtopics in surgery or in medicine; that we demand of the department more than that it be simply a mechanical thing well done and possibly safely done; that we demand not only instruc-

tion of our students and the development of experts in that particular line, but that we demand of that department such strength and such organization as will enable it to carry on research work and to add to our present sum of knowledge.

DR. EDWARD WALLACE LEE, New York: I believe absolutely and thoroughly in all that has been said in regard to training, and all that pertains to the scientific administration of an anesthetic; but one point I want to bring out is that the administration of an anesthetic by an intern should be held up to him as an ambition and a privilege, and if he attains that privilege he must work for it. I speak of that because the general feeling today among interns is that they do not like it when they are appointed, as they often express it, to "give the dope." The giving of the "dope" in a great many hospitals has sort of degraded, in the minds of the intern, that very responsible position, and I make the suggestion that an intern, before he has the privilege of administering an anesthetic, should be made to understand, or he should be inspired with the idea that there must be some ambition, something he must work for before he is permitted to give an anesthetic. Make a thing hard to get for a student, give him to understand that he has reached an exalted position, and he will be more keen and more ambitious and will take a greater and a keener interest.

DR. A. F. ERDMANN, Brooklyn: Perhaps it is fair that one of the men who has taught the subject we are discussing today should say a word. For a number of years I have been endeavoring to do what Dr. Gatch has been talking about—to teach students anesthesia. I have found that all we can teach them to do is to be administrators rather than to be anesthetists. I believe thoroughly in what Dr. Gatch has said, and I would explain myself in this way. In the earlier days we probably gave more time to the teaching of anesthesia, but not in the right way, for not enough attention was given to its proper relation to allied subjects. It does seem to me that time could be very well used by the instructor if he could take up the work in the different departments, as Dr. Gatch suggested; that is, that he should teach anesthesia in connection with surgery; that he should teach it in connection with physiology and with pharmacology. There must be some definite correlation and agreement; otherwise a surgeon's teaching might be at variance with that in the physiologic department; and so a physiologist might differ with a pharmacologist. I have known that to happen. One man would teach one thing and another man another. If a man were big enough to be a surgeon, a pharmacologist, a physiologist and an anesthetist, he would be the ideal man. The work could be best done by a man who is able to do that sort of thing, because he would bring the instruction together, rather than have it done by half a dozen different men in half a dozen different ways.

DR. TORALD SOLLMANN, Cleveland: There is one phase of the matter that I would like to emphasize as a teacher of pharmacology, namely, that the teachers in charge of the clinical applications of the subject should inform themselves more than they appear in the habit of doing, as to how the subject is taught and to what extent it is taught, in the so-called fundamental branches. Anesthesia scientifically is a problem that does not differ from the other problems that concern biology, physiology or pharmacology. In its fundamental aspects it is perfectly capable of investigation by laboratory methods, perhaps even better than by clinical methods, and it is now covered in the fundamental courses to an extent that I believe would be rather surprising to the clinical men. I believe that the curriculum would be in much better shape if the men who are in charge of the clinical teaching of anesthesia would inform themselves of what is done in their own institutions in the fundamental branches of this subject.

I must differ to some extent with the last speaker in his idea that the subject of anesthesia should be taught in the fundamental departments by a clinical man who covers the entire subject of anesthesia. Such a conception of education is of course possible. We could have in the course of pharmacology one man come in to teach the subject of anesthesia from the pharmacologic standpoint, and another man to dis-

cuss the pharmacology of morphin from the standpoint of internal medicine, and another man to give the pharmacology of digitalis from the standpoint of the clinician. If we extended that system sufficiently there would be very little left for the pharmacologist proper to do; but on the whole it would give the student a rather choppy sort of view of the subject. I think it is better on the whole for the teachers in fundamental subjects to give a rounded-out course.

DR. KENNETH A. J. MACKENZIE, Portland, Ore.: We sometimes find ourselves confronted with difficulties in relation to the question of anesthetics and the message given by Dr. Gatch is a most timely one. In relation to teaching, the suggestion made by Dr. Gatch meets every indication. What could be better than the correlation of teaching so that the anatomist can give instruction in the proper manner, and at the proper time the physiologist, the biochemist and the pharmacologist. In the small clinic of which I have had charge for a number of years, we have pursued the following method for several years: In their senior year, after having previously been coached, four students enter the amphitheater, two at the head taking instructions from a trained anesthetist, and two assisting the operator under the tutelage of his assistant. One of the two students at the head takes his instruction in the immediate administration of the anesthetic; the other is studying the reaction of the operative procedures on the patient as registered by the sphygmomanometer. These records are not only taken, but recorded. When this method is followed it is astonishing what messages are received at times by the operator which would otherwise pass unnoticed. It was regarded at first as a bold step to put students within the operating field, but after their work has progressed for a month or two they begin to give the anesthetics themselves and to make useful observations, so that in a class of only twenty-five or thirty members all the students receive a considerable degree of instruction in operative technic and anesthetics, which we find increasingly useful as time goes on. Our wounds have not been affected adversely by this step, nor have casualties in anesthetics appeared more frequently. The experience has been most valuable for students.

DR. F. W. PINNEO, Newark, N. J.: I speak from the standpoint of the general hospital, not connected with a college, and would show the difficulty that not only colleges, but the whole medical world realize the need for better anesthesia. The basis of these problems is in the education of the intern. This education is of two kinds—theoretical knowledge when in college, which is inadequate, and anesthesia in practical surgery. Anesthesia has four factors, involving the induction of so-called comfortable anesthesia; second, even maintenance at only the desired depth; third, quick recovery; fourth, no after-effect. Now how can an intern solve these problems and what is concerned in them of the underlying medical sciences if he has not studied them theoretically and found in their application their correlation in anesthesia? He is much more than an administrator of the anesthetic. He has carried through the anesthesia after the choice of the anesthetic has been decided, and he is now in a safe and sufficient maintenance. In the maintenance of the anesthesia an administrator without fundamental knowledge may do very well, but when the interns get bad results they do not know what the trouble is. In a case in point intratracheal anesthesia was to be given; the hospital intern was administering it, and when I asked what he would do under certain problems of lack of oxygen and respiratory arrest, he said, "I don't know." To be sure his supervising anesthetist was at hand, supervising his work, but it shows—although he was a very good administrator—how little he was master of the possible problems he would meet and would have to solve instantly. I stand, therefore, for the education of the intern in order that the world can have better anesthesia, and this is a good time to talk of it when we consider how many men must go to the front and anywhere in the world give satisfactory anesthesia.

DR. WILLIS D. GATCH, Indianapolis: I agree with almost everything that has been said in this discussion. We in the teaching school ought to keep our methods as simple as

possible. With that end in view, at present when our students are going out into a service where they will have to meet trying conditions, I believe it might be helpful if we were to adopt a standard anesthetic and a standard method of administration, and train our students in it. I do not say what I think would be the ideal method for military surgical anesthesia. We should adopt a method of anesthesia which we know will work under all conditions; which will be as simple and as easy as possible.

SHOCK DURING GENERAL ANESTHESIA *

FRANK C. MANN, M.D.

ROCHESTER, MINN.

Owing to the indiscriminate use of the term "shock," it seems necessary to define the meaning of the word as applied to this particular discussion.¹ It is used in the sense that the surgeon applies it when a patient develops alarming symptoms during or immediately following an operation, the definite cause of which is doubtful. While the data and conclusions presented are, to a considerable extent, experimental in origin, they may also be applied to corresponding clinical conditions. The two points of paramount importance in considering the subject of shock during general anesthesia are the cause or the causes of the condition and the effect of the anesthetic in either preventing or accentuating it. Owing to the general use of ether and the ease with which definite tensions may be administered it was the only anesthetic used in my experiments, and all the conclusions are based on this anesthetic.

In the history² of the subject there has always been a tendency to ascribe the condition of shock to a single cause, although the condition itself and the circumstances under which it developed have been quite varied. This tendency in all probability has reached its zenith and it is quite probable that in the future both experimental observers and clinicians will study the subject with the view to determine the cause in each individual case. It is my purpose to discuss here the different possible causes of shock during anesthesia, the probable physiologic mechanism involved, and their relation to ether anesthesia.

In general, surgeons agree that the most common cause of the symptoms of shock, either as a primary or a secondary factor, is free hemorrhage. Experimentally this has also been found to be true. Many investigators have carefully determined and reported on the mechanism involved. It is important to emphasize the points that all persons do not react the same to identical losses of blood, and that estimates of the amount of blood lost during operative procedures must be inaccurate. Further insight into this form of shock awaits our more complete knowledge of the control of the volume of blood. It should be noted that the reaction following hemorrhage is very similar, particularly in regard to the vasomotor mechanism, to that following trauma to the abdominal viscera.³

The only uniform and certain method of producing shock experimentally is by exposure of the abdominal viscera. The time necessary to expose the viscera before shock develops is variable, depending on many conditions. Usually a state of deep shock takes place within an hour or two. Owing to the fact that in most experimental work shock has been produced by exposure of the abdominal viscera and that clinically most cases of postoperative shock develop after abdominal operations, more is known concerning this form of shock than any other. While the mechanism which produced the condition is not fully understood, many of the most important factors are known.

Undoubtedly the cause of shock produced by exposure and trauma of the abdominal viscera is mainly due to a failure of the venopressor mechanism as enunciated by Henderson,⁴ although in all probability loss of carbon dioxide is not the primary factor. The investigations of Janeway and Ewing,⁵ my own experiments and the work of others⁶ make it possible to follow quite clearly the process by means of which the condition of shock is produced when the viscera are exposed. The process is as follows:

When the great delicate vascular area of the viscera is first exposed to the air, changes of temperature and handling, there is an immediate dilatation of all the arterioles in the exposed area. Rarely a short period of constriction precedes the dilatation. As a result of this dilatation of the splanchnic arterioles blood pressure decreases. The splanchnic capillaries and veins are markedly distended, which may be due to one or all of the following causes: a local inhibition of vasomotor tone, an active dilatation, changes in abdominal pressure, and venous obstruction. On the whole, the process resembles the first stage of acute inflammation and does not appear to differ essentially from the phenomena as observed in the classical experiments on the subject. After this initial fall in blood pressure the condition of the animal may remain stationary or even slightly improve. However, as the loss of tone and paralysis of all the tissue involved take place, the blood pressure progressively falls, the temperature becomes subnormal and the animal develops profound shock. This loss of circulatory fluid and changes in temperature quickly imperil the life of the cells of the rest of the organism and death usually results from anemia of the medullary centers, particularly the respiratory. At the time the viscera are exposed and during the period that shock is developing, the vasomotor center increases in tone and the untraumatized arteries constrict. The amount of this constriction depends on their previous condition and the degree of splanchnic dilatation. During this time the center will usually respond to reflex stimulation and asphyxia, which demonstrates that it is still active although not functioning to its maximum extent. When the state of shock is fully developed it is usually, but not always,

4. Henderson, Yandell: Acapnia and Shock, I, Carbon Dioxide as a Factor in the Regulation of the Heart-Rate, *Am. Jour. Physiol.*, 1908, **21**, 126-156; Acapnia and Shock, II, A Principle Underlying the Normal Variations in the Volume of the Blood Stream and the Deviation from this Principle in Shock, *ibid*, 1909, **23**, 345-373; Acapnia and Shock, III, Shock After Laparotomy: Its Prevention, Production, and Relief, *ibid*, **24**, 66-85; Acapnia and Shock, V, Failure of Respiration After Intense Pain, *ibid*, **25**, 385-402; Acapnia and Shock, VI, Acapnia as a Factor in the Dangers of Anesthesia, *ibid*, 1910, **26**, 260-286.

5. Janeway, H. H., and Ewing, E. M.: The Nature of Shock, *Ann. Surg.*, 1914, **59**, 158-175.

6. Morison, R. A., and Hooker, D. R.: The Vascular Tone and the Distribution of the Blood in Surgical Shock, *Am. Jour. Physiol.*, 1915, **37**, 86-93. Muns, W. E.: Changes in the Peripheral Circulation Following Intestinal Trauma, *Proc. Soc. Exper. Biol. and Med.*, 1914-1915, **12**, 87-90. Seelig, M. G., and Lyon, E. P.: The Condition of the Peripheral Blood Vessels in Shock, *THE JOURNAL A. M. A.*, Jan. 2, 1909, pp. 45-48.

* From the Mayo Clinic.

¹Read before the joint meeting of the Section on Surgery, General and Abdominal, and the Section on Pathology and Physiology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Mann, F. C.: The Peripheral Origin of Surgical Shock, *Johns Hopkins Hospital Bull.*, 1914, **25**, 205-212.

2. Meltzer, S. J.: The Nature of Shock, *Arch. Int. Med.*, July, 1908, pp. 571-588. Seelig, M. G.: The Nature of Shock, *Internat. Abst. Surg.*, 1914, **18**, 117-123. Vale, F. P.: Concerning Shock, *Med. Rec.*, New York, **66**, 325-330.

3. Mann, F. C.: Shock and Hemorrhage: An Experimental Study, *Surg., Gynec. and Obst.*, 1915, **21**, 430-441.

possible to obtain a response of the center, due to the long-continued blood pressure or to the fact that all untraumatized arteries are constricted to their maximum extent or that the great splanchnic area through which most reflex responses of blood pressure are produced is completely paralyzed.

The heart and respiratory mechanism are probably affected mainly by the loss of circulating fluid. The following facts should be emphasized: that the resulting condition is essentially one of loss of circulating fluid; that the process takes place in the area traumatized and in that sense it is peripheral; that the primary involvement of the nervous system is probably mainly in regard to the local reflexes; and that the higher nervous mechanism is affected secondarily.

I have never been able to produce in an etherized animal the shock produced by excessive nervous irritation which is the most popular clinical cause of the condition. A careful review of experimental work leads me to believe that other investigators have experienced the same difficulty. While all traumatic procedures, such as crushing joints, evulsing nerves, etc., will produce marked respiratory and blood pressure changes, it must be very rare for the condition of shock to develop. This must be due either to the fact that nerve impulses are not the primary factors in the cause of shock, or that ether protects the nervous mechanism from excessive stimulation.

The phenomena of so-called psychic shock, the shock of railway and other painful accidents, all testify that at least in some instances the nervous mechanism may be a factor in some forms of shock. An explanation of the cause of the condition in these cases is most difficult.

I have studied recently the effect of different traumatic procedures on decerebrated animals. Exposure of the abdominal viscera produces the condition of shock in exactly a similar manner in a decerebrated animal as in an etherized animal. No difference in the development of the process could be noted. Traumatic procedures on the limbs and nerves of a decerebrated animal, while producing marked individual variations, produce greater changes in respiration and blood pressure than in etherized animals and in a very small percentage of instances death is actually produced. This condition probably corresponds to the shock produced by accidents; I am not sure it has any relation to the shock produced under an anesthetic.

In the few instances in which death occurred, I was unable to determine the cause. However, I believe the factors involved will be found to be either excessive inhibition as held by Meltzer,² a decrease in general tone due to changes in the synapses as suggested by Hill,⁷ or excessive depressor stimulations. If the latter is true, work along the line pursued by Ranson⁸ should give positive results.

It is highly improbable that physiologic fatigue will be found to play any primary part in the production of shock, or at the most in only a small percentage of instances. The belief that physiologic fatigue is not a common cause of shock during anesthesia is based on several facts. The work of Porter⁹ which demon-

strated that the vasomotor center is not primarily fatigued by excessive stimulation and that electrical stimulation of the major nerve trunks for many hours did not produce shock, and my own experiments,¹⁰ which show that it must be rare indeed for shock to be produced in an etherized animal by excessive trauma to nerves and limbs, prove that from the experimental standpoint, fatigue is not of great importance.

In a recent series of experiments I have investigated, quantitatively, the relation of nerve impulse to shock. Utilizing the method devised by Forbes and Miller¹¹ to detect the changes in potential at the brain stem of decerebrated animals following nerve stimulation, I have attempted to determine quantitatively the amount of nerve reaction produced by various operative procedures.

The method, which did not differ from that described by Forbes and Miller except that the electrodes were made large enough to connect both sides of the brain stem, consisted of connecting the brain stem of a decerebrated cat to a galvanometer and recording the changes in potential produced by different traumatic and operative procedures. These changes in potential depend on nerve reaction and have been shown to be a true index of the nerve impulse.¹²

Many difficulties were encountered in the investigation, the most important of which was to obviate the mechanical factor. Very slight movements of the brain stem will produce deflections of the galvanometer. This error was never fully obviated. However, by carefully immobilizing the animal and making careful controls it was possible to determine some of the effects of traumatic procedures. Of course only comparative studies could be made.

The results of this investigation are difficult to interpret, and until more experiments are performed conclusions must be cautiously made. However, the following facts seem true: (1) traumatic and operative procedures on the limbs, joints and nerves produce a very marked nerve response as shown by the deflection of the galvanometer; (2) exposure of the abdominal viscera produces either no deflection or a very slight one; and (3) pulling on the mesentery and other viscera produces a definite deflection but not so great as that usually produced by trauma to a leg. In fact, it was possible to expose the viscera and cause shock in an animal without producing any deflection of the galvanometer.

If future experiments, in which all errors are eliminated, prove these results to be absolutely true, it will be justifiable to conclude that the nerve impulse bears no qualitative relation to shock. The idea that shock due to visceral trauma is not dependent on a primary impairment of the higher nerve mechanism will be substantiated.

In the experience of some surgeons a small number of cases have occurred in which the amputation of a limb, an operation for an ununited fracture, or similar operations have resulted in conditions of shock. The experimental investigator has never been able to explain the cause of shock in these cases because he has not been able to reproduce them. The recent work

7. Hill: *Further Advances in Physiology*, London, 1909, p. 178.

8. Ranson, S. W., and Billingsley, P. R.: *The Conduction of Painful Afferent Impulses in the Spinal Nerves*, *Am. Jour. Physiol.*, 1916, **40**, 571-584. Ranson, S. W., and von Hess, C. L.: *The Conduction Within the Spinal Cord of the Afferent Impulses Producing Pain and the Vasomotor Reflexes*, *Am. Jour. Physiol.*, 1915, **38**, 128-152.

9. Porter, W. T.: *The Effect of Uniform Afferent Impulses on the Blood Pressure at Different Levels*, *Am. Jour. Physiol.*, 1907-1908, **20**, 399-406. Porter, W. T., Marks, H. K., and Swift, J. B.: *The Relation of Afferent Impulses to Fatigue of the Vasomotor Center*, *ibid.*, 444-450.

10. Mann, F. C.: Footnotes 1 and 3.

11. Forbes, A., and Miller, R. H.: *Detection with the String Galvanometer of Afferent Impulses in the Brain Stem and Their Abolition with Ether Anesthesia*, *Am. Jour. Physiol.*, 1916, **40**, 148-149.

12. Forbes, A.; McIntosh, R., and Sefton, W.: *The Effect of Ether Anesthesia on the Electrical Activity of Nerve*, *Am. Jour. Physiol.*, 1916, **40**, 503-513.

of Bissell,¹³ and of Porter¹⁴ will probably clear up these obscure cases. Bissell has shown that in patients suffering from fractures of the long bones there is a great increase in the fat content of the blood. Some of the patients dying with symptoms of surgical shock following operation which involved considerable trauma to large areas of fat showed a large amount of fat in the lungs, death being due undoubtedly to pulmonary fat embolism. Porter, while studying shell shock, was led to consider the possibility that fat embolism was the cause of the low blood pressure found in cases in which fractures had occurred. Undoubtedly in a small percentage of cases in which hitherto a diagnosis of surgical shock has been made it will be found that the patients are suffering from pulmonary fat embolism.

The endocrine glands have been given as factors in the etiology of shock. This idea has been largely associated with the suprarenals and is based on the facts obtained as follows: Elliott¹⁵ showed that stimulation of an afferent nerve produced a discharge of epinephrin; Cannon and De La Paz¹⁶ demonstrated that there was a discharge of epinephrin during emotional states; Corbett¹⁷ investigated the epinephrin content in shocked animals and found it greatly diminished. Bedford and Jackson¹⁸ found that in conditions of low blood pressure there was an increased amount of epinephrin in the blood. Bedford¹⁹ showed that it was an active secretion of the suprarenals. Stewart and Rogoff²⁰ concluded from their work on the effect of nerve and drug stimulation on the suprarenal that the discharge of epinephrin from the suprarenal is not indispensable to life or health. My own experiments²¹ have demonstrated that an animal may live for several days after the removal of all suprarenal tissue and maintain an apparently normal condition in all respects, including emotional reactions, and that an animal will survive and be maintained normally with only one half to one third of one suprarenal which has been separated from all nerve supply.

In all probability some of the endocrine glands, particularly the suprarenals, enter as factors in the complex condition of shock, but it is quite difficult to determine to what degree they participate as primary active agents in producing the state or how much they are affected by the low blood pressure and the changes incident to the condition itself.

There is no doubt that an anesthetic may prove harmful to a patient, but it is not possible to state to what degree ether is a factor in the production of shock. Henderson⁴ has pointed out the dangers of light anesthesia. Certainly an animal can be killed in the very early stages of etherization by a too high concentration administered during excessive respiration, but this is more of an anesthetic than a shock

problem. The effect of trauma and nerve stimulation during very light etherization probably causes harmful results mainly because of the ensuing struggling which they produce, as was shown by Gatch, Gann and Mann,²² than for any other cause.

There seems to be little definite data as regards the question of whether hemorrhage under an anesthetic affects the individual more than without the anesthetic. My own experiments are too few at present to allow conclusions to be drawn. Also it has not been determined to what extent the loss of blood changes the reaction to definite tension of ether. Boothby²³ cites a case in which it was necessary to maintain the anesthetic tension the same as it was before (47) after a severe hemorrhage.

The result of excessively deep etherization is more nearly related to shock. Animals may be anesthetized for nine to ten hours with an ether tension just sufficient to maintain anesthesia for operative work without the production of a condition resembling shock. On the other hand, a higher tension which will depress blood pressure to or below the critical level and if maintained for one hour will produce most of the symptoms of shock. In such instances the blood pressure usually remains low and is not restored after an hour or two of artificial respiration. The animal depressed by ether, however, differs from the animal in shock in the fact that the former will become conscious and require more anesthetic even with a low blood pressure, while the latter usually will not. This depressed condition following deep etherization, while it is primarily due to the ether, is soon complicated by the condition itself, namely, low blood pressure, subnormal temperature, etc. The shock-like condition resulting is quite largely due to these secondary factors.

While ether depresses the vasomotor center directly it should be noted that the vascular system is affected by deep etherization in many other ways. Gatch²⁴ has pointed out that deep etherization also affects blood pressure by loss of muscular tone and a decrease in the action of the respiratory pump.

While studying the vascular and respiratory reflexes under various tensions of ether, I observed one phenomenon which may have a direct bearing on the cause of some cases which were diagnosed as shock. Stimulation of the vagus nerve and most of the other mixed nerves by a suitable electrical stimulus will produce inhibition of respiration. Simple stretching of some nerves, particularly the brachial plexus, will sometimes stop respiratory movements. It is interesting to note that ether never blocks these inhibitory reflexes, but as long as the respiratory center acts the reflexes are present. As the respiratory mechanism is depressed by the higher tensions of ether the inhibition following nerve stimulation usually becomes more pronounced. Finally, it is possible to use a tension under which respiration, though greatly depressed, would afford enough ventilation to keep the animal alive but which would be inhibited for so long following nerve stimulation that the animal would in all probability die if artificial respira-

13. Bissell, W. W.: Pulmonary Fat Embolism—a Frequent Cause of Postoperative Surgical Shock, *Surg., Gynec. and Obst.*, 1917, **24**.

14. Porter, W. T.: Shock at the Front, *Boston Med. and Surg. Jour.*, 1916, **175**, 854.

15. Elliott, T. R.: The Action of Adrenalin, *Jour. Physiol.*, 1905, **32**, 401-467.

16. Cannon, W. B., and De La Paz, D.: Emotional Stimulation of Adrenal Secretion, *Am. Jour. Physiol.*, 1911, **28**, 64-70.

17. Corbett, J. F.: The Suprarenal Gland in Shock, *THE JOURNAL A. M. A.*, July 31, 1915, pp. 380-383.

18. Bedford, E. A., and Jackson, H. C.: The Epinephric Content of the Blood in Conditions of Low Blood Pressure and "Shock," *Proc. Soc. Exper. Biol. and Med.*, 1916, **13**, 85-87.

19. Bedford, E. A.: The Epinephric Content of the Blood in Conditions of Low Blood Pressure and Shock, *Am. Jour. Physiol.*, 1917, **43**, 235-257.

20. Stewart, G. N., and Rogoff, J. M.: Liberation of Epinephrin, *Jour. Pharmacol. and Exper. Therap.*, 1916, **8**, 205; Liberation of Epinephrin from Adrenals, *ibid.*, 479; Epinephrin Content of Adrenals, *Jour. Exper. Med.*, 1916, **24**, 709.

21. Unpublished data.

22. Gatch, W. D.; Gann, D., and Mann, F. C.: The Danger and Prevention of Severe Cardiac Strain During Anesthesia, *THE JOURNAL A. M. A.*, April 26, pp. 1273-1278.

23. Boothby, W. M.: The Determination of the Anesthetic Tension of Ether Vapor in Man, with Some Theoretical Deductions Therefrom, as to the Mode of Action of the Common Volatile Anesthetics, *Jour. Pharmacol. and Exper. Therap.*, 1913-1914, **5**, 379-392.

24. Gatch, W. D.: The Effect of Laparotomy on the Circulation, *Tr. Am. Gynec. Soc.*, 1914, **39**, 180-192.

tion were not maintained. This combination of deep anesthesia with inhibition of respiration may have been a factor in some cases which were called shock.

Bernstein²⁵ seems to have been the first to investigate the place in the reflex arc on which the general anesthetics (chloroform) acted. By destroying the blood supply to a portion of the spinal cord of an animal so that certain segments would not be affected by the anesthesia, he showed that stimulation of a sensory nerve whose cell body was in an anesthetized part would not produce a motor response, but that the stimulation of a sensory nerve whose cell body was not anesthetized would produce a motor response. This proved that chloroform acted first on the sensory side of the reflex arc. Deeper anesthetization depressed the motor side as well.

In a previous investigation of the condition of shock I concluded that ether prevented afferent impulses from reaching the higher nerve centers. Recently Forbes and Miller,¹¹ by means of the galvanometric method previously described, have clearly demonstrated this fact in a very delicate and graphic manner. By connecting a galvanometer to the brain stem of a decerebrated cat they were able to show that a weak stimulation of the sciatic nerve produced a deflection of the galvanometer corresponding to a difference of the potential following nerve response; after etherization this deflection did not occur but reappeared when the animal recovered from the anesthetic. Undoubtedly ether does block afferent nerve impulses to the higher centers.

SUMMARY

Surgical shock, using the term in the sense employed by the surgeon, occurring during general anesthesia may be due to several causes. For a correct understanding of the physiologic mechanism involved it is necessary to differentiate between these possible causes.

The most common cause of the symptoms of shock is free hemorrhage. It should be emphasized that all persons do not react the same to loss of blood and that the estimation of hemorrhage during operation is very inaccurate.

Another common cause of shock is trauma to the viscera. Under this condition shock is due to loss of circulatory fluid in the traumatized areas, mainly brought about by a local peripheral mechanism.

Shock produced by excessive nerve irritation under an anesthetic is probably a much more rare occurrence than clinical reports would seem to show. The mechanism involved in these cases is unknown. In cases of fractures and operations involving trauma to large areas of fat in which shock is diagnosed, pulmonary fat embolism may be a cause.

Some of the endocrine glands, particularly the suprarenals, are factors in some causes of shock; but it is very difficult to determine to what degree they participate as primary active agents in producing the state, or how much they are affected by the low blood pressure and the changes incident to the condition itself.

The nerve impulse probably bears no quantitative relation to shock.

Deep etherization may produce most of the symptoms of shock. The continued depressed state follow-

ing deep anesthesia, while primarily due to the anesthetic, is soon complicated by the resulting factors of low blood pressure, subnormal temperature, and other changes.

Some cases of the conditions diagnosed as surgical shock may be due to a combination deep anesthesia with reflex inhibition of respiration.

Ether certainly does block afferent impulses to the higher centers but some of the reflexes involving the medullary centers, particularly those which inhibit respiration, are not blocked when very strong stimuli are employed.

ABSTRACT OF DISCUSSION

DR. FENTON B. TURCK, New York: I have carried out investigations on shock in animals under anesthesia with the abdomen open and with the abdomen closed. The two conditions differ. I wish to call attention to one of the important findings in my investigations. A Brücke lens, used by the older physiologists, I found valuable in examining the vascular supply of the viscera in shock. The first change found taking place in the exposed viscera was venous dilatation as the first sign of shock, followed by changes in blood pressure and temperature. The various stages of these changes, beginning as Dr. Mann reports, with slight rosy tint, then going into the bluer shades, finally develop into complete shock with large tortuous vessels. I reported, in 1896, shock as a local peripheral disturbance first involving the veins of the viscera. Dr. Crile came to Chicago at the time I was continuing my experiments in shock and brought out his vasomotor center exhaustion theory in his vivid fashion, afterward presented as the Cartwright lectures. Kocher and others have practically disposed of the question of this vasomotor center exhaustion theory. My more recent investigations have been carried out on histologic lines, with sections fixed in vivo, and confirm my earlier findings. If we expose the viscera to the air and find shock intervening, a certain selected area is held and fixed in fixing solution and section is made to observe the exact changes taking place in the advancing stages of shock. We obtained sections from one to six hours, of the different portions of the viscera of various animals in shock, and all presented similar phenomena. First there is an alteration in the venous walls, especially "waxy" changes of the muscle cells, with relaxation and turgescence of the veins. The contents of the veins then pass out through the walls, and asphyxiation of the muscle cells of the walls and tissues occurs, which gives the picture of so-called "acidosis." Also, the experiments that I have published in anesthesia, chloroform, ether and other anesthetics being used, set forth how we found that there was an excretion into the intestines of the anesthetic used. After prolonged anesthesia we plugged up the esophagus so none of the anesthetic could reach the stomach direct, and scraped off the mucous membrane and recovered the anesthetic from the mucosa. The changes were very manifest in the abdominal viscera as a local condition similar to the conditions in shock. The experiments showed that there was a loss of antiferments in the blood. The "acidosis" was often benefited by alkalis. The greatest injury was exposure of the viscera to air. I demonstrated the value of a rubber dam for the purpose of protecting from the air the whole of the viscera during operative procedures, and the introduction into the abdominal cavity of heat. Small rubber bags filled with hot water were placed in the abdominal cavity, and small bags attached to a stomach tube were introduced into the stomach, most marvelous results being produced. The heat stimulation was not remarkable for its restoration of the local circulation alone, but of the whole of the viscera. I do not know of anything so striking as the effects compared with the animal used as a control. Both animals were in shock, but one had bags filled with hot water placed in the abdominal cavity, and had the viscera covered with a rubber dam to prevent evaporation and the dissipation of heat, and hot water bags in the stomach, thus keeping up the continuous stimulation of the venous circulation with the reduction of shock.

25. Bernstein, J.: Ueber die physiologische Wirkung des Chloroform's in Moleschott, J.: Untersuch. z. Naturl. d. Mensch. u. d. Thiere, Giessen, 1870, 10.

Shock appears to be a local manifestation observed in the splanchnic area, and is more promptly obtained by exposure of the viscera to air. The result of anesthesia, in which there is excretion of the anesthetic into the alimentary tract, may also be similar to manifestations of shock. The arteries contract always and the veins dilate, and that seems to be the law that governs shock. The unstriated muscle cells in shock show early protoplasmic changes.

DR. SAMUEL J. MELTZER, New York: I agree with Dr. Mann that the term shock, as it is now used, covers a variety of forms which superficially look alike. I am reminded of the good old time when many practitioners made a diagnosis of "a touch of malaria." We ought to learn how to diagnose internal hemorrhage or a fat embolus, etc., and not call them shock. Shock may occur without these phenomena and even without a fall in blood pressure.

I said years ago that shock is an inhibitory phenomenon. I am afraid that those who do not agree with me do not understand my point of view. I do not deal with the *cause* of shock but only with its *nature*. I said that in shock some, or many, or all nerve cells, and perhaps also other functioning cells of the body, are partly or wholly inhibited, their activities are suppressed. This state can be brought about by a variety of causes, of which trauma is one. A clear example is the temporary depressing effect of cutting of the cord on the nerve cells in the section below the cut. For hours no reflex can be elicited from this section. Concussion of the brain is probably a fact in spite of the disbelief in it of our modern surgeons. They may change their minds about that as they changed about antisepsis. The terrific shell explosions on the battle field are well fitted to cause concussion and shock.

When shock affects many cells of the body, cell activities will be greatly reduced; hence, perhaps, the reduction of carbon dioxide in the body fluids. Acapnia, therefore, is perhaps the *result* of shock and not the *cause* of it.

DR. FRANK C. MANN, Rochester Minn.: In regard to the discussion of hemorrhage in connection with the shock problem, I do not mention hemorrhage as a cause of shock but as a cause of the symptoms of shock. In a paper with any clinical application I think it is important to emphasize that, because in clinical reports of patients who have been said to have died of shock, usually it is found that a certain amount of hemorrhage has also occurred. It is known from experiments as well as from clinical observation that different persons do not react the same to hemorrhage, and in a certain proportion of cases diagnosed as shock, hemorrhage was undoubtedly the cause of the condition, and the diagnosis from a purely technical conception of shock was incorrect.

In regard to Dr. Meltzer's inhibition theory, I am not sure that the results we get on exploration of the abdominal viscera in which there is a stasis in the blood vessels is not due to an inhibitory mechanism, but I am sure that if this is the case it involves the lower neurons and not the higher nerve centers. I feel confident of this because in a series of experiments in which the cervical cord was sectioned, dilatation and stasis in the blood vessels of the viscera took place on exposure in the same manner as when the higher centers were intact. When we devise some method of demonstrating psychic shock experimentally, inhibition will probably be found to be a factor.

Street Accidents Increase.—There have been in New York during the last six months 12,284 street accidents, as against 10,593 for the corresponding period in 1916. There was a 20 per cent. increase in accidents last June as compared with June, 1916. The report of the commissioner of highways just published shows that 63 per cent. of the accidents are recorded between noon and 8 o'clock in the evening, as compared with 24 per cent. between 4 and 8 a. m. This increase in the number of accidents has prompted Police Commissioner Woods to make an appeal to merchants, manufacturers and truckmen requesting them to have the bulk of their heavy hauling done between 4 and 8 a. m., causing a better distribution of traffic.

THE BLOOD LIPOIDS IN DIABETES *

E. P. JOSLIN, M.D., W. R. BLOOR, PH.D., AND
HORACE GRAY, M.D.

BOSTON

With an excess of fat diabetes begins and from an excess of fat diabetics die. In 45 per cent. of our diabetic cases an increase of body fat preceded the onset of the disease, and in 60 per cent. of the fatal cases abnormalities of fat metabolism resulting in acidosis caused death. Such facts show the need for an intensive investigation of fat metabolism in diabetes. The importance of the problem is further manifest when it is realized that there are approximately 1,000,000 individuals in the United States who either have or will have diabetes before they die. As a preliminary to the investigation of fat metabolism a knowledge of the fat in the blood is essential. Save for Bloor's series of thirty-eight accurately analyzed diabetic bloods no extensive data of this sort exist.

For this reason, and to serve as a basis for further work, during the last eight months a study of the blood lipoids of the diabetic patients at the New England Deaconess Hospital has been carried out by Horace Gray, working in the laboratory of Biological Chemistry at the Harvard Medical School with W. R. Bloor. Complete analyses of 131 specimens of blood, taken from eighty-seven patients, were made for the three groups of lipoids of the blood; namely, the fatty acids, cholesterol and lecithin. Not only were these three groups of lipoids determined in the whole blood, but in each instance in the plasma and corpuscles as well. In this paper salient points brought out in the analyses relating to the whole blood alone will be mentioned, leaving for Dr. Gray to report at another time his work in extenso.

These data, taken in conjunction with thirty-eight analyses, made by W. R. Bloor on the Deaconess patients last year, render it possible to draw deductions of therapeutic value. To the clinical student of diabetes these analyses are of much interest, for they represent progress along one of the two lines of investigation in diabetes that today promise the most to investigator and patient alike. These are the developments of our knowledge about the metabolism of fat and the explanation of the power of a diabetic patient during fasting to show a respiratory quotient above that of a normal individual under the same circumstances.

It is desirable to refer to the fat in the blood as blood lipoids, because the so-called blood fat is present in several forms. Of these lipoids about 50 per cent. exist as combined fatty acids, mainly oleic and palmitic; 30 per cent. more or less is in the form of cholesterol (and cholesterol esters), while the remaining 20 per cent. is composed of lecithin and related bodies which are distinguished by their content of phosphorus. The lipoids represented by the cholesterol and lecithin groups constitute most of the "built in" fat of the body. If a term is desired to cover these two substances, the already existing description cytolipoids is suitable. A fat man is good natured; his fat tissue like his disposition is free from acid qualities.

* From the Laboratory of Biological Chemistry of the Harvard Medical School and the Laboratory of the New England Deaconess Hospital.

* Read before the Section on Practice of Medicine at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

It is readily comprehensible with so many different substances making up the lipoids in the blood that progress in the study of the same has been slow. Even today the nomenclature alone is a serious handicap, but a still greater obstacle has been the complexity of the analytic methods employed for the determination of these various lipoids. It is only recently that it has been shown that analyses of the lipoids to be accurate must be begun within one hour from the time the blood is drawn. No ready test has been available by which a knowledge of the total lipoids could be obtained, and to determine each lipoid separately is impracticable in clinical work. The cloudiness of the plasma, the old clinical test, is not a guide, for there are clear plasmas which when tested are hyperlipemic and cloudy plasmas which on analysis show a normal quantity of lipoids. Hitherto evidence based on a sufficiently large series of diabetic cases has been lacking to show whether the estimation of the quantity of one lipoid would furnish information of enough clinical value to warrant the neglect of the remaining lipoids.

The 131 analyses made by Dr. Gray are most helpful in this connection, for they teach that when

made by Bloor. The table shows the number of bloods analyzed; the percentage of lipoids obtained by Bloor's method in the whole blood and plasma; the total fatty acids in whole blood, plasma and corpuscles, respectively; and the same for lecithin and cholesterol, the glycerids in the plasma and corpuscles, and the total lipoids in the plasma. Figures are inserted for comparison with the results of former analysis. Incidentally the percentage of blood sugar is given.

The specimens of bloods obtained have been separated into three groups based on the clinical condition of the patients on the day the samples of blood were drawn. In general the mild diabetics showed a positive carbohydrate tolerance of 50 or more grams; the moderate cases of diabetes a tolerance between 50 and 10 gm., and the severe diabetics a tolerance below 10 gm., and often a minus carbohydrate balance. The presence or absence of acidosis and the blood sugar values were also considered in the grouping of the patients. Occasionally the blood of a patient was considered as belonging to the severe group of diabetes, whereas a later specimen belonged distinctly to that of another group. It was perfectly clear that this method

BLOOD LIPOIDS IN DIABETES

	Number of Bloods	Fat by Bloor's Method		Total Fatty Acids			Lecithin			Cholesterol			Glycerids		Total Lipoids	Blood Sugar, per Cent.
		Whole Blood, per Cent.	Plasma, per Cent.	Whole Blood, per Cent.	Plasma, per Cent.	Corpuscles, per Cent.	Whole Blood, per Cent.	Plasma, per Cent.	Corpuscles, per Cent.	Whole Blood, per Cent.	Plasma, per Cent.	Corpuscles, per Cent.	Plasma, per Cent.	Corpuscles, per Cent.	Plasma, per Cent.	
Normals.....	23	0.59	0.62	0.37	0.39	0.34	0.30	0.21	0.42	0.22	0.23	0.20	0.10	0	0.68	0.10*
Mild diabetes.....	32	0.83	0.90	0.59	0.64	0.45	0.32	0.24	0.42	0.24	0.26	0.21	0.33	0.18	0.98	0.17
Moderate diabetes.....	37	0.91	1.06	0.65	0.75	0.48	0.33	0.28	0.40	0.26	0.30	0.20	0.46	0.23	1.16	0.26
Severe diabetes.....	55	1.41	1.80	1.01	1.28	0.62	0.40	0.40	0.40	0.41	0.51	0.24	0.84	0.38	1.98	0.23
Mild diabetes																
With nephritis.....	12	0.87	0.93	0.63	0.66	0.53	0.32	0.24	0.43	0.24	0.26	0.22	0.41	0.24	1.01	
Without nephritis.....	20	0.86	0.88	0.54	0.63	0.40	0.32	0.24	0.41	0.25	0.25	0.21	0.36	0.13	0.97	
Severe diabetes																
With acidosis.....	21	1.32	1.66	0.99	1.23	0.58	0.39	0.38	0.40	0.33	0.43	0.22	0.82	0.32	1.81	
Without acidosis.....	34	1.49	1.87	1.02	1.31	0.64	0.41	0.41	0.40	0.46	0.57	0.25	0.86	0.43	2.07	

* Estimated, not analyzed.

Bloor's so-called fat method is used, 91 per cent. of the total lipoids in the blood are obtained, the variations from this average not being over 5 per cent. above or 3 per cent. below the 91 per cent. mentioned. We therefore recommend this method to clinicians in the routine study and treatment of their patients.

The Bloor method¹ is sufficiently simple for clinical use.² A single analysis can be performed in an hour and a half, but a series of twelve analyses could be completed in a day. An analysis for cholesterol requires half again as long, and for lecithin twice the time. The Bloor method is advantageous therefore (1) because by it at least 90 per cent. of all the blood lipoids are determined and (2) because it furnishes information of a representative character concerning all the blood lipoids, since by means of it all the fatty acids existing as glycerids are thus obtained, as well as those in the cholesterol esters and in lecithin.

In the accompanying table are embodied the data on which the conclusions which follow it are based. For comparison, in the first line is inserted the average figures for the analyses of twenty-three normal bloods

of differentiation was fairer than to separate the bloods on the basis of patients alone.

All types of diabetes are distinguished by a marked increase in lipoids of the blood, and the general statement can be made that the increase is progressive with the seriousness of the disease. Thus, the average quantity of lipoids obtained by Bloor's method in the whole blood amounted to 0.59 per cent. in nineteen normal individuals, but was increased to 0.83 per cent. in thirty-two mild diabetics, to 0.91 per cent. in thirty-seven moderately severe diabetics, and to 1.41 per cent. in fifty-five severe cases of diabetes. The increase holds not alone for the lipoids obtained by this method, which, as before said, amount to approximately 91 per cent. of the total blood lipoids, but for each of the three groups of lipoids. Although the quantity of total fatty acids is trebled, the cholesterol is only doubled and the lecithin increased but one third. The increase in cholesterol is significant and suggestive, and seems indeed pathognomonic of the prolonged diabetic hyperlipemia, since Bloor has found it lacking in the acute lipemia of overfeeding which is characterized by an increase in the total fatty acids alone. In Dr. Gray's detailed paper, which will contain many facts not touched on here, he will show

1. Bloor: Jour. Biol. Chem., 1914, 17, 379.
2. The latest modifications are given by Joslin: The Treatment of Diabetes Mellitus, Ed. 2, Philadelphia, Lea and Febiger, 1917.

that the variation in the lipoids takes place chiefly in the plasma; in fact, with lecithin and cholesterol there is practically no change in the corpuscles between normal individuals and the different types of diabetes.

So large a number of the cases of mild diabetes were accompanied by renal involvement that this group is divided into two classes, and the average analyses of twelve mild diabetic cases showing nephritis are compared with twenty mild diabetics that were free from nephritis. The table shows a remarkable uniformity of results in the two groups, and this uniformity is so close that it holds not only for the lipoids determined by Bloor's method, for the lipoids in the plasma, but also for the constituent lipoids, the fatty acids, lecithin and cholesterol.

From analysis of the individual specimens of blood of normals and diabetics it is also possible to arrive at a lipid threshold, analogous to the blood sugar threshold. To be sure, this is not absolutely definite, but it is sufficiently distinct, for the number of mild diabetics with low lipoids which reach the high level of normal individuals is negligible. With Bloor's fat method this normal lipid threshold can be stated to be not far from 0.67 per cent. As a matter of fact only 9 per cent. of 131 diabetic specimens of blood showed a level below this.

The fifty-five analyses made on severe diabetics were also divided into two groups, according to the presence or absence of acidosis. With the recent work of Fitz on beta-oxybutyric acid and its allies in the blood, it is, however, questionable whether one is justified without blood analyses in considering a case of diabetes to be actually free from acidosis. But in the main it is true that in the one group acidosis was distinctly present and to a marked degree, and in the other, the ordinary signs of acidosis, such as the ferric chlorid test for diacetic acid, the Fridericia test of the alveolar air, and the Van Slyke test of the blood, were absent. The compilation of the data gave unexpected results, and at first sight would indicate that the patients with severe diabetes that were free from acidosis showed a higher lipid content than their companion diabetics that presented all the typical signs of acid poisoning. But if the entire series of 131 bloods is examined to determine the relation between acidosis and the lipoids, the evidence is clear that the cases of diabetes with acidosis exhibit a higher level of total lipoids than the cases without acidosis. It is an interesting fact, however, and one worth further study, that when the bloods obtained during acidosis are classified according as to whether the acidosis is mild, moderate or severe, the lipoids are found to be nearly twice as great in those bloods obtained from patients showing moderate acidosis as from those patients who showed severe acidosis. We hesitate to even speculate on the explanation of these figures, until a more detailed study of the individual protocols has been made.

In general, it may be said that the lipoids in the blood decrease with fasting, but more evidence is needed on this point, for it is quite possible that the extent of adipose tissue in the body is an important factor. Whereas a diet rich in fat favors an increase of lipoids in the blood, it is certainly true that fat is not the only element in the diet which must be considered in this regard, for a study of food charts of the patients indicates that the presence of carbohydrates in the diet is an important element.

The maximal value for lipoids in this series of 131 bloods occurred in Case 786, which showed total lipoids of 16.3 per cent. On another occasion, this same patient showed approximately 9 per cent. of lipoids, but following restriction of diet, the lipoids decreased to nearly 1 per cent.

An analysis of the lipoids before and after ether anesthesia in one case deserves attention. It showed that the total fatty acids were increased after the operation, whereas the lecithin and cholesterol remained unchanged. The increase in total fatty acids was followed later by a fall in the same below that of the patient's level before anesthesia.

The blood lipoids do not rise and fall with the changes in the blood sugar. Thus, the moderately severe cases of diabetes showed higher blood sugars than did the severe diabetics. The blood sugar was not nearly as accurate a test of the severity of the case of diabetes, measured from all points of view, as was the lipoids of the blood. It would appear that a knowledge of the blood lipoids would be distinctly more helpful from the prognostic point of view than a knowledge of the blood sugar. Cases of diabetes with high lipoids present a less favorable outlook than cases with low lipoids.

ABSTRACT OF DISCUSSION

DR. R. GEYELIN, New York: During the past year at the Presbyterian Hospital I have been more or less interested in the macroscopic appearance of the plasma for fat. As Dr. Joslin has pointed out, this is not an accurate guide to the amount of lipemia, as some patients showing turbidity of the plasma, according to quantitative chemical methods, have no increase in the fat content of the blood over normal. It was first brought to my attention by noticing in severe cases of diabetes that there was a marked increase in the turbidity of the plasma, and when I say a marked increase I mean an appearance which looks very much like thickened cream. There was one case which, in view of what Dr. Joslin has told you, may be of some special interest relative to the value of the blood fats from the standpoint of the patient's subsequent tolerance. I do not want to draw any conclusions from one case, but a brief outline will perhaps be of interest. This patient had a lipemia so marked that it looked like thick cream; at the same time the blood carbon dioxid was slightly depressed; according to the combining method it was about 25, and the blood sugar was over 500. The patient showed symptoms of a mild acidosis and it took six days of fasting to clear them up. The blood carbon dioxid combining capacity came up to 45 and stayed up, and the blood sugar came down 500 to 250 in two months' treatment, with a great many fast days thrown in. That patient never developed a tolerance of over 500 calories in spite of the fact that foods were shifted around in various ways to determine whether there was any class of food to which she was particularly susceptible. All the time the appearance of the plasma was that of thick cream, whereas the blood sugar and blood combining capacity stayed where it was. It was not until after two months of treatment that the blood plasma lipoids became almost clear, the blood sugar and blood combining capacity staying about where they were before. The patient's tolerance was increased almost twofold inside of two weeks after the plasma became clear. Now, are we going to find that the fat content of the blood, that is, the lipoids, have any relation to the patient's tolerance? That is, is it going to be found when we diminish by treatment the lipoids that the patient's condition is going to improve? This particular case has been in marked contrast to that of two other patients whose blood lipoids, at least from the gross appearance, decreased, and whose blood cleared up at the same time that the blood carbon dioxid combining capacity went up and the blood sugar came down.

DR. F. M. ALLEN, New York: I do not believe anything can be said offhand on a subject as little understood as the blood lipoids. A subject is always opened up when the necessary methods become available, and it is to be hoped that the methods of Bloor will serve to bring light on these problems. These extensive observations of Drs. Joslin and Gray are important pioneer work on the clinical side. A fundamental question back of these phenomena is why fat behaves in this way in diabetes. Evidently it is one more illustration of the fact that diabetes is an impaired assimilation of all foods, and not merely of carbohydrate. But the mechanism by which fat is normally taken up from the blood, and which breaks down in diabetes, is unknown. We have some animal experiments in progress which may later yield a little information concerning it. One point which may perhaps be shown when Dr. Joslin's full figures are published is the possible influence of lipemia on the carbon dioxid capacity of the blood. When the plasma is so full of fat, what is the relation between its carbon dioxid capacity and the values in the alveolar air? Therapeutically, it is always desirable, and generally possible, to clear up a pathologic lipemia. We have had some patients in whom heavy lipemia was thus cleared up and who are alive now. High lipemia was formerly regarded as a very bad prognostic sign, and presumably an intractable lipemia may still be so considered. Dr. Geyelin has had some of the severest cases of diabetes ever described. The one which he reported with Dr. Du Bois was perhaps the severest ever studied by accurate methods. There is a possible question whether the metabolism is in some cases specially defective on the fat side and in other cases on the carbohydrate side. Distinctions in types of diabetes have generally proved unreal. Probably the apparent differences in lipemia and other symptoms will be explainable by diet and other special influences.

DR. HORACE GRAY, Boston: Dr. Geyelin's point, as I understand it, is that two of his patients, as they improved, lost their cloudy plasma, while another patient, who improved little, kept the cloudiness. That can perhaps be reconciled with our figures by saying that although, in general, it is distinctly not safe to judge the amount of fatty substances in the blood by the appearance of the plasma, still the very creamy plasmas do have high lipoids. Stating this in other words, we have described plasmas in twelve divisions, from "clear" to "thick creamy." In the lower divisions up through "very cloudy" it is a delusion to think one can predict whether the lipoids will be high or low, but the plasmas which were described as "milky," "creamy," and "thick creamy" did regularly have a high lipid content.

Dr. Allen's point about bad prognosis in patients with creamy plasmas agrees with Dr. Joslin's patient, Case 786, who had thick creamy plasma and total lipoids of about 16 per cent. It may interest you to know incidentally that the highest value generally accepted in the German literature is about 19 per cent., while there have been reported even higher.

When you start to do this work two things need to be agreed on: the method and the nomenclature. The naming is a complicated business, but one thing we can easily do is to use "lipemia" in a more definite way. To some people it means a cloudy plasma; to others it means a large lipid percentage on analysis. We might well adopt the French "lactescence" for the gross appearance, and restrict "lipemia" or "hyperlipemia" to the chemical analysis, similar to the use of the term "hyperglycemia." The method which Dr. Joslin has recommended under the name of "Bloor's fat method" was called by Dr. Bloor "total-fat." Dr. Joslin and I venture to urge this change of name to avoid confusion with "total lipoids," which, being a more inclusive term, seems more entitled to be called "total."

For a routine practice the use of whole blood instead of plasma is easier and requires less blood.

Social Reform.—All attempts at reform at present should be in the direction of acquiring greater flexibility in the social organism, not in the direction of a definite system.—*Scientific American.*

STANDARDIZATION OF SERUMS AND VACCINES

SOME DIFFICULTIES AND MISUNDERSTANDINGS

G. W. McCOY

Director, Hygienic Laboratory, U. S. P. H. S.

WASHINGTON, D. C.

The misunderstanding that exists even among usually well informed health officers and physicians in regard to the standardization of biologic products is sufficient reason for a brief consideration of the subject. For example, under the heading "Standardization of Biological Products" on page 1416 of THE JOURNAL, May 12, 1917, a note states that the official Conference of State and Territorial Health Officers adopted a resolution recommending that the Public Health Service "establish and promulgate standards as to potency with reference to all biologic products, vaccines and serums, not only with relation to diphtheria and tetanus antitoxin, but especially with relation to antimeningococcus and pneumonia serums, and vaccines for typhoid fever, paratyphoid fever, and bacillary dysentery."

A standard is defined as "that which is set up and established by authority as a rule for the measure of quantity, weight, extent, value or quality; especially the original specimen weight or measure sanctioned by government as the standard pound, gallon, yard, width, or the like."

One sees that there are strict limitations as to what may be allowable under the definition of a standard. Those who have devoted the most time and have had imposed on them the greatest responsibilities in relation to the field of biologic products have thus far been willing to recognize as standardizable only a small number of preparations. Firmly based on substantial scientific grounds, standards have been formulated for the antitoxins of diphtheria and tetanus. In the case of the former we have as a standard a serum which laboratory tests and long observation have shown to be constant, a true standard by which specimens of antidiphtheria serum can be measured, though perhaps not quite so accurately as we can measure things which do not depend on living creatures (guinea-pigs) for the indications that the end of the measure has been reached. With slight modifications, what has been said of diphtheria antitoxin may be said of tetanus antitoxin. It is not the purpose to go into the details of the beautifully worked out methods of testing these antitoxins, but the standards have now been in use for a number of years, and are very satisfactory; though unless large numbers of test animals are used, only approximate measurements of the strength (unitage) of given specimens of serum may be made. A most important point is the fact that the measure of the antitoxic value of these serums is also a measure of the usefulness of the product in clinical use.

At the Hygienic Laboratory, much time has been devoted also to the standardization of antityphoid vaccine, and there has been devised a tentative standard for this agent. This tentative standard requires that the dose intended for human beings, when administered to rabbits in a certain manner, shall provoke a certain agglutinin response. It was recognized that the agglutinin response was not necessarily a measure of the prophylactic value of the vaccine as applied to man, but it was felt that the procedure would improve the quality of the vaccine on the market, which had

been found to be very variable. Experience has shown that it is advisable to furnish a standard vaccine and to require that commercial products shall equal that in agglutinin producing properties; in this manner, inequalities in results, due to differences in technic, are eliminated.

This completes the list of preparations for which there are standards, only a small fraction of the great number of biologic products on the market. This does not mean that attempts at standardizing other products have not been made. It simply means that science has not progressed far enough to enable the proper authorities to set up a rule for the measurement of preparations which are of recognized value.

There are three fundamental difficulties in standardizing biologic products. The first of these is the fact that none of the factors is constant. We are dealing with living organisms in which vital processes are going on, or with the products of these vital processes, and we know that neither processes nor products are constant. It is true that certain of the toxins and antitoxins are relatively stable, when kept under certain conditions, and this stability was at once utilized to establish such standards as we now have.

The second great difficulty is the fact that animals must be used in making comparisons between the standard and the preparation to be investigated. Individual laboratory animals vary in their reactions to toxic agents to which they are susceptible, as well as to the antitoxic agents, these terms being used in a broad sense.

The main difficulty, however, is the fact that we lack laboratory animals susceptible to many of the agents which we need to test; thus, the ordinary staphylococcus, the gonococcus, and the pertussis bacillus are good examples of organisms which we cannot submit to animal tests.

These points make it clear that, in the very nature of things, we cannot hope to have standards which are comparable to those of a purely physical nature, or even to those having a chemical basis.

When a preparation is in the purely experimental stage, that is, before clear evidence as to its value is available, it would be a waste of time and energy to try to standardize it officially; and the same may be said of products for the value of which there is no substantial basis.

Certain preparations which have passed the experimental stage within recent years, and certain others the value of which has long been established, are without recognized standards, as will be shown presently.

Aside from the purely technical difficulty of standardizing many preparations is the fact that the establishment of an official standard is likely to be regarded as setting the stamp of governmental approval on claims made for the usefulness of the preparations. It would certainly be contrary to public interest if official action capable of such interpretation should be taken. The German authorities have established a number of provisional standards for biologic preparations, but the wisdom of the policy is debatable.

SPECIAL PREPARATIONS

Some of the special preparations that have been mentioned as being in need of standardization, a need that no one will deny, will be considered.

Antimeningococcus Serum.—The effectiveness of this agent seems to be established, but experience has shown that at least some specimens of serum have

been found to be useless in certain outbreaks of meningitis. One reason for this, of course, is that, from an immunologic point of view, there is a very considerable variation in the organisms isolated from various sources. The meningococci have been divided into groups depending on their serologic reactions, but there is no agreement among workers as to the number of groups nor the characteristics which govern the differentiation of the several groups. All antimeningococcic serums are polyvalent, that is, contain antibodies for various cultures of the organism; but just what constitutes sufficient polyvalency is not determined. It would not be sufficient to say that a serum shall represent a minimum number of different cultures, because this might overlook whole groups; nor would it suffice to say that all groups of the organism must be represented, although this is inquired into during governmental inspections, because of the lack of agreement as to grouping and the fact that immunologic relations of individual members of groups vary considerably. These difficulties have not deterred those who are interested in the subject from endeavoring to establish some criterion of the value of the serum.

All serums made in the United States are submitted to some form or other of potency test. Several manufacturers determine the agglutination titer of the serum, others, the titer in a complement deviation complex, while others make an opsonic index determination. An animal protection test is also in use. Unfortunately, there is no agreement among those who have given this subject special attention as to which test is the more satisfactory; no proposed standard has sufficiently impressed those who are concerned with this problem to lead to its adoption.

Good authorities insist that the results of the therapeutic use of the serum afford the only reliable evidence of its value, and it may be remarked that almost any manufacturer can produce glowing testimonials as to the clinical results of the use of his product. The question that naturally occurs is why some one of these tests is not adopted, and all serums required to comply with it. The answer is that in spite of much experimental work we are without sufficient evidence as to the superiority of any method of testing. The multiplicity of types of meningococci, and the variations even among members of the same group of organisms, make accurate standardization impossible at the present time.

The serums made by American manufacturers represent all the way from ten to forty-six strains of meningococci, and most manufacturers make it a rule to utilize every new strain that comes into their possession unless it is one that is immunologically identical with cultures they are using already.

Finally, an additional obstacle to the standardization of the product is the fact that, even when all conditions are favorable, it is difficult for two workers, using the same method, to get comparable results.

Antipneumococcus Serum.—It is only recently that the value of serum in this disease has been put on a sufficiently substantial foundation to justify its general use. Indeed, this serum illustrates the creation of a demand prior to the placing of the product on a sound scientific basis. As soon as it became known that there was in experimental use a promising treatment for pneumonia, physicians naturally desired to utilize it in a disease otherwise most unsatisfactory from a therapeutic point of view; and manufacturers sought

to meet the demand. In the case of pneumonia we have conditions somewhat analogous to those in meningococcus infections, though probably less complex. The causative organisms of pneumonia can be divided immunologically into several groups; four, according to Cole and his collaborators.

At the present time there is evidence of the therapeutic value of a serum prepared against but one of the types (Group I). While scientific observation has failed to show the value of specific serum against the other groups (II, III, IV), or of Group I serum against these other groups, clinicians working without group determinations and presumably without adequately controlling their work, have reported satisfactory results from the use of the serum in pneumonia in general. We may be pardoned if we remain skeptical as to the validity of the observations.

Antipneumococcus serum affords a good example of the difficulties in standardization when what we might call the "test object" is a living organism. It is impossible to secure a constant minimum lethal dose of culture as a criterion. The rate of growth varies, and the virulence varies. With these factors so inconstant, and yet absolutely vital, there seems to be no immediate prospect beyond the establishment of a provisional standard.

Other Serums.—When we come to consider these, we find that there is practically no ground for establishing standards. To say that they should show some evidence of potency, without prescribing a minimum, is futile; to prescribe a minimum that would not be reasonably near the maximum obtainable would put a premium on mediocre work on the part of producers; and we have no means of demonstrating the maximum degree of potency.

Bacterial Vaccines.—It is perhaps not too sweeping to say that at present, as regards the majority of bacterial vaccines, potency standardization is both impracticable and undesirable. Aside from antityphoid vaccine, evidence of value is meager, and practically none of the vaccines can be submitted to potency tests on laboratory animals. Generally speaking, the doses that have been adopted are purely arbitrary. In many cases the dose might be multiplied by ten, or divided by the same factor, without, so far as we know, influencing the effect of the vaccine.

The determination of the number of organisms per given volume of fluid is apparently a simple procedure; but, as a matter of fact, two workers equally careful will often get most divergent results; even when the same method is employed, and when different methods are used, the results are little better than guesses based on turbidity would be. Obviously this is a minor matter, in view of what has been said above regarding the size of dose.

The question of standardization of tuberculins is one that recurs constantly. These agents are employed comparatively little in the treatment of tuberculous infections, but they are used rather extensively in diagnosis. The varieties are legion. It would scarcely serve merely to require that they shall produce a reaction, unless we prescribe the quantity and the dilution. Nor do we know whether or not the results of animal experiments are comparable with the results that may be expected when the agent is applied to man.

Vaccine Virus.—The ultimate criterion of the potency of this agent is the percentage of "takes" it will give, when used to vaccinate persons not pre-

viously successfully vaccinated. Whether any testing on laboratory animals can be used as a satisfactory substitute for this is uncertain.

Even here there must be qualifications, if we are to speak in terms of a standard; thus, how large an abrasion is required to give a successful result, and how much may the vaccine be diluted and still give uniform success? This particular product does not especially concern those of us who are familiar with the subject of standardization, because the demand for vaccine virus comes largely from health officials who are in position to judge from the results of use as to the potency of a given manufacturer's product. If the vaccinator gets poor results he is not likely to order a second supply from the same source. In other words, a poor product will not be a commercial success. It is the judgment of those who have had most experience with the subject that we should not at present insist on a vaccine which is free from contaminating micro-organisms, though the promising work of Noguchi leads us to hope that we may have a dependable pure vaccine in the not far distant future.

Antirabic Virus.—So long as the preparation of this agent followed, or followed approximately, the original Pasteur method, the products probably varied comparatively little. Now, however, there are available dialyzed and desiccated viruses for which certain advantages are claimed; attempts at standardizing these have been made, but there is not sufficient evidence to warrant the adoption of a standard.

In connection with vaccine virus and antirabic virus, there is this element of security in regard to potency: The propagation of the product requires the inoculation of material from animal to animal; and the failure in one case to develop pocks, and in the other the failure to produce rabies, would indicate at once that the material has become inert; in either case, failure to infect animals used for propagation may be regarded as evidence of the lack of power to protect man.

Many products may be tested by purely serologic methods, but the results of such tests may or may not bear any relation to the usefulness of the product. Of what value is it to know that a certain serum gives a reaction in a certain dilution by means of complement deviation, agglutination, opsonic index determination, or a bacteriolytic determination, when we do not know that these reactions bear any relation to one another; or, what is more important, to the effect the serum may have on the infection against which it is expected to act?

A possibility that must not be lost sight of is that the establishment of a standard may result in the fixing in the minds of workers and manufacturers the feeling that, as regards the particular product, there is no need for improvement. If a thing conforms to a government standard, why try to improve it?

A factor that must be considered in discussing the standardization of biologic products is the rate of deterioration. It is not too much to say that we know almost nothing of this, barring the two antitoxins for which we have potency standards. This absence of information has led to great variation in "expiration" dating for the same product. To remedy this, some manufacturers place the date of manufacture on the label, leaving to the purchaser the determination of the wisdom of using the preparation. There is justification for this, on account of the fact that the man-

ner in which products are kept influences deterioration. The serum or vaccine displayed on the pharmacist's shelves, or stored in a drawer, loses its efficacy much faster than one kept in an adequate refrigerating device. If the purchaser knows the age of a preparation, he may be in some position to judge of its probable value, when kept under given conditions.

SUMMARY

From the foregoing it is evident that these questions have already claimed much attention, and that the subject of standardization may be thus summarized:

The chief difficulty in standardizing biologic products is due to the unstable nature of the factors.

Legal standards have been established for diphtheria antitoxin and tetanus antitoxin. A provisional standard has been established for antityphoid vaccine.

Vaccine virus and antirabic virus are, in effect, tested for potency in the process of manufacture.

It is not wise to attempt to standardize products in the purely experimental stage, or those for which there is no sound scientific basis.

Those who are engaged in manufacturing and controlling these products are alive to the necessity for standardization.

COMPARISON OF METHODS OF TREATING WOUNDS

KENNETH TAYLOR, M.A., M.D.

Director, the Robert Walton Goelet Research Fund. American Red
Cross Hospital of Paris

PARIS, FRANCE

The difficulty of judging and comparing the clinical results of different methods of the treatment of wounds is so great that it seems desirable to consider how more exact information as to the value of a treatment can be attained. It is obvious from a study of the literature since the beginning of the war that the superiority of no one form of treatment has become firmly established. The treatment of infection in wounds is thus still largely in the experimental stage.

The haphazard way of trying first one and then another method on each case, hoping to stumble on a suitable one, is as nearly barren of progress as is treating all wounds in the same way. This proceeding is not likely to lead to the recognition of the best methods of treatment for infected wounds. It is important, therefore, to organize in hospitals a system which may give a clear idea of what is being accomplished by each method of treatment.

As in most other therapeutic problems, the great difficulty in associating cause and effect lies in the number of variable factors which must be controlled. In the case of infected wounds, the first and one of the most important of these factors is the personal element in the manner of applying the treatment and handling the wound. It is of little use to compare two methods of treatment conducted by different men. No two surgeons will carry out the details of the same treatment in exactly the same way. One may secure satisfactory results by a certain method entirely from delicate and careful handling of the regenerating tissues of the wound, while another, using the same method of dressing, may counteract the benefits of the

system by careless treatment of the young epithelium and granulations with which he is dealing. Yet both results may be ascribed to the particular method or dressing solution which is being used.

It is also unsatisfactory to compare the results of one method of treatment conducted in a series of cases with a different method used by the same surgeon in a previous series. It will often be stated that better results were obtained with the second method than with the first, when the difference is really due, not to a better method, but to the increased experience of wounds that has been gained by the surgeon.

There are other important factors which vary with the patient. First there is that of the *general vitality* and ability to react to the infection. Although this is not so great as might be supposed, owing to the fact that much of the military surgery deals with men more or less carefully selected for their sound health and freedom from debilitating disease, it cannot be entirely discounted.

The *age of the wound* and the previous treatment to which it has been subjected are also factors which must be standardized to be compared. This can partly be accomplished by establishing a system of periodic examinations and descriptions of each case at short intervals, and grouping the cases according to the number of *days since the injury* was received.

One of the most serious difficulties is encountered in the varying conditions within the wounds themselves. No two wounds can be safely considered to be exactly alike, although their external appearance may be very similar. Differences of *location and vascularity* may influence seriously the course of repair. The degree of *trauma*, both the obvious damage and the more subtle microscopic destruction of the soft tissues, is probably the most important of all the factors to standardize and yet the most difficult to estimate. Thus compound fractures are particularly unsatisfactory for study. The presence of *foreign bodies*, especially fragments of clothing and dirt, loose pieces of bone, etc., also alters materially the rate of repair; and, finally, the degree and kind of *infection*, which may vary with each patient, still further complicates the problem.

Although the difficulties of comparison are, as may be seen, great, there are certain methods by which cases can be arranged to reduce the number of the variable factors which confuse the issue and to give a more accurate comparison between them.

There are three ways in which these cases can be profitably studied. The first is by comparison of groups of selected cases. Each surgeon may collect under his service cases which have some points in common—for instance, open fractures, wounds of soft parts only, or cases of approximately the same age as to the injury. These may then be divided into groups, each set being treated in a different way.

Another system lies in a comparison of large groups of unselected cases. This is a logical but cumbersome method. The beds of the service may be divided into two or more groups, each treated by a different method, and patients sent to each group on entry, in rotation. Thus there would be no choice of treatment for a particular case as the result of a preconceived idea of suitability, but the distribution would be purely automatic. Owing to the great variety of patients on each method of treatment, it is necessary to continue the system for a long period of time and in a large number of cases in order to form any satisfac-

tory idea of the characteristics of each form of treatment.

The third, and by far the most satisfactory, system of comparison, one which eliminates the largest number of variable factors, is the treatment of two or more wounds in the same individual by different methods. This has the great advantage of eliminating variations in individual reaction on the part of the patient; also it is probable that the two or more wounds are of the same age and have been subjected to similar treatment up to the time the patient was received. The bacterial infection is apt to be similar. They are treated by the same surgeon. This leaves uncontrolled only the individual variations of the wounds. One case of this sort is worth a comparison of many cases in different individuals, and the special characteristics of the treatments in use can be determined. A separate history and description of each wound should be kept, and the progress of repair and the extent of infection recorded at regular intervals.

What points should be considered in judging the efficacy of a treatment?

The estimation of the ultimate success of any treatment must be based, of course, on the rate of repair of the injured tissues, that is, the *time required for the cure*. As corollaries to the rate of repair, the severity of the systemic reaction to the infection and the *frequency of complications* must be taken into account.

It is necessary to have some definite standards of judgment to apply in order to estimate accurately the results. The time factor must be standardized. Considerable information can be obtained by a systematic, *periodic* examination of the wound, and the observation, at regular intervals, of the rate of growth of the granulations and epithelium, the disappearance of sloughs, and the evidence of bone repair. A form of chart devised for the standardization of this information permits of an intimate association of the systemic reaction with the daily course and treatment of the wound.

Measurements of the wound surface are difficult to obtain accurately, but should be kept when possible in the case of open wounds. The type of scar resulting from the wound must be taken into account. This is more or less dependent on the rate of repair—the more rapid the repair, as a rule, the softer the scar. During the course of treatment, any damage to the tissues resulting from the method of treatment must be noted. A painful dressing is usually an indication that new tissues are being injured. Burning and blistering of the skin in the region of the wound, or the erosion of new epithelium, may materially retard the whole healing process. The evidences of absorption of toxins, as manifested by the fever reaction and the general comfort of the patient, must be considered.

The frequency of extension of the infection must be charged against the treatment. Pocketing, or the retention of purulent discharge, is usually evidence of unsatisfactory drainage resulting from the improper distribution of tubes or the use of some material which becomes easily plugged by the discharge. Local cellulitis may be due to the same cause. Erysipelas, pyemia or bacteremia are evidences of unsatisfactory treatment. Secondary hemorrhage must also be considered an avoidable complication, and is often due to improper treatment.

A further point of considerable importance which must be considered in judging the efficacy of a treat-

ment is the alteration in the bacterial flora of the wounds dependent on it. This must be compared with the natural alteration which occurs spontaneously during the course of repair in every wound. The unusual disappearance of special bacteria from a suppurating wound under treatment may be evidence of the specificity of the antiseptic dressing solution for those bacteria.

The frequency of reinfection of the wound by any one organism (the *Bacillus pyocyaneus* is the commonest example) must also be taken into account in establishing the characteristics of a method of treatment.

The discharge should be kept under observation; record should be made of its amount, consistency, odor and color. There is a great tendency to place too much importance, however, on a superficial consideration of the discharge. The discharge is interesting chiefly as a symptom of an infective process. After it reaches the surface of the wound it is of little importance to the patient. Certain dressing solutions are claimed to "suppress suppuration." True suppression of suppuration may be a sign of failure to react to the infection, and then gives a bad prognosis to the case. There is, however, another process—that seen with the use of hypochlorite solution—on which great importance is sometimes placed as evidence of a decrease in the infection of the wound. This is the dissolving and decolorizing of the solid constituents of the discharge as a result of the alkali and chlorine freed from the solution. The infection and the reaction of the tissues may remain unaltered, that is, the activity of the bacteria remain the same within the granulations, and the leukocytes continue to emigrate at the same rate from the infected walls, although the character of the pus seen on the dressings may change from a thick purulent discharge to a thin, serous and colorless fluid giving an entirely different appearance to the surface of the wound. If the solution is withheld for twenty-four hours the pus cells reappear—a reaction which has been taken as evidence of reinfection. This alteration in the discharge, which has nothing to do with suppression of suppuration, may give what is really an optical misinterpretation of the true conditions within the tissues.

Exact observations on the particular effects of different methods of treatment are especially important on account of the confusion existing in the management of infected wounds. This study has rarely been carried out in a critical, scientific spirit.

It is only by comparing methods of treatment and keeping systematic observations of the wounds at regular intervals, and with a proper understanding of the true value of the changes in and about the wound, that the characteristics of any one method of treatment can be established, and an accurate judgment of its efficiency be made. Only then can dressings be applied intelligently, with a specific purpose in mind, and, according to definite indications, to particular cases.

6, rue Piccini.

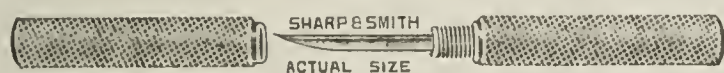
The Age of Insects.—The naturalists tell us that this would be the Age of Insects if it were not for man. And man's supremacy over the insects is not such a matter of course as is generally believed, to say nothing of their allies, the spirochetes, bacteria, et al. To the intervention of the rat flea may be credited the deaths from plague which in two years in India killed more persons than have been killed in the world war to date.

Clinical Notes, Suggestions, and New Instruments

A NEW BLOOD LANCET

IRVING F. STEIN, M.D., CHICAGO

I have devised a small blood lancet as shown in the illustration. It is small, and solidly set in a steel case with a screw-top protecting cover. It has proved efficient for drawing an adequate droplet of blood from the ear or finger tip.



New blood lancet.

It costs twenty-five cents—half the amount of the instrument usually used for this purpose. It will easily fit into any hemacytometer case, and is convenient to carry in the vest pocket.

A NEW PARAFFIN SPRAY APPARATUS

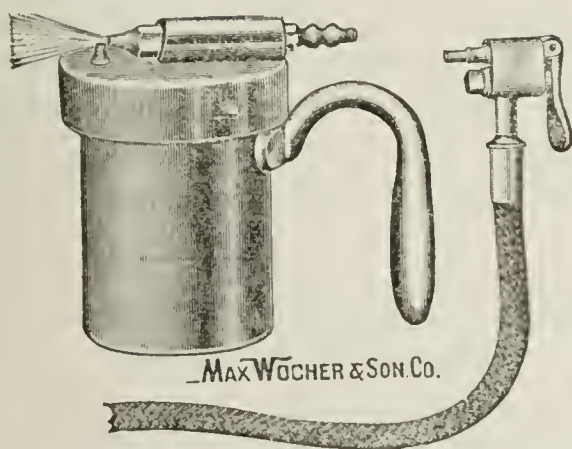
JOHN A. CALDWELL, B.S., M.D., CINCINNATI

Fellow of the American College of Surgeons; Assistant Attending Surgeon, Cincinnati General Hospital.

The use of the various paraffin wax mixtures in the treatment of burns and other extensive granulating wounds seems to have proved a distinct advance in the treatment of this class of wounds. The two methods of applying the wax are by brush and by spray. The brush method has been rather unsatisfactory (especially with children) because the preparation must be applied too hot for comfort, and the redipping of the brush contaminates the original supply.

Many sprays have not given satisfaction because the hot wax is congealed at the outlet by the passage of the cold air jet through the spray nozzle.

With the assistance of Mr. Max Schmidt of the Max Woche Company, and his workmen, I have made a spray which has given perfect satisfaction during several weeks' practical use on the wards of the Cincinnati General Hospital. The result has been accomplished without the use of complicated and capricious electrical heating device or hot water jacket. The illustration gives a full idea of the principle of construction.



Apparatus for spraying paraffin.

This spray is simply a modification of those which have been in general use in the arts for several years for spraying varnishes, paints and glazes on pottery. The sole modification consists in making the top from which the air and wax nozzles project sufficiently heavy to retain the heat. The reservoir holds 16 ounces—enough to spray several wounds of large area—and this quantity when thoroughly heated will remain fluid for a long time.

The device filled with the wax is placed in a sterilizer or covered vessel partially filled with water, and the water is boiled until the wax is heated to the temperature of boiling water. A layer of wax is then sprayed over the thoroughly dried wound. A single layer of gauze is then spread over the

wax surface and sealed to it by further spraying. The gauze facilitates the removal of the wax on the following day.

A compressed air reservoir delivering a free flow of air at a pressure of not less than 20 pounds to the square inch is necessary. A tank holding 5 gallons and a hand or foot pump will work, but of course a power pump is much more satisfactory.

Other advantages of this spray to be noted are that all tubes and nozzles are straight, so that if they become clogged they may be easily freed, and also that the siphon type of spray will receive the wax at a temperature of 212 F., and when sprayed at a distance of 2 inches from the wound it reaches the surface sufficiently cool to cause no discomfort. In actual use we have been able to spray three patients in succession without reheating the apparatus.

My experience so far has not been sufficient to justify reports on the treatment except to state that it constitutes the most convenient method for the physician or the nurse, and the most comfortable for the patient.

350 Ludlow Avenue.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, SECRETARY.

ARSENPHENOL-AMINE-S. — $\text{NH}_2.\text{OH}.\text{C}_6\text{H}_3.\text{As}:\text{As}.\text{C}_6\text{H}_3.\text{OH}.\text{NH}.\text{(CH}_2\text{O)OSNa}$.—A mixture of sodium 3-diamino-4-dihydroxy-1-arsenobenzene-methanal-sulphoxylate, with inert inorganic salts. The arsenic content of 3 parts of arsenphenol-amine-S. is approximately equal to that of 2 parts of arsenphenol-amine hydrochloride.

Actions, Uses, Dosage, and Physical and Chemical Properties.—The same as those of neosalvarsan (see New and Nonofficial Remedies, 1917, p. 43).

Neodiarsenol.*—A proprietary brand of arsenphenol-amine-S.

Manufactured by the Synthetic Drug Company, Toronto, Canada (The Diarsenol Company, Limited, Toronto, Canada). Canadian patent No. 144,874. U. S. trademark Nos. 90,128 and 90,129.

Neodiarsenol, 0.15 Gm. Ampoules.—Each hermetically sealed ampule contains neodiarsenol, 0.15 Gm.

Neodiarsenol, 0.3 Gm. Ampoules.—Each hermetically sealed ampule contains neodiarsenol, 0.3 Gm.

Neodiarsenol, 0.45 Gm. Ampoules.—Each hermetically sealed ampule contains neodiarsenol, 0.45 Gm.

Neodiarsenol, 0.6 Gm. Ampoules.—Each hermetically sealed ampule contains neodiarsenol, 0.6 Gm.

Neodiarsenol, 0.75 Gm. Ampoules.—Each hermetically sealed ampule contains neodiarsenol, 0.75 Gm.

Neodiarsenol, 0.9 Gm. Ampoules.—Each hermetically sealed ampule contains neodiarsenol, 0.9 Gm.

* Neodiarsenol is accepted for New and Nonofficial Remedies, as the available supply of neosalvarsan appears to be insufficient to meet the demand, and this preparation conforms to the rules of the Council for acceptance of proprietary preparations. Neodiarsenol is made in Canada under a license issued by the Commissioner of Patents of Canada. The Farbwerke-Hoechst Company, however, announces that the sale of brands of arsenophenol-amine-S. other than that sold as neosalvarsan is, in its opinion, an infringement on its rights, and has stated that all violations of these rights will be prosecuted under the law.

Brass Band Methods and Typhoid Fever.—A cry of "Mad Dog!" will fetch out all who hear, and excite instant measures for the destruction of the dog by the bold, and self-protection by the timid. But let men parade the streets with steam-calliopes and exhibit banners appealing for public health funds sufficient to exterminate typhoid fever, and not 1 per cent. of that amount will be voted for. Yet one has a better chance to avoid a mad dog than typhoid fever.—E. A. Ayers, M.D., *Public Health News*, New Jersey.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address "Medic, Chicago"

Subscription price Five dollars per annum in advance

*Contributors, subscribers and readers will find important information
on the second advertising page following the reading matter*

SATURDAY, AUGUST 4, 1917

THE PANCREAS AND FAT ABSORPTION

Since the early scientific researches of Claude Bernard,¹ it has been known that the pancreas is concerned in some way with the utilization of fats in the body. When the fat-digesting properties of the pancreatic juice were duly appreciated, a possible explanation for the phenomenon of suggested interrelationship between the pancreas and fat absorption became available. Lack of pancreatic secretion thus might mean failure of fat digestion and consequent utilization. This is emphasized by the fact that when the pancreatic juice is experimentally diverted from the alimentary tract, fats used in the diet almost invariably appear in the stools, though the failure of utilization is by no means always complete.

Recently it has been suggested that, so far as the utilization of fat is concerned, the mere exclusion of the pancreatic secretion from the intestine is not precisely equivalent to the loss of the entire function of the pancreatic gland as it occurs in extirpation or in various forms of atrophy of the organ. Lombroso, for example, declared that a considerable portion of ingested fat might still be absorbed after all direct communication between the pancreas and duodenum was supposedly interrupted; but if complete depancreatization had been effected there was either little or no absorption of fat from the intestine. Such evidence was adduced in favor of the hypothesis that the pancreas may be involved in interruption of the natural process of fat metabolism not only by lack of participation of its external secretion—the pancreatic juice—in the intestinal processes, but also by delivering to the blood an "internal secretion" by which fat transformation ordinarily is modified in some way. Thus the pancreas was conceived to influence fat utilization in somewhat the same way as it is believed to regulate or modify carbohydrate metabolism.²

Von Fürth³ pointed out, in commenting on this belief, that properly to interpret this idea one should

keep especially in mind that total pancreatic extirpation is a serious interference which results in an inexpressible wasting of the body. It might be asked properly whether, when "everything is upset" in metabolism in sequence, it really is a matter of much wonder that the fat digestion should also become disordered. He adds that offhand there does not seem to be any insistent reason for ascribing to the internal secretion of the pancreas, besides its dominant part in the metabolism of sugar, a second analogous cardinal function in relation to the metabolism of fats. Disturbances of the latter process, after complete pancreatic extirpation, can be fully explained in the first place by the failure of its external secretion, and in the second place by the general disturbance of the economy which severe pancreatic diabetes brings with it.

A direct study of the problems involved has been undertaken on animals in the Laboratory of Medicine at the Harvard Medical School by McClure, Vincent and Pratt.⁴ They also assert that the absorption of fat by the intestinal mucous membrane is always markedly disturbed when the pancreatic secretion is excluded from the intestine. They found that dogs with a subcutaneous transplant secreting and discharging pancreatic juice externally absorbed no more fat than dogs in which a pancreatic remnant was undergoing rapid atrophy and sclerosis. This shows that the condition of the pancreatic tissue remaining in the body does not influence the amount of fat absorbed by the intestine. The new investigations show further that even after complete removal of all pancreatic tissue the absorption of considerable amounts of fat can still take place. This need not cause surprise now since it is asserted that the gastric secretory apparatus, as well as the intestinal secretion derived from non-pancreatic sources, produces a fat-digesting enzyme, or lipase. Although the pancreatic juice appears to be the predominant, it is not the exclusive source of fat-digesting power in the alimentary canal.

PERIODIC VARIATIONS IN THE LIFE PROCESSES IN WOMEN

The regular occurrence of the menstrual period in women is one of the indisputable evidences of a rhythm of functional activities in the human organism. Menstruation is presumably associated with comparable periodic changes in the condition of the ovaries, though there is a difference of opinion as to the exact relations between ovulation and menstruation. Cycles of performance, alterations of rest and activity, are familiar in the daily routine of all persons; but the extent to which more far reaching though normally regular variations or recurrences of physiologic states of

1. Bernard, Claude: *Mémoire sur le pancréas et sur le rôle du suc pancréatique dans les phénomènes digestifs, particulièrement dans la digestion des matières grasses neutres*, Paris, 1856.

2. Compare Gross, O.: *Deutsch. Arch. f. klin. Med.*, 1912, **108**, 106.

3. Von Fürth, O.: *The Problems of Physiological and Pathological Chemistry of Metabolism*, Philadelphia, 1916.

4. McClure, C. W., Vincent, B., and Pratt, J. H.: *The Absorption of Fat in Partially, and in Completely Depancreatized Dogs*, *Jour. Exper. Med.*, 1917, **25**, 381.

unlike character may be found in nature is not easily answered.

The theory that the life processes of women have a demonstrable rhythm which centers about the menstrual period was suggested in 1876 by Dr. Mary Putnam Jacobi.¹ Her observations on the pulse, temperature, blood pressure and muscular strength have been repeated and extended by other workers. In general, the conclusions have been that the highest point in all of these processes is reached from two to three days before the onset of the menstrual period, and that they sink to the lowest point at its close, gradually rising to normal during the intermenstrual period.

Several years ago Dr. Jessie L. King¹ of Goucher College, Baltimore, undertook to verify some of these generalizations by methods of physiologic and clinical measurement. Her studies of the pulse and temperature of young women tend to support this usually accepted theory of a rhythmic alternation in the life processes. The highest point was reached at from three to four days before the menses, the lowest about three days after their cessation. Blood pressure records gave such irregular statistics that they could not be adduced in support of the rhythm hypothesis.

The variations in pulse and temperature, though apparently unquestionable, are slight at most. They alone would scarcely appear to afford any adequate explanation of the feeling of discomfort frequently experienced by certain apparently normal women immediately preceding and at the onset of the menstrual period. This has raised the question as to whether there may not be a corresponding variation in the tone of the nerve centers.

Dr. King² has recently reported a series of observations on a group of normal young women over periods varying from one to five menstrual cycles in which the knee jerk was used as an index of such tone. The evidence points in the direction of the conclusions that a period of hyperexcitability immediately precedes or accompanies the onset of the menstrual period; that this is followed by a decline in excitability which continues for a few days after the menses have ceased, and that there is then a tendency for it to rise to a slightly higher level than the preceding during the intermenstrual interval.

If the mental depression and physical fatigue which are so often associated, rightly or wrongly, with the approach of the menstrual period are based on substantial physiologic variations of the bodily states and performances, it is important to have a detailed analysis of them for social and economic as well as for more immediately scientific reasons. It may be well,

however, in the absence of more extensive data of a strictly objective value, to bear in mind Dr. King's earlier conclusion that there has been a tendency to overemphasize the inefficiency of women during the menstrual period. To quote her own words:

Granted that lowering in pulse rate, temperature and blood pressure occur during the menstrual and postmenstrual periods, should much significance be attached to a diminution in pulse rate of from two to three beats, to temperature variations rarely greater than 1 degree, and to blood pressure changes averaging from 2 to 5 millimeters? Certainly one would suppose that in a healthy individual a normal periodic function should not be accompanied by a marked depression in all of the life processes and a generally lowered efficiency so emphasized by numerous writers. If there is a compensation for the loss of blood by the retention of nitrogen, then it would seem that there should be a compensation in the cardiovascular system, and this is indicated in the tendency of the blood pressure to show such slight variations.

THE DIASTATIC ACTIVITY OF THE BLOOD IN DIABETES

The increasingly successful application of chemical methods to the clinical examination of the blood has decidedly enhanced the diagnostic and prognostic possibilities of practical medicine. Estimations of blood sugar, nonprotein nitrogen and chemical factors, such as the carbon dioxide combining power of the plasma conditioned by acidosis, stand out as conspicuous examples of the service of modern biochemistry in clinical work. Numerous additional instances might be cited in which the deserts of new procedures and the merits of new analytic methods applied to the study of the blood must remain in abeyance until more facts and further critique are available. In illustration one may recall the content of cholesterol and other lipoids, of amino-acids and other simple nitrogenous compounds in the blood in relation to health or disease.

The existence of a variable starch-digesting power on the part of the urine has long been known. In recent years, attempts have been made from time to time to associate the variations in the quantity of the urinary amylase with altering physiologic states as expressed in the functional capacity of the kidneys or in the activity of the pancreas from which the enzyme was believed to be derived. C. E. King,¹ who conducted elaborate studies on blood and urinary amylase at the University of Chicago, has remarked that it is not surprising that amylase elimination has not been more generally adopted as a diagnostic measure, if we take into consideration that the physiologic conditions governing the elimination of enzymes, as well as their actual source, are not definitely known. As starch-digesting enzyme, or amylase, is secreted by both the salivary and the pancreatic glands, one naturally assumes at the outset that the enzymes from them somehow find their way into the blood and thus into the urine. The appearance of the enzyme there

1. Jacobi, Mary P.: The Question of Rest for Women During Menstruation, Boylston Prize Essay, 1876. This is cited from a paper by Dr. Jessie L. King (Concerning the Periodic Cardiovascular and Temperature Variations in Women, *Am. Jour. Physiol.*, 1914, **34**, 203), from which some of the statements given above are extracted.

2. King, Jessie L.: Possible Periodic Variations in the Extent of the Knee-Jerk in Women, *Proceedings of the American Physiological Society, Am. Jour. Physiol.*, 1917, **42**, 607.

1. King, C. E.: Studies on Blood and Urinary Amylase, *Am. Jour. Physiol.*, 1914, **35**, 301.

is conceivably due to absorption from the alimentary tract or to direct passage from the gland tissue to the blood stream. King believes that both paths are followed; but he adds that the digestive glands pouring amylase into the alimentary tract are not the only source of enzyme finding its way into the urine.

There are variations in the amylolytic power of urines from different individuals not accounted for by differences in diet. Lesions causing obstruction to the natural outflow of the pancreatic juice lead to an increase of amylase in the urine. Traumatic injury to the pancreas results in an increased amylolytic power of the urine. Pancreatectomy results in a decrease in urinary amylase. The amount of amylase in the urine depends on the amount finding its way into the blood, and on the functional capacity of the kidney. King ventures the belief that the amylase in the blood and urine plays no important rôle, but, having found its way into a medium normally containing no substrate, is destined to destruction and elimination.

Myers and Killian² have avoided some of the uncertainty as to the quantitative significance of circulating amylase by disregarding the kidney factor. Their studies at the New York Post-Graduate Medical School and Hospital have been directed primarily to the diastatic properties possessed by the blood. Its amylase content is evidently increased in almost all instances of pronounced diabetes and likewise in nephritis. It is suggested that the increased diastatic activity in both diabetes and nephritis (as shown by the analyses of the blood) may be the important factor in the production of the hyperglycemia in these conditions. The increased diastatic activity of the blood in nephritis finds probable explanation in the decreased excretion of diastase in the urine, now well known in this condition; but it is not possible, at present, to offer a satisfactory explanation of the increased diastatic activity of the blood in diabetes. This activity, however, may explain the inability to secure storage of glycogen in the liver of diabetic animals. If we accept the conclusions of Myers and Killian, a decrease in the blood diastase may afford a more reliable guide to the efficacy of the dietetic treatment in diabetes than either the blood sugar or urine sugar. Furthermore, an increase in blood diastase may constitute a very early sign of impending diabetes. These suggestive investigations need extension and corroboration, however, before their real significance can be evaluated.

2. Myers, V. C., and Killian, J. A.: Studies on Animal Diastases, I, The Increased Diastatic Activity of the Blood in Diabetes and Nephritis, *Jour. Biol. Chem.*, 1917, **29**, 179; *Proc. Am. Physiol. Soc.*, *Am. Jour. Physiol.*, 1917, **42**, 582.

The Origin of Concave Spectacles.—Within two hundred years from the first statements in the *Opus Majus* (Roger Bacon) concerning the use of convex glasses for old men, mention becomes more and more common of concave glasses for the myopes, and from 1568 onward convex and concave spectacles have a fixed place as aids to vision.—S. H. Gage.

Current Comment

IS BILE ITSELF A CHOLAGOGUE?

The review of the assertions of Hooper and Whipple of San Francisco that there is no "circulation of the bile" in the sense in which this expression is usually interpreted, and that feeding fresh bile fails to cause any augmentation of the output of bile pigments¹ may tend to raise a question as to whether bile itself is, after all, a true cholagogue. In early years an enhancing effect on biliary secretion was ascribed to diverse chemical agents. Calomel, rhubarb, jalap, turpentine and olive oil, among many other therapeutic products, received favorable mention. With the introduction of more careful methods of observation and an appreciation of the previously underestimated irregularities in biliary secretion under the casual conditions of many earlier experiments, many of the original claims have been abandoned as untenable. Schiff's view, that bile absorbed from the alimentary tract increases the secretion of bile and thus acts as a true cholagogue, seems to have been well established. Hooper and Whipple² have found that even though there may be a fall in the output of the bile pigments, feeding fresh bile to bile fistula dogs causes an almost constant cholagogue action. Bile of the dog, sheep and pig all has this effect, and ox bile seems to be the most active cholagogue. A separate investigation of some of the individual components of the bile by Hooper² showed that glycocholic acid has a moderate cholagogue action, but usually causes a great drop in bile pigment output in a bile fistula dog. Taurocholic acid has a strong cholagogue action, but little, if any, inhibiting effect on the bile pigment secretion. Bile fat (ether extract of whole bile) has no influence on bile flow, but causes inhibition of bile pigment secretion. Cholic acid has little effect on bile flow, but may decrease somewhat the bile pigment output. This indication of the potency of the bile acids in promoting biliary output is a substantiation of observations first recorded long ago.

WATER ECONOMY AND HEAT REMOVAL IN THE HUMAN ORGANISM

Warmth is one of the products of metabolism. As our body temperature is maintained at a remarkably constant level, despite the wide range of variations in the temperature of the environment and the other shifting conditions of climate, an efficient regulatory device is essential. Among the factors of the physical regulation of temperature, the loss of heat by vaporization of water from the lungs and skin has long been recognized to play a conspicuous part. As the surrounding temperature grows lower, conduction and radiation can serve as paths for the heat dissipation. At a low temperature there is little evaporation of

1. Hooper, C. W., and Whipple, G. H.: Bile Pigment Metabolism, IV, Influence of Fresh Bile Feeding upon Whole Bile and Bile Pigment Secretion, *Am. Jour. Physiol.*, 1917, **42**, 264. The Life of the Red Blood Corpuscles and "Bile Circulation," editorial, *THE JOURNAL A. M. A.*, June 16, 1917, p. 1819.

2. Hooper, C. W., and Whipple, G. H.: Footnote 1. Hooper, C. W.: Bile Pigment Metabolism, V, The Influence of Bile Constituents on Bile Pigment Secretion, Taurocholic, Glycocholic and Cholic Acids and Bile Fat, *Am. Jour. Physiol.*, 1917, **42**, 280.

water. On the other hand, with a rise in the external temperature the other physical processes fail to participate as largely in the removal of heat, so that when a temperature of 37 C. (98.6 F.) is reached, water evaporation provides for practically the entire loss of heat, unless perchance the temperature of the body rises. Pathology is obviously concerned with these mechanisms. In fever, for example, special needs for the elimination of heat may be created. Long ago it was believed, particularly by von Leyden, that water retention in fever plays an important part in the pathology of the latter condition, although the phenomenon is not regarded as specially characteristic of fever alone at the present time. In view of the limited number of facts regarding the water economy of the organism, so far as it relates to heat removal, an unusual value is added to the determination of water elimination in 300 experiments in the Sage respiration calorimeter at Bellevue Hospital, New York.¹ They were carried out for the most part under standard conditions of climatic environment represented by an air temperature of between 22 and 24 C. (71.6 and 75.2 F.) and a relative humidity of from 25 to 50 per cent., the persons being lightly clad. Thirteen normal men were thus found to give off, on the average, 29 gm. of water (approximately 1 fluid-ounce) an hour through the vaporization of water from the skin and the respiratory passages. Twenty-four per cent. of the heat calories were lost in this way. These average results are reported to agree closely with the figures obtained under circumstances more divergent from the normal, as figures obtained from experiments on men after large meals of sugar or protein, on boys of adolescent age, on very old men, on dwarfs, and in a variety of diseases, including diabetes, pernicious anemia and cardionephritic maladies. They are accordingly fairly representative of the body's usual performance in this feature of the regulation of temperature. These factors, particularly as they show that about one quarter of the heat produced is lost under ordinary conditions of health and climate by the channels indicated, apparently have not been heretofore so extensively and carefully ascertained.

NEW YORK EVENING POST STARTS CAMPAIGN AGAINST VENEREAL DISEASES

At this time, when hundreds of thousands of the picked young men of the nation are being called to concentration camps, it is not only advisable but imperative that we realize the dangers to which our soldiers will be exposed unless definite and stringent methods for the suppression of organized vice and the control of venereal infections in military camps are instituted at once and rigidly prosecuted. Probably no class of diseases has levied as heavy a toll on military forces in all wars and in all campaigns. A soldier incapacitated by venereal infection is not only useless from a military standpoint but he is dangerous

to his comrades through the possibility of spreading infection. Our nation is making every effort to organize, train, equip and send out the most efficient force in the shortest possible time. To do this, we must utilize every available means for the prevention and control of those diseases which may incapacitate thousands of men. This is possible only through an aroused public sentiment which will demand the utmost measure of protection for the young men called to military service. It is, therefore, particularly gratifying to note that one of the leading New York newspapers—the *Evening Post*—has announced a definite editorial policy, looking to the arousing of public sentiment and the creation of public support for the prevention and control of venereal diseases. In its issue for July 14 appears a lengthy special article on the dangers of venereal disease and an announcement that the *Post* has not only abandoned the attitude of the majority of newspapers on this subject, which it designates as a “conspiracy of silence,” but that it has laid out a definite program of public education on the prevention of venereal diseases. In its issue for July 21, appears a second article based on the report of the Massachusetts State Department of Health, and showing the dangers of syphilis as compared to typhoid, smallpox and other diseases. Additional articles are to appear each Saturday. In taking up this task, the *Evening Post* is performing a valuable service which should meet with the unqualified support of all good citizens and with the support and cooperation of all physicians, and which should go far, by example, in doing away with the attitude of most of our newspapers in ignoring or refusing to discuss one of the most vital public health problems of our day.

An Effective Plan of Social Hygiene.—The Massachusetts Society for Social Hygiene after five years of work has decided that its most effective efforts are educational. It confines its efforts to teaching in quiet ways such parts of sex or social hygiene as may be expected to diminish the amount of sexual transgression and vice, and to check the spread of venereal diseases. As set forth in the *Public Health Bulletin* of the State Department of Health of Massachusetts, April, 1917, the society's methods of work are as follows: Two paid agents are employed, both of whom have been practicing physicians, one a man and the other a woman. They give all their time to correspondence, to talking to small groups of boys and young men, girls or young women, or fathers or mothers assembled under the auspices of schools, colleges, clubs, associations, settlements, churches, friendly societies, young men's or young women's Christian associations, women's clubs, men's clubs, and to advising the numerous inquirers who come to the office of the society. The sexes are talked to separately, for the most part. Four physicians give their services gratuitously in lectures to groups of men or occasionally to mixed groups. The field for this work is said to be wider than the society is able to cultivate. A lending library of carefully selected books on social hygiene and related subjects is maintained, which is much used at the office and by groups to whom lectures have been given. A reading list prepared by the society is distributed in thousands of copies, some of which are given out by the public health nurses. The officers of the society are Prof. Charles W. Eliot, president; David L. Edsall, M.D., vice president; Ernest B. Dane, treasurer; Irving E. Stowe, M.D., secretary. The office and library of the society are at 50 Beacon Street, Boston.

1. Du Bois, E. F., and Soderstrom, G. F.: The Vaporization of Water from Skin and Respiratory Passages in Health and Disease, Proceedings of the American Physiological Society, *Am. Jour. Physiol.*, 1917, **42**, 604.

Medical Mobilization and the War

TEXTBOOKS DEALING WITH THE ADVANCE OF MEDICINE AND SURGERY DURING THE WAR

EDWARD MARTIN, M.D.

Chairman, Editorial Committee, General Medical Board

WASHINGTON, D. C.

The intensive training to which some thousands of the civilian doctors who have entered the Army are now being subjected excites, in the minds of those who know how thoroughly this has been organized and is being administered, nothing but unqualified admiration. It must be assumed, and usually with justice, that these men have all received an adequate medical education, that they are qualified to meet the calls incident to civilian professional life. It is equally clear that, with the exception of a very few who have had experience at the front, they are entirely ignorant of the new problems introduced as a result of the present methods of warfare and the terrain on which it is conducted, and that the medical and surgical knowledge gained by the three years of experience on the western and eastern fronts has come to them only in fragmentary, disconnected and often confusing ways through current literature or by word of mouth on the part of those who have had a limited chance for observation; from which it follows that in the final education of these Army surgeons, it is of vital importance that the results of the experience gained, often at frightful cost, should be systematized, formulated, condensed and digested in the shape of a text which shall serve as the basis of their technical education.

This text should cover hygiene; it should present a broad general view of military surgery as practiced at the present time; it should cover infections and the treatment of wounds; fractures and the lesions of joints; the methods of first-aid dressing; the treatment to be applied at the advance dressing station, where only the immediate needs of the hour can be met; the treatment to be applied at the field hospital, where the first complete and surgical treatment is practicable.

The problems of the base are not of such urgent need from the immediate educational standpoint, since they will, in the main, be taken up by technicians already trained.

The profession will be glad to know that arrangements are being made for a collection and proper presentation of the best and most recent thought and practice bearing on medical and surgical military problems.

The Editorial Committee of the General Medical Board of the Council of National Defense, in cooperation with the Surgeon-General's office, which has the largest representation on this committee, has, with the authorization of the Secretary of War, arranged for a series of hand-books of such size as can readily be carried in the pocket, corresponding closely with the Manual of Drill Regulations, each intended to cover a fundamental subject from the standpoint of the immediate needs of the military surgeon.

If the preliminary summarization and digestion of current literature prove satisfactory, the collator may be sent over for a final study at the front and for consultation with those of largest experience and who have been most successful. During this period the manuscript will be put in shape for publication, will be returned and finally passed on by the Surgeon-General's office, and, if approved, will be issued as a manual which will serve as a text in the education of the military surgeon.

The committee has already approved "Military Hygiene," by Major Vedder; "War Surgery," by Dr. Stimpson, and "Medico Military Service," by Colonel Goodwin, and has in course of preparation "Infections," "Wounds of the Head and Trunk," and "Wounds of the Extremities."

The new Army surgeons should be sent to the front with an accepted standard antiseptic or antiseptics, with an accepted standard technic, in which, before their going, they may be thoroughly drilled.

In addition to the textbooks, and supplementing them, Major Munson has arranged for a series of illustrated lectures by men prominent in the profession, and for practical demonstrations of splints, traction and other mechanical measures so constantly called for in modern war.

It is the hope that our surgeons, thus educated to the hour, may not suffer by comparison with our English and French brethren, who possess the priceless advantage of a larger experience.

The Medical Officer and His Rank

The lowest rank held by a medical officer is that of first lieutenant. As such he is entitled to salute by second lieutenants, sergeants and corporals, as well as by privates of the line. If there is anything that "gravels" even a second lieutenant it is this demand of the service. At one of the training camps for officers of the line and for medical reserve officers, the latter have become accustomed to the somewhat satirical salutes and gibes of the embryo line officers. The "medics" retaliate by good-natured advice to the "boy-scouts." One of the students in the line training camp said: "The hardest thing we have to do is to salute those fellows (the medical officers). They can't march, they salute funny and they are not soldiers anyway you look at it." The attitude of these men who may some day be in a position to reject a suggestion of immense sanitary importance from the men who now amuse them is significant. Perhaps the cure for the problem lies in teaching the line officer the deeds of the medical department in the past, in impressing on him the lessons of the Mesopotamia tragedy, in convincing him that the greatest sacrifice on the altar of duty to one's country is made by the medical officer.

The Care of Soldiers' Dependents

The Children's Bureau has issued a report on the care of dependents of enlisted men in Canada, which is particularly timely, as this problem will soon become one of immediate importance in this country. The principle that some provision by the government or otherwise should be made for the dependents of those who are called on to serve their country is generally recognized, but, as is pointed out in Miss Lathorp's letter of transmittal, this tendency has developed entirely since the Civil War and is a part of the growing recognition of the responsibility of the state. The plans adopted by belligerent nations in Europe are interesting but hardly applicable to this country on account of different standards of living. In Canada, however, the situation is more nearly comparable to our own. The assistance extended by the Canadian government comes under two general classes, namely, pensions payable while in service and pensions payable after discharge. The dependents of an enlisted man may receive assistance from four sources. These are:

1. Assigned pay. Enlisted men are required to assign at least one half of their pay (not including field allowance) at the time of their enlistment, and are permitted to assign not more than twenty days' pay. Officers are not required to assign any definite amount.

2. Separation allowance granted by the Canadian government to dependents of volunteers. This varies from \$20 a month for privates to \$60 a month for lieutenant-colonels. No allowance is made for children in this arrangement.

3. Life insurance. In certain localities in Canada, families of enlisted men are protected by life insurance, the premiums on which are paid by the municipalities in which the volunteers resided at the time of their enlistment. The policies in most cases have been issued by insurance companies located in the United States. In Toronto, however, three fourths of the insurance is being carried by the city of Toronto itself, a \$2,000,000 bond issue having been floated for this purpose. Every officer and enlisted man residing in Toronto at the time of entering the service has, from the date of his enlistment, a life insurance policy for \$1,000.

4. The Canadian Patriotic Fund, incorporated. This fund, organized in 1914, renders assistance to families in need whose income from all sources is insufficient for their needs. The resources of the fund are derived from volunteer contributions and from grants made by the Provinces as well as cities and counties.

Applying these various means of relief to a specific case, the wife of a private having three children between the ages of 10 and 15 would receive the following sums monthly: assigned pay of a private, \$15; separation allowance, \$20;

Canadian Patriotic Fund, \$25; total, \$60. From Sept. 1, 1914, to April 20, 1917, nearly \$17,000,000 was dispensed to soldiers' dependents, while over \$6,000,000 was on hand for further distribution. Benefits payable after discharge include pensions in case of disabled men and payments during reeducation and preparation for self-support. Pensions range from \$480 a year for enlisted men to \$2,700 a year for brigadier-generals, there being six classes of disability ranging from 20 to 100 per cent. In case the soldier is killed or dies as the result of injuries received or disease contracted in active service, the widow is entitled to a pension and an allowance for children. This amounts to nearly as much as the pension for total disabilities, the allowance for the widows of all men below the rank of petty officers being \$432 a year, with \$66 additional for each child, that of the widow of a commodore or brigadier-general being \$2,430 a year with an allowance of \$108 for each child.

Much is being done to fit disabled and incapacitated soldiers for self-support. A military hospital commission has been organized which sees to it that the disabled soldiers go to the hospital home or sanatorium which will give them the most efficient treatment and restore them to the most complete condition of health possible. While under the supervision of the hospital commission, the soldier receives his regular pay and his family receives all allowances, he being regarded as still in active service. On being discharged from the hospital and the service, he is passed on to the board of pension commissioners, and the first pension instalment is paid him on the day that he is discharged. In each district a vocational officer keeps track of the discharged man. If it is found necessary to teach him a new trade, a course of instruction is outlined for him. While taking this course, he receives a pension, an allowance of \$8 a month by the commission, his maintenance at one of its institutions or an allowance of a dollar a day if he lives at home, with a further allowance to his wife of the difference between the \$35 a month and the pension paid to her husband. Allowances are also made for children at different ages, the whole forming a maximum of \$55 a month for the wife and children and which with the \$1 a day maintenance allowance and the \$8 from the commission gives the family a total monthly income of \$93. The pamphlet issued by the Children's Bureau also contains in the appendix pay and allowance tables, reports of the board of control of Toronto on insurance, the act incorporating the Canadian Patriotic Fund and numerous other laws, ordinances, tables and blanks of use in studying this subject.

Physicians Recommended for Commission in the Medical Reserve Corps

During the week ending July 21, 1917, 472 physicians were recommended for commission in the Medical Reserve Corps, the proportion being 6 majors, 57 captains and 409 lieutenants.

Special Service for Psychiatry and Neurology

Major Pearce Bailey, M. R. C., chairman of the Committee on Furnishing Hospital Units for Nervous and Mental Disorders to the United States Government, has been asked by the Surgeon-General to serve as personal advisor to the Surgeon-General in all matters pertaining to psychiatry and neurology.

Plattsburgh Soldiers Forbidden Vermont

On July 19, Colonel Wolf issued orders forbidding any members of the Plattsburgh garrison and training camp to visit the state of Vermont without written permission of the commanding officer because of the presence of infantile paralysis in that state. As yet no cases of this disease have been reported on the New York side of Lake Champlain.

Promotions in Naval Medical Corps

The Surgeon-General has recommended the promotions of three medical inspectors to medical directors; seventeen surgeons to medical inspectors and thirty-three P. A. surgeons to surgeons. The promotions are calculated on a basis of 489 as total strength of the corps. On July 1, the authorized strength of the corps was 824, and on this basis promotions would be ordered to bring the several grades to the following strengths: four medical directors with the rank of rear

admiral; thirty-two medical directors with the rank of captain and sixty-six medical inspectors.

Commissions for Contract Surgeons

A bill was introduced in the House, July 3, by Mr. Hulbert, providing that acting assistant or contract surgeons, who have served under standard contracts at Army posts under Army contracts and who were not commissioned in the Medical Reserve Corps at the time of the passage of the Act of April 23, 1908, be commissioned as first lieutenants, Medical Reserve Corps, date of entry into service to be contingent on the authorization of the Surgeon-General for recommendation for active service in the Medical Corps, in case of necessity, any physician who has served as commissioned medical officer in volunteer service in the naval guard or militia or as acting assistant or contract surgeon for at least three months, providing that they are mentally and physically qualified to perform the duties required.

New Divisions in Public Health Service

House Bill, No. 5347, introduced by Representative Adamson, July 9, provides:

That there shall be established one additional division each of mental hygiene and rural sanitation in the United States Public Health Service, and said divisions shall be in charge of commissioned medical officers of the United States Public Health Service, detailed by the Surgeon General, which officers, while thus serving, shall be assistant surgeons general within the meaning of section three of the act approved July 1, 1902, entitled "An act to increase the efficiency and change the name of the United States Marine Hospital Service." Sec. 2. That the duties of the division of mental hygiene shall be to study and investigate mental disorders and their causes, care and prevention. The duty of the division of rural sanitation shall be to investigate improved methods of rural sanitation, and the prevention and suppression of communicable diseases.

Netherlands Physicians Inspectors of Prisoner Camps in Germany

The *Nederlandsch Tijdschrift* states that until America declared war on Germany, some American physicians in Germany had been entrusted with the supervision of prison camps in Germany where English prisoners were confined. The inspection dealt with the hygienic conditions, the food and the medical treatment in the camps. After the United States withdrew from the neutral nations, the English government appealed to the Netherlands government to appoint two Netherlands physicians for the task. After some search, two physicians residing at 's-Gravenhage accepted the appointment and went to Berlin last March. One, however, Dr. E. A. Keuchenius, was deemed not neutral enough, and was obliged to return home. Dr. R. Römer, of the same town, formerly in the East Indies, was appointed in his place. The other member of the party is Dr. J. A. Rademaker.

Longevity Pay for Contract Surgeons

The Court of Claims has rendered a decision in the case of Lieut. Herbert W. Yeamans, M. R. C., U. S. Army, who, while serving as a contract surgeon, was appointed a member of the Medical Reserve Corps, and claimed that he was entitled to longevity increase for his services as contract surgeon, basing his claim on Section 9 of the act of April 3, 1908, which provides "That officers of the Medical Reserve Corps, when called on active duty in the service of the United States, as provided in Section 8 of the act, shall be subject to the laws, regulations, and orders for the government of the regular Army, and during the period of such service shall be entitled to the pay and allowances of first lieutenants of the Medical Corps with increase for length of service now allowed by law, said increase to be computed only for time of active duty." The Court of Claims holds that this legislation was prospective in its character and operation, and does not contemplate the computation of former service in fixing the longevity pay of officers rendering service in the Medical Reserve Corps; that the plain meaning of the language quoted is that officers of the Medical Reserve Corps shall only receive longevity pay while they are on active duty in the active service of the United States in the Medical Reserve Corps, and that no service performed elsewhere, even though performed in other branches of the military service, can be computed in determining the longevity pay provided for in this statute.

Orders to Officers of the Medical Reserve Corps

ALABAMA

To ALLENTOWN, PA., for duty, Lieut. L. A. Fox, Birmingham.
To ARMY MEDICAL SCHOOL, Washington, D. C., for instruction, Lieut. William L. Staggers, Birmingham.
To FORT SAM HOUSTON, Lieut. B. F. Adams, Fulton.
To report in person to commanding general, Southern Dept., for duty, Lieut. D. P. Dixon, Talladega.
To home from further active duty, Capt. John O. Rush, Mobile.
The resignation of Lieut. E. S. Sledge, Alabama N. G., Mobile, is accepted.

ARIZONA

To report by telegraph to the commanding general, Southern Department, for assignment to duty, Capt. J. E. Bacon, Miami.

ARKANSAS

To FORT OGLETHORPE, Lieut. L. Thompson, Hot Springs.

CALIFORNIA

To FORT BENJAMIN HARRISON for instruction, Lieut. Louis Felger, Los Angeles.
To CHICAGO, Major George F. Shiels, San Francisco, and Lieut. G. M. Hubbell, Los Gatos.
To FORT SAM HOUSTON, Lieut. J. H. Graves, San Francisco.
To ROCKEFELLER INSTITUTE, New York, N. Y., Lieut. J. R. Oliver, San Francisco.
To SAN FRANCISCO for duty, Major B. F. Hayden, Soldiers Home; Capt. E. A. Newton, Los Angeles; H. R. Green, Palo Alto; R. K. Hutchings, E. S. Kilgore, San Francisco; F. R. Fairchild, Woodland; Lieuts. H. E. Foster, Berkeley; E. R. Bridge, La Vina; R. L. Rierison, Oakland; C. F. Gelston, E. W. O'Donnell, and J. B. Spalding, San Francisco.
To WASHINGTON, D. C., for duty, Major W. F. Snow, Stanford University.
To HAWAII, for duty, Lieut. A. L. Davis, San Francisco.

CANADA

To ARMY MEDICAL SCHOOL, WASHINGTON, D. C., for instruction, Lieut. Donald Munro, Ontario.
To FORT BENJAMIN HARRISON for instruction, Lieut. E. A. Smith, Hornings Mill, Ontario.

COLORADO

To FORT DOUGLAS, Lieut. A. L. Beaghler, Denver.
To HAWAII for duty, Lieut. R. L. Drinkwater, Denver.
To report by telegraph to the commanding general, Southern Dept., for assignment to duty, Lieut. R. DeL. Wilson, Holly.

CONNECTICUT

To FORT OGLETHORPE for instruction, Lieut. John L. Kelly, New Britain.

DISTRICT OF COLUMBIA

To ARMY MEDICAL SCHOOL, Washington, D. C., for instruction, Lieut. Carroll E. Bingman, Washington.

FLORIDA

To ATLANTA, GA., Lieut. C. A. Andrews, Tampa.
To FORT OGLETHORPE for duty, Lieut. H. B. Cordes, Jr., and W. G. McKay, Jacksonville.
To WASHINGTON, D. C., for duty, Lieuts. Hyman M. Ginsberg, Pensacola, and John K. Johnston, Tallahassee.

GEORGIA

To ARMY MEDICAL SCHOOL, Washington, D. C., for instruction, Lieuts. Robert S. Wynn, Atlanta, and John A. White, Augusta; Roy A. Gunter, Jackson, and William G. Herrington, Nunez.
To ATLANTA, GA., Lieuts. W. P. Ellis, Gay; and O. E. Herndon, Powelton.
To COLUMBIA, S. C., Lieuts. C. E. Lawrence, Atlanta; and D. P. Belcher, Sale City.

To FORT McPHERSON for duty, Capt. Richard R. Daly, Atlanta.
To FORT OGLETHORPE, Capt. Young A. Little, Milledgeville; Lieuts. Adrian D. Williams, Folkston, and Egbert M. Townsend, Tilton.

IDAHO

To ALLENTOWN, PA., for duty, Lieut. F. L. Cole, Rigby.

ILLINOIS

To ARMY MEDICAL SCHOOL, Washington, D. C., for instruction, Capt. Charles H. McKenna, Chicago; Lieuts. Julian N. Dow, Arcola; Asa R. Freeman, Blomington; Irving F. Barnett, Bernard P. Conway, Harry A. Dimond, Kendall P. Frost, Orlando M. Gochnaur, David A. Horner, Vincent F. Keller, Chicago; Elvin O. Brown, Clayton; Lawrence A. Ryan, East St. Louis; Percy P. Haslitt, Marshall, and William L. Smith, Toledo.
To FORT BENJAMIN HARRISON, Lieuts. J. C. Hall, Centralia; Guy E. Krolick; Arthur W. Wermuth, Chicago, and Charles F. Childs, New Boston.

To FORT RILEY for duty, Lieut. T. B. Knox, Quincy.
To HAWAII for duty, Lieut. C. S. Brewer, Fairburg.
To ROCKFORD, ILL., Lieuts. G. R. Allaben and H. Harvey, Rockford. Par. 51, S. O. 145, June 25, 1917, War D., relating to Lieut. Imas P. Rice, Oak Park, is revoked.
To report in person to commanding general, Southern Department, Lieut. E. S. Adams, Chicago.

INDIANA

To FORT BENJAMIN HARRISON for duty, Lieuts. George H. Hockett, Anderson, and C. M. Williams, Kokomo.
To FORT OGLETHORPE, GA., Lieut. W. C. Moore, Anderson.

IOWA

To HAWAII for duty, Capt. F. G. Murray, Cedar Rapids, and A. V. Hennessy, Council Bluffs.
To DES MOINES, IOWA, Capt. J. J. Daly, Decorah; A. C. Hansen, Chester, and C. E. Ruth, Des Moines.

KANSAS

To FORT DOUGLAS, Lieut. W. R. Dillingham, Sabetha.
To FORT RILEY, Capt. W. A. Carr, Junction City; Lieuts. M. L. Bclot, Clyde, and L. T. Simpson, Moran.
To ROCKFORD, ILL., Lieut. C. W. Hall, Cedar.
To report in person to commanding general, Southern Department, for duty, Lieut. J. C. Butler, Stafford.

KENTUCKY

To FORT BENJAMIN HARRISON for duty, Capt. J. L. Phythian, Newport.
To FORT OGLETHORPE for instruction, Lieuts. Edward Stumbo, Allen, and Lawrence F. Boland, Stone.
To LOUISVILLE, KY., Capt. Irvin Lindenberger, Fort Thomas; Lieuts. J. F. Cook and L. J. Ernstberger, Louisville.
To report in person to commanding general, Southern Department, for duty, Capt. W. B. Gossett, Louisville.

LOUISIANA

To ARMY MEDICAL SCHOOL, Washington, D. C., for instruction, Lieuts. Marvin Cappel, Alexandria; James A. Coleman, Jena; Addley H. Gladden, Jr., William G. Milholland, New Orleans; Eric L. Major, Oscar; Claude A. Martin, Welsh, and L. B. Faulk, Monroe.
To FORT McPHERSON, Capt. J. T. Halsey, New Orleans.
To FORT OGLETHORPE for instruction, Lieut. J. McKowen, Baton Rouge.
To FORT SAM HOUSTON, Lieut. O. B. Kiel, New Orleans.

MARYLAND

To ANNAPOLIS JUNCTION, Lieuts. M. T. Burrows, Baltimore, and W. E. McClanahan, Highlandtown.
To ARMY MEDICAL SCHOOL, Washington, D. C., for instruction, Lieuts. Edward H. Benson, Charles E. Sima, Baltimore, and Amos F. Hutchins, Brooklyn.
To report to John D. Ryan, director general of military relief, Washington, for duty as his assistant, Major W. H. Smith, Baltimore.
To BALTIMORE, Lieut. J. F. Lutz, Baltimore.
To FORT BENJAMIN HARRISON for duty, Lieut. Pinkney L. Davis, Baltimore.
To FORT OGLETHORPE, Lieut. G. M. Boyer, Damascus.
To PHILADELPHIA, Capt. D. MacCalman, Baltimore.
To WASHINGTON, D. C., Lieut. E. S. DuBray, Baltimore.
So much of Par. 33, S. O. 157, July 9, 1917, War D., as relates to Capt. Clement A. Penrose, Baltimore, is revoked.

MASSACHUSETTS

To ARMY MEDICAL SCHOOL, Washington, D. C., for instruction, Lieut. Harry Olin, Boston, and Louis H. Limauro, Lynn.
To ATLANTA for duty, Lieut. Homer L. Conner, Haverhill.
To AYER, MASS., Capt. A. H. Crosbie, Boston, and Lieut. A. G. Bolduc, Attleboro.
To FORT BENJAMIN HARRISON for duty, Lieuts. John M. Birnie and Patrick M. Moriarty, Springfield.
To FORT GREBLE, R. I., Lieut. J. H. Kearney, Fitchburg.
To FORT SAM HOUSTON for duty, Lieuts. D. J. MacPherson, Boston, and G. L. Schadt, Springfield.
So much of Par. 51, S. O. 121, May 25, 1917, War D., as relates to Lieut. H. E. Carney, Boston, is revoked.

MICHIGAN

To BATTLE CREEK, MICH., Capt. T. B. Henry, Northvell; Lieuts. S. S. Danziger, H. B. Schmidt, Detroit.
To FORT BENJAMIN HARRISON, Lieut. G. C. Hafford, Albion.

MISSISSIPPI

To ARMY MEDICAL SCHOOL, Washington, D. C., for instruction, Lieuts. William W. Allred, Kiln, and Fred L. Ricks, Starksville.
To CANAL ZONE for duty, Lieut. M. C. Henry, Bentonia.
To FORT OGLETHORPE, Lieuts. L. F. Barrier, Greenwood; H. T. Cuming, Gloster, and R. P. Hentz, Itabena.
To report in person to commanding general, Southern Department, for duty, Capt. W. E. Richards, Columbus.

MISSOURI

To ARMY MEDICAL SCHOOL, Washington, D. C., for instruction, Capt. Arthur H. Sewing, St. Louis; Lieuts. Louis M. Edens, Cabool; Guy F. Robinson, Koch, and Alvin H. Maeys, St. Louis.
To CHICAGO, Lieut. W. L. Moore, St. Louis.
To AYER, MASS., Lieut. F. L. Bishop, St. Louis.
To FORT OGLETHORPE for duty, Lieut. O. F. McKittrick, St. Louis.
To FORT RILEY, Major M. P. Ravenel, Columbia, and Capt. W. L. McBride, Kansas City.
To HAWAII for duty, Capt. R. K. Ogilvie, East Prairie; F. D. Dickson, Kansas City; R. S. Bryan, St. Louis, and Lieut. C. P. Mueller, Kansas City.
To WASHINGTON, D. C., Capt. V. P. Blair, St. Louis.

MONTANA

To FORT RILEY for instruction, Lieut. F. W. Loring, Whitehall.

NEBRASKA

To FORT DOUGLAS, Capt. J. A. Henske, Omaha; B. L. Shellborn, Peru.
To HAWAII for duty, Lieut. C. E. Pinckney, Gretna.

NEW JERSEY

To ALLENTOWN, PA., Lieut. H. Rogers, Orange.
To ARMY MEDICAL SCHOOL, Washington, D. C., for instruction, Lieuts. Normann S. Garrison, Rutherford, and David W. Green, Salem.
To FORT OGLETHORPE, Lieuts. Morris R. Faulkner, Vineland; to post hospital for duty, A. A. Strasser, Arlington, and W. L. Vroom, Ridgewood.
To FORT ONTARIO, N. Y., for duty, Capt. F. W. Cornwall, Plainfield.
To WRIGHTSTOWN, N. J., Lieuts. J. C. Bitler, Hammonton; E. K. Fee, Lawrenceville, and J. B. Griswold, Morristown.

NEW MEXICO

To FORT BLISS to examine troops on duty for tuberculosis, Capts. David C. Twitchell, Albuquerque; Earl S. Bullock, Silver City, and Lieut. Ernest A. Duncan, Silver City.

To report by telegraph to the commanding general, Southern Department, for assignment to duty, Major H. A. Ingalls, Roswell.

NEW YORK

To ALLENTOWN, PA., Lieuts. Joseph S. Baldwin, Brooklyn; Harvey R. Gaylord, Buffalo; Darwin O. Lyon, Mount Vernon; Mark F. Healy, T. E. Lavelle, and C. E. S. Webster, New York.

To ANNAPOLIS JUNCTION, MD., Capt. E. E. Tull, New York.

To ARMY MEDICAL SCHOOL, Washington, D. C., for instruction, Capt. John A. Battin, Westport; Lieuts. Carl E. Dunaway, Henry J. Meister, New York; Alson J. Hull, Troy, and Page E. Thornhill, Watertown.

To ATLANTA for duty, Capt. Howard L. Van Winkle, Albany, and Lieut. Stephen H. Curtis, Troy.

To CANAL ZONE for duty, Lieut. I. Michkin, New York.

To CORNELL MEDICAL COLLEGE, New York, Capt. U. S. Kann, Binghamton; Lieuts. W. G. Herrman, Brooklyn; J. C. Howard, New York, and D. S. Childs, Syracuse.

To FORT BENJAMIN HARRISON, Major F. W. Loughran; Capt. A. S. Vosburg; Lieuts. Harry T. Morton and H. E. B. Pardee, New York, and F. H. Spencer, Waverly.

To FORT OGLETHORPE for instruction, Lieut. Charles N. B. Camac, New York.

To FORT ONTARIO, N. Y., for duty in connection with Unit N., Lieut. J. J. Cunningham, New York.

To FORT SNELLING, MINN., Capt. W. M. Richards, New York.

To GOVERNORS ISLAND, N. Y., Lieut. Arthur G. Quinn, Staten Island.

To MADISON BARRACKS, N. Y., for duty, Major Henry L. K. Shaw, Albany.

To NEW YORK, Capts. A. M. Kane, Brooklyn, and E. W. Caldwell, New York.

To ROCKEFELLER INSTITUTE, New York, Capt. Ethan F. Butler, Yonkers; Lieut. M. McBurney, and T. F. X. Sullivan, New York.

To WASHINGTON for duty, Capt. Sidney R. Burnap, New York.

To YAPHANK, LONG ISLAND, N. Y., Capt. A. I. Boyer, New York; Lieuts. R. E. Brodie, Albion, and B. B. Benson, New York.

To report in person to commanding general, Southern Department, for duty, Lieut. F. L. Horton, Brooklyn.

To home, Lieut. B. H. Eliasberg, New York.

NORTH CAROLINA

To BALTIMORE, Lieut. H. H. Ogburn, Greensboro.

To COLUMBIA, S. C., Lieut. G. S. Coleman, Kenly.

To FORT OGLETHORPE, Lieuts. L. N. West, Raleigh; to post hospital for duty, F. J. Pate, Greensboro.

To report to commanding general Southern Department, for duty, Lieuts. G. W. Pressly, Charlotte, and J. L. Moore, Wendell.

NORTH DAKOTA

To HAWAII for duty, Capt. A. J. McCannel, Minot, and Lieut. F. O. Brigham, Stanley.

OHIO

To ARMY MEDICAL SCHOOL, Washington, D. C., for instruction, Lieuts. Luman G. Moore, Kinsman; John F. Stober, Lexington; John J. South, Massillon, and Karl D. Figley, Toledo.

To CHILLICOTHE, OHIO, Lieuts. C. C. Crosby, R. B. Wynkoop, Ashtabula, and B. F. Cureton, Walhonding.

To FORT BENJAMIN HARRISON for duty, Major Colin R. Clark, Youngstown; Lieuts. Charles D. Treister, Robert W. Williams, Cleveland, and John C. Larkin, Hillsboro.

To FORT LEAVENWORTH for duty, Lieut. H. R. Wahl, Cleveland.

To FORT OGLETHORPE post hospital for duty, Lieut. H. de G. Sherman, Cleveland.

To WALTER REED HOSPITAL, Takoma Park, D. C., Capt. David M. Roberts, New Richmond.

OKLAHOMA

To FORT RILEY for duty, Lieut. J. G. Janney, Lawton.

To FORT SAM HOUSTON, Lieut. H. C. Johnson, Antlers.

To report by telegraph to the commanding general, Southern Department, for assignment to duty, Lieut. H. S. Browne, Tulsa.

OREGON

To ARMY MEDICAL SCHOOL, Washington, D. C., for instruction, Lieut. John E. Kuydendall, Eugene.

PENNSYLVANIA

To ARMY MEDICAL SCHOOL, Washington, D. C., for instruction, Lieuts. Thomas L. Smyth, Allentown; William B. Evans, Chester; L. M. Sankey, Jeannette; Samuel LeR. Ridge, Longhorne; Isaac I. Parsons, Media; Chester A. Bardsley, James B. Clinton, Toby A. Greco, Samuel B. Greenway, John V. Kearney, Howard F. Keating, Baldwin L. Keyes, Thomas Klein, Richard J. Miller, George K. Tweddel, William F. Whelan, Philadelphia; A. R. Howard, Herbert M. Long, Charles H. Marcy, Harry L. Murphy, Ward I. Pierce, Frank C. Rote, Pittsburgh; Clyde E. Tibbens, Scranton; Albert Shannon, Titusville; Benjamin P. Doran, and Robert H. Jeffrey, Uniontown.

To FORT BENJAMIN HARRISON, Lieuts. Joseph Turner, W. S. Shimer, and E. E. Johnson, Philadelphia.

To FORT OGLETHORPE, Major A. C. Abbott, Philadelphia; Capt. M. J. Shields, Scranton; Lieuts. R. A. Keilty, Lansdowne; F. W. Knippel, Mercer, and William P. C. Clancy, Warren.

To FORT SAM HOUSTON for duty, Lieut. C. H. Bailey, Jamestown.

To NEW YORK, M. W. Meyers, Allentown.

To PHILADELPHIA, Lieut. J. E. Livingood, Womelsdorf; as instructor in military roentgenology, Major Willis F. Manges.

To ROCKEFELLER INSTITUTE, New York, for duty, Lieut. Alan C. Woods, Philadelphia.

To WASHINGTON, D. C., Lieut. M. S. Bowers, Braddock.

PHILIPPINE ISLANDS

To ALLENTOWN, PA., Capt. C. C. Hillman, Manila.

SOUTH CAROLINA

To CANAL ZONE for duty, Lieuts. T. J. Peake, Clinton, and E. E. Epting, Williamstown.

To FORT OGLETHORPE for instruction, Lieuts. Ralph H. McFadden, Chester, and George F. Klugh, Crosshill.

SOUTH DAKOTA

To FORT OGLETHORPE for instruction, Capt. David J. Carson, Faulkton.

To ST. LOUIS, Lieut. A. J. Black, Oldham.

TENNESSEE

To FORT BENJAMIN HARRISON for duty, Lieut. M. E. Bry, Memphis.

To FORT OGLETHORPE for instruction, Capt. William A. Carnes and Lieut. Marcus G. Spingarn, Memphis.

To FORT SAM HOUSTON, Lieut. C. McK. Beck.

To LITTLE ROCK, ARK., Lieuts. J. C. Eldridge, Chattanooga; R. R. Sellers, Erwin, and W. H. Baldwin, Memphis.

To WASHINGTON for duty, Lieut. Louis W. Desprez, Memphis.

To report in person to commanding general, Southern Department, for duty, Lieuts. W. M. Blackshore, Lucy, and S. S. Moody, Shelbyville.

TEXAS

To ALLENTOWN, PA., Capt. H. J. Hallett, San Antonio.

To ARMY MEDICAL SCHOOL, Washington, D. C., for instruction, Lieut. Giles W. Day, Fort Worth.

To FORT ADAMS, R. I., Major William H. Lloyd, El Paso.

To FORT BLISS to examine troops for tuberculosis, Lieut. Paul Gallagher, El Paso.

To FORT SAM HOUSTON, Capt. T. H. Harrell, Gonzales; Lieuts. R. M. Prather, Beeville, and J. W. Conley, Saron.

To report by telegraph to the commanding general, Southern Department, for assignment to duty, Capts. I. McNeil, El Paso; W. H. Hargis, San Antonio; Lieuts. D. M. Vogt, Fort Bliss; T. O. Wooley, German town; C. C. Cody, Jr., E. L. Goar, Houston; C. C. Cade, San Antonio, and G. P. Acton, Sherman.

UTAH

To FORT DOUGLAS, Lieut. J. J. Galligan, Salt Lake City.

VIRGINIA

To CORNELL MEDICAL COLLEGE, New York, Lieut. G. O. Crank, Madison Heights.

To FORT BENJAMIN HARRISON for instruction, Lieut. Henry C. Bradford, Norfolk.

To FORT OGLETHORPE, Lieuts. H. C. Mallory, Greenbackville, and Frank Levinson, Hopewell.

To FORT SAM HOUSTON, Lieut. B. L. Crawford, Richmond.

To PETERSBURG, VA., Capt. H. T. Nelson, Charlottesville; Lieuts. W. F. Merchant, Manassas, and H. R. Seelinger, Norfolk.

To RICHMOND, VA., Lieuts. F. M. Hodges, C. L. Rudosill, Richmond.

WASHINGTON

To AMERICAN LAKE, WASH., Lieuts. W. F. Cunningham, Seattle; M. R. Charlton and R. N. Hamblen, Spokane.

WEST VIRGINIA

To FORT OGLETHORPE, Capt. E. Davis, Salem, and Lieut. E. H. Bitner, Martinsburg.

WISCONSIN

To FORT BENJAMIN HARRISON, Lieuts. C. H. Andrew, Platteville, and Benjamin B. Rowley, Whitefish Bay.

To FORT LEAVENWORTH, KAN., Lieut. F. B. Taylor, Madison.

Orders to Officers of Medical Corps

Major Louis T. Hess, M. C., to Washington for examination for promotion.

Lieut.-Col. D. F. Duval, M. C., from Canal Zone to Fort Riley for duty.

Major H. H. Johnson, M. C., to Fort Washington for duty.

Capt. R. C. Bull, M. C., having been found physically disqualified for the duties of a major by reason of disability incident to the Service, his retirement with the rank of major is announced from May 15, 1917, the date on which he would have been promoted to that grade had he been found qualified.

Capt. N. T. Kirk, M. C., to Fort Oglethorpe for temporary duty.

Capt. E. R. Gentry, M. C., to Fort Leavenworth.

Capt. Edgar D. Craft, M. C., having been found physically disqualified for duties of major by reason of disability incident to service, his retirement with the rank of major is announced from May 15, 1917, the date on which he would have been promoted by reason of seniority had he been found qualified.

Major William A. Powell, M. C., now at training camp, Fort Benjamin Harrison, Ind., will report to C. O. of that camp for duty.

Major Clarence H. Connor, M. C., will report in person to Col. William H. Arthur, M. C., president of the examination board at Washington, D. C., for examination to determine his fitness for promotion.

Major Harold W. Jones, M. C., in addition to his other duties, is detailed as professor of medical department administration at the Army Medical School, Washington, vice Col. James D. Glennan, relieved.

Major Henry F. Pipes, M. C., is relieved from further station at Fort Slocum, N. Y., and is assigned to duty at Jefferson Barracks, Mo.

Lieut. Col. Jere B. Clayton, M. C., is relieved from his present duties and will proceed to Fort Sam Houston, Tex., and report in person to the commanding general, Southern Department, for assignment to duty as sanitary inspector of that department.

Lieut. Col. Henry A. Shaw, M. C., will report to Washington, D. C., and report in person to the Surgeon-General of the Army for the purpose of making such special sanitary inspections as may be deemed necessary from time to time.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CONNECTICUT

Personal.—Dr. Marvin Z. Westervelt, Litchfield, has associated himself with the surgical department of the Winchester Arms Company, New Haven.—Dr. Ralph B. Cox, Collinsville, has been appointed health officer, succeeding Dr. George F. Lewis, who resigned after twenty-three years of service.—Dr. Carrie North Stevens, West Cornwall, has been appointed health officer of Goshen.

New Bureau of Laboratories.—Dr. Charles J. Bartlett, New Haven, director of the pathologic laboratory, Yale University, has been appointed director of the bureau of laboratories of the state department of health, succeeding Prof. Herbert W. Conn, deceased.—P. E. Bransfield, Ira D. Joel, Ira V. Hiscock and George E. Stookey, who were assistants to Professor Conn, have been appointed to similar positions by the new director. It has been decided to remove the laboratory from Middlebury to the Agricultural Experiment Station, New Haven.

Free Orthopedic Dispensary.—The New Haven Orthopedic Dispensary has been established by the New Haven Normal School of Gymnastics. The institution is open daily and has ample equipment. The staff consists of Dr. Ernest H. Arnold, who has been in charge of the orthopedic clinic of the New Haven Dispensary for twenty-three years; Dr. James F. Rogers and Dr. Harry E. Stewart, Washington. The seniors of the New Haven Normal School of Gymnastics attend the daily clinics in sections, and carry out the manual and gymnastic treatment under the direction of the staff.

GEORGIA

Personal.—Dr. Thomas F. Abercrombie, Brunswick, has been elected secretary of the state board of health, succeeding Dr. Henry F. Harris, deceased.—Dr. John C. McAfee, Macon, has been elected president of the Idle Hour Country Club.

New Buildings Near Completion.—On the campus of the Atlanta Medical College, now the medical department of Emory University, three fireproof buildings are being completed, and will be ready by the beginning of the session of 1917-1918. The cost, respectively, will be \$90,000, \$98,000 and \$54,000.

Hospital Item.—Dr. Harlan L. Edwin and Dr. John C. Rollins have purchased the Herndon property in Dalton and will establish a hospital on the site.—At the meeting of the city council of Carrollton, it was decided to accept the offer of the late C. B. Simonson to donate \$10,000 toward the erection of a sanatorium. For building and equipping the sanatorium about \$30,000 will be required.

ILLINOIS

Chicago

New Lying-in Hospital.—The opening exercises of the Chicago Lying-in Hospital and Dispensary, located at Fifty-First Street and Vincennes Avenue, were held, July 28. The building is known as the Joseph Hobart Moore Memorial, is seven stories in height, and will accommodate 120 patients.

Army Tuberculosis Work.—Dr. George Thomas Palmer, Springfield, president of the state tuberculosis association and a member of the committee on tuberculosis of the National Council of Defense, has appointed Drs. Robert S. Berghoff, Clyde D. Pence and John H. McClellan to examine the officers at the Fort Sheridan Training Camp, with special reference to tuberculosis. Capt. James A. Britton, M. O. R. C., has been assigned by Dr. Palmer to similar work at Fort Benjamin Harrison, Indiana.

Recruiting for Hospital Units.—Recruiting for the new field hospitals, Nos. 3 and 4, and for ambulance companies, Nos. 1 to 4, under the direction of Major Gustavus M. Blech, commanding Field Hospital No. 1, has been completed, and the new hospitals and ambulance companies have been mustered into the state service. The commanders of these units are: Field Hospital No. 3, Major Frederick O. Frederickson;

No. 4, Major James J. McKinley; Ambulance Company No. 1, Capt. George U. Lipshulch; No. 2, Capt. Henry C. Johannes; No. 3, Capt. J. Kubik, and No. 4, Lieut. C. S. Rogne.

Personal.—Dr. Hugh McGuigan, professor of pharmacology in Northwestern University, has accepted the position of professor and head of the department of pharmacology, materia medica and therapeutics in the College of Medicine of the University of Illinois.—A banquet was given at the Morrison Hotel recently in honor of Capt. George U. Lipshulch, commanding Illinois Ambulance Company No. 1.—Major Philip S. Chancellor, M. O. R. C., U. S. Army, has asked a reduction in rank to that of captain in order that he may participate in the work of a unit now being formed in California, for service in France.—Dr. Edward L. Moorehead has been appointed attending surgeon to the Mercy Hospital.

KENTUCKY

Sanatorium Fund Collected.—Up to noon, July 13, \$40,000 of the \$55,000 required for the Fayette County Tuberculosis Sanatorium, Lexington, had been subscribed.

Hospital Unit Organizes.—The Louisville City Hospital Red Cross Unit D, organized by Dr. Lewis S. McMurty, Louisville, has the following personnel: Director, Capt. Irwin Lindenberger, M. O. R. C., U. S. Army; chief of surgical division, Dr. Charles Farmer; chief of medical division, Dr. John B. Voor; surgical section, Drs. Isaac A. Arnold, Elbert W. Jackson, Lamar W. Neblett and Harry L. Pelle; medical section, Drs. Charles E. Gaupin, James H. Pritchett, Hiram S. Eggers and George H. Day.

MARYLAND

Personal.—Capt. Thomas R. Chambers and Lieut. Edward D. Ellis, Baltimore, have been appointed by Lieut.-Col. Henry Page, commanding the Medical Officers Training Camp at Fort Oglethorpe, Ga., members of the staff of the American Evacuation Hospital to be established in France.

Infantile Paralysis Again Appearing.—Several cases of infantile paralysis have appeared recently in Baltimore, and Health Commissioner John D. Blake is making an effort to prevent a repetition of the outbreak of last year. At Barton, Allegany County, several cases of infantile paralysis have appeared. There has been one death at Barton.

War Neuroses.—At the invitation of Dr. Adolf Meyer, Baltimore, the members of the Maryland Psychiatric Society attended a lecture on "War Neuroses" given by Dr. Thomas W. Salmon, New York, Medical Director of the National Committee for Mental Hygiene, July 26, at the Henry Phipps Psychiatric Clinic. The lecture was illustrated by pictures obtained by Dr. Salmon while abroad studying conditions at the front.

Tuberculosis Conference Planned.—The Maryland Tuberculosis Association announces a conference in Baltimore, October 18 and 19, of representatives of North Atlantic states. The general assembly at its session next winter will be asked to make large additions to the state's equipment for dealing with this disease. A local committee, of which Louis Hamman is chairman and H. Wirt Steele, secretary, is arranging the conference.

Meetings.—The first annual meeting of an association of medical societies of the Eastern Shore of Maryland, the Eastern Shore of Virginia, and Delaware was held at Ocean City, Maryland, July 26. The committee in charge of organizing the new association consisted of Drs. J. McFaddin Dick, Salisbury, chairman; Henry M. Lankford, Dawson O. George, W. H. Houston, A. A. Parker, W. N. Palmer, H. A. Cantwell, Princess Anne; Frank B. Hines, Chestertown; Herman F. McPherson, Centerville, and Eldridge E. Wolff, Cambridge, secretary.

MASSACHUSETTS

Personal.—Dr. Ralph R. Fitch, Dorchester, Boston, was made a Knight of the Legion of Honor for distinguished work in his hospital at St. Valery-on-Caux, by President Poincaré.—Dr. Henry L. Flynn has been appointed technical assistant in the bacteriologic department of the Boston Health Department.

Hospital Dedicated.—The Benjamin Stickney Cable Memorial Hospital, Ipswich, was formally dedicated, July 21. The building with its equipment is the gift of Mr. and Mrs. Richard T. Crane, Castle Hill. The hospital has at present arrangements for twenty-four beds, with an ultimate capacity of 150 beds, and has an endowment fund of \$30,000.

Health Boards Hold Meeting.—At the regular quarterly meeting of the Massachusetts Association of Boards of Health, held at Pemberton Inn, Hull, Mass., July 26, Dr. Fred W. Johnson, secretary of the Civilian Health Committee of the Boston Chapter, American Red Cross, presented a paper on "The Red Cross and Health in Civilian Communities," and Dr. Charles E. Simpson, Lowell, city health officer, discussed "A Large Concentration Camp in Its Relation to a Civilian Community."

Directory of Food Facts.—An Information Bureau and Directory of Food Facts has been established at 69 Bedford Street, Boston, under the auspices of the War Service Committee of the Boston Women's City Club. The objects of the bureau are to collect and catalog literature on food conservation, to catalog agencies in the state for dealing with this problem, to act as a clearing house for other social forces in Boston capable of assisting in food conservation, and to publish a bulletin of information called *Food Facts*.

MONTANA

Hospital Incorporated.—Articles of incorporation of the Billings Deaconess Hospital were filed, July 13. The amount of capital stock is not recorded. It is stipulated that all accruing profits shall revert back to the maintenance fund, and that any balance remaining is to be devoted to charity uses in connection with hospital purposes.

Suggest Changes in Medical Examinations.—The jury of physicians that upheld the action of the state board of medical examiners in denying a license to Dr. Tracy T. Noland returned a supplemental report in the district court recommending the state board change its systems. At present only five questions are asked applicants, the physicians aver, and if a man fails in one he must make a perfect answer to the other four to pass. The jury recommends fifteen questions be submitted and that applicants be privileged to answer two-thirds. It also deprecates the practice of giving catch questions.

NEBRASKA

Hospital Item.—The cornerstone of the New Swedish Mission Hospital, Omaha, was laid, July 15.—The Lincoln Hospital has been incorporated with a capital stock of \$10,000, and with the object of conducting a hospital for the treatment of obstetric, medical and surgical cases, and the training of nurses.

New Advisory Board.—The advisory board to the state board of health, provided for in the Fox bill passed by the last legislature, has been appointed by the governor, and includes Dr. Joseph J. Hompes, Lincoln; Dr. Joseph E. Spatz, Fairfield; Dr. William T. Johnson, Pawnee City, and Dr. Charles L. Mullins, Broken Bow.

Personal.—Dr. Edwin W. Cook, Plattsmouth, has been appointed supreme medical director of the Modern Woodmen of America, and has moved to Rock Island, Ill.—Dr. H. Winnett Orr, formerly superintendent of the State Orthopedic Hospital, Lincoln, has been assigned to duty in the Welch Metropolitan War Hospital near Cardiff, South Wales.

NEW YORK

Personal.—Dr. Paul E. Betowski has been appointed surgeon-in-chief of the Bath Soldiers' Home Hospital, succeeding Dr. Raymond C. Hill, who has been called into active service.—Dr. Otto Pfaff, Oneida, has been elected president, and Dr. Nelson O. Brooks, Oneida, treasurer of the Madison County War Emergency Committee on Tuberculosis.

New Laws Affecting Public Health.—The *Weekly Bulletin* of the department of health, July 14, gives a summary of recent legislation affecting public health work. Among these laws are the following: General Corporation Law, providing for the revocation of charter or authority to do business in this state of corporations which conduct their business in another state in such a manner as to create a nuisance in this state by discharge of dust, smoke, steam, gas or offensive odors or fumes. On complaint, the state commissioner of health is to determine whether a nuisance is being committed. This law provides a remedy for the abatement of the nuisance caused by the offensive fumes arising from the manufacturing plants located in New Jersey opposite Riverside Drive and opposite Staten Island.—Senate Bill No. 242, introduced by Mr. Gilchrist, requiring laboratories and places where live pathogenic germs are handled or cultivated to be licensed by the state department of health. The fee is \$1. Each cul-

ture sent out by such laboratory must be labeled to show the laboratory license number, name of person obtaining it, and destination of the germs.—Senate Bill No. 488, adding a new section to the Education Law, providing for the education of children with retarded mental development. It requires local school authorities to ascertain the number and provide classes for such children.—Senate Bill No. 35, introduced by Mr. Whitney, requiring the superintendent of the state hospital at Ray Brook to give superintendents of county tuberculosis hospitals courses in the diagnosis and treatment of tuberculosis and in hospital administration, and regulating the receipt of free patients at the hospital.—Assembly Bill No. 1509, introduced by Mr. Grant, providing that standardized, evaporated or condensed milk must contain not less than 25.5 per cent. of milk solids, and not less than 7.8 per cent. of milk fats. Sweetened condensed milk must contain not less than 28 per cent. of milk solids and not less than 8 per cent. of milk fats.

New York City

Camp to Become Hospital.—The reserve camp at Sacket Harbor, known as Madison Barracks, is to be used as a hospital after the present reserve camp ends about August 15.

Floating Hospital Needs Funds.—The Floating Hospital of St. John's Guild, which sails every day with 1,000 sick babies and their mothers, makes an appeal for funds with which to continue its work. The wards of the Seaside Hospital also supported by St. John's Guild are overcrowded with sick babies.

Drafted Men to Be Treated Free.—The medical examiners of the men drafted in this city have arranged for men who want to enter the draft army but are barred by physical disabilities that may be removed by operation to be treated free at Bellevue Hospital. It is hoped that other hospitals will make similar offers.

Honor to Doctor Baruch.—At a meeting of the committee on departments of the New York city council, it was recommended that the Rivington Street Public Bath in the Borough of Manhattan be known hereafter as the Dr. Simon Baruch Public Bath, in honor of Dr. Simon Baruch, the first person to make a plea for the institution of such baths in the United States.

The Blackwell Island Fire.—The committee on finance of the city council of New York has recommended the issuance of special revenue bonds, amounting to \$7,000, for the purpose of reimbursing clergymen, physicians and others, serving in an official capacity, connected with the department, who suffered losses by fire at the workhouse on Blackwell's Island, March 17.

Columbia University Admits Women Medical Students.—A gift of \$50,000 from George W. Brackenridge of San Antonio, Texas, will enable Columbia University to open its doors to women students this fall. An addition to the present building will be begun at once, in order to provide laboratory facilities in the departments of chemistry, pharmacology, pathology and bacteriology.

Surgeons as Police Aids.—Three hundred surgeons of New York have been enrolled in the Police Surgeon Auxiliary Medical Corps, which also includes the surgeons of the police and fire departments. The corps has been organized through the Women's Auxiliary of the New York Hospital. Dr. Edward T. Higgins, as chief police surgeon, is commanding officer. Each borough forms its own unit and is in charge of a borough chief. The borough chiefs include Dr. Harold Barclay, Dr. Alban E. Munson, Dr. Walter D. Sherwood, Dr. William T. Scovil, Richard Hill, and Dr. Alfred H. Thomas, New Brighton.

Personal.—Dr. George David Stewart was operated on for goiter in St. Mary's Hospital, Rochester, Minn., July 20.—Dr. Victor W. Anderson was seriously injured, July 19, when an automobile in which he was riding collided with a street-car.—Capt. Le Compte du Nouy and Major Lowey, who have been working with Dr. Alexis Carrel, have arrived in this country to demonstrate the new methods of treating trench wounds.—Dr. Michael J. Thornton, assistant superintendent of Bellevue Hospital, has been appointed captain and assistant surgeon in the Medical Corps of the United States Army.

Adequate Dispensary Treatment for Venereal Diseases.—At the last meeting of the board of health the following new section was added to the sanitary code to take effect immediately: Section 223. *Dispensaries—Communicable Disease;*

Regulations. "No public dispensary where communicable diseases are treated or diagnosed shall be conducted or maintained otherwise than in accordance with the regulations of the board of health." Under this section the department expects to compel dispensaries either to give up their departments for venereal disease or else to meet the standards set by the department of health, standards demanded by our present knowledge of these diseases and by the important relation of venereal disease to public health.

Labor Sanitation Conference.—The workers in this city have organized a movement for industrial sanitation, with headquarters at 32 Union Square. The chairman is Alfred J. Boulton, and the medical adviser, Dr. Louis I. Harris. The purposes of this organization are: 1. To find ways and means for labor to justly express its sanitary needs, and to establish direct communication with the official sanitary agencies of the nation, state and city. 2. To have representatives from all ranks of all laboring groups in the city act as a vigilance committee to guard sanitary standards. 3. To confer and agree on proper standards in their respective trades. 4. To form trade group committees to further the sanitary interests of workers in their respective fields. 5. To insure labor the opportunity to be consulted about educational work and to give it a part in disseminating such education. 6. To create public opinion for the enactment of such additional laws as may be required to safeguard the health of workers.

Health Department Issues Annual Report.—The annual report of the New York health department for the year 1916 shows that despite the epidemic of poliomyelitis last summer the death rate was the lowest the city has ever recorded, namely, 13.89 deaths per thousand population. The per capita cost of the department's activities have also been lower than for many years past, namely, 59.1 cents, whereas the average in recent years has been 65 cents. Among the most notable achievements to which the report calls attention was the reduction of the infant mortality rate. In 1910, out of every thousand infants born, 125 died during the first year of life; in 1915 the rate was ninety-eight. In 1916 it was ninety-three. The number of deaths from typhoid fever during the year was 1,617, as compared with 2,456 for the year preceding, a decrease of 839. In 1916, only 3,205 persons were bitten by dogs as compared with 3,648 in 1915. Only twenty-three rabid dogs were encountered in this city in 1916 as compared with 113 in 1915. The birth records show an actual decrease of 3,592 over the number for the preceding year. The reasons for this are ascribed to the decrease in foreign immigration and the low marriage rate experienced during the previous year, this being probably due to financial depression, nonemployment, etc. The year 1916 witnessed an increase in the number of deaths from violence, 4,235 deaths from this cause occurring in 1916 as compared with 3,819 deaths in 1915. In commenting on these the report states that the majority of these deaths were avoidable.

NORTH CAROLINA

War Study.—The Buncombe County Medical Society, Asheville, N. C., is holding regular weekly meetings for the purpose of special study of subjects pertaining to the war.

Personal.—Dr. James S. Mitchener has been appointed whole time health officer for Lenoir County, under the three-year cooperative plans arranged between the North Carolina State Board of Health and the counties for certain specific purposes. Ten North Carolina counties have volunteered for this work. To date Wilson, Nash, Northampton, Davidson and Lenoir counties have been accepted. The city of Kingston will have a joint board of health with the county under direction of Dr. Mitchener.—Dr. Thomas J. Summey, Brevard, prior to leaving for Ft. Oglethorpe, Ga., was tendered a banquet by citizens of Transylvania County at which he was presented with a watch.—Gov. Thomas W. Bickett has designated Dr. Charles O'H. Laughinghouse, Greenville, and Dr. John W. Long, Greensboro, medical members of the district exemption boards.

NORTH DAKOTA

Amalgamate for Sanitary Work.—The state board of health, the state public health laboratories and the state anti-tuberculosis association have amalgamated under the name of the North Dakota Public Health Service. The organization has already begun a sanitary survey of Park River.

Personal.—Dr. Henry E. Dahleen has been appointed local surgeon for the Minneapolis, St. Paul and Saulte St. Marie at

Hankinson.—Dr. Henry H. Healy has presented a flag and flag-pole to the St. Michael's Hospital, Grand Forks.—Major Frank E. Wheelon, Minot, has been commissioned major, M. C., N. D. N. G., and assigned to duty with the Second Infantry.

PENNSYLVANIA

York County Makes a Creditable Record.—York County Medical Society reports that 41 out of its membership of 121 have taken the examination for the Medical Reserve Corps.

Hospital Dedicated.—The new main building of the Grand View Hospital at Sellersville was dedicated with fitting ceremonies, July 22. Dr. Wilmer Krusen delivered the dedicatory address.

Personal.—Dr. John B. Lowman, Johnstown, councilor for the fifth district, goes to France as a member of the Jefferson Medical College Unit.—Dr. Joseph P. Ritenour, Uniontown, has been appointed college physician to the Pennsylvania State College.—Dr. George R. Moffitt, city bacteriologist of Harrisburg and a member of the Medical Reserve Corps, has been ordered to the Rockefeller Institute in New York for advanced work preparatory to entering active service.—Dr. Warren H. Butz, Allentown, has been appointed resident physician of the Taylor shipbuilding camp at Cornwells.

Philadelphia

Hospital Property Sold.—The property of the Providence General Hospital, consisting of the hospital building and 6 acres of ground on Lincoln Drive, Fairmount Park, has been acquired by the city for park extension. The price paid for the institution was \$80,000.

Personal.—Dr. Thomas McCrae, professor of internal medicine in Jefferson Medical College, has been made chief medical officer of the Ontario Military Hospital, Orpington, Kent, England. This institution is said to provide 2,040 beds.—Dr. Richard Penn Smith, Ft. Loudon, has been made a member of the Red Cross Mission to be sent to Roumania.

Medical Institutions.—The officers of the Central Pennsylvania Roentgen Ray Society for the ensuing year are: Dr. Harry M. Stewart, Johnstown, president; Dr. Forrest L. Schumacher, Dubois, vice president; Dr. William E. Reiley, Clearfield, secretary-treasurer; Drs. Russell H. Boggs, Pittsburgh; Francis C. Smathers, Punxsutawney, and Horatio W. Gass, Sunbury, censors, and Dr. Gerald D. Bliss, Altoona, reporter and editor. The next meeting will be held in Altoona in October.

Reception to Jefferson Unit.—The Ladies' Auxiliary of the Jefferson Medical College entertained the sixty-five nurses in the college library, July 26. These nurses are to constitute the nursing staff of Jefferson Base Hospital No. 38. Addresses were made by Mr. William Potter, president of the Board of trustees; Alba B. Johnson, a member of the board of trustees, and Dr. William M. L. Coplin, director of the unit. Each of the nurses was presented with a special Jefferson Medical College Hospital pin.—A three days' campaign by the Logan Improvement League, Fourth of July Committee and the Logan Branch of the Emergency Aid resulted in the collection of \$2,500. This sum is to be used to purchase an ambulance for Jefferson Base Hospital No. 38.

SOUTH DAKOTA

Personal.—Lieut. Harry T. Kenney, M. C., S. D. N. G., Highmore, has been transferred from the Fourth Infantry and promoted to major, being assigned to duty with the First Cavalry.—Dr. Isaac W. Leighton, Scotland, has been commissioned captain, S. D. N. G., and assigned to duty with the Fourth Infantry.—Dr. Park B. Jenkins, Waubay, has been appointed physician to the state nurses' examining board.

VERMONT

Addison County Physicians Elect.—At the annual meeting of the Addison County Medical Society, in Middlebury, the following officers were elected: president, Dr. Charles H. Dean, Middlebury; vice president, Dr. Peter L. Dorey, Middlebury, and secretary-treasurer, Dr. Edward H. Martin, Middlebury.

Accepts Certificates of National Board.—At its recent business meeting, the Vermont Board of Medical Registration voted to accept certificates granted after examination by the National Board of Medical Examiners. This is the twelfth state in which either by special legislation or by board rulings certificates of the national board have been recognized.

Infantile Paralysis.—The state board of health, after a conference with the governor, has issued an order forbidding the holding of state and county fairs, chautauquas, street carnivals or circuses until further notice. The cause for this interdiction is the prevalence of infantile paralysis, sixty-eight cases having been reported, the majority of which were in Washington County.

WISCONSIN

Smallpox.—Smallpox has developed in Company I, First Wisconsin Infantry, in camp at Beloit.

Tuberculosis Camp Established.—A summer camp for children suffering from tuberculosis has been established near Neenah, Wis., by the common council of that city.

Hospital Items.—Drs. Robert B. Clark and Wilson G. Bear announce that they are about to open a hospital in Monroe. —Excavation work was commenced on the St. Mary's Hospital, Ladysmith, July 1. The building will be three stories in height, with a basement, and will cost about \$30,000. —The Dominican Sisters have been presented with 5 acres of land on the lake shore, near Kenosha, and will erect a hospital on this site. —The Lakeside Methodist Hospital Company has been incorporated to establish, conduct, maintain and operate a hospital and a training school for nurses at Oshkosh. The incorporators are Dr. Wilbur N. Linn, C. C. Konrad and Dr. John G. Morris.

Personal.—Capt. Edgar C. Barnes, Ripon, has been commissioned major, M. C., Wis. N. G., and assigned to duty with the Fourth Infantry. —Dr. George Martin, Baldwin, announces his retirement after twenty-three years' practice. —Dr. Miles D. Cottingham, Lake Geneva, has been commissioned first lieutenant, M. C., Wis. N. G. —Drs. Oscar Lotz, Milwaukee; Frederick C. Haney, Watertown; Fay T. Clark, Waupun, and Edward Murphy, Eau Claire, have been appointed members of the state board of medical examiners. —Dr. T. J. McCrory, Racine, has been appointed physician to the state athletic commission. —Col. Gilbert E. Seaman, chief surgeon, Wis. N. G., has resigned from the Board of Education of Milwaukee.

CANADA

Dominion Medical Council.—At the fifth annual session of the Dominion Medical Council, held recently in Ottawa, the registrar's report was submitted. It showed that thirty-six practitioners in Canada, over ten years in practice, had registered as members since the last annual meeting, and that thirty-five candidates had successfully passed in the two examinations, spring and fall. The next examinations will be held in Montreal and Halifax on the second Tuesday in October; in Toronto and Winnipeg, on the third Tuesday in June, 1918. The following officers were elected: president, Dr. Emmanuel P. Lachapelle, Montreal; vice president, Dr. R. Eden Walker, New Westminster, B. C., and registrar, Dr. Robert H. W. Powell, Ottawa (reelected).

Personal.—Surg.-Gen. John T. Fotheringham, C. A. M. C., Toronto, has returned after two years' service in France, and recently made a tour of the Northwest, in the interests of the recruiting propaganda. —Dr. Donald MacGillivray, Toronto, is home on furlough from the University of Toronto Base Hospital at Saloniki, where he has been nearly two years. —Lieut.-Col. D. King Smith of the University of Toronto Base Hospital, who came back from Saloniki last fall, returned to England for active hospital work. Malaria which he contracted in Greece, however, had seized too strongly on his system, and he has again returned to Toronto. —Dr. Edwin G. Hodgson, Toronto, has joined the C. A. M. C., and has left for England. —Dr. Ansel M. J. Tanney, Montreal, has been appointed superintendent of the General Hospital, Quebec City. —The Military Cross has been awarded to Capt. Frank L. McKinnon, Winnipeg, and Frank M. Walker, Stony Creek. —Major Thomas D. Archibald, Toronto, who has been overseas a year, has been appointed chief medical officer of the Military Hospital, Whitby, Ontario. —Lieut.-Col. H. Ernest Kendall, Halifax, Sydney, N. S., is now in command of the St. Francis Xavier Hospital at Bramshott, England. —Dr. J. H. Carson, Vancouver, B. C., has been appointed medical superintendent of the Langara Convalescent Hospital, British Columbia.

GENERAL

Tuberculosis Conference.—The Southwestern Tuberculosis Conference will meet at Hotel El Tovar, Grand Canyon, Ariz., October 21 to 23.

Orthopedists Elect Officers.—At the annual meeting of the American Orthopedic Association, the following officers were elected: president, Dr. Herbert P. H. Galloway, Winnipeg, Manit.; vice president, Dr. Walter G. Stern, Cleveland; secretary, Dr. John Ridlon, Chicago, and treasurer, Dr. Gwilym G. Davis, Philadelphia.

Not Yellow Fever.—Surg.-Gen. Rupert Blue, U. S. P. H. S., advises that the news notice in THE JOURNAL of July 14, regarding a patient with yellow fever, said to be held at the Reedy Island quarantine, was based on erroneous information, as the postmortem findings were sufficient to exclude a diagnosis of yellow fever.

Obstetricians and Gynecologists to Meet.—The American Association of Obstetricians and Gynecologists will hold its thirtieth annual meeting at the Robert Treat Hotel, Newark, N. J., September 17-19, under the presidency of Dr. John William Keefe, Providence, R. I. Dr. Edward J. Ill, Newark, is chairman of the committee of arrangements.

Control of Cancer.—The National Council of the American Society for the Control of Cancer, at its June meeting, adopted a resolution commending the "action of the U. S. Bureau of the Census in publishing its notable report on the mortality from cancer in the U. S. Registration Area in 1914, and recording its appreciation of the courteous cooperation of the Director of the Census and all the members of his staff who contributed to the contribution of this unique volume, which represents an unparalleled contribution to the statistical study of malignant disease, and has already furnished the basis for many promising special investigations."

Bequests and Donations.—The following bequests and donations have recently been announced:

Fayette County Memorial Hospital, Indianapolis, \$10,000, by the will of Edward Anstedd.

Presbyterian Hospital, Chicago, and Massachusetts General Hospital, Boston, each \$10,000; Perkins' Institute for the Blind and Massachusetts Institute for the Blind, Boston, and Pasadena, Calif., Hospital, each \$5,000, by the will of Mary Rose Harris, Chicago.

Goodhue County (Minn.) Tuberculosis Sanatorium, \$1,000, by the will of Mrs. Minnie M. Barlow, Canyon Falls.

Lakeview Hospital, Chicago, and Home Hospital, Lafayette, Ind., each one-half of the estate, valued at \$175,000, of Mrs. Nicholas W. Box, on the death of the husband of the deceased.

FOREIGN

State Department of Public Health in Austria.—The *Policlinico* of Rome states that the new emperor of Austria has organized a new state department, the chief of which is to be known as the minister of hygiene and social welfare.

Japanese Medical Officers on Way to Roumania.—One hundred Japanese physicians are said to be on the way to Roumania in charge of Dr. Motegi, chief of the Saiseikai Hospital and head of the surgical department of the Keio University.

Cost of Medical Service in Leeds.—Records of the medical service in the schools of Leeds show that in the year 1915-1916 the cost was \$18,444. Nine physicians and six nurses were employed, and 18,069 children were examined, the treatment including both medical and dental attention.

Hookworm in Brazil.—Through the efforts of Dr. Charles Seidl, director of the public health department, and Drs. Lewis Wendell Hackett and George Stone of the Rockefeller Foundation, the Brazilian government has given the institution a free hand to wage a campaign against hookworm in the interior of Brazil.

Medals for Repatriated Physicians and Nurses.—It is announced in France that the *médaille d'honneur des épidémies* is to be conferred on a number of recently repatriated nurses and physicians who have been in prison camps in Germany and Austria. This is in honor of their conspicuous devotion during epidemics in the prison camps.

Italian Physician Condemned for Aiding Malingering.—A courtmartial at Ancona has just condemned to a year in a military prison a private in the artillery on account of a factitious infectious process which had temporarily disabled him. The inoculation had been done for him by a surgeon, U. P. Vincenzo of Bari, who was sent to prison for six months.

Change in Staff of "Riforma Medica."—According to the wishes of the late Professor Rummo, the founder and director of the *Riforma Medica* of Naples, the weekly passes into the hands of Prof. A. Cardarelli, chief of the second medical clinic of the University of Naples, and Prof. E. Maragliano,

professor of clinical medicine at the University of Genoa and pioneer in various branches of medicine, especially in tuberculosis. A. Ferrannini is to be the editor in chief. He is professor of clinical medicine at the University of Camerino. The *Riforma* is now in the thirty-third year of its dignified existence. Its large pages, large type and broad spacing have always set it apart from its more strenuous fellow journals.

LONDON LETTER

LONDON, July 11, 1917.

War Bread

War bread—the only bread now permitted—is made from wheat and flour milled to 81 per cent. to which a minimum of 20 per cent. of maize products, barley, oatmeal, rye, rice and beans must be added. This bread is more nutritious than the white bread, made from wheat milled to a lower percentage, which was practically universally used before the war. It is no hardship whatever to eat war bread, but a certain number of people find it less palatable, and complaints have been made that it is less digestible and produces skin eruptions, and that it quickly becomes stale and uneatable. Many of these complaints are unfounded, but some bakers have not been very successful in dealing with the new flour and have produced an unpalatable loaf. Moreover, a “disease” of bread, the “rope” disease, has made its appearance sporadically throughout the country. When a piece of ropy bread is broken it is found to be gummy inside, and when pulled apart this sticky substance is drawn out into numerous glistening strands. The whole bread problem is being investigated by experts appointed by the government. The rope disease has been found to be due to a germ—the *Bacillus mesentericus*—which is generally present in any dirt or dust and is usually found on the outer husk of wheat. The germ is almost always present in flour, but milling to a higher percentage of extraction and the use of wheats of lower grades, such as are now coming to this country, tends to increase the risk. The bacillus is normally quite harmless; but when the conditions are favorable it causes fermentation, and the bread becomes “ropy.” In the earlier stages of the disease the bread is unwholesome, and in the later uneatable. There does not seem to be any evidence that admixtures increase the risk of “rope.” The conditions leading to the fermentation are warmth and excessive moisture, and the wide distribution of the trouble recently is probably partly due to the exceptional weather conditions. Generally speaking, bakers have done their best under difficult circumstances, and with increased experience it is believed that they may succeed in producing a still more nutritious and palatable bread. It has been found impossible for bakers to maintain an exact weight of the loaf, and the absence of any latitude in weight has had a tendency to underbaking. This seems to be a disposing cause of “rope.” After baking, the desire to avoid loss in weight leads the baker to cover the loaves with damp cloth, producing the exact conditions most favorable to the growth of germs. The combination of undercooked dough with a moist warm temperature appears exactly suitable for the growth of “rope.” Mr. W. B. Hardy, F.R.S., secretary of the Royal Society, one of the experts appointed by the government, states that the *Bacillus mesentericus* is exceedingly tolerant of heat and therefore is not killed in baking. He makes the almost incredible statement that five hours’ boiling is necessary for its destruction.

Baby Week

The great loss of life in the war has caused increased attention to the saving of infant life. A national baby week campaign has taken place in order to awaken the public conscience and promote measures which make for the welfare of mothers and children. The queen opened a child’s welfare and mothercraft exhibition, and a public meeting of health and social workers was held in the Guildhall and addressed by three ministers of state. All the machinery of propaganda has been set in motion, and no effort has been spared to bring home to parents, municipal authorities, societies, school-children and the general body of citizens, by meetings, lectures, leaflets, exhibitions, competitions, cinematograph films and in a score of other ways, the vital importance of mobilizing for the prevention of infantile mortality and the preservation of the health of mother and babies. Baby shows and “pram parades” are among the more picturesque features of the plan for popularizing the cult of the child. Lord Rhondda, lately president of the Local Government Board, stated at the Guildhall meeting that through carelessness,

want of knowledge, and lack of the necessities of life, 2,000 infant lives are lost every week under the age of 1 year, and 3,000 a week under the age of 5. According to medical authority, at least 1,000 of those 3,000 lives could be saved. This saving it is hoped to effect by the campaign. A greater effect would be that the bulk of the babies who lived would be stronger, and when they grew up, more efficient citizens. What are wanted are cleaner and healthier homes, proper food and care for expectant and nursing mothers, more maternity centers, more health visitors, more skilled attention for mothers and children, and pure milk for the children.

Anthrax from Shaving Brushes

Some time ago I reported cases of anthrax due to a cause not previously recognized—infected shaving brushes. A government inquiry has been conducted into the subject by Dr. F. H. J. Coutts. He found that the hair used in making these brushes consisted in great part of Chinese horsehair, which had not been disinfected. The remaining unmanufactured hair from the same source was found to be largely infected. The manufacturer explained that the hair was invoiced to him as “goats’ hair,” which does not come under the Home Office regulations, and that for this reason he had not subjected it to disinfection. Four other cases of anthrax were traced to brushes made in New York, and a consignment of shaving brushes from Japan was found to be heavily infected with anthrax. The Local Government Board has under consideration what administrative action is required to make sure that hair used in the manufacture of shaving brushes in this country is satisfactorily sterilized before the brushes are manufactured. It will be necessary also to see that imported brushes are similarly free from infection. For this purpose, a guarantee of origin may be desirable, as well as examination of samples of brushes after importation.

The British Medical Association and the Insurance Act

In spite of the war, the discussion of the working of the insurance act continues. The British Medical Association has issued a report based on the views of all its local branches and divisions which were asked to appoint representative subcommittees to consider the present system so far as it affects the relation of the medical profession to the public health and the treatment of disease, and to make suggestions for its improvement. The general system in the main is approved. It is agreed that there must be an extension of the number of salaried medical officers in connection with preventive medicine and of purely administrative officers, on both the preventive and clinical sides, but that the treatment of individual patients, in their interest as well as in that of the profession, shall not be through salaried officers but by physicians paid by some method dependent either on the actual items of work done or on the number of persons for whom they accept responsibility. It is held that healthy competition as far as possible on the lines of private practice keeps physicians up to a good level of efficiency and encourages initiative and individuality. The wide possibility of the choice of physician by the patient tends to promote that influence of personality and that mutual confidence so important in treatment. If it is said that the patient is often unable to exercise a wise choice, it can be replied that he is more likely to know the physician who most appeals to him than any other person or body can. The systematic partitioning off of particular classes of disease from the general practitioner’s usual work is held to be uneconomical, unscientific, detrimental to the interests of the patient, and productive of deterioration in the general standard of professional ability. Whole-time appointments in a state service would of necessity be made by bodies in which the lay element was paramount, and advancement by influence or for political or other improper reasons would be not unlikely. All are agreed that the present system is imperfect and should be modified so as to attract as many physicians as possible. Benefits should be extended so as to include a consultant and specialist service and institution treatment.

The War

THE VALUE OF WILD FOODS

As stated in a previous letter, attention is being directed to the value of wild foods which are almost entirely neglected. The inhabitants of rural districts are being shown what extensive supplies of natural food lie at their doors and around their dwellings, and are being taught so to utilize them that the ordinary products of the farm, garden or allotment may be made available, at a remunerative price to the

grower, for the sustenance of the population of the larger towns and cities. Following the recent publication of a practical guide to "The Wild Foods of Great Britain," which indicates over 260 different articles of diet only awaiting collection of those who have learned to distinguish them, and provides recipes for their treatment in order to render them palatable and nutritious, it has been decided to send to the villages and smaller towns lecturers and demonstrators, equipped with traveling kitchens or using the school kitchens and appliances already possessed by the various education committees. They will point out to the people the wild foods immediately available in their own localities, and show them how to prepare them for home consumption. The amount of available wild food that has been wasted in England in past years is incalculable. In continental countries, and to a lesser extent in Scotland, these natural sources of supply have never been neglected; while in most parts of the kingdom some one or other wild product of the countryside has always been used by its inhabitants. The instructors to be sent out by the county councils will find that in one place snails, in another the edible frog, in others hedgehogs, in some nettles, or whortleberries, or avrongs, or the edible fungus called blewits, and on the coast dulse and laver and samphire, are already commonly eaten. Basing their instruction on the fact that some one or other of the natural foods of the country are already eaten by the inhabitants of the locality they are visiting, it will not be difficult for them to demonstrate that there are others of the seventy-odd food-producing plants, edible fungi, and freshwater fish equally worth gathering and eating. The plan to be adopted is for the lecturers and demonstrators in wild food collection and cookery to visit the smaller centers either with a caravan fitted as a traveling kitchen or with one of the traveling kitchens already possessed by different county councils, and after they have examined the natural resources of the locality and determined its available food supply at the moment, to deliver a brief lecture in the schoolroom, parish hall, or on the village green, and to call for volunteers from the inhabitants—schoolchildren, teachers and others—to form a collection of them on the following morning. This collection will be brought to the traveling kitchen or to that of the schoolhouse, and the demonstrator will then give practical instruction to the villagers in the different methods of preparing them for food.

PARIS LETTER

PARIS, July 12, 1917.

Personal

Dr. Henri Roger, professor of experimental and comparative pathology at the Faculté de médecine de Paris, has just been chosen dean of the institution in place of Professor Landouzy, deceased. Dr. Georges-Eugène-Henri Roger was born at Paris in 1860. He became hospital intern in 1883 and doctor of medicine in 1887, his thesis being "The Action of the Liver on Poisons." In 1892 he was appointed surgeon of the Hôpitaux de Paris and agrégé at the Faculté de médecine, and in 1905 he was given the chair of experimental pathology. He was a pupil of Bouchard, and made a special study of infectious diseases, their origin, their evolution, the resistance of the organism to their invasion, and the therapeutic treatment recommended in divers cases. Autointoxication and malignant tumors have likewise been favorite subjects of research. Roger presided over the first Congrès de pathologie comparée, and was an active collaborator of the "Dictionnaire encyclopédique des sciences médicales" and the "Traité de pathologie générale" by Bouchard. He is also author of an "Introduction à l'étude de la médecine," which deserves to become a classic. Professor Roger has been a member of the Académie de médecine since 1910.

Dr. Widal, professor of internal pathology at the Faculté de médecine de Paris, has been appointed, at his own request, professor of the medical clinic of the same institute, in place of Professor Landouzy.

Death of Dr. Albert Mathieu

Dr. Albert Mathieu, physician of the Hôpitaux de Paris, died recently, aged 59. He had specialized in diseases of the stomach. He was the author of numerous works on this general subject, as well as many special studies on alimentary regimens for dyspeptics, the hygiene of obesity and gout, etc. Dr. Mathieu was the organizer of the first three Congrès d'hygiène scolaire which brought to Paris educators and medical men from all parts of the world.

The War

SOLDIERS CONVALESCING FROM MALARIA

At the last meeting of the Académie de médecine, Dr. Jeanselme, agrégé professor at the Faculté de médecine de Paris, and physician of the Hôpitaux de Paris, called attention to the desirability of excluding from the hospitals such soldiers as have been suffering from malaria, but whose condition is improved, though not sufficiently to allow them to return to their regiments. The preferable disposition of such semi-invalids seems to be to send them to the abandoned farms, which there has been an organized effort to reclaim. These soldiers would be divided up into groups, and would work under superintendents. A physician would inspect them from time to time, and would report on the effect of the work, which it would be the endeavor to adapt to their weakened strength. It would be necessary, moreover, to ascertain in advance whether or not the country to which they were to be sent is infested with mosquitoes of the genus *Anopheles*, which are carriers of malaria.

THE REEDUCATION OF WAR CRIPPLES

The senate has just finished the examination of the proposed bill looking to the obligation of vocational reeducation of the war wounded and the war cripples who are beneficiaries of the law regarding military pensions.

The first paragraph of Article I reads thus: All soldiers, or former soldiers, of the army or navy suffering from infirmities resulting from wounds received or diseases contracted or aggravated during the present war may demand enrolment at a school for vocational reeducation, with a view to their readaptation to work, especially to their vocational reeducation and their future employment.

The proposed bill as a whole having been passed by the senate, this body declared that it is a matter of urgent necessity to carry on vigorously the vocational reeducation of the war wounded and the war cripples during the discussion of the bill before the Chamber of Deputies, and expressed the hope that the government will develop and stimulate the action of the organizations created by the state, the several departments and the communes, and will encourage the work begun through private initiative, which has sprung up since the very beginning of the war throughout the whole country, having for its purpose the giving to the victims of the war the place to which they are entitled in the economic life of the nation.

PREPARATION OF INVALID LIST

Justin Godart, undersecretary of state for the military medical service, has just addressed a communication to the chairmen of the different district boards, the purpose of which is to avoid any delay that might arise in the preparation of the invalid list. This communication emphasizes especially that the chief surgeons should prepare promptly the lists required by the medical and administrative service; said lists to contain names of the wounded and the sick that may be eligible to pensions or allowances. In case boards do not respond within ten days to the demands as set forth in this communication, an appeal may be taken to the general in command of the district whose officials are dilatory. The chairmen of the boards and the consulting medical officers must see to it that the names of the wounded and the unfit, who are entitled to be placed on the invalid list or the pension list, are sent to the special commissioners as soon as possible. They will be held personally responsible for any delays or any evidence of neglect of duty.

THE ARMY MEDICAL CORPS AND THE WAR

At the instance of the Union des Syndicats médicaux de France, a delegation of representative medical officers has been sent to Justin Godart, undersecretary of state for the military medical service, to present to him the recommendations of the Army Medical Corps, which were as follows: 1. The appointment of medical officers, with the rank of "sous-aide-major." 2. The promotion of capable medical officers, together with the accordance of special distinctions. 3. The retirement of medical officers who, on account of age or ill health, are unfit for service. 4. The application of the decree of Oct. 17, 1916, relative to the new status of the Army Medical Corps. This decree should be modified in such a way that the alphabetical arrangement of the names of medical officers going to the front shall be superseded by an arrangement which would permit of consideration of the time spent at the front and the wounds received. Publication of this list is demanded. 5. The desirability of consulting the medical associations of each department in regard to the organization of the civil clientage in the sections of the country that are

bereft of physicians. 6. The status of the students of the P. C. N. and of foreign students and medical men.

ANTITETANIC SEROTHERAPY

In connection with the recent discussions held at the Société de chirurgie de Paris on the value of antitetanic serotherapy, Dr. Chavasse communicated to the society an important statistical study on the cases of tetanus (213) encountered in the army during the period of fifteen months, extending from Nov. 1, 1915, to Feb. 1, 1917. The general conclusions that may be drawn from this study are:

1. The preventive injections of antitetanic serum employed in cases of gunshot wounds, even though they may not have always prevented the development of tetanus, have shown their efficacy in an incontestable manner in bringing about a very perceptible diminution of the number of cases of this dreaded complication in the hospital units of the army.

2. The gravity of tetanus has been shown in a general way in relation to the gravity of the local lesions. It has been found to be especially excessive in the complications of frost-bites. Tetanus appears to become less grave in war wounds in proportion to the number of preventive injections given, even though one may be dealing with the most serious and complicated cases.

3. The preventive doses employed have not always been proportioned in accordance with the gravity of the wounds. However, it was recommended to the army in June, 1916, on the advice of Roux and Vaillard, that the standard dose of 10 c.c. should be doubled or even tripled, at least for the first injection, in the case of wounds with extensive lacerations, and infected wounds, especially such as contain foreign bodies. One may add multiple wounds, even though not at all serious. In the moderate and serious cases, it is indispensable to repeat the injections with the dose of from 10 to 15 c.c. if the first injection was 30 c.c., or with a much stronger dose if the first injection was only 10 c.c., using from 20 to 30 c.c., according to circumstances, at intervals of from seven to eight days, which makes it possible to avoid more easily many untoward results of an anaphylactic nature.

4. In the complications of frost-bite with phlyctenules, ulcerations or gangrene, the first dose should be from 20 to 30 c.c.; and, according to the advice of Raymond, the injection should be repeated with a dose of from 10 to 15 c.c. for all these cases, and even with 20 c.c. in serious cases, at intervals of a week, until recovery.

5. In order to be fortified against late postoperative tetanus, one should use, as recommended by Bérard and Lumière, a preventive injection before every surgical intervention, no matter what. The dose in such cases will be from 10 to 20 c.c. according to the importance of the operation.

In discussing this communication, Dr. Phocas gave an account of six cases of tetanus encountered by him during his two years' experience with the war wounded. In two cases, in spite of two injections, tetanus appeared eleven or twelve days after the last injection. All cases developed without being incited by an operation; in other words, they were not postoperative, and Phocas has not had to ask himself the question whether tetanus serum should be injected before an operation. If it had been done, he would not have avoided a single case of tetanus, so far as these six patients are concerned. These considerations seem to afford the opponents of the serum some ground for persisting in their doubts as to the utility and the efficacy of the serum when used in man.

But we must not lose sight of the fact that all these cases of tetanus developed slowly and only partially, and that they were mild, chronic and benign, all of them being retarded cases. It cannot be denied that we are dealing here with a new disease that bears only a remote resemblance to the tetanus of the first period of the war. Also diagnosis is sometimes difficult. In all the cases the actual presence of the disease could not be established for several days after the appearance of the first symptoms, and Phocas is convinced that many other facts have passed unnoticed. It would seem that one is authorized in establishing a relation of cause and effect between the systematic antitetanic injections in the service at the front and the appearance of this retarded and attenuated disease in the base hospitals. Two injections are not always sufficient to protect the patient completely, but they are sufficient to arrest the course of the disease. As for the question whether the serum should be injected before an operation, Phocas' statistics seem to show that this question is sometimes badly put, and that it is not so much a question as to whether those to be operated on should be reinjected, as it is whether all the wounded who arrive at

the base hospitals should not be reinjected. Phocas has almost reached the point of believing that this action should be taken, and that all the wounded coming from the front should be reinjected once, at least, if not several times, until the cicatrization of their wounds has been brought about.

Meal Hours

I reported in my preceding letter a communication from Dr. Bergonié to the Académie des sciences on the modification of meal hours. At a recent meeting of the academy Dr. Amar declared with reference to this communication that the work ration of 3,200 calories proposed as a maximum by Bergonié is in reality insufficient, asserting that the work ration usually exceeded 4,000 calories. He remarked that the meal hours proposed by Bergonié, namely, 7:30 a. m. and 6 p. m., if accepted as the hours for the two principal meals, might serve as well for the night workers and the noctambulists. Amar concludes, however, that the custom of taking two principal meals, one at noon and the other toward 8 p. m., supplemented by a light breakfast on rising, is justified from the standpoint of experimental hygiene and the loss of human energetics. Supporting his view by a series of carefully conducted researches, he maintained that the carbohydrates are utilizable thirty minutes after their ingestion, which signifies an economy of 5 per cent. as regards expenditure of energy, whereas the nitrogenous foods are difficult to utilize for the first two hours after meals. Under these circumstances, it would be advantageous, while continuing to work and to eat at our usual hours, to consume farinaceous foods and fruits in abundance, and to devote at least ninety minutes to each of our two principal meals.

Gift from an American University

The University of Columbia, through the intermediation of M. Jusserand, the French ambassador, has just presented to the municipality of Lyons the proceeds of a prize of \$2,000, which it has bestowed on the work of Edouard Herriot, mayor of Lyons, "Les oeuvres de guerre lyonnaises." This sum will constitute the first donation toward a Franco-American sanatorium founded by the municipality for the reception of tuberculous patients.

Marriages

ASST. SURG. OVID CLEMMONS FOOTE, U. S. Navy, Norfolk, Va., to Miss Eleanor Potter of Chicago, in New York City, July 12.

ARTHUR G. KESSLER, M.D., Battle Lake, Minn., to Miss Agnes P. Reinmiller of Pelican Rapids, Minn., July 25.

WILLIAM FRANKLIN TEMPLE, JR., M.D., Boston, to Miss Marguerite Mayberry of Pittsfield, Mass., July 10.

FRED ROMER REED, M.D., Detroit, Mich., to Miss Julia Davis of Rock Island, Ill., in Detroit, July 18.

PHILIP EDWARD MARKS, M.D., Pittsburgh, to Miss Elizabeth Kennedy Toddie, Braddock, Pa., July 16.

P. A. SURG. ROBERT EARLE STOOPS, U. S. Navy, to Miss Ethel Louise Saunders of Cleveland, July 9.

HOMER MARLATT MCINTIRE, M.D., Eveleth, Minn., to Miss Eileen Matthews of Ashland, Wis., July 10.

HOMER MCCLELLAND CARTER, M.D., to Miss Eleanor Hardy Keller, both of Madison, Wis., July 16.

ROY ALTON MORTER, M.D., to Miss Jannette B. Johnson, both of Kalamazoo, Mich., July 18.

NORMAN CLYDE MARVELL, M.D., to Miss Marguerite M. Hogg, both of Baltimore, July 7.

NICHOLAS ISRAEL FOX, M.D., Chicago, to Miss Evelyn Adele Hattis of Oak Park, Ill., July 5.

ISAAC IVISON PARSONS, M.D., to Miss Elizabeth G. Hennessey, both of Media, Pa., recently.

ALGIE RAY SHREFFLER, M.D., St. Louis, to Miss Edna Hitterbrand of Henry, Ill., recently.

MILTON J. LONGSWORTH, M.D., to Mrs. Anna Beutelspacher, both of Lima, Ohio, July 13.

LEO JOSEPH WOJCZOWSKI, M.D., to Miss Mary D. Rzepski, both of Philadelphia, June 20.

Deaths

William Beer Ewing, M.D., Pittsburgh; University of Pittsburgh, 1896; aged 51; a Fellow of the American Medical Association; professor of dermatology and syphilis in his alma mater; a member of the staff of St. Francis, Allegheny General and the Children's hospitals, Pittsburgh; for several years president of the Pittsburgh Academy of Medicine and treasurer of the Allegheny County Medical Society; died at his home, in Schenley Farms, Pittsburgh, July 17, from heart disease.

Darlington J. Snyder, M.D., Columbus, Ohio; Columbus (Ohio) Medical College, 1891; aged 74; a Fellow of the American Medical Association; assistant secretary and treasurer of the National Confederation of State Examining and Licensing Boards, in 1910; for twenty-seven years principal of the Reynoldsburg (Ohio) Academy; died suddenly, July 15, from heart disease.

Odillion B. Weed, M.D., Detroit College of Medicine and Surgery, 1888; aged 65; a Fellow of the American Medical Association; surgeon of the Thirty-Third Michigan Infantry, U. S. V., during the war with Spain, and later a medical officer of the Forty-Second New York Infantry, U. S. V., with service in the Philippine Islands; died at his home, July 17.

F. G. Marrero, M.D., Covington, La.; Tulane University, New Orleans, 1884; aged 62; formerly a member of the Louisiana State Medical Association; for one term coroner of Jefferson Parish and for five terms mayor of Covington; died in the Presbyterian Hospital, New Orleans, July 13, from cerebral hemorrhage.

Charles Young, M.D., Newark, N. J.; College of Physicians and Surgeons in the City of New York, 1866; aged 75; formerly a Fellow of the American Medical Association; for many years a member of the staff of St. Michael's, St. Barnabas and the Newark City hospitals; died at his home, July 14.

Harry Joseph James, M.D., Phoenix, Ariz.; University of Toronto, 1907; a member of the Arizona Medical Association; vice president of the Anti-Tuberculosis Society of Arizona and medical director of St. Luke's Home, Phoenix; died in that institution, July 20, from nephritis.

Harry Rayburn Johnson, M.D., New Hope, Ala.; University of Nashville, Tenn., 1887; aged 54; a member of the Medical Association of the State of Alabama; a member of the Madison County Medical Board; also a druggist; died in a hotel in Huntsville, Ala., July 7, from dropsy.

Frederick A. Rettig, M.D., Chicago; Rush Medical College, 1894; aged 48; a Fellow of the American Medical Association and president of the staff of Alexian Brothers Hospital, with which he had been associated for twenty-five years; died at his home, July 21, from myocarditis.

Thomas W. Hurley, M.D., Bentonville, Ark.; Memphis (Tenn.) Medical College, 1855; aged 83; a member and once president of the Arkansas Medical Society; a surgeon in the Confederate Service, during the Civil War; died at the home of his son in Bentonville, July 15.

Sigismund Edward Inda, M.D., Buffalo; University of Buffalo, N. Y., 1913; aged 26; formerly a member of the Medical Society of the State of New York; was drowned, July 18, when his automobile overturned in a shallow ravine, near South Dayton, N. Y.

Leland A. Moss, M.D., McMillen, Mich.; Cincinnati College of Medicine and Surgery, 1902; also a druggist; aged 41; died at his home, July 7, from the effects of a gunshot wound of the head, self-inflicted, it is believed, with suicidal intent, while despondent.

Guy Stewart Vinyard, M.D., Colorado Springs, Colo.; Denver and Gross Medical College, Denver, 1903; aged 40; formerly a Fellow of the American Medical Association; a member of the Colorado State Medical Society; died at his home, July 15.

Edward Barnwell Bangasser, M.D., Buffalo; University of Buffalo, 1913; aged 31; a member of the Medical Society of the State of New York; was drowned by the overturning of his automobile into a ditch, near South Dayton, N. Y., July 18.

James Louis Williamson, M.D., Milwaukee, Wis.; Northwestern University School, Chicago, 1881; aged 61; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of Wisconsin; died about July 16.

James Goravar Amerig Davies, M.D., Dalton, N. Y.; Druidic University of Maine, Lewiston, 1882; aged 79; a Fellow of the American Medical Association; died in Oakland, N. Y., April 12, from heart disease.

James B. Maclin, M.D., Shreveport, La.; Meharry Medical College, Nashville, Tenn., 1887; aged 56; the first colored practitioner of medicine and dentistry in Shreveport, died in Mercy Sanitarium in that city, July 3.

Edwin Nelson Mayberry, M.D., South Weymouth, Mass.; University of Vermont, Burlington, 1882; aged 60; a Fellow of the American Medical Association; died at his home, July 14, from cerebral hemorrhage.

John Francis Curlette, M.D., Monticello, N. Y.; New York University, New York City, 1889; aged 64; local surgeon of the New York, Ontario & Western Railway; died at his home, July 14, from septicemia.

Charles Henry Call, M.D., Greeley, Colo.; Harvard Medical School, 1881; aged 58; formerly a Fellow of the American Medical Association; died at his home, April 7, from an overdose of a narcotic.

Harry V. Lucas, M.D., Louisville, Ky.; University of Louisville, Ky., 1880; aged 66; for many years a practitioner and druggist of Louisville; died at his home, July 14, from organic heart disease.

Albert Eugene Greer, M.D., Brownstown, Ill.; Marion-Sims Medical College, St. Louis, 1895; aged 49; a Fellow of the American Medical Association; died at his home, July 3, from pneumonia.

Lucien F. Bachelder, Rockland, Maine (license, Maine, act of 1895); aged 81; a veteran of the Civil War; also a clergyman of the Methodist Episcopal Church; died at his home, July 10.

Samuel Birkbeck, M.D., Gratiot, Wis.; College of Physicians and Surgeons, Keokuk, Iowa, 1898; aged 50; a Fellow of the American Medical Association; died suddenly at his home, July 3.

Charles Miller Ginn, M.D., Dayton, Ohio; Cleveland-Pulte Medical College, Cleveland, 1899; aged 41; a member of the staff of Miami Valley Hospital; died at his home, July 13.

George Elmer Bushnell, M.D., Rochelle, Ill.; Hahnemann Medical College, Chicago, 1885; aged 52; formerly a Fellow of the American Medical Association; died at his home, July 17.

Ira Walton Marsteller, M.D., White Haven, Pa.; University of Vermont, Burlington, 1884; aged 58; for eighteen years school director; died at his home, July 11, from kidney disease.

Adolph E. Loberg, M.D., Minneapolis; University of Minnesota, Minneapolis, 1901; aged 41; a Fellow of the American Medical Association; died at his home, July 18, from pneumonia.

Hannah Leah Nichols Schmalling, M.D., Fulton, Ill.; University of Michigan, Ann Arbor, 1885; aged 54; a Fellow of the American Medical Association; died at her home, July 14.

Isaac Seldon Graves, M.D., Jermyn, Pa.; New York University, New York City, 1888; aged 57; a Fellow of the American Medical Association; died at his home, July 16.

Charles S. Castellaw, M.D., Fort Worth, Tex.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1903; aged 35; died in a sanatorium in Fort Worth, July 14.

Oscar Henry Barthel, M.D., Pocahontas, Iowa; Rush Medical College, 1885; aged 60; a member of the Iowa State Medical Society; died at his home, July 17.

Julius A. Roeder, M.D., Omaha Medical College, 1892; aged 68; also a druggist; died at the home of his mother in Omaha, July 13, from heart disease.

Ferre Joel Walker, M.D., Maquon, Ill.; College of Physicians and Surgeons, Keokuk, Ia., 1896; aged 51; died in Brunswick, Mo., April 13.

William Allen Dumbauld, M.D., Cartersville, Mo.; Cincinnati College of Medicine and Surgery, 1845; aged 70; died at his home, about July 9.

Richard Floyd Worth, M.D., San Benito, Tex.; Chicago Homeopathic Medical College, 1888; aged 53; died at his home, about July 23.

Walter J. Saunders, M.D., Wyoming, Pa.; Baltimore University, 1891; aged 62; died at his home in West Wyoming, July 15.

Correspondence

THE USE OF PAPER AS A SURGICAL DRESSING AND BANDAGE

To the Editor:—During the past six months we have been experimenting at the New York Orthopaedic Dispensary and Hospital with the use of paper as a surgical dressing, and our experiments there warrant me in making this preliminary report of its use in the hope that other surgeons may try it, that further experience may prove it to be a substitute for gauze, muslin, etc., and that its use will effect a great economy in the expense of our surgical work.

Among our experiments we have used sterilized newspapers in the dressing of clean wounds, and have found them perfectly satisfactory, causing no irritation and no disturbance whatever. We have also used various forms of paper, such as those used in making towels, toilet paper, table cloths, napkins, etc., in the dressing of clean wounds, and have had no trouble whatever. We have used sterilized newspapers also in the dressing of suppurating wounds, but it is believed doubtful if these are sufficiently absorbent for this purpose. It is believed, however, that further study from the manufacturer's standpoint will produce a paper sufficiently absorbent for suppurating wounds. We have used sterilized newspapers also as padding under plaster, with considerable saving, as cotton, lint and felt are very expensive. In the matter of bandages, there is not the slightest difficulty, as they can be made pliable and with sufficient tensile strength to be used for almost any purpose for which an ordinary bandage is used.

No attempt has been made to use paper as packing, as thus far we have found no paper that would not become disintegrated.

RUSSELL A. HIBBS, M.D., New York.

UNNECESSARY OPERATIONS

To the Editor:—Will you permit a humble medical and surgical practitioner, whose chief means of keeping even at the rear of the medical procession is through reading the better medical journals, to express her opinion as to one of the reasons why unnecessary operations are advised so frequently—fear of being considered out of date by fellow practitioners, and a conscientious desire to do all that may be done for the relief of patients. Had we the courage of our convictions, many of us of humble attainments would decline to operate or advise operation in debatable cases, but our literature is so emphatic that we fear to obtrude our opinion.

The remedy for this lies with our investigators, who should be less hasty in writing conclusions that may have to be revised.

Appendectomy for indefinite symptoms, tonsillectomy for remote affections, and intraspinal and intraventricular medication are mentioned merely to show how bewildered an ordinary surgeon may become on some of the debatable phases of these operations. Hasty publication by eminent authorities of conclusions drawn from incomplete data is the cause of many absurd and tragic operations.

JESSIE C. FARMER, M.D., Felton, Calif.

SHORTAGE OF SYNTHETIC DRUGS

To the Editor:—To facilitate the manufacture of synthetic drugs in this country and thus to relieve the shortage and reduce the exorbitant prices which have resulted from the war, the National Research Council has established a committee on synthetic drugs.

Having been asked to assume the chairmanship of the committee, I have selected, as my associates, M. Gomberg, of the University of Michigan; Roger Adams, of the University of Illinois, and W. A. Puckner, secretary of the Council on Pharmacy and Chemistry.

It being the purpose of the committee to aid in relieving the present shortage of synthetic drugs, its efforts will extend in two main directions: In the first place, to assemble reliable

information as to which drugs are really hard to obtain or, if obtainable, are sold at an exorbitant price. In the second place, to organize research work, especially in universities, and to assist manufacturers in working out the problems of the production, on a large scale, of synthetic drugs of a high degree of purity without great delay.

Physicians are cordially invited to notify W. A. Puckner, 535 North Dearborn Street, Chicago, of any difficulty they may find in procuring important synthetic drugs. It is essential that the committee obtain this information, because certain firms have been asserting that they can supply synthetics which, according to the reports of physicians and of pharmacists, are exceedingly scarce, are sold at an outrageous price, or are altogether unobtainable. In other words, the committee would like to have information from physicians and pharmacists, and not from self-interested dealers or agents.

JULIUS STIEGLITZ, Chicago.

[COMMENT.—The medical profession and the American manufacturers are to be congratulated that Professor Stieglitz, head of the Department of Chemistry of the University of Chicago, and one of the foremost organic chemists of the country, has assumed the chairmanship of this important committee—a committee which may be the means of permanently freeing us from dependence on Germany for many of our synthetic drugs. In order that the committee's energies may be wisely conserved, physicians and pharmacists should report any shortage of the synthetic drugs which they deem most important and which in the past have been imported.—ED.]

THE NEURASTHENIC AS A SOLDIER

To the Editor:—In a note in THE JOURNAL (July 28, 1917, p. 290) Sir William Osler warns examiners of recruits against certain defects which will render men unfit for service in the field, and mentions "the neurasthenic." This reminds me of facts also worthy of recognition in connection with the examination of recruits which deserve to supplement in a measure the caution given by Dr. Osler. A certain number of men of unstable brain and nervous system will present themselves who, while all surface indications seem favorable, still are especially apt, whenever brought under severe or strenuous conditions, to suffer a breakdown or collapse of brain and nervous system.

Many of the neurasthenics mentioned by Dr. Osler are also "psychasthenics." By this I mean persons lacking in power of adaptation to severe external conditions, such as necessarily occur in connection with active military service.

It is especially important to know the previous history of such men, especially from a neuropsychopathic standpoint, and to inquire carefully into any sickness or disability that may have affected them. They should in particular give an account of any sojourn in any hospital or medical institution, and supply the names of physicians who have advised or treated them in the past.

Individuals of the "moron" type often present an entirely satisfactory physical appearance, and require tests which will develop mental incapacity or deficiencies.

In these categories there are many young men coming from sedentary occupations who might be capable of certain forms of service in the home camps, as Sir William Osler suggests. With the discipline and outdoor life, these men will improve both mentally and physically, and will even render brilliant service after passing successfully through the "try out." But they ought never to be sent to the front.

In this connection, it is worthy of note that an important movement has been inaugurated by the American Neurological and the American Medico-Psychological Associations for establishing neuropsychopathic units to supplement the work of base hospitals by especial care and treatment of the neuroses and psychoses. Dr. Pearce Bailey of New York has charge of this work, and has appointed men in each state of the Union to cooperate. I understand that two or three complete units of this class have already been formed and are in readiness to take the field. Dr. Bailey's address is 50 Union Square, New York.

RICHARD DEWEY, M.D., Wauwatosa, Wis.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

SIGNS OF ADDICTION TO OPIUM

To the Editor:—During this stage of China's fight against opium, our hospital is often called on by the officials of the district to express its opinion as to whether or not a certain person is a user of opium or its derivatives. Do you know of any tests which might be of use to us in collecting this evidence?

G. L. HAGMAN, M.D.,
Nantungchow Christian Hospital, Nantungchow, Kiangsu, China.

ANSWER.—The confirmed opium eater usually has a sallow, pasty complexion, and is emaciated. He is restless, irritable and unable to remain quiet for any very long period of time. The mental condition, except when he is directly under the influence of the drug, is usually one of depression. The pupils, except when under the direct influence of the drug, are usually dilated, but sometimes unequally. Pseudoneuralgic pains are common, and notably gastric-intestinal symptoms, as gastralgia, vomiting and diarrhea, especially if the drug is withheld. The skin is wrinkled, dry and harsh, and may show numerous needle scars and abscesses in those addicted to the hypodermic use of the drug. In most instances the diagnosis must be made by a careful investigation of the patient's habits and history.

CLOTHING ALLOWANCE FOR BRITISH MEDICAL RESERVE OFFICERS

To the Editor:—I do not see why the War Department does not give the physician who is commissioned an officer in the Medical Reserve Corps an allowance to cover his initial outfit. I know that when England called on her physicians at the declaration of war, each man commissioned was given £50 for his outfit. Please publish this so I can see the opinions of other men, members of the Medical Reserve Corps. Kindly omit my name and address.

M. H. L.

ANSWER.—Although the writer—a member of the Medical Reserve Corps—asks to have his name omitted, we publish his letter because it calls attention to a fact that should be known, namely, that in Great Britain the temporary medical officers, corresponding to our Medical Reserve Corps officers, do receive an allowance; but it is £30—approximately \$150—not £50. Incidentally, the doctor also is allowed a gratuity of £60, or approximately \$300, at the termination of his term of service, if it has been satisfactory.

"SHUT YOUR MOUTH AND SAVE YOUR LIFE"

To the Editor:—The special article on "Medical Mobilization and the War" by Sir William Osler, Bart., refers to a certain pamphlet by Kit Catlin, one I would be pleased to have, as the title "Shut Your Mouth and Save Your Life" appeals to me as a good one. I should be pleased to know where it can be obtained. If you can supply me with it or give me the name of its publisher I should be grateful to you.

D. B. BUEHLER, M.D., Pretty Prairie, Kan.

ANSWER.—The book referred to is:

Catlin, George: *Breath of Life; or Malrespiration and its Effects Upon the Enjoyments and Life of Man*, New York, 1861, 76 pp. John Wiley & Sons.

The English edition was published under the title:

Shut Your Mouth and Save Your Life, London, Trübner & Co., 1869.

The book is out of print, but can probably be obtained second-hand.

Protection from the Pseudoscientist.—The government has at last begun to realize that it is its duty to protect the masses from the medical quack. Your speaker is of the opinion that the masses need equal protection from the irresponsible literateur or politician who makes it his business to spread the seed of fanaticism and emotionalism by a claim of knowledge of biology which he does not possess. The cure for this form of pernicious mischief is the spread of knowledge of the exact sciences which will put an end to the business of the pseudoscientist.—Dr. Jacques Loeb, *Science*, Jan. 26, 1917.

Book Notices

REST, SUGGESTION AND OTHER THERAPEUTIC MEASURES IN NERVOUS AND MENTAL DISEASES. By Francis X. Dercum, A.M., M.D., Ph.D., Professor of Nervous and Mental Diseases in the Jefferson Medical College, Philadelphia. Second Edition. Cloth. Price, \$3.50 net. Pp. 395. Philadelphia: P. Blakiston's Son & Co., 1917.

As the author states in the preface, this work is a reprint of Volume VIII of Solis-Cohen's "System of Physiologic Therapeutics," largely rewritten and revised. It is an epitome of the author's ideas of the neuroses and psychoses and their treatment. In the main, his ideas are sound. Here and there one might call them old-fashioned. But especially in the sections on treatment will the reader find a rich fund of common-sense directions obviously based on wide experience. Not all neurologists would agree with the author in the great preponderance he gives to neurasthenia as a "fatigue neurosis" compared with his scant consideration of psychasthenia; but when it comes to practical advice as to carrying out the rest cure and the management of nervous patients, there can be no difference of opinion. The author knows what he is talking about. The book contains many hints or pointers familiar to neurologists but seldom seen in print. Finally there is a consideration of suggestion, hypnotism, mesmerism, Christian Science, etc., and some twenty pages devoted to a criticism of psychoanalysis. The sections on hypnotism and the like are largely of historical interest, though the author emphasizes his radical opposition to hypnotism as a therapeutic measure. The criticism of psychoanalysis is a fair statement of the origin of this "cult," as the author calls it, and of its weaknesses, inconsistencies and possible dangers. His attitude may be said to be that of an alien enemy.

NOTES ON MILITARY ORTHOPAEDICS. By Colonel Robert Jones, C.B., Inspector of Military Orthopaedics, Army Medical Service. With an Introductory Note by Surgeon-General Sir Alfred Keogh, G.C.B., Director-General, Army Medical Service. Cloth. Price, \$1.25. Pp. 132, with 128 illustrations. New York: Cassell & Co., Ltd., 1917.

This book is composed of a series of articles which appeared in the *British Medical Journal* during 1916. Col. Robert Jones is the leading orthopedic surgeon of England, and, it will be remembered, is the head of the unit of twenty orthopedic surgeons who recently went from this country to do war work in England.

There is an introductory note by Surgeon-General Keogh, who calls attention to the importance of the after-treatment of military surgical cases, in a way making the disabled soldiers an asset rather than a permanent liability to the community.

The chapters concern: (1) positions of election for ankylosis following gunshot injuries of joints; (2) suture of nerves, and alternative methods of treatment by transplantation of tendon; (3) the soldier's foot, and the treatment of common deformities of the foot; (4) malunited and ununited fractures; (5) transplantation of bone, and some uses of the bone graft; (6) disabilities of the knee-joint, and (7) the mechanical treatment of fractures under war conditions. By far the most interesting and important chapter for the ordinary practitioner and for the medical officer in general is the third chapter. This is very practical and easily understood. Particularly noteworthy is the statement of the qualities of a good marching boot, which follows:

A good marching boot should, therefore, leave the foot free to adapt itself to altering conditions of balance and strain.

1. The boot should fit comfortably and closely round the heel and ankle so as to avoid lifting of the heel in the boot, which results in chafing, ending in a blister of the heel.

2. To save the arch from giving way and to avoid flat-foot, the heel of the boot should be slightly higher on the inner side than on the outer.

3. The inner side of the boot should be straight right up to the tip of the big toe—that is to say, the inner sides of the two boots should be parallel to each other all the way along to the great toe. There should be no trace of pointedness, for pointedness tends to produce hallux valgus and helps to cause flat-foot.

4. The sole of the boot inside should be as broad as the foot with the weight of the body on it. In the case of a soldier it should be as broad as the foot is when carrying the weight of the soldier in full marching order—that is to say, the weight of the man himself, his pack, and all his accoutrements.

5. The upper of the boot should not compress the fore part of the foot in any way. The toecap should be stiff and deep enough to clear the toes and allow free movement inside the boot. This stiffening should run back on the inner side of the boot to a point behind the metatarsophalangeal joint of the great toe.

6. The boot should be long enough to allow the foot to extend to its full length when the soldier is carrying his pack and all his accouterments.

These last points, dealing with freedom of movement of the fore part of the foot, are essential to the full development of the small muscles of the foot on which the soldier's endurance and marching powers depend to so large an extent.

Corns do not develop in a foot encased in a boot which allows free play to the fore part of the foot. The regimental chiropodist is a most valuable asset, but his existence is, *ipso facto*, a confession that the fit of the men's boots is not all it might and ought to be. The man should not be allowed to judge of the tightness of his boot when his foot is cool. On the contrary, boots should be served out when men have come in from a long route march, and their feet are engorged with blood, and therefore at their largest. If this were done, interference with the circulation of the foot by the boot would less often occur. When a foot swells after a march, the swelling is practically all in the fore part, not round the heel. To serve out boots, therefore, after a route march would not prevent a man from choosing a pair which fitted properly round the heel and ankle.

ACUTE POLIOMYELITIS. By George Draper, M.D., Associate in Medicine, College of Physicians and Surgeons, Columbia University. With a Foreword by Simon Flexner. Cloth. Price, \$1.50 net. Pp. 149, with 19 illustrations. Philadelphia: P. Blakiston's Son & Co., 1917.

A foreword by Dr. Simon Flexner recommends Draper's book as a practical guide for the diagnosis, care and specific treatment of epidemic poliomyelitis. Dr. Draper has been engaged in poliomyelitis work for several years, and is therefore qualified to speak as one who has practical knowledge of the subject. In the first chapter the author gives a history of the disease and then considers in regular order etiology, epidemiology, experimental poliomyelitis, pathology, classification of the types of poliomyelitis, symptoms, clinical pathology, the paralyses, prognosis and treatment. The last part of the book is devoted to case reports with discussion. Some of this material appeared in Dr. Draper's recent extensive article in *THE JOURNAL*. As to the new organism recently described, the author says:

Whether or not the polymorphous organism described by Mathers, Rosenow, and others and having affinities with the streptococcus is the same biological entity as that of Flexner and Noguchi is a question which the accumulative weight of scientific observation and experiment will determine. At the present writing adequate proof of a relationship has not been brought.

The book can be especially recommended to those physicians who feel the necessity of making a special study of this disease.

RATIONAL SEX ETHICS. A Physiological and Psychological Study of the Sex Lives of Normal Men and Women, with Suggestions for a Rational Sex Hygiene. By W. F. Robie, A.B., M.D., Superintendent Pine Terrace, Baldwinville, Mass. Cloth. Price, \$3.50 net. Pp. 356. Boston: Richard G. Badger, 1916.

In the present flood of literature on sex topics, it is refreshing to find an author who writes from the point of view of the general practitioner and who has endeavored to secure his material from normal persons rather than from the abnormal, the eccentric or the criminal classes. Dr. Robie seeks to discuss some of the perplexing problems of sex relations in a common sense way without obscuring his meaning by the complex terminology and fantastic theories of many writers in this field. He is even able to discuss psychoanalysis dispassionately and, without going to the extremes of the Freudian enthusiasts, to recognize the value of many of Freud's theories. The numerous case histories given are well selected as illustrations, and in many cases will be recognized as analogous to those encountered by most practicing physicians. While not intended to be either complete or final, Dr. Robie's book can hardly be overlooked by those interested in this subject.

SOME PERSONAL RECOLLECTIONS OF DR. JANEWAY. By James Bayard Clark. Cloth. Price, \$1. Pp. 36, with 1 illustration. New York: C. P. Putnam's Sons, 1917.

In this little book the author, a former assistant of Dr. Janeway, gives some personal incidents and memories of the life of the noted pathologist and sanitarian who died in 1911. The memoir will be of decided interest to those who knew Dr. Janeway.

Medicolegal

Classification of Prostatitis Regardless of How Caused

(*Bartallotte vs. Commercial Casualty Insurance Co.* (N. Y.), 163 N. Y. Supp. 95)

The Supreme Court of New York, Appellate Term, First Department, reverses a judgment entered in favor of the plaintiff who, having had prostatitis, sought to recover on a health insurance policy which provided: "The insurance hereunder shall not cover any disability . . . sustained by the insured . . . which shall result directly or indirectly from venereal diseases, childbirth, or any disease of the generative organs or their appendages, or any disease or injury, fatal or nonfatal, not common to both sexes, anything herein to the contrary notwithstanding." The court says that the defense was that the plaintiff's disability was due to an illness not within the terms of the policy, being a disease of a generative organ (the prostate gland) not common to both sexes. The contention of the plaintiff was that the disease of the prostate gland was due primarily to a germ infection of the nose and throat, and therefore came within the general terms of the policy, and not within the exemption set forth in the provision quoted above. This view, apparently adopted by the trial judge in directing judgment for the plaintiff, was not supported by the proof. The evidence was uncontradicted that, whatever its remote cause, the immediate illness which caused the disability of the assured was prostatitis, a disease of the prostate gland, a generative organ, not common to both sexes. The physician whose preliminary report was filed by the plaintiff with the defendant testified that the plaintiff had acute prostatitis, and that he had a high fever and painful symptoms, a condition due to urinary trouble. On further examination, the physician stated that he had been told that, a week before he examined him, the plaintiff had been suffering from the nose and throat; that at that time, on examining the plaintiff's nose and throat, he found symptoms of follicular tonsillitis, and rhinitis in the nose, and stated further: "My opinion was that this infection was a secondary infection from throat trouble, and it traveled down to the gland." Under the terms of the policy, it was immaterial what caused the prostatitis, whether the causes were external or internal, hereditary, or an incident of old age or early dissipation. The exemption was as to disability resulting from such diseases. The motion made by defendant's counsel at the close of the case to dismiss the complaint on the ground that the plaintiff had failed to make out a cause of action should have been granted, the proof being conclusive that the plaintiff's disability was due to an illness for which, under the policy, the plaintiff had no right to recovery.

Insufficient Evidence of Malpractice in Treatment of Fracture

(*Snearly vs. McCarthy* (Ia.), 161 N. W. R. 108)

The Supreme Court of Iowa affirms a judgment in favor of the defendant, who was sued for damages for alleged malpractice in the treatment of a simple oblique fracture of the femur of the plaintiff's right leg. The court says that while the method of treatment adopted by the defendant was fully pointed out and described in the testimony, no witness was called by the plaintiff to show that this was not regarded as proper practice by the profession in the locality where the defendant practiced. If there was any such testimony, it was to be inferred from what the defendant did, or failed to do, viewed from the standpoint of a nonexpert, or deduced from what some of the medical experts said while on the stand. As a general rule, it may be safely affirmed that in matter requiring special skill and training it is not permissible for laymen as nonexperts to set up any artificial standards as to methods of treatment. This is especially true in surgery; for in that field neither courts nor juries are presumed to know more regarding methods of treatment than ordinary laymen, and that is practically nothing. After hearing the theories, deductions, and scientific facts from experts, both

judge and jury must often oppose one set of opinions against another and determine which is the more reasonable, but they cannot, without some guide, presume to fix any standard on which to determine the correctness of any kind of treatment. It was claimed that the defendant was negligent in not using the Roentgen ray before he did anything toward reducing the fracture, but the testimony showed that it is entirely optional with physicians and surgeons whether to use the Roentgen ray or not in the first instance. The purpose, of course, in using it is to diagnose the case, and if this may properly be done without the use of this modern appliance, then no negligence is to be inferred from failure to use it. Moreover, the record here showed that the nature of the fracture was discovered when the defendant was first called; hence a Roentgen-ray examination would have added nothing. There was a nonunion of the bones for some reason which the experts failed to explain, except to say that nature fails sometimes to make the necessary union, without any fault being attributed to the operator. This theory was fortified by the further fact that, after the plaintiff had been taken to Chicago and placed in the hands of one of the most skilful operators in the country, he, too, had to resort to three operations before he secured a union, and the shortening of the limb resulted after he took the case in charge. It did not appear that this final shortening of the limb was due to anything which the defendant did or neglected to do. It might be true, of course, that he should be held liable for the delayed union, or for pain and suffering and loss of time, although not responsible for the permanent shortening of the limb; but to hold him liable for this, it must be shown that these things resulted proximately from his lack of care in handling the case. As the plaintiff selected the grounds of negligence on which he would stand, stating them with great particularity, and nowhere claimed that the defendant failed to give him the necessary constitutional treatment to aid nature in throwing out the callous or bony substance which cements the ends of broken bones together, that proposition must be eliminated from the case. Nor, after the plaintiff had been permitted to show that some years before he had suffered another fracture—one of the bones below the knee, was there error in denying him the right to show how long he was disabled by reason of that other fracture, as the fractures were not similar in kind or nature.

Consideration for Promise to Pay for Services for Another

(*Baumhauer vs. McGill (Ala.)*, 73 So. R. 753)

The Court of Appeals of Alabama, on account of what it holds was an erroneous instruction given to the jury at the instance of the defendant, reverses a judgment that was rendered in his favor in this action on a promise to pay for medical services for another. The instruction read: "Gentlemen of the jury, you must be reasonably satisfied from the evidence in this case that J. I. McGill promised to pay Dr. Baumhauer for the services rendered for Austin Sims in this case, and that the promise grew out of a consideration moving to said McGill; otherwise you must find for the defendant." The court says that the plaintiff based his right of recovery on a contract claimed to have been made by him directly with the defendant, whereby the defendant contracted for him to render medical services to one Austin Sims, the beneficiary of the defendant's bounty. In this aspect of the case, it was not, as charged, a sine qua non or indispensable condition to recovery "that the promise grew out of a consideration moving to said McGill"; it was sufficient though the consideration did not "move" or insure to the benefit of McGill, but for the benefit of a party not privy to the contract. It is thus expressed in 1 Elliott on Contracts, Section 252: "While the consideration must move from the promisee at the instance of the promisor, it is not necessary that the promisor be the recipient of it. It need not pass directly to the latter, but under the prevailing rule may move from the promise to a third person at the promisor's request." The detriment to the promisee (Dr. Baumhauer) in the performance of services and loss of time was a sufficiently valuable consideration. In view of the erroneous instruction, the judgment for the defendant must be reversed, and the cause remanded for another trial.

Society Proceedings

COMING MEETINGS

Michigan State Medical Society, Battle Creek, Sept. 4-6.

AMERICAN ASSOCIATION OF ANESTHETISTS

Fifth Annual Meeting, held in New York, June 2, 1917

Dr. F. W. NAGLE, Vice President, in the Chair

Officers Elected

The following officers were elected for the ensuing year: president, F. W. Nagle, Montreal; vice presidents, Albert H. Miller, Providence, R. I.; Isabella C. Herb, Chicago, and Freeman Allen, Boston; secretary-treasurer, James T. Gwathmey, New York.

A Comparative Study of Blood Pressure During Anesthesia

DR. ALBERT H. MILLER, Providence, R. I.: A comparative study of blood pressure was made under nitrous oxid-oxygen anesthesia. Anesthetic dosage and vapor tensions are comparatively stable, but occasional instances of personal susceptibility and recalcitrance were noted. The dosage required to maintain a definite degree of anesthesia increases in proportion to the severity of the operative procedure. The requisite dosage for anesthesia during shock is greatly diminished, but this diminution of dosage bears no direct relation to the blood pressure. Excitement and examination, preliminary to operation, increase blood pressure. Cyanosis, retching and vomiting during anesthesia all cause an immediate rise of from 10 to 30 mm. The systolic pressure is increased in the lithotomy position. Overdosage required by recalcitrant patients does not affect blood pressure materially, whereas overdosage necessitated by operative trauma makes for shock. McKesson's rule is of the greatest practical value. He characterizes typical shock by a diastolic pressure of 60 mm. or less, a pulse pressure of 20 and a pulse rate above 120. If this state is allowed to continue half an hour, the patient will not recover. Serious operations under local anesthesia are regularly attended with wide but transient variations in both systolic and diastolic pressure. Spinal anesthesia is attended by falls in both pressures of alarming proportions.

Effects of Anesthesia on the Blood Volume and Its Relation to the Production of Shock

DR. ALBERT A. EPSTEIN, New York: Most authorities now recognize that the most striking pathologic feature of shock is the reduction of the total quantity of blood in the body. Anesthesia plays an important rôle in the production of shock because, of itself, it causes a prompt and considerable reduction in the blood volume. While pursuing researches on the blood sugar changes in experimental diabetes, I was forced to the conclusion that the hyperglycemia observed under operative conditions was to some extent due to a concentration of the blood, caused by the reduction of the blood volume. Animal experiments were made on forty-one cats, under anesthesia, some with, others without operative interference. Susceptible animals show a prompt reaction in the blood volume, while in refractory animals the changes in blood volume were insignificant. Experiments were performed to show that this blood volume reduction is not due to concentration of cellular content. While increased salivation and mucous secretion as well as sweating may, in a measure, account for some of the reduction in blood volume under anesthesia, it seems probable that abstraction of the fluid by the tissues, from the blood, plays the major part in the production of the phenomenon observed. The occurrence of acidosis during anesthesia and the mobilization of lipoids favor development of a condition in the tissues which renders them hydrophilic, that is, capable of absorbing fluid. The fact that refractory animals show the slightest reaction would rather rule out acapnia as an etiologic factor. The reduction in blood volume, in animals susceptible to anesthesia, occurs promptly and is slightly increased by operation. Mere prolongation of anesthesia does not materially affect the reaction. Recovery from the anes-

thetia is accompanied by a return of the blood volume to normal.

Effects of Ether Anesthesia and of Visceral Trauma, as Shown by Vasomotor and Blood Pressure Changes

DR. WALDEN E. MUNS, Columbia, Mo.: In a series of experiments on dogs it was found that (1) ordinary third stage ether anesthesia prolonged beyond one hour results in marked vasodilatation of peripheral vessels; (2) there is a direct relationship between the condition of the vasomotor control and the blood pressure, and (3) the end-result of ether depression is loss of vasomotor function, and death. The normal tone and resistance in the arteries were altogether or partly destroyed in all cases, and the blood pressure lowering effect of this one factor, obtaining throughout all of the periphery, was tremendous. It is evident that as half the cases showed a decided and fatal fall in blood pressure, while the other half recorded a decided maintenance of pressure to the time of death, the normal compensatory reaction of the heart to the blood pressure lowering tendency of the peripheral dilatation must be taken into consideration. While the heart beat did not increase in any instance in rate, there was a decided increase of ventricular output, an increase great enough to overcome the hypostatic effect of the peripheral dilatation. If the heart fails to show this compensatory reaction, because of organic disease, or too early response of the nervous system to the effect of the anesthetic, the blood pressure must fall. The results of a series of intestinal trauma experiments showed that: (1) manipulation of the intestine brings about a vasoconstriction, and (2) there is a relationship between this vasoconstriction and the blood pressure. Thus it is apparent, in the light of these results, that an anesthetic, such as ether, and an irritation of the abdominal viscera, produce two different kinds of stimuli. The anesthetic first excites and then depresses, the depression being its essential and marked effect, and if too prolonged it results in total functional incapacity. The effect of visceral irritation is wholly excitatory, being mechanical. When this irritation becomes too severe or is continued too long, the summated excitant stimuli lead to overactivity and fatigue, and the end of fatigue is exhaustion. Thus both the anesthetic and the visceral injures may lead to complete depression or complete exhaustion, respectively. Either means complete functional incapacity. When sensory stimuli and the anesthetic are exhibited together, there is one period when the excitation from the surgical technic and the depression from the drug are pitted against each other to the good of the patient. If the anesthetic and its neutralizing irritation are continued too long, or are of undue severity, the two antagonists become allies in effect and bring about a much quicker collapse. Thus the syndrome known as postoperative shock may be considered a combination of the effects of excitation and depression, and varies directly with the interaction of these two factors. If the prevention of postoperative shock depends on a proper balance between the two types of stimuli, then both surgeon and anesthetist should quite properly understand such relationship and so govern the interaction of the stimuli that they will not be too severe, too long continued or too out of balance. It is also obvious that postoperative ether depression must be handled in a manner different from exhaustion from sensory shock.

DISCUSSION

DR. S. J. MELTZER, New York: Undoubtedly there is something in Henderson's contention that acapnia produces shock and that rebreathing is a proper form of treatment. But not all physiologists accept his views, and I question whether the decreased carbon dioxid content causes shock or shock causes the decreased carbon dioxid content. Similarly, it would be difficult to determine whether the loss of blood volume causes shock or shock causes the decreased blood volume. With regard to recovery following low blood pressure, systolic or diastolic, in experiments on animals I have found that irrespective of pressures as low as 20 systolic, if respiration could be maintained, all animals recovered. Life is, after all, dependent on the integrity of respiration and circulation, but the latter will withstand more variation

than the former; in this connection it must always be remembered that ether paralyzes the peripheral nerve centers, and respiration is much less than normal during anesthesia. Animals will recover from nine or even thirty-six hours of anesthesia, if respiration is sufficiently well maintained. The control of this one factor so important in the preservation of life assists in controlling the other.

DR. JAMES T. GWATHMEY, New York: In working with one of our surgeons, it has been my custom to use saline hypodermoclysis at the beginning of each operative procedure that will last an hour or more. This preliminary hypodermoclysis enables the surgeon to obviate the occurrence of shock, and 95 per cent. of the patients so handled come off the operating table with a pulse of 72, normal respiration, and in a most favorable condition for recovery. With regard to the rôle of the anesthesia in precipitating acidosis: Series of guinea-pigs have been anesthetized with ether-air and ether-oxygen, some receiving preliminary sodium bicarbonate alkalization. Those pigs not receiving the sodium bicarbonate were all acidosed, whereas those which received the sodium bicarbonate showed normal or raised alkalinity of the blood. Further, pigs anesthetized with ether-oxygen showed a higher percentage of alkalinity than those anesthetized with ether-air.

DR. E. I. MCKESSON, Toledo, Ohio: In regard to the question of cardiac compensation, I have seen a number of cases in which the systolic blood pressure has been reduced 40, 50 or 60 mm. for a few moments, and the patients recovered; but when extremely low pressures have persisted for from twenty to thirty minutes, the longer they continued the less likely was the patient's recovery. These patients may not die for two or three days, but they do die. They seem unable to recover cardiac tone. When diastolic blood pressure is reduced, but the systolic pressure is maintained at practically the normal, we have a cardiac compensation which saves the life of the patient. The heart moves a larger volume of blood at each stroke, and thus sustains systolic pressure. The double pressure maintains circulation, and saves the patient, even though the diastolic pressure, which is the measure of the hypotonus, has indicated that the patient is approaching, but has not yet reached the stage of surgical shock. When the heart from organic disease, severe strain, infection or rapid action has been worn out, or worn to the point at which it will no longer compensate, we have a crisis in which the patient is apt to go into surgical shock and not recover. It may take several days before the patient will finally succumb to heart exhaustion.

Anesthesia in Orthopedic Surgery

DR. WALTER G. ELMER, Philadelphia: In orthopedic surgery, whether the operation is to be of short or long duration, we keep our patients very lightly anesthetized. The anesthetic is not continued for the application of the plaster-of-Paris dressing. Thus a double osteotomy for knockknee requires not more than six minutes of anesthesia and operating, while the plaster work lasts half an hour; but the child receives no ether during this period, and on account of this discreet use of anesthesia, we almost never see any of our little patients go into a state of shock. Anesthesia, however deep, does not block subconscious pain. In weak and delicate children a slight amount of conscious pain may act as a stimulant, whereas severe pain, necessarily inflicted under anesthesia, combined with the effects of profound anesthesia, may lead to collapse. Children with tuberculosis of the spine on whom a bone grafting operation is to be done are hazardous risks. These children, while conscious and in control of their voluntary muscles, are able to protect themselves from harm while being handled; but when relaxed and unconscious under ether, this power of self-protection is lost. The child's body is limp and unresisting. Care in handling is of the utmost importance, as an abscess may be ruptured at the seat of the disease, causing sudden or ultimate death. Even the spine itself may buckle and be broken. These children should be handled as carefully as though they were made of fragile glass, and from the time the anesthetic is started, they should be held motionless on a rigid support which fixes the spine from the head to the pelvis.

DISCUSSION

DR. JOHN R. WORLEY, Dallas, Texas: In view of the damage that may result from buckling of the spine under the relaxation of even light ether anesthesia, the question arises as to whether nitrous oxid-oxygen anesthesia is not preferable for orthopedic surgery. While supposedly contraindicated in young children, specialists in anesthesia are finding nitrous oxid-oxygen increasingly available even in infants. I have seen a number of children, under a few weeks of age, kept under perfect nitrous oxid-oxygen anesthesia for orthopedic surgery and other prolonged operations, without any untoward consequences.

Vascular Reflexes with Various Tensions of Ether Vapor

DR. FRANK C. MANN, Rochester, Minn.: In general, the physiologic phenomena occurring under ether were found to be remarkably constant at the same tension in different dogs. While the effects of different tensions on blood pressure, the vascular reflexes, respiration and the respiratory reflexes were not always progressive or absolutely constant, yet there were certain narrow limits of tension within which certain changes always occurred. With a more accurately calibrated apparatus (than the one experimented with) I believe all the reflexes will be found to be proportionate to the anesthetic tension used. It was found that the lowest tension compatible with operative work on the dog was approximately 36. The optimum tensions for operative work are probably between 38 and 45. While blood pressure and respiration may both be depressed greatly, it seems impossible to kill an animal with any tension within these limits, provided time is not allowed to become a factor. When the tension is increased above 48, the animal becomes profoundly anesthetized, and respiration is liable to fail and blood pressure to fall to a very low level. Tensions above 60 are fatal for the dog. The corneal reflex does not persist at tensions above 45. Blood pressure may remain practically the same or be successively slightly decreased at each increase of tension up to 48. It is always greatly decreased by tensions at or over 50. It reaches zero under tensions between 50 and 60. The pressor vascular reflex produced by stimulation of the central end of the vagus is greatest at tensions between 36 and 45. It is decreased under tensions above 45, although a well-marked rise usually occurs under all tensions up to 48. It is either absent or only barely perceptible at a tension of 50, and rarely present at all above this tension. The pressor vascular reflex produced by stimulation of the central end of the sciatic is depressed by all tension above 45 and does not persist at tensions above 50. The pressor reflex of the sciatic seems to be depressed more greatly by increased tension than that of the vagus. In the instances in which it was possible to study the depressor reflex, it appeared to parallel quite closely the pressor reflex in the same nerve under the same tensions, although it did not persist under quite as high tensions. Respiration usually ceases under a slightly lower tension than the pressor vascular reflex of the vagus disappears, although either one may fail slightly before the other.

DISCUSSION

DR. F. W. NAGLE, Montreal: Clinically I have noted the same difference in the calibration of the anethetometer that Dr. Mann noted in comparisons of tensions with the gas balance. In using the Connell apparatus during the past year I have utilized pressures from 50 to 60, the lower pressure providing an efficient anesthesia only for children or very weak patients.

DR. S. J. MELTZER, New York: While it has been stated that the same tension of ether in all individuals produces the same effects, it must be understood that, no matter how accurately an apparatus has been made, animals and persons vary in their susceptibility to anesthetics, and consequently the biologic element in percentage methods of anesthesia remains variable and occasionally disconcerting. The apparatus is reliable enough, but the individual reaction remains unstable. Thus tensions and pressures can only be approximated in relation to their usual results.

DR. B. VAN HOUSEN, Chicago: Dr. Mann's investigations offer a scientific explanation why ether and chloroform, following scopolamin-morphin narcosis, should never be pushed to the point of abolishing reflexes. Should the reflexes become inadvertently abolished, the supplemental anesthetic must be withdrawn until they again become active.

DR. FRANK C. MANN, Rochester, Minn.: Working with a somewhat inaccurate apparatus makes my conclusions open to question; but I feel justified in holding that within limited range of tensions you get the same phenomena in all individuals. In animal experimentation one can readily sense the variations in response to different tensions, and I believe it can be established, with a more accurate adjustment of the apparatus, that within limited range of tensions, all animals of a species will respond similarly.

(To be continued)

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Anatomy, Philadelphia

July, XXII, No. 1

- 1 Factors Involved in Excavation of Cavities in Cartilaginous Capsule of Ear in Human Embryo. G. L. Streeter, Baltimore.—p. 1.
- 2 Metopism. L. Bolk, Amsterdam.—p. 27.
- 3 Frequency of Localized Anomalies in Human Embryos and Infants at Birth. F. P. Mall.—p. 49.
- 4 Cytologic Observations on Behavior of Chicken Bone Marrow in Plasma Medium. R. Erdmann, Princeton, N. J.—p. 73.
- 5 Relationships and Histogenesis of Thymus-Like Structures in Ammocetes. I. E. Wallin, Milwaukee.—p. 127.

American Review of Tuberculosis, Baltimore

July, I, No. 5

- 6 *War Tuberculosis Program for Nation. H. M. Biggs.—p. 257.
- 7 Lessons from Canada's War Experiences with Tuberculosis. J. H. Elliott, Toronto.—p. 267.
- 8 Prognosis in Tuberculosis from Standpoint of Occurrence of Hemoptysis and Tubercle Bacilli in Sputum. F. H. Heise, Trudeau, N. Y.—p. 280.
- 9 Study of Signs and Symptoms of Automatic Disturbance Occurring in Pulmonary Tuberculosis. M. S. Cohen, Philadelphia.—p. 289.
6. War Tuberculosis Program.—It is suggested by Biggs that the services of voluntary experts in tuberculosis be employed in various parts of the country in the examination of recruits for the army who show any signs or symptoms suggestive of pulmonary disease, or in whom the history indicates its possible existence. And that an expert in the physical examination of the chest should make an examination before enrolling an applicant whose history shows that he has at any previous time had any illness resembling in character pulmonary tuberculosis; who gives a history at any previous time of an attack of pneumonia or pleurisy; whose history shows that one or more members of his immediate family (father, mother, brother, sister, etc.) has had pulmonary tuberculosis, or died of this disease; every man with a flat chest whose weight as compared with his height is 15 per cent. below the normal; every man who gives a history of chronic catarrh or who has a cough or any symptoms of any disease in the chest; every man in whom any abnormal physical signs of any kind are found in the chest. A careful history of previous illnesses should be taken in the case of every recruit, and preserved. This history should also include the history of his immediate family as to typhoid. (In the latter case if the man has suffered from typhoid the Widal test and an examination of the urine and feces for typhoid bacilli should be made). In any instances in which there is a cough with sputum, the sputum should be examined, and, if negative, it should be reexamined at least two or three times. Any man with even a very limited amount of pulmonary tuberculosis that is latent or arrested, is almost certain to break down under the physical strain of military training

and army life and a focus of disease previously latent or arrested will almost certainly become active. Systematic and complete periodic reexaminations should be made of all troops within three months after enrolment and at intervals of three months thereafter.

Every soldier who has had a cough for a period of two weeks, or any other symptom of pulmonary disease, or whose general physical condition has undergone a serious deterioration, should, if necessary, be isolated and referred to an expert for reexamination, and every soldier showing any definite signs or symptoms suggestive of pulmonary disease (when a positive diagnosis is not possible) should be placed under expert observation until a positive diagnosis can be made, or until the existence of pulmonary tuberculosis can definitely be excluded. Cases in which a positive diagnosis of pulmonary tuberculosis has been made should receive sanatorium or hospital treatment, preferably in institutions located in their home states, since homesickness is likely to counteract the beneficial effects of climate in remote localities. It is also recommended that an educational campaign on matters relating to the conservation of the health of troops be carried on in connection with all military training camps.

Archives of Internal Medicine, Chicago

July, XX, No. 1

- 10 *Pulse Flow in Brachial Artery. Influence of Certain Drugs. A. W. Hewlett, San Francisco.—p. 1.
- 11 *Study of Case of Diabetes Insipidus with Special Reference to Mechanism of Diuresis and of Action of Pituitary Extract on It. C. D. Christie and G. N. Stewart, Cleveland.—p. 10.
- 12 *Multiple Hemangiomas of Skin Associated with Dyspituitarism. G. D. Head, Minneapolis.—p. 24.
- 13 *Phthisis Pulmonalis and Other Forms of Intrathoracic Tuberculosis. W. A. Gekler, Chicago.—p. 32.
- 14 Study of Small Outbreak of Poliomyelitis in Apartment House, Occurring in Course of Epidemic in Large City. M. T. Burrows and E. A. Park, Baltimore.—p. 56.
- 15 *Influence of Splenectomy on Metabolism in Anemia. W. Denis, Boston.—p. 79.
- 16 Electrocardiogram; Its Relation to Cardiodynamic Events. C. J. Wiggers, New York.—p. 93.
- 17 *Studies of Blood in Beriberi. I. Yoshikawa, K. Yano and T. Nemoto, Tokyo.—p. 103.
- 18 Renal Function in Patients Convalescing from Acute Fevers. A. Bookman, New York.—p. 112.
- 19 *Two Cases of Heart Block Associated with High Blood Pressure. J. H. Musser, Jr., Philadelphia.—p. 127.
- 20 Studies in Variations of Tonus of Gastric Musculature in Health and Disease. B. B. Crohn and A. O. Wilensky, New York.—p. 145.

10. **Pulse Flow in Brachial Artery.**—Of the drugs studied by Hewlett, nitroglycerin, pituitary extract, veratrum viride, atropin, strophanthin, camphor, epinephrin and strychnin, only the first two produced definite and unmistakable alterations in the size and form of the volume pulse recorded from the arm of man. Nitroglycerin caused the pulse to become larger and more pointed, while pituitary extract had the opposite effect. The fall of pressure produced by adequate doses of veratrum viride is not accompanied by definite changes in the pulse form. In this respect the action of this drug differs essentially from the action of nitroglycerin.

11. **Diabetes Insipidus.**—The regulation of the excretion of water by the kidney was studied by Christie and Stewart in a case of diabetes insipidus. It was supposed that on account of the high degree of the diuresis, the great quantity of water ingested and transported, and the marked diminution in the excretion and ingestion caused by pituitary posterior lobe extract, the conditions for such a study would be unusually favorable. The conductivity of the blood serum was slightly increased and the relative volume of serum slightly diminished when the water excretion was lessened by posterior lobe extract or by water restriction. The blood flow in the hands seemed to be increased during the anti-diuretic action of posterior lobe extract. This, so far as it goes, supports the view that a vascular effect in the opposite direction on the renal vessels may be responsible for the diminution in the urine excretion. It was shown that under the action of posterior lobe extract the kidneys had the power of effecting a considerable concentration of the urine. Other kidney functional tests gave a normal response.

Accordingly, no indication was obtained that the condition was in any way associated with a pathologic alteration in the kidney.

12. **Hemangioma of Skin.**—The two cases reported by Head are remarkable examples of multiple hemangiomas of the skin associated with clinical manifestations of pituitary gland changes. In one case the skin of the scrotum, penis, inside of the thighs, arms, back and abdomen was affected. In the second case the skin of the scrotum and the mucous membranes of the lips and mouth were involved.

13. **Phthisis Pulmonalis and Intrathoracic Tuberculosis.**—Roentgen-ray examinations of over 600 patients, with all forms of tuberculosis, and clinical and laboratory observation of over 2,500 such cases form the basis of Gekler's paper. He says that the primary tuberculosis of children is the result of direct inoculation by inhalation of either dried bacilli or droplets containing bacilli. The primary lesion is usually small and very often near the surface of the lung. The regional bronchial gland involvement is invariably present, and the symptomatology is caused by the bronchial gland disease. The bronchial gland tuberculosis of the adult may be a flaring up of a latent process which dates back to childhood, or may be the result of the infection of an adult who has never before come in contact with tuberculosis. Here again the symptoms are caused by the glandular disease. Phthisis pulmonalis is a bronchogenic metastasis from a diseased gland. In rare instances it may be caused by the reinfection from without of an already infected individual. Pleural tuberculosis, as it is known clinically, either dry or with effusion, is also a metastasis from a preexisting focus in a bronchial gland or in the lungs themselves. Possibly this may in rare instances be caused by a reinfection from without. Miliary tuberculosis is a hematogenous metastasis which also very often comes from a bronchial gland. This hematogenous metastasis may be such as to result in a general miliary tuberculosis, or in an abortive miliary tuberculosis with local manifestations in the kidneys, joints, etc. Lymphangitis tuberculosa as a clinical entity is a rather uncommon condition, in Gekler's experience, and the true tuberculous granuloma of the lungs, and presents a very different type of disease than any of the others. It is usually benign, with a good prognosis.

In many instances, in the majority perhaps, tuberculosis is a cryptogenic disease, and the organic manifestations are due to bronchogenic or hematogenous metastasis. From the standpoint of therapy it is of immense importance, to discover the crypts and use such treatment as will inhibit metastasis, rather than try to treat the metastatic disease after it has once manifested itself. Particular stress is laid on the diagnosis of bronchial gland tuberculosis before the development of metastasis with its very uncertain outcome.

15. **Influence of Splenectomy on Metabolism in Anemia.**—Metabolism studies were conducted by Denis before and after operation in six cases of anemia in which splenectomy was performed. These included two cases of pernicious anemia, two of Banti's disease, one of family jaundice and one of "atypical splenic anemia." It was found that while, in some of the cases examined, changes in the excretion of certain bodies occurred, these changes were not constant; thus in two cases the uric acid output was much increased after operation, in one it was reduced, while in three no change was noted. In a series of observations on the phosphate excretion it was found that while in five cases the output of phosphates by the kidney was increased after operation, in one it was decreased. It is of interest to note that there is no relation between these changes in uric acid and phosphate excretion and the increase in leukocytes noted in the blood counts made during the postoperative period. A study of the sulphur excretion showed no changes, either relative or absolute, which could in any way be attributed to the removal of the spleen. Blood analyses did not confirm the findings of King and Eppinger regarding the increased content of fat in the blood after splenectomy; cholesterol was found to be more or less increased in every case.

17. **Studies of Blood in Beriberi.**—The authors found that the quantity of urea in the blood of beriberi patients shows,

in mild cases, no deviation from the normal, but in the majority of severe cases a marked increase. Ambard's coefficient is not infrequently higher than normal in beriberi; that is, the function excreting urea is frequently disturbed. The disturbance of the kidney function does not necessarily coincide with the gravity of the clinical manifestations. Even in cases in which the clinical symptoms are severe, if the function excreting urea is intact, the prognosis is hopeful. It is possible that cardiac failure in beriberi is due to an accumulation of some unknown toxic products in the blood, the elimination of which is coincident with the elimination of urea.

19. Heart Block Associated with High Blood Pressure.—Two cases of heart block with extremely high systolic pressure are recorded by Musser. Evidence is offered to show that this high pressure is dependent more on increased blood mass discharged by the left ventricle than on the associated cardiac hypertrophy and peripheral sclerosis.

Archives of Ophthalmology, New Rochelle, N. Y.

July, XLVI, No. 4

- 21 Ocular Anaphylaxis. Rôle of Uveal Pigment. A. C. Woods, Philadelphia.—p. 283.
- 22 Glioma Retinae and Atrophia Bulbi. D. F. O'Connor, Worcester, Mass.—p. 298.
- 23 Sarcoid of Eyelid. G. Derby, Boston.—p. 312.
- 24 Pressure Signs of Certain Intracranial Conditions Observable in Fundus of Eye. W. Sharpe, New York.—p. 320.
- 25 Report of One Hundred and Three Successive Cataract Operations; Eighty-Three in Capsule, Twenty with Capsulotomy. C. B. Medling, New York.—p. 331.
- 26 Ideal Intracapsular Cataract Extraction. L. Mills, Los Angeles.—p. 344.
- 27 Blockage of Trephine Opening after Elliot Operation. J. W. Stirling, Montreal, Canada.—p. 352.
- 28 Case of Unilateral Vertical Nystagmus Acquired in Adolescence, and caused by Accident. A. Lutz, Havana, Cuba.—p. 357.

Boston Medical and Surgical Journal

July 19, CLXXVII, No. 3

- 29 Use of Precipitin Test for Detection of Human Blood in Criminal Trials. W. R. Stokes and H. W. Stoner, Baltimore.—p. 65.
- 30 Syphilis in Internal Medicine. W. P. Boardman, Boston.—p. 72.
- 31 *Comparison of Several Methods of Specific Early Treatment of Acute Anterior Poliomyelitis. H. Ulrich, Boston.—p. 78.
- 32 Technic and Interpretation of Dental Roentgenograms. H. McIntosh, Boston.—p. 84.
- 33 Preparation of Animal Food Proteins for Anaphylactic Tests. R. P. Wodehouse and J. M. D. Olmsted, Boston.—p. 85.
- 34 *Body Types in Epileptics. M. B. Hodskins, Palmer.—p. 87.

31. Several Methods in Treatment of Poliomyelitis.—The 120 cases studied by Ulrich were divided into six groups, each group being treated in a different manner. Group I was treated with three intraspinal injections of immune serum; Group II was treated similarly with normal serum; cases of Group III were injected with their own spinal fluids (auto-therapy—Duncan); Group IV comprised cases on which the effect of simple withdrawal of spinal fluid was tested; Group V received no specific treatment; Group VI includes cases of which one was of doubtful diagnosis, one died of pneumonia, and the others were moribund on admission. The immediate effects showed no apparent differences in the various series. A comparison of the results obtained shows that none of the measures used had any favorable influence whatever on the progress or outcome of a single case. Ulrich concludes, therefore, that not only must the various measures employed in this study be looked on as useless, at least after the onset of paralysis and under the conditions under which the investigation was carried out, but the manipulation of the sufferers necessarily attendant on lumbar puncture causes great pain, and would seem to be permanently harmful in view of the great need of rest during the early stage of the disease.

34. Body Types in Epileptics.—One hundred and fifteen patients are included in Hodskins' study, which, on analysis, gave forty-seven carnivores, 40.8 per cent.; eight herbivores, 6 per cent., and sixty normals, 52.1 per cent. The causes of the epilepsy in the carnivores, as determined by the clinical examination, are as follows: idiopathic, twenty-two; indigestion, seventeen; meningitis, four; diphtheria, two; hydrocephalus and alcohol poisoning, one each. In the normal

group the determined causes were: encaphalitis, sixteen; meningitis, ten; cerebral hemorrhage, seven; birth injury, three; rachitis, six; blow on head, congenital syphilis, diphtheria, pneumonia and sunstroke, one each; measles, two; idiopathic, four; indigestion, seven. On further analysis it was found that, in the carnivorous group, 10 per cent. were due to organic causes, and in the normal group, 60 per cent. Thirty-six per cent. of the carnivores and 48 per cent. of the normals had a hereditary tendency.

California State Journal of Medicine, San Francisco

July, XI, No. 7

- 35 Nonsuture Ocular Tendon Shortening with Results of Forty Operations. R. O'Connor, Oakland.—p. 232.
- 36 Glaucoma; Methods of Treatment. H. Barkan, San Francisco.—p. 235.
- 37 Treatment of Iritis. M. W. Fredrick, San Francisco.—p. 239.
- 38 Early Surgical Treatment of Squint. V. H. Hulen, San Francisco.—p. 243.
- 39 Tumors of Kidney. H. C. Moffitt, San Francisco.—p. 246.
- 40 Diagnosis and Treatment of Nephrolithiasis. W. E. Stevens, San Francisco.—p. 250.
- 41 Acute Dilatation of Stomach. Report of Six Cases, Three Occurring During Anesthesia. F. B. Reardan, Turlock.—p. 253.
- 42 Mercurialized Serum Injections in Syphilitic Nervous Diseases. H. G. Mehrtens, San Francisco.—p. 255.
- 43 Economic Importance of Well Poised Person. H. L. Langnecker, San Francisco.—p. 256.
- 44 Fractures in War Time. L. Eloesser, San Francisco.—p. 259.
- 45 Leukopenia, Its Significance. J. H. Catton, San Francisco.—p. 264.
- 46 Subdeltoid Bursitis. S. T. Pope, San Francisco.—p. 268.
- 47 Two Cases of Poisoning from Use of Alypin in Urethra. L. C. Jacobs, San Francisco.—p. 268.
- 48 Common Injuries of Eye and Their Treatment. H. Barkan, San Francisco.—p. 270.

Cleveland Medical Journal

July, XVI, No. 7

- 49 Diagnosis and Treatment of Congenital Pyloric Stenosis. C. G. Grulee and D. D. Lewis, Chicago.—p. 459. To be continued.
- 50 *Acidosis in Diabetes and Nephritis. C. D. Christie, Cleveland.—p. 481.
- 51 Epidemiology of Whooping Cough in Cleveland for 1915 and 1916. G. E. Harmon, Cleveland.—p. 487.
- 52 Clinical Forms of Nervousness. A. R. Timme, Cleveland.—p. 491.

50. Acidosis in Diabetes and Nephritis.—About seventy determinations were made by Christie on the blood of patients afflicted with varying degrees of nephritis for acidosis. He used the methods of determining the carbon dioxid tension in the alveolar air and the volume of carbon dioxid in the blood and at the same time attempted to correlate the results obtained by the use of the so-called Sellards test in some of the patients. In addition he estimated the total nonprotein nitrogen or the urea content of the blood. The results obtained show that not all patients having incompetent kidneys for the excretion of nitrogen show the same incompetency for the excretion of acids. Usually if there was a high degree of accumulation of nonprotein nitrogen in the blood there was at the same time some lowering of the alkaline reserve of the blood. Very frequently mild accumulations of nonprotein nitrogen were encountered with a normal alkaline reserve. Instances also show that there may be no accumulation of nonprotein nitrogen in the blood of nephritics but at the same time very marked lowering of the alkaline reserve. Varying degrees of acidosis are encountered very frequently in nephritis. Usually they are only of moderate severity and are largely due to phosphate and sulphate retention. Occasionally it may become of severe degree with complicating factors. It is usually present in uremia, but doubtless plays a small part in the phenomena. Rarely do the nephritic patients with their mild acidosis suffer any outward unpleasant symptoms. Another type of acidosis which may be of service eventually in the explanation of certain clinical phenomena is that due to the impaired elimination of the volatile acid carbon dioxid through the lungs.

Journal-Lancet, Minneapolis

July 15, XXXVII, No. 14

- 53 Acute Inflammation of Middle Ear. J. H. James, Mankato.—p. 474.
- 54 Auricular Fibrillation. W. G. Richards, Billings, Mont.—p. 478.

Kansas Medical Society Journal, Topeka*July, XVII, No. 7*

- 55 Diagnosis and Reporting of Diseases in Its Relation to Public Health. J. J. Sippy, Topeka.—p. 177.
- 56 Some Indications for Use of Forceps. W. A. Gartner, Troy.—p. 180.
- 57 Diagnosis of Syphilis. L. A. Lynch, Kansas City.—p. 182.
- 58 Scarlet Fever. E. C. Wickersham, Independence.—p. 184.
- 59 Appendicitis as Viewed from Angles of Internist and Surgeon. F. A. Carmichael, Osawatomie.—p. 188.

Medical Record, New York*July 14, XCII, No. 2*

- 60 Results of Psychic Treatment of Mental Torticollis. L. P. Clark, New York.—p. 48.
- 61 Osmosis, Factor in Treatment of Tuberculosis. P. S. Bailey, Fort Bayard, N. M.—p. 55.
- 62 Medical Ethics. F. H. Barnes, Stamford, Conn.—p. 59.
- 63 Mixed Types of Nephritis. H. M. Moses, Brooklyn.—p. 61.
- 64 Club Foot as Product of Evolution. T. Abbe, Washington, D. C.—p. 62.

Military Surgeon, Washington, D. C.*July, XLI, No. 1*

- 65 General Administrative Methods, Sanitary Precautions, and Evacuation Service in Austro-Hungarian Army. J. H. Ford.—p. 1.
- 66 Organization and Administration of British Army with Especial Reference to Medical Services. T. H. Goodwin.—p. 32.
- 67 Sanitary Service with National Guard Troops. W. N. Bispham.—p. 43.
- 68 Epidemiologic Study of Outbreak of Measles, Camp Wilson, San Antonio, Texas. E. L. Munson.—p. 63. To be continued.
- 69 Prevalence of Hookworm Disease in Fourth Texas Infantry, First Mississippi Infantry and First Alabama Cavalry Regiments. J. F. Siler and C. L. Cole.—p. 77.
- 70 U. S. Public Health Service; Functions and Value as Preparedness Asset. W. C. Billings.—p. 100.

Nebraska State Medical Journal, Norfolk*June, II, No. 6*

- 71 Cardiac Arrhythmia. A. K. Detwiler, Omaha.—p. 323.
- 72 Theory of Psychic Causation in Insanity. L. B. Pilsbury, Lincoln.—p. 329.
- 73 Nervous States. G. W. Dishong, Omaha.—p. 331.
- 74 Congenital Hypertrophic Pyloric Stenosis. F. S. Clarke, Omaha.—p. 334.

New Orleans Medical and Surgical Journal*July, LXX, No. 1*

- 75 Clinical Observations and Reactions in Leprosy. J. A. Honeij, New Haven, Conn.—p. 5.
- 76 Vaccines and Vaccine Therapy. W. H. Harris, New Orleans.—p. 14.
- 77 Influence of Present War on Treatment of Infected Wounds. K. W. Ney, New Orleans.—p. 20.
- 78 Unsuspected Chronic Appendicitis Recognized During Roentgen Examination of Gastro-Intestinal Tract. A. Granger, New Orleans.—p. 28.
- 79 Empyema. G. S. Bel, New Orleans.—p. 33.
- 80 Spina Bifida; Report of Cases. E. D. Fenner, New Orleans.—p. 42.
- 81 Early Manifestations of Leprosy. R. Hopkins, New Orleans.—p. 56.
- 82 Operation for Hallux Valgus. E. S. Hatch, New Orleans.—p. 63.
- 83 Complications and Sequellae of Influenza. J. M. Moseley, Arcadia.—p. 68.
- 84 Ovarian Transplantation; Report of Cases. W. D. Phillips, New Orleans.—p. 73.
- 85 Registered Nurse. J. T. Crebbin, New Orleans.—p. 80.
- 86 Parenteral Injection of Milk as Curative Agent. T. J. Dimitry, New Orleans.—p. 83.
- 87 Treatment of Persistent Gonorrheal Infection in Female Urethra. M. J. Gelpi, New Orleans.—p. 87.
- 88 What Tulane Has Done for Country in Times of War. R. Matas, New Orleans.—p. 90.

New York Medical Journal*July 14, CVI, No. 2*

- 89 Roentgen-Ray Diagnosis in Diseases of Chest. G. E. Pfahler, Philadelphia.—p. 53.
- 90 Blood Transfusion. C. G. Heyd, New York.—p. 57.
- 91 Study of Sixty-Seven Cases of Epidemic Cerebrospinal Meningitis. R. C. Rosenberger and D. F. Bentley, Jr., Philadelphia.—p. 60.
- 92 Acute Appendicitis. A. Nicoll, New York.—p. 62. To be concluded.
- 93 Physical Examination in Pulmonary Tuberculosis. C. Rayevsky, Liberty.—p. 66.
- 94 Cardiac Arrhythmia. C. L. Palmer, Pittsburgh.—p. 68.
- 95 Mesenteric Venous Thrombosis Following an Abdominal Hysterectomy for Fibroids. M. Rabinovitz, New York.—p. 71.

Oklahoma State Medical Association Journal, Muskogee*July, X, No. 7*

- 96 Bladder Stone; Report of Case. L. S. Willour, McAlester.—p. 275.
- 97 Treatment of Club Feet. R. L. Hull, Oklahoma City.—p. 278.
- 98 Do's and Dont's of Pelvic Surgery. R. Grosshart, Tulsa.—p. 281.
- 99 Hysterectomy for Carcinoma of Uterus with Galvano-Cautery. V. Berry, Okmulgee.—p. 285.
- 100 Goiter. C. R. Phelps, Oklahoma City.—p. 290.
- 101 Stone in Bladder; Report of Case. W. G. Ramsey and B. T. McClure, McCurtain.—p. 293.

Rhode Island Medical Journal, Providence*July, I, No. 7*

- 102 Thirty Years Spent in Study and Practice of Medicine. E. D. Chesebro, Providence.—p. 149.
- 103 Evils of Drug Store Prescribing in Venereal Disease. H. G. Giddings, Boston.—p. 154.
- 104 Medical Men and War. J. W. Keefe, Providence.—p. 159.

Southern Medical Journal, Birmingham, Ala.*July, X, No. 7*

- 105 Unwarranted Fear of Tuberculosis. C. H. Cocke, Asheville, N. C.—p. 539.
- 106 *Irrigation Method of Treating Flagellate Infection of Intestines. H. L. McNeil, Galveston, Texas.—p. 544.
- 107 Bothrioccephalus Latus Infection; Report of Case. M. D. Levy and D. P. Wall, Galveston, Texas.—p. 546.
- 108 Pellagra; Its Etiology and Treatment. J. H. Graves, Waco, Texas.—p. 547.
- 109 Advances in Public Health Work in Louisiana During Past Year. O. Dowling, Shreveport, La.—p. 552.
- 110 Local Health Work Under State Board Supervision with Special Reference to School Inspection and Typhoid. G. M. Cooper, Raleigh, N. C.—p. 554.
- 111 Diaphragmatic Hernia; Report of Case. J. F. Mitchell, Washington, D. C.—p. 561.
- 112 Acute Appendicitis with Peritonitis; Cases that Should Not Be Drained. J. W. Long, Greensboro, N. C.—p. 565.
- 113 *Acute Hematogenous Unilateral Infection of Kidney; Report of Case. J. M. Maury, Memphis, Tenn.—p. 567.
- 114 *Traumatic Asphyxia. J. G. Sherrill, Louisville, Ky.—p. 568.
- 115 Bathing Facilities and Habits of Soldiers and Officers of Army. C. C. McCulloch, Jr., Washington, D. C.—p. 572.
- 116 First Aid to Injured as it Applies to Railroads. R. W. Knox, Houston, Texas.—p. 581.
- 117 Functions of Splint in Treatment of Fractures of Long Bones. E. B. Claybrook, Cumberland, Md.—p. 585.
- 118 Simple Enucleation and Evisceration of Eyeball are Unsururgical Technics. T. J. Dimitry, New Orleans.—p. 594.
- 119 Direct Laryngoscopy and Bronchoscopy. C. Stockard, Atlanta, Ga.—p. 600.
- 120 What Tulane Has Done for Country in Times of War. R. Matas, New Orleans.—p. 605.
- 121 Patriotism and Profession. J. N. Baker, Montgomery.—p. 608.
- 122 Relation of Medical School to Community. W. F. R. Phillips, Charleston, S. C.—p. 609.

106. **Flagellate Infection of Intestines.**—Direct irrigations of the duodenum with substances, toxic to these parasites, but harmless to the patient, are used by McNeil. The following solution has been used in numerous cases: methylene blue (medically pure), 5 grains; quinin sulphate, 20 grains; hydrochloric acid (concentrated), 30 mm.; distilled water sufficient to make 1 pint. This solution is injected directly into the duodenum through a duodenal tube to which a funnel is attached. About ten minutes is required for the injection. The fluid is injected warm. There is said to be absolutely no danger to the patient from such injections. As a preliminary to the treatment, it is advised to keep the patient on a liquid or semiliquid diet for two days preceding the injection and to administer a saline purgative on the preceding night. One such injection is given daily for three mornings, the last two injections, in an adult, being double quantity. On the evening of each day on which an injection has been given, an enema of 1:5,000 methylene blue is given high up into the colon. After three such treatments the patient is allowed to go about his business, but is instructed to return at the expiration of one month for further examination. On his return a saline purge is given and the stools following this purgative are examined very carefully for the presence of parasites.

113. **Acute Hematogenous Infection of Kidney.**—In Maury's case, the preoperative diagnosis was appendical abscess with the appendix turned outward and confined between the lateral wall of the iliac fossa and the cecum. Entering the peritoneal cavity through an incision over the mass, Maury found the

cecum high, the appendix normal and both closely applied to the mass which was in the cellular tissue behind the bowel and evidently connected with the lower pole of a kidney, which was displaced downward. Closing the incision and making one on the loin, an abscess was encountered in the lower pole of the kidney, which had ruptured through the capsule and infected the surrounding cellular tissue. Isolating and bringing up the kidney revealed no other lesion, so it was returned to its bed and the wound closed around a rubber drainage tube.

114. Abstracted in *THE JOURNAL*, Jan. 27, p. 309.

Southwestern Medicine, El Paso, Texas

June, I, No. 6

- 123 Rest and Exercise in Treatment of Tuberculosis. W. T. Murphey, Albuquerque, N. M.—p. 9.
- 124 Interpretation of Ghon's Work. E. S. Bullock, Silver City, N. M.—p. 15.
- 125 Perforating Ulcers of Stomach and Duodenum; Report of Cases. F. D. Garrett, El Paso.—p. 26.
- 126 Cases of Focal Infection with Special Features. H. H. Stark, El Paso.—p. 30.
- 127 Intra-Ocular Tumors; Report of Case of Melanotic Sarcoma of Lamina Fusca Choroidca. D. F. Harbridge, Phoenix, Ariz.—p. 33.
- 128 Use of Corpora Lutea in Treatment of Nausea and Vomiting of Pregnancy. E. J. Cummins, El Paso.—p. 38.
- 129 Orthostatic Albuminuria; Report of Case. W. R. Jamieson, El Paso.—p. 39.

United States Naval Medical Bulletin, Washington, D. C.

July, XI, No. 3

- 130 Place of Intelligence in Modern Warfare. H. H. Goddard.—p. 283.
- 131 Incidence of Tuberculosis in Navy—Study of Admissions to Naval Hospital, Las Animas, Colo., 1916. G. H. Barber.—p. 289.
- 132 Studies of Drug Addicts. W. A. Bloedorn.—p. 305.
- 133 Plea for Greater Care in Performance of Duty by Medical Officers at Recruiting Stations. A. Farenholt.—p. 318.
- 134 Study of Mental Tests in Examination of Recruits. A. R. Schier.—p. 325.
- 135 Report on Jennings Test for Color Blindness. G. B. Tribble.—p. 334.
- 136 United States Naval Medical Supply Depot. R. P. Crandall.—p. 337.
- 137 Poisoning by Arseniuretted Hydrogen on Submarines. M. Giordano.—p. 342.
- 138 Border-Line Cases at Recruiting Office. W. G. Farwell.—p. 346.
- 139 Apparatus for Removal of Sick and Wounded on Shipboard. J. S. Taylor.—p. 371.
- 140 Roentgen-Ray Treatment with Special Reference to Skin Lesions. A. Soiland.—p. 373.
- 141 Report of Five Operations Performed in Haiti. R. B. Williams.—p. 374.
- 142 Case of Uncinariasis with Severe Anemia. J. J. A. McMullin.—p. 380.

West Virginia Medical Journal, Huntington

June, XII, No. 12

- 143 Thorium for Pyelography. J. E. Burns, Baltimore.—p. 434.
- 144 Physical Diagnosis as Applied to Life Insurance. E. W. Stevenson, Pittsburgh.—p. 447.
- 145 Symptoms and Diagnosis of Incipient Tuberculosis. E. E. Watson, Salem, Va.—p. 451.

Wisconsin Medical Journal, Milwaukee

July, XVI, No. 2

- 146 *Pneumonia in Children. A. W. Myers, Milwaukee.—p. 41.
- 147 Artificial Feeding of Infants. A. L. Kastner, Milwaukee.—p. 49.
- 148 Pituitary Extract in Obstetrics. E. E. Tupper, Eau Claire.—p. 56.
- 149 Laboratory Methods and Their Clinical Application. W. D. Stovall, Madison.—p. 60.
- 150 Lactosuria; Case Presenting Unusual Features; Clinical Report. L. M. Warfield, Milwaukee.—p. 63.
- 151 Miners' Consumption. A. J. Lauza, Denver.—p. 64.

146. **Pneumonia in Children.**—Myers says that the best results are obtained by looking on the process as an intoxication rather than a localized inflammatory disease of the lungs. In addition to general measures an abundance of water to drink, sodium bicarbonate internally, and occasionally digitalis, are the only things mentioned. The soda seems to lessen the toxemia in many cases and thus to enable the child to pass through the period of illness with the minimum amount of discomfort and danger. Myers believes that when sodium bicarbonate is used freely the need for the

treatment of special symptoms is greatly reduced. Perhaps for this reason digitalis seems to be required only rarely. Persistent or painful cough may call for a few doses of opium in some form, but it is better to administer it separately and only when it is needed to secure sleep, and not to give it in a mixture which is to be taken throughout the whole twenty-four hours.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Radiology and Electrotherapy, London

June, XXII, No. 1

- 1 Simplified Roentgen Ray Methods. H. C. Gage.—p. 1.
- 2 Roentgen Observations on Duodenum, with Special Reference to Lesions Beyond First Portion. J. T. Case.—p. 16. To be continued.

Glasgow Medical Journal

June, LXXXVII, No. 6

- 3 Maternity and Child Welfare Schemes: Responsibility of Local Authorities Under Notification of Births (Extension) Act, 1915. A. K. Chalmers.—p. 321.
- 4 Acute Cystitis. A. G. Faulds.—p. 336.

Indian Journal of Medical Research, Calcutta

April, IV, No. 4

- 5 *Vitality of Tubercle Bacillus Outside Body. M. B. Soparker.—p. 627.
- 6 Results of Bacteriologic Examination of Stools of Six Hundred and Fifty-Nine Cases of Cholera at Calcutta. E. D. W. Greig.—p. 651.
- 7 Bacteriologic Studies of Cholera-like Vibrios Isolated from Stools of Cholera Cases in Calcutta. E. D. W. Greig.—p. 658.
- 8 Study of Kala-Azar. J. W. Cornwall and T. K. Menon.—p. 672.
- 9 Experimental Immunization Against Rabies by Method of Phisalix. J. W. Cornwall and T. K. Menon.—p. 688.
- 10 Chemical Investigation of Varieties of Chaulmoogra Oil in Connection with "Leprosy Treatment." S. Ghosh.—p. 691.
- 11 *Hemolysis by Sodium Oleate and Sodium Gynocardate. W. D. Sutherland and G. C. Mitra.—p. 698.
- 12 Rôle of Blood in Ovulation in Culicidae. S. K. Sen.—p. 729.
- 13 Gireterakis Girardi (n. g., n. sp.) and Other Suckered Nematodes. C. Lane.—p. 754.
- 14 *Appearance of Malignant Tertian Rings in Blood During Intravenous Injections of Tartar Emetic. E. D. W. Greig.—p. 766.
- 15 Prevalence of Ankylostomiasis in Madras Presidency. K. S. Mhaskar.—p. 771.
- 16 *Improvements in Bacteriologic Media. New and Efficient Substitute for Nutrosc. R. L. M. Wallis.—p. 786.
- 17 New Test for Chlorin in Drinking Water and Its Application for Estimation of Chlorin Present. R. L. Wallis.—p. 797.
- 18 Use of Aromatic Chloramin Compounds for Sterilization of Water for Drinking Purposes. R. L. M. Wallis.—p. 800.
- 19 Sprouting Capacity of Grains Issued as Rations to Troops. E. D. W. Greig.—p. 818.

5. **Vitality of Tubercle Bacillus Outside Body.**—It is evident from Soparker's experiments that there is an appreciable period after the complete drying of tuberculous sputum, during which some of the tubercle bacilli contained therein remain alive. In the case of direct sunlight the time is approximately two hours; this interval is not long, and the danger of infection from tuberculous sputum deposited in open places exposed to the sun cannot therefore be considered to be great. In the case of sputum deposited in a place exposed to diffused daylight the interval during which sputum dust may remain infective can be calculated in days. But here, too, the tubercle bacilli soon lose their virulence if the place be well lighted, the rate at which the tubercle bacilli become devitalized probably depending on the intensity of the light. The danger of spreading infection is greatest when sputum is deposited indoors, especially in dark ill-ventilated places. In these conditions tubercle bacilli may retain their vitality and power to cause the disease as long as 309 days. From decomposing sputum living tubercle bacilli could be isolated after twenty days but not after twenty-six days. Bovine tubercle bacilli were found to be more resistant to sunlight and diffused daylight than human tubercle bacilli. When exposed to electric light the bovine bacilli were found alive for seventy-four days but dead after one hundred days. It took three to four hours in direct sunlight and three to four days in diffuse daylight for a pellet of sputum to become

sufficiently dried to be capable of being reduced to dust. The adoption of suitable building by-laws to ensure the entrance of sufficient light and air in all inhabited rooms in houses will do much to combat the spread of tuberculosis.

11. Hemolysis by Sodium Oleate and Sodium Gynocardate.—Sutherland and Mitra found that 0.16 c.c. of serum, homologous or heterologous, interferes with the hemolytic action of sodium oleate and the sodium gynocardates to such an extent that four times the dose of these which, when no serum is present, causes hemolysis of 5 c.c. of a 5 per cent. suspension of erythrocytes in two hours, has no effect within twenty-six hours. The proportions here are 0.16 c.c. of serum to 0.025 c.c. of erythrocytes. In vivo the serum and the erythrocytes are equal, but 1,000 times the minimum hemolytic dose of the gynocardates may kill a rabbit within five minutes. It is unlikely that the hemolytic effect has anything to do with the lethal result in such a case; the action of the soap on the lipoids of the heart muscle must be a factor in causing so rapid a result. Further experiments will be made as to the rôle played by rapid intravascular coagulation.

14. Tartar Emetic and Malaria.—Two observations are reported by Greig. In one during the intravenous injections of tartar emetic the benign tertian parasite appeared in the blood and produced fever, in the other fever occurred and malignant tertian rings appeared. If Rogers' observation be confirmed it would seem that tartar emetic has a very delicate selective action; it would appear to be capable of killing the protoplasm of the sexual form of malignant tertian parasite of malaria, but has little or no action on the asexual form.

16. Substitute for Nutrose.—A new and efficient substitute for nutrose has been prepared by Wallis from substances obtained in India, namely, casein 5 parts, peanut flour 94 parts, and sodium carbonate 1 part. This preparation combines ready solubility in water, with a high protein content, and consequently is of great nutritive value. This preparation when used for making the Conradi-Drigalski medium gives a transparent medium, on which the typhoid coli group of organisms grows with marked luxuriance. The property of stimulating the growth of organisms appears to be due to the presence of a vitamin associated with the globulin contained in the peanut flour. In view of the high protein content, and relatively small amount of carbohydrate present, this preparation is particularly useful for making bread for diabetic patients, and also for admixture with ordinary flour. The new preparation combines the properties of a highly nutritive foodstuff, containing a vitamin, and extreme cheapness.

Journal of Tropical Medicine and Hygiene, London

June 15, XX, No. 12

- 20 Seven Day Fever in Anglo-Egyptian Sudan. R. G. Archibald. —p. 133.

Lancet, London

June 23, I, No. 4895

- 21 Treatment of War Wounds. A. E. Wright.—p. 939.
22 *Masks for Facial Wounds. F. D. Wood.—p. 949.
23 Albuminuria in Trenches. H. B. F. Dixon.—p. 951.
24 Universal Arm Splint. G. E. Wilson.—p. 953.
25 *Temporary "Pilons." A. H. Bizarro.—p. 954.
26 Case of Pharyngeal Diverticulum. J. McClure.—p. 955.
27 Development of Trained Nursing in France. E. Montizambert. —p. 971.

June 30, No. 4896

- 28 Day's Work. A. Macphail.—p. 979.
29 Limitations of Vaccine Treatment. R. J. Rowlette.—p. 984.
30 *Treatment of War Heart. A. E. Garrod.—p. 985.
31 *Analysis of Cases of Tetanus Treated in Home Military Hospitals. D. Bruce.—p. 986.
32 Detection of Entameba Histolytica and Its Cysts. A. C. Inman. —p. 990.
33 *Treatment of Trench Rheumatism and Allied Conditions by Colloidal Sulphur. J. D. Comrie.—p. 991.
34 Effect of Vaccinia on Well-Being of Children. J. P. Kinloch.—p. 993.
35 Sole Use of Reverdin's Needle. V. Bonney.—p. 994.
36 Ultraviolet Radiation. C. A. Schunck.—p. 996.
37 Case of Acute Intestinal Obstruction by Meckel's Diverticulum. E. M. Sympton.—p. 998.
38 Case of Suprapubic Hernia. W. H. Forshaw.—p. 998.
39 Case of Antral Abscess Treated with Salicylic Acid. P. R. Wilde. —p. 998.

22. Masks for Facial Wounds.—The cases treated by Wood are those in which the wounds or depredations of disease have been so severe as to remove them beyond the range of even the most advanced plastic surgical operations. A cast is made of the patient's face in plaster of Paris. All wound cavities are filled up with dressing and cottonwool, and these in turn covered with goldbeater's skin. The nostrils are blocked with cottonwool, the patient breathing through the mouth; if through the nose a quill is inserted for breathing throughout this operation. It depends on the area of wound as to whether nose or mouth breathing can be allowed during the process. Having obtained the mold and dried it slowly the next stage is to French-chalk it and take from it a clay or plasticine squeeze, which provides a positive model of the patient's healed wound and the surrounding normal tissue surface. This model is further developed by means of sittings of the patient, and this stage is completed by taking another cast—a negative.

The task now is to reconstruct the destroyed feature or features from the model taken from this negative mold, by building them up to match the corresponding or adjoining features of the patient, or from prewound photographs, taking the utmost care the whole time to keep the adjustment of the edges to the patient's face-planes. A cast is then taken of this; further manipulation is required for the fitting of an artificial eye (if the case includes such); a last comparison with the original is made, and the mask, in plaster, is complete. From this an electrottype plate is deposited. It is of pure copper, $\frac{1}{32}$ inch in thickness. The necessary fitments for glass eye and attachments are fixed, and it is finally well covered with an electric deposit of silver. The last adjustments are now made to the patient's face, the securing of the plate to the face being carefully considered. The attachment is usually made by means of strong spectacles, but spirit-gum and ribbons have sometimes to be used, varying with the character of the wounded area. Everything depends on the efficiency of the attachments in the matter of comfort to the patient, which is necessary in such cases, so that his attention shall never be drawn to his deficiency unless necessarily. The adjustment must be exact, therefore, and the edges of the plate can in no case be allowed to part from the sections of the patient's skin with which they coincide.

The plate has now to be pigmented to match the complexion of the patient. A thin coating of cream colored spirit enamel forms a good basis for the subsequent flesh color matching, as it leaves the oil color mat when dry, which facilitates the blending of plate with face. If the patient has an oily or shiny skin a semblance is easily obtained by varnish rubbed down to match. The eyebrows are painted to match and the eyelashes are made of thin metallic foil, carefully soldered to the plate, cut finely by scissors, and tinted to match. Renewal of the pigmentation must be made from time to time, however, for scar tissue changes the contours of the face, and readjustments must occasionally be made. If these changes are very great a new plate might have to be substituted for the original.

25. Temporary "Pilons."—The material used by Bizarro consists of a wooden frame, easily made, poroplastic, webbing, plaster, bandages and a little felt. The first step in applying a pilon is to make a mold of the stump with poroplastic. With the patient standing (particularly in thigh cases) on the sound leg the bony tuberosities should be well marked, and the upper end of the first layer well adapted to them so as to support the weight of the body in walking. The lower end of this first layer, in the great majority of cases, is left open, and all the support of body takes place on the superior part of the tube. Having molded and fixed this inner coat of the pilon, keeping it very smooth on its inner face, it is covered with a few layers of plaster. Then, having tried it well on the patient, the wooden frame is measured, allowing for the heel of the boot, and is fixed to the inner cylinder by means of plaster. Webbing pieces are included in it, and when the plaster is dry, the inner cylinder is fixed to the frame by means of screws or rivets to make the whole more solid. For stumps of the thigh felt only is

used on the upper part of the poroplastic, and Bizarro emphasizes that in these cases the bottom of the cylinder is entirely open. To avoid softening of the structure of the cylinder due to perspiration, particularly in warm weather, holes of 5 cm. diameter can be drilled through the supporting belt which at the same time make the pilon lighter.

30. Treatment of War Heart.—Treatment by graduated exercises which has proved so useful in the differentiation and cure of the functional cases, Garrod says, is unsuitable and does actual harm in the organic cases, so long as the physical signs of damage to the heart muscle persist. The symptoms described by the patients are shortness of breath on exertion, inability to walk any distance, and, in some cases, precordial pain. The physical sign is an extension of the cardiac dulness toward the right, often to $1\frac{1}{2}$ or 2 inches beyond the midsternal line. Only in extreme cases is there any conspicuous extension toward the left. The dull area has a clearly defined outline, and yields a sense of resistance on percussion. The resistance can also be appreciated by dipping with the pads of the fingers along the course of the ribs or intercostal spaces. Experience has convinced Garrod that the fitting treatment for such patients is complete rest until the cardiac dulness has returned to its normal limits and for at least a week afterward. The hearts of many patients which have not responded to modified rest have come in after complete rest has been imposed. The patient is not allowed to rise from his bed for any purpose, or even to sit up in bed for his meals; nor is he permitted to smoke. When the dilatation is recent the cardiac area may return to its normal limits within as short a period as a week. In cases of longer standing, in which rest has not been imposed at the outset, longer periods, up to six or eight weeks, have been required. As a rule, under such treatment, the heart does not redilate.

31. Tetanus in Home Military Hospitals.—In the 200 cases of tetanus under review by Bruce the mortality was 36.5 per cent. The greatest number of cases occurred between the ninth and the fourteenth days. Among the 200 cases, 102 patients are noted as having received a prophylactic injection of antitoxin in France immediately after being wounded. Only three patients are reported to have received prophylactic injections in home hospitals. Of these 102, seventy-four recovered and twenty-eight died, giving a mortality of 27.4 per cent. Of the remaining cases, there is no record of prophylactic treatment in eighty-seven, although in all probability most of them received it. Of these eighty-seven, forty-eight recovered and thirty-nine died, a mortality of 44.8 per cent. The remaining eleven patients are said to have had no prophylactic injection of any kind. Of these, five recovered and six died, a mortality of 54.5 per cent. Of seventy-two patients inoculated on day of wound the average incubation period was 29.5 days. Of the eleven patients who received no prophylactic inoculation the average incubation was 15.7 days. Out of the total of 200 cases the number of patients treated with antitetanic serum after the onset of symptoms was 198 (99 per cent.). Two patients did not receive therapeutic treatment with antitetanic serum in England; both died. There is no record that either of these men received a prophylactic injection in France. Of the 198 patients who received serum treatment, 127 recovered and seventy-one died; mortality, 35.8 per cent.

33. Trench Rheumatism Treated with Colloidal Sulphur.—Comrie has found intramuscular injections of colloidal sulphur to be of the very greatest value in the treatment of subacute painful conditions in the muscles and joints. The most satisfactory course of treatment consists of an injection administered every second day for three weeks (ten injections), combined with rest and with massage on the intervening days. In the greater number of subacute cases, lasting several months, complete recovery may be expected after three to five weeks from the commencement of the treatment. This method is also very helpful in lingering cases of gonorrheal rheumatism. It does not, however, take the place of salicylate of soda in relieving the pains of acute articular rheumatism.

Archives de Médecine des Enfants, Paris

June, XX, No. 6, pp. 281-336

- 40 *The Immediate and Remote Prognosis for Convulsions in Children. A. Collin and T. Revon.—p. 281.
41 *Diabetes Proving Fatal in Two Months in Girl of 15. P. Gautier and C. Saloz.—p. 314.
42 Present Status of Scleroderma in Children. J. Comby.—p. 318.

40. Convulsions in Children.—Collin and Revon assert that the old idea that the gravity of convulsions in children depends on the severity of the attacks, their frequency and the age of the child is no longer tenable. The prognosis depends exclusively on whether the convulsions are merely the manifestation of an overexcitable nervous system or are the initial symptoms of organic meningeal or brain disease. This, they say, can be determined by the character of the spasms. Clonic spasms are benign; the tonic are of grave import. Clonic convulsions are the expression of the infantile spinal type, as long as this lasts. They occur only on certain soils: an inherited neuropathic taint or an inherited alcohol taint. They are an episode during the course of a predisposition, not the beginning of organic disease. These clonic spasms can be brought on, with this predisposition, by any mechanical, toxic or physical cause for excitement of the cell. They are a manifestation of bulbomedullar excitation, not involving the cortex. In the clinic they are always bilateral, while in experiments made by stimulating the cortex they are always unilateral. Still another argument is the minimal symptoms on the part of other apparatus with them.

Tonic convulsions may, on the other hand, occur at any age and are the expression of some actual lesion of the cell. They may occur in any one who has an infection involving nerve centers. They can be produced by any physical, toxic, mechanical or infectious process modifying the histologic structure of the cell. They are the manifestation of some lesion of nervous tissue, as excitation of any point kept up long enough or intense enough will induce a tonic reaction, possibly accompanied by grave respiratory or cardiac symptoms. The later history of children with these benign or grave convulsions differs entirely. The former are neuropaths and they will present symptoms more or less often, but these symptoms do not correspond to any pathologic anatomy known to date. The children who have had tonic convulsions develop hemiplegia or epilepsy or succumb to meningitis or encephalitis, and in the immense majority of the cases pathologic processes can be discovered with the microscope. In short, as Collin and Revon reiterate, with any tonic phase in the course of a convulsive condition the prognosis should be reserved, both the immediate and the remote outlook. The article is based on protracted study of eighty cases of convulsions. Only seventeen were of the clonic type. These were mostly older children, and it was usually learned that other children in the family had had convulsions. The details of these cases and also of the sixty-three children with convulsions of the tonic, malignant type are tabulated. The reflex convulsion causes merely clonic movements without concomitant symptoms, and it is thus possible to determine the prognosis from the first convulsion. Any grave infection or intoxication damaging the nerve cell may bring on tonic convulsions even in a previously normal child.

41. Rapidly Fatal Diabetes in Girl of Fifteen.—Death occurred in two months after the first symptoms which were an enormous appetite and thirst with rapid loss of weight. The coma lasted only one day, and intravenous injection of sodium bicarbonate did not seem to have any effect. The leukocytes numbered 30,000 and the sugar content of the cerebrospinal fluid was 5.8 per thousand; of the urine, 50 per thousand. The liver and spleen were apparently normal even under the microscope.

Bulletin de l'Académie de Médecine, Paris

June 12, LXXVII, No. 24, pp. 755-776

- 43 *Isolation and Treatment at Paris of Tuberculous Soldiers. Mesureur.—p. 768.
44 Functional Lung and Heart Disturbances after War Wounds of the Chest. E. Sergeant.—p. 770.
45 Surgical Pneumothorax. R. Le Fort.—p. 772.

43. Isolation and Treatment of Tuberculous Soldiers at Paris.—Mesureur is chief of the entire public hospital system at Paris, the *Assistance Publique*. He here reports what has been accomplished since the municipal authorities in March, 1916, appropriated over \$1,000,000 to erect barracks for tuberculous soldiers. By May, 1917, ten pavillions were in operation, with accommodations for 700 men. They were erected on the grounds of nine Paris hospitals, including the Laennec and the Salpêtrière. Other pavillions with a total capacity of 1,400 beds are being constructed on the grounds of four large hospitals in the suburbs. Some of the pavillions, such as the one at the Tenon Hospital, have been constructed of reenforced concrete. For a capacity of 600 beds this costs per bed only 2,500 francs instead of the 7,500 francs required for stone, brick and iron (\$500 instead of \$1,500). The soldiers are distributed in the pavillions according as they are taking sanatorium treatment or are convalescing or in advanced stages of the disease. There are numerous advantages in thus having the tuberculous soldiers within close reach of their families, either in the city or suburbs.

Journal de Médecine, de Bordeaux

June, LXXXVIII, No. 7, pp. 123-144

- 46 Trench Foot and Its Prophylaxis. G. Jeanneney.—p. 123.
- 47 Vaccination against Typhoid and Paratyphoid after Attack of Typhoid. L. Verdelet and P. Lande.—p. 126.
- 48 Recent Legislation against Habit-Forming Drugs Hampers Treatment of Syphilis, etc. W. Dubreuilh.—p. 127.
- 49 *Importance of Iodin in the Fight against Tuberculosis. L. Boudreau.—p. 129.
- 50 Physiotherapy of Cicatricial Adhesions after War Wounds. Fraikin.—p. 132.
- 51 *Combinations of Mercury in the Organism. P. Carles.—p. 134.

49. Iodin in Treatment of Tuberculosis.—Boudreau reiterates that iodine has an actual curative action in many cases of pulmonary tuberculosis, but it has to be given properly. The patient must be gradually accustomed to it, taking it fractioned into as many doses as possible during the day. He commences with one drop of tincture of iodine repeated six or seven times during the day, adding this drop to the usual beverage at the meals. The next day two drops are given at each dose, the third day three drops, and so on, gradually increasing to thirty, sixty, ninety drops or more, according to the way the stomach bears it and the individual need for it. He has patients who finally reach doses of several hundred drops and keep this up for months or even years. He has never had any real inconveniences with this method of treatment. Iodism is encountered with iodides, not with iodine. He is convinced that the tuberculous do better at home in the long run, under the surveillance of the physicians, than in the hospital. The iodine treatment can be applied better in the home, and he urges its systematic application according to this effectual method. The asphyxiating drift gases of modern warfare have been an important factor in the recrudescence of tuberculosis in the trenches. (The French tincture of iodine contains one part of iodine to twelve parts of alcohol.)

51. Fate of Mercury in the System.—Carles refers in particular to the insoluble combination of mercury with the sulphur in vegetables and other foods or sulphur dust inhaled in factories or in spraying fruit. The mercuric sulphid thus formed during mercurial treatment is insoluble in plain water but it is easily dissolved in most sulphur alkaline mineral waters. This explains their efficacy in treatment of those "saturated with mercury."

Le Nourrisson, Paris

May, V, No. 3, pp. 129-192

- 52 *Infection with Disease of the Digestive Tract in Infants. A. B. Marfan.—p. 129.
- 53 Women's Work in Munitions Factories. E. Apert.—p. 153; A. B. Marfan.—p. 165.

52. Infection with Gastro-Enteritis in Infants.—Marfan concludes his historical and critical study of this subject with the statement that, aside from disease due to a specific microbe such as cholera, etc., infection has too contingent and too variable an action, it is too dependent and often too

difficult to determine, to allow infection to be the basis of classification and nomenclature of the digestive affections in infants. He warns further that secondary diarrheas are far more common than is generally recognized. When an infant has digestive disturbances, we must not be too hasty in ascribing them solely to improper feeding. We must examine whether some general malady is not responsible for the digestive trouble. This may disclose occult tuberculosis or overlooked syphilis. On treatment of the causative trouble, the diarrhea may subside, while treatment of the latter alone would be futile. This is especially liable with inherited syphilis. He declares that it has not been definitely proved to date that any special type of diarrhea in infants is due to any special pathogenic microbe (aside from dysentery, cholera, typhoid, tuberculosis and syphilis).

Paris Médical

June 9, VII, No. 23, pp. 485-500

- 54 Work in the Country for Disabled Soldiers. Cestan, Dalous and P. Descomps.—p. 486.
- 55 *Uncontrollable Vomiting in Soldiers. C. Nordman and Goiffon.—p. 492.
- 56 Subacute Syphilis of the Lung: Three Cases. G. Boudet.—p. 495.

55. Uncontrollable Vomiting in Soldiers.—Nordman and Goiffon pass over the vomiting due to injury of nerve centers from wounds or tabes. Between the strictly neuropathic vomiting and the vomiting from organic stomach trouble, stands what they call reflex vomiting. A neuropathic predisposition is reenforced by a reflex starting in some focus of irritation, usually in the colon. There is a history of old or recent intestinal trouble, and the vomiting phase develops when diarrhea has given place to constipation. The vomiting comes on during digestion and usually following some abrupt movement of the abdomen, stooping over, getting up from table or other exertion. The temperature is always a little abnormal, and runs up after an hour's walk. No signs of stenosis can be found even with roentgenoscopy, but the latter shows how the vomiting attack starts with a massive contraction of the stomach, forcing contents out at both ends. Treatment should be addressed to the intestinal trouble, with measures to lower the reflex threshold, and avoidance of abrupt movements after eating. No drugs gave more than transient relief. The main point is to recognize these cases early and give suitable treatment before the antiperistaltic movements become a settled habit.

Presse Médicale, Paris

June 4, XXV, No. 31, pp. 313-328

- 57 *Etiology and Different Forms of Inflammatory Stenosis of Esophagus in Cardia Region. J. Guisez.—p. 313.
- 58 Grave Form of Trench Foot. E. Chauvin.—p. 317.
- 59 *Gluteus Reflex as Sign of Sciatica. F. Rose.—p. 319.
- 60 Factors Cooperating in Malaria. C. Garin.—p. 319.
- 61 Present Status of the Duodenal Tube. M. Romme.—p. 321.

June 7, No. 32, pp. 329-336

- 62 The Variations in Cholesterolemia during the Menstrual Cycle. A. Chauffard.—p. 329.
- 63 Origin and Treatment of Vicious Attitudes of the Feet, of Neuropathic Origin, after Traumatism of the Legs. P. Descoust.—p. 330.
- 64 Sulphur and Eucalyptol in Treatment of Psoriasis. L. Bory.—p. 331.
- 65 Disinfection of the Peritoneum with Alcohol. I. Tansini.—p. 336.

57. Inflammatory Stenosis of the Esophagus Close to the Stomach.—Guisez comments on the absence from the textbooks of descriptions of inflammatory stenosis in the cardia or close above. The stenosis from this cause has been brought to our attention by the findings on direct visual inspection and by the correction of the stenosis by progressive dilatation, as if it were of cicatricial origin. The trouble is a thickening of the walls of the lower esophagus from hypertrophy or fibrocicatricial degeneration, the whole forming a constricting ring or the constriction may involve more or less of the walls of the esophagus. The esophagus becomes dilated above, and the mucosa shows signs of old inflammation. He was able to trace the trouble to an initial spasm of the esophagus, and this in turn to imperfectly masticated food, either from bolting it in haste or from lack

of teeth to chew it. In a recent case the esophagus was completely obstructed; the trouble had begun directly after the man's set of false teeth had been broken so that he was unable to chew. In many cases of this inflammatory stenosis the assumption of cancer seemed justified and apparently confirmed by the patient's death, when in reality he merely starved to death. A foreign body may lodge at the stenosis and cause complete obstruction; this was the finding in several of Guisez' cases. In fourteen others a cancer developed at the spot after several years of spasmodic dysphagia. In examination he uses a catheter softened in very hot water; this shows the site of the stenosis, but he warns against trying to push the catheter through, as the tip is liable to get into some recess. Direct visual inspection is more instructive, and he reproduces a number of views obtained with the esophagoscope. The preferable technic for this is described.

In three of his patients the stenosis had been erroneously ascribed to the cardia, and gastro-enterostomy done. Others had been long treated with gastric lavage, but the majority had been classed as cases of cancer. The aspect and general condition may be the same in both, and only the recovery under treatment proves decisive. The progressive dilatation should be done along the same lines as for stenosis of the urethra, but when the stenosis is from a hard ring, circular electrolysis may be necessary. A long, hollow, bougie-like cap fitting over a whalebone guide, with a string emerging from the mouth, serves the purpose of progressive dilatation while at the same time permitting ingestion of fluid food. The diet should be semifluid, avoiding sugar and milk as they ferment in the esophagus. By a combination of these simple measures he has always succeeded in curing his patients while previous operations on the stomach had never induced any benefit.

59. The Gluteus Sign of Sciatica.—The patient lies prone, relaxing the gluteal muscles. Rose then taps on the point of attachment of the gluteus maximus on a level with the second, third and fourth parts of the sacrum. This muscle then contracts; this contraction is exaggerated in case of true sciatica.

Progrès Médical, Paris

May 26, XXXII, No. 21, pp. 169-178

- 66 Case of Muscular Atrophy of Reflex Origin. R. Oppenheim and G. L. Hallez.—p. 171.
67 *Wounds of the Eyeball. Bourdier.—p. 173. Conclusion.
68 Frame to Aid the Blinded Soldier in Writing. (La rééducation de l'écriture par la "Tablette Verdon".) E. Ginestous.—p. 176.

67. Wounds of the Eyeball.—Bourdier concludes his study of treatment of wounds of the eyeball with statistics showing the constant improvement as the war progresses, and suitable measures can be applied early. De Lapersonne has called attention to the gravity of injury from minute scraps of metal. Fully half of the totally blinded lost their vision from bilateral iridocyclitis following a comparatively insignificant injury of this kind. All the evidence is in favor of early extraction of the foreign body. The crystalline lens seems to tolerate the presence of a foreign body better than the vitreous body. Bourdier says that avoidable accidents were responsible for 344 out of 1,021 wounds of the eyeball in his service since the war began, and in over 35 per cent. of the 314 penetrating wounds. All protecting goggles interfere with vision, reduce the visual field, and they cannot be used at all at night.

Correspondenz-Blatt für Schweizer Aerzte, Basel

June 16, XLVII, No. 24, pp. 753-784

- 69 No Habituation of Fever Center to Fever-Inducing Substances. M. Cloetta.—p. 753.
70 *Ear Disease in the Swiss Army. E. Schlittler.—p. 757. Conclusion.
71 Emetin and Liver Abscess. Paravicini (Yokohama).—p. 772.

70. Ear Disease in the Swiss Army.—Schlittler comments on the appallingly large percentage of cases of ear disease in the Swiss army, similar to what Mauthner reported in 1915 in regard to the Austrian army, and Ostmann in 1900 for the German army. Acute infections, trauma, etc., we are unable to ward off, but chronic otitis media we can attack.

This forms 25 per cent. of the total cases and is the cause of rejection of 45 per cent. of the recruits (50 per cent. according to Mauthner). Thorough treatment in time cures in the majority of cases. This is one of the greatest benefits from school inspection, as chronic otitis media generally begins in childhood, following some infectious disease, under the injurious influence of adenoids with obstruction of the eustachian tubes. Laubi at Zurich found 2,500 deaf children among the 23,000 examined and a fifth of them had or had had chronic disease of the middle ear. Bezold and others found elsewhere still higher percentages. Schlittler states that at Basel twenty-five with chronic otitis media were found among 113 quite deaf children last year. By curing the chronic disease of the middle ear in children, we prevent such losses to the army as now prevail from the large numbers of deaf recruits. In conclusion he mentions that the examining physician must remember that while some recruits and soldiers feign deafness in order to be discharged from the army, others who are really deaf may conceal this infirmity as they prefer military to civilian life.

Gazzetta degli Ospedali e delle Cliniche, Milan

May 20, XXXVIII, No. 40, pp. 601-616

- 72 Triple Standard for Immobilizing while Plaster Cast is being Applied. D. de Francesco.—p. 604.
73 Conservation of Milk with Gas. C. Rapa.—p. 616.
May 24, No. 41, pp. 617-624
74 Roentgenoscopy for Abdominal Wounds. V. Maragliano.—p. 617.
75 Progressive Duodenal Ulcer. G. B. Queirolo.—p. 620.

Policlinico, Rome

June 17, XXIV, No. 25, pp. 785-812

- 76 *Camphor in Cardiovascular Disease. P. Marfori.—p. 785.
77 The Individual Case Chart to Accompany the Sick and Wounded. S. Ottolenghi.—p. 787.
78 *Necessary Revision of Exemptions from Military Service. G. Galli.—p. 790.

76. Camphor in Treatment of Cardiovascular Disease.—Marfori pleads that camphor should not be reserved for a last resort in serious conditions, but should be regarded as a useful drug in small doses for dilating the vessels to reduce the blood pressure both in the greater and the lesser circulation. Nothing can compare with camphor, he asserts, to stimulate the heart and regulate the pulse in cases of chronic myocarditis with simple cardiac insufficiency, with arrhythmia, with auricular fibrillation. The benefit from camphor may persist after its suspension, but as a rule it should be given systematically, over long periods. The camphor can be given in subcutaneous injections of camphorated oil, one or two a day, each with 0.1 gm. camphor. Or it can be given in pill or other form by the mouth; it is borne well and may have a useful influence on the digestive tract. In valvular disease, when the predominating disturbances are hypertension in the right ventricle and lesser circulation, camphor is the most rational treatment and, in his judgment, the most effectual. Insufficiency with several forms of vascular disease is often directly connected with stomach-liver trouble inducing dilatation of the right heart and spasm of the pulmonary vessels. The almost elective action of camphor under these conditions shows that it may be regarded as the medicine for the right heart. Whenever the heart is compelled to work harder on account of increased resistance in the respiratory domain, then camphor is called for, as with the pulmonary sclerosis of the tuberculous. Camphor can also be given with advantage in cases of high arterial pressure from hypertrophy of the heart or vascular spasms, as with the high pressure of the menopause, with arteriosclerosis, etc. This work issues from the Institute for Pharmacology and Therapy of the University of Naples, and is based on considerable experimental as well as clinical experiences.

78. Heart Disease and Military Service.—Galli is chief of the special medical service for soldiers with heart affections, and his long experience has convinced him that valvular affections should be judged by the functional rather than the anatomic findings. He reiterates that warfare is a complicated mechanism, with all kinds of large and small gear, subjected to different degrees of attrition. They are all

equally important, each in its own line, and useful places can be found for capable men with valvular or other heart disease who can safely do excellent work at posts where the attrition is less. The French regulations classify the service as *armé* and *auxiliaire* and the advantages of this are obvious. The man with well compensated heart disease is likely to benefit by the army life in the auxiliary service, office work, garrison duty, etc., while he releases an able-bodied soldier for the *service armé*. The state will have less pensions to pay as they will not break down in the auxiliary service. This arrangement also reduces the number of cases of neuroses. He cites the report of a pathologist who found evidences of arteriosclerosis of the aorta and coronaries in 45 per cent. of sixty young soldiers supposedly entirely healthy when killed.

Riforma Medica, Naples

June 2, XXXIII, No. 22, pp. 589-608

- 79 The Preventorium in the Campaign against Tuberculosis. A. Pirera.—p. 589.
- 80 Old Colonies Differ in Response to Decolored Stain Tests for the Cholera Germ. A. Azzi.—p. 593.
- 81 Dysentery from Protozoa. C. Vallardi.—p. 594. Conclusion.

Prensa Medica Argentina, Buenos Aires

June 10, IV, No. 1, pp. 1-12

- 82 *Difficulty of Individualizing the Diagnosis and Prognosis in Pulmonary Tuberculosis. G. A. Alfaro.—p. 2.
- 83 *The Cardiovascular Lesions in Two Cases of Severe Myopathy. J. C. Navarro and C. Correas.—p. 4.
- 84 *Hematemesis in Gastric Crises of Tabes. C. B. Udaondo.—p. 6.
- 85 Acute Abdominal Diseases. R. E. Pisman.—p. 8. Continuation.

82. **Prognosis of Pulmonary Tuberculosis.**—Alfaro insists that tubercle bacilli in the sputum are of less moment for prognosis than continued clinical observation of the case as a whole. The experiences with induced pneumothorax and climatic treatment have proved that even advanced and destructive cases may become arrested and heal.

83. **Cardiovascular Disturbances with Muscle Disease.**—Chronic myocarditis was found at necropsy of a boy of 11 with a serious muscular affection. In a second similar myopathy case, a girl of 11 was completely crippled, the myopathy following an attack of measles at the age of 5. The legs were permanently flexed at angles of 90 and 120 degrees and there was extreme muscular atrophy. The latter had not yet developed in a third case still in the initial stages. There was marked sclerosis of the vessels in the fatal case and this seems evident or probable in the two still living children. Muscle tissue has been replaced with connective tissue, and the latter has invaded the vessels also. In still another case of progressive myopathy the arterial pressure is exceptionally high and the heart dulness much enlarged, especially the right side.

84. **Hematemesis in Gastric Crises of Tabes.**—Udaondo reports two cases in which an operation was done on the stomach for recurring hematemesis from assumed ulcer. No lesions were found, but gastro-enterostomy was done. The pains recurring afterward as before, finally led to recognition of the tabes and improvement followed mercurial and sedative treatment. In one case the first symptoms, pain in the limbs, had appeared four years before, and the gastric symptoms a year later. In the second case pains in the stomach and vomiting were the first signs of trouble. The man vomited more or less blood on several occasions in the following four months, and gastro-enterostomy was done. Neither of these patients had had previous stomach trouble, and the hematemesis occurred at the height of the pains. The blood was always of the coffee-grounds aspect. One patient estimated that he had vomited a pint of blood on one occasion. The fact that the hematemesis never occurred during an interval between pains should aid in differentiation in similar cases. Siding reported a case in 1909 in a woman of 62 with hematemesis and lacteal secretion and also recurring atypical herpes zoster. Another differential point is the absence of stomach symptoms during the intervals between the attacks of pain. In his experience with tabetic gastric crises, hyp acidity was the rule except during the crises.

Revista de la Asociacion Medica Argentina, Buenos Aires

May, XXVI, No. 150, pp. 419-594

- 86 Unusual Form of Pigmented Retinitis. R. Argañaraz.—p. 419.
- 87 *Operative Treatment of Gastric Cancer. A. J. Bengolea.—p. 426.
- 88 Colectomy for Acquired Megacolon. A. Ceballos.—p. 471.
- 89 History of Bubonic Plague. A. M. del Pont.—p. 477. Continuation.
- 90 *Papillomatous Form of Venereal Granuloma. A. H. Roffo and J. A. Farini.—p. 550.
- 91 Secondary Nutritional Disturbances in Tuberculous Infants. F. Schweizer.—p. 570.
- 92 *Protecting Salve for the Surgeon's Hands. T. Varsi.—p. 578.

87. **Gastric Cancer.**—Bengolea describes three typical cases with twenty-four illustrations to show the preferable technic for total or subtotal gastrectomy. Mayo calls it the Polya method, but Bengolea thinks that Delagenière published the same technic three years earlier.

90. **Venereal Granuloma.**—The lesions in the case described extended from high up in the inguinal region to back of the anus, with extensive papillomatous hypertrophy, in the course of seven years, but there was no impairment of the general health. The same parasitic elements first discovered by Donovan in 1905 were found in the smears, and prompt benefit followed intravenous injections and local application of antimony and potassium tartrate.

92. **The Surgeon's Hands.**—Varsi paints with iodine the nails, then scrubs with running water and soap, wipes dry and then applies petrolatum containing 4 per cent. eucalyptol and 2 per cent. thymol. This sterilizes and protects the hands against both germs and irritations of all kinds, and he has found this method of caring for the hands absolutely reliable.

Revista de Medicina y Cirugia, Havana

June 10, XXII, No. 11, pp. 273-296

- 93 *Pseudomyxoma of the Peritoneum. J. A. Presno.—p. 275.
- June 25, No. 12, pp. 297-320
- 94 *Clonorchis Sinensis in Cuba. P. L. Querens.—p. 297.
- 95 Child with Two Heads and Necks. (Monstruo derodimo.) J. M. Cabarrouty.—p. 305.
- 96 *The Cause of Appendicitis and Means to Ward It Off. A. Lorand (Carlsbad).—p. 309.

93. **Pseudomyxoma of the Peritoneum.**—Presno recalls that the condition in which the abdominal cavity contains a quantity of jelly-like substance, has been called *maladie gelatineuse* or pseudomyxoma of the peritoneum. Much confusion has been caused by the indiscriminate use of the terms "colloid" and "mucinous substance" in describing the jelly-like substance in question, as the origin of colloids and of mucin is quite distinct, as also the prognosis. Rupture or metastasis of colloid ovarian cysts is of a cancerous nature, while pseudomyxoma from rupture of a mucin cyst is not malignant. Presno has encountered three cases in which the pseudomyxoma was the result of perforation of the appendix distended with the jelly-like substance. He says that sixteen such cases had been published by 1912, and a number have been reported since. Elbe compiled in 1909 over 150 cases of cysts or cystic dilatation of the appendix, but neither he nor Kelly mentions pseudomyxoma of the peritoneum as a consequence of rupture of an appendiceal cyst. The jelly-like substance as analyzed by Sarvonat consists of mucin with traces of fat and cholesterol, but no colloid. Presno's patients were three women between 22 and 38 with a history of chronic or recurring acute appendicitis. All were cured by appendicectomy and clearing the peritoneum from the jelly-like masses. No signs of metastasis or recurrence have been detected in any instance during the years to date.

94. **Clonorchis Sinensis in Cuba.**—Querens reports what he thinks is the first case to be published in Cuba of this intestinal parasite. He quotes freely from Gunn's article in THE JOURNAL, Dec. 16, 1916, p. 1835, and warns against the danger of this parasite getting a foothold in Cuba. His patient was a Chinese laborer at Preston in eastern Cuba. He had been living in Cuba for eight years, and claimed to have been always in good health until four years ago when a dull ache and oppression attracted attention to the liver region. The symptoms gradually became more severe and during the last year he lost weight and for four months had been vomiting after meals. There was also diarrhea and finally slight chills

every day with fever. The discovery in the stools of the very small eggs of the clonorchis cleared up the puzzling diagnosis. The malaria parasite was found in the blood and quinin was given, but the condition grew progressively worse, the vomiting uncontrollable, with death the tenth day. In prophylaxis, besides measures to prevent the importation of the parasite it is important to boil the drinking water and cook most thoroughly all marine food, as, in Japan at least, the intermediate host has been shown to be a fish.

96. Prophylaxis of Appendicitis.—Lorand calls attention to the rubbing of the psoas muscle on the appendix as impeding the evacuation of the appendix and also as a cause of irritation. In a naturally large appendix the mark made by the pressure of the psoas on the appendix is quite noticeable. When the psoas is relaxed, the appendix rests on it peacefully; but when the psoas is exercised the appendix may be tossed about, its outlet squeezed together, and a predisposition to appendicitis develops. Running, skating, bicycling and sitting with the legs crossed all keep the psoas at work, and the appendix suffers. This can be discovered by having the right foot raised as high as possible while the right hand compresses the muscle. If there is latent appendicitis, pressure with the left hand on McBurney's point will induce intense pain. By this means it is possible to diagnose appendicitis in its initial stage. When this is discovered, all exercise straining the psoas muscle must be forbidden and the intestines kept open. Even when the pain is quite acute, the trouble may be merely from impacted feces or retained gases, and when the bowel is cleared out the pain can no longer be elicited. Another possible cause for appendicitis is sympathetic disturbance with inflammatory processes in the tonsils, the whole endocrine system being liable to share in pathologic conditions involving even only one link in the chain. He has often noticed hypertrophy of the tonsils with myxedema, exophthalmic goiter, acromegaly, diabetes, etc. The tonsils may likewise affect the appendix by infectious matter from them reaching the bowel. Adenoids may also contribute indirectly to pathologic conditions in the appendix.

Semana Medica, Buenos Aires

May 10, XXIV, No. 19, pp. 539-562

- 97 Nasal Treatment of Asthma. A. Quadri.—p. 539.
- 98 Gastrulation in Mammals. (Por ultima vez el canal neurenterico.) M. Fernandez.—p. 544.
- 99 History of Public Health Service in Argentina. E. R. Coni.—p. 547. Conclusion.

Siglo Medico, Madrid

June 2, LXIV, No. 3312, pp. 385-404

- 100 *Case of Transparent Peripheral Ectasia of the Cornea. Marquez.—p. 386.
- 101 Hygienic Measures in Treatment of Pulmonary Tuberculosis. L. Calandre.—p. 387. Continuation.

June 9, No. 3313, pp. 405-424

- 102 *The Pains with Kidney Stones. A. P. Martin.—p. 406.
- 103 Excision of Entire Rectum. A. Morales.—p. 409.
- 104 Diathermy in Gynecology. Poblacion.—p. 417. Continuation.

100. Marginal Ectasia of the Cornea.—Marquez' patient was a man of 46 who complained of impaired vision in the right eye. A white line, like the senile arc, ran along the outer margin of the cornea. It bifurcated to form a crescent enclosing the area of ectasia, which comprised the two inner thirds of the upper semicircumference of the cornea. The first sign of the anomaly was noted at the age of 10. The astigmatism was $-55 + 145$ degrees 21 D. The patient would not accept the proposed removal of the ectasia with the actual cautery. This proved successful in Terrien's case with 0.5 and 11 D.

102. The Pains with Kidney Stones.—Martin describes the manifold forms of pain that may be induced by renal calculi. Besides actual kidney colic, there may be pain and discomfort during movements, induced pain, reflex pain and crossed pains. Pain in the urinary apparatus during exercise is suspicious of kidney stones. The patient during examination should be told to jump, and the sensibility then be tested anew. Crossed pain is liable to mislead into serious error. In one case of this kind a boy of 11 after having had a stone

removed from the urethra, developed severe pain in the right kidney region when he moved about. The right kidney was tender on palpation from front and rear. The urine was bloodstained one day after fatiguing exercise but at all other times was apparently normal. A radiogram of the right kidney showed normal conditions there, but a peculiar shadow farther along proved to be that of a stone in the left kidney. He has been free from all trouble since the removal of the oxalate-urate stone by nephrolithotomy on the left kidney.

Russkiy Vrach, Petrograd

XVI, No. 9, pp. 193-216

- 105 *Scurvy, and General Measures in Prophylaxis. (O tsingyie.) A. I. Shibkoff.—p. 193.
- 106 *Mortality from Erysipelas in Relation to Location and Age. (O rozhi.) N. M. Ivanoff.—p. 198.
- 107 *Smallpox Scars and Vaccinations. N. T. Gamalieya.—p. 201.
- 108 *The Rapidity of the Rise in the Pulse Rate. V. L. Yanovsky.—p. 204.
- 109 *Auricular Fibrillation with Heart Block. N. I. Leporsky.—p. 205. Conclusion.
- 110 Suggestions for Simpler and Less Expensive Artificial Limbs. V. N. Pilkoff.—p. 209.
- 111 Adjustable Band to Protect against Secondary Sudden Hemorrhage from Large Vessels After War Wounds. N. M. Viner.—p. 210.

105. Scurvy.—Shibkoff urges that housing conditions are an important factor in scurvy, as foodstuffs are liable to mold and spoil in the damp houses of the Russian peasants.

106. Erysipelas.—Ivanoff tabulates the details of 5,270 cases of erysipelas in the last three years at a hospital for women at Petrograd. The total mortality was 4.4 per cent. but it was much higher with advancing years, being only 1 per cent. up to 20 and increasing progressively to 8 and 14 per cent. at 50, 60 and older. In the young the face was the seat of the erysipelatous process twice as often as in the older patients.

107. Smallpox Scars and Vaccination.—Gamalieya tabulates statistics showing a total of 414, 143 cases of smallpox in European Russia, 1909-1910, including 1,739 cases in Petrograd. Among the measures in vogue against it are house-to-house vaccinations when the disease is so prevalent as to arouse a smallpox scare. But this is waste of energy, it is asserted. There should be an ample vaccination force and regulations to enforce vaccination on those that really require it, not waiting for the smallpox scare and then have the vaccination done ineffectually, and wasted on persons who do not need it.

108. The Pulse Coefficient.—Yanovsky has published a number of articles in the last nine years to call attention to the practical advantages of mathematical accuracy in estimating the work of the heart. This is particularly useful, for purposes of comparison, with arteriosclerosis, as he describes in detail here. The coefficient celeritatis pulsus, CCP, is the square root of the quotient obtained by dividing the square of the pulse pressure, PP, by the product of the time required for the rise of the pulse wave, TAP, multiplied by the time required for the decline of pulse wave, TDP. In this communication he introduces a new element to add to the precision of the formula, namely, the rapidity of the rise of the pulse wave, the celeritas ascensionis pulsus, CAP. This figure is calculated from the ratio between PP and TAP.

109. Heart Block with Fredericq Symptoms.—The fibrillation of the auricles was accompanied by bradycardia of the ventricles, dissociation being complete, in the case described with much detail by Leporsky. The left ventricle also showed pronounced hypersystoles with hyposystole in the right ventricle. The auricular fibrillation changed to a slower rhythm, namely, tachysystole, probably from the influence of the medication, digitalis and inhalation of oxygen. The case thus presented simultaneously the Adams-Stokes syndrome and the Fredericq syndrome. The latter must therefore be regarded as occurring in two groups, cases with and without the Adams-Stokes symptoms.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

May 12, I, No. 19, pp. 1527-1622

- 112 *Roentgenograms Showing What Seem to be Calculi but which are not. (Pseudonierensteen.) N. Voorhoeve.—p. 1528.
- 113 *Deficiencies of Present Methods of Fighting Contagious Diseases. P. W. Onnen.—p. 1535.

114 *Electrocardiograms of Frog Heart under Influence of Antiarin. H. C. Rümke.—p. 1551.

115 *Comparative Mortality of the Sexes. J. P. H. Kroon.—p. 1564.

116 Case of Intraperitoneal Rupture of the Bladder. H. Jonker, Jr.—p. 1571.

112. **False Kidney Stones.**—Voorhoeve is instructor in roentgenology at the University of Amsterdam, and he here gives six roentgenograms showing shadows which seemed to be cast by unmistakable calculi in the kidney. They proved, however, to be merely the shadows of gallstones, or of a tuberculous cavity with calcified content, or an old calcified echinococcus cyst. Small tumors and local thickenings of connective tissue are also liable to cast faint shadows which may be misleading. One patient had passed a kidney stone without colic and had no further trouble until six months ago when urination became painful and the urine contained traces of albumin and blood corpuscles. A shadow was evident in the superior pole of the kidney, but its peculiar location and the fact that it was not a dark shadow, while the outline was irregular and not well defined, and the shadow of the kidney tissue around was rather lighter than usual—all suggested a calcified tuberculous cavity. This was confirmed by discovery of tubercle bacilli in the urine and by the findings at nephrectomy. His experience demonstrates the incorrectness of the tradition that gravel does not cast a shadow. In one woman two calculi were found when the kidney was opened, but the third stone shadow proved to be merely from a mass of gravel. Six roentgenograms show these various findings. The calcified collapsed echinococcus cysts cast sharp, regular shadows, the outer part dark, with a lighter center. A roentgenogram taken with the plate against the abdominal wall gives better shadows. Gallstones cast smaller shadows under these conditions.

113. **Inadequacy of Present Measures of Prophylaxis against Contagious Diseases.**—Onnen discusses the experiences with diphtheria, scarlet fever, typhoid and measles in the Netherlands in recent years and the lessons to be learned therefrom. They emphasize the necessity for placing the oversight over diphtheria and typhoid in the locality, each in the hands of one person who is supplied daily with all the data concerning these diseases in the place and also in the districts surrounding it, and the local conditions for combating it, and his authority, even if only advisory, is recognized by the local administrative authorities. The absence of one or more of these four factors proved disastrous in some districts in the Netherlands, and also division of responsibility, instead of having one person at the head of the whole prophylaxis against each one of these diseases. He reviews in particular the experiences in his own district, where he is an officer in the board of public health. In the last ten years there had been from 3 to 7 cases of scarlet fever every year until 1913 and 1914 when there were 21 and 10 cases, respectively. Special efforts were made to seek out in the schools and render harmless all abortive cases, and cases of "fourth disease," and other eruptions with fever. The value of thus stamping out possible sources of infection is evident from the fact that the following year not one case of scarlet fever developed in the whole district. During the same ten year period there were 90 deaths from measles, over two thirds in children under 2. None died among the children over 7 with measles. The importance of warding off measles infection from very young children is emphasized anew by these figures. This can be done efficiently only with notification of measles. Prophylaxis on this basis is particularly imperative in day nurseries, kindergartens, etc. Only 3 of the total 90 deaths were in children over 6. Onnen comments on the difficulties encountered when a physician tries to keep up his practice while serving on the public health board. Individual and public interests are liable to conflict and hamper his work; it is much better, he declares, to have a salaried whole-time public health officer in charge of the measures against contagious diseases.

114. **Experimental Research on the Heart to Explain the Electrocardiogram.**—Rümke experimented with the frog heart under the toxic influence of antiarin. The changes in the rhythm of the heart beat shown by the tracings and also by

the electrocardiograms suggest an explanation of the nature of the latter.

115. **Comparative Mortality of the Sexes.**—Kroon analyzes the mortality statistics of the Netherlands for males and females at different ages. The almost universal higher mortality of males over females at corresponding ages is most pronounced the first year of life. For each 100 girl babies that died between 1910 and 1914, 139 boys died in the first two months of life; 134, third month; 130, fourth; 127, fifth; 123, sixth; 115, seventh and eighth; 113, ninth and tenth, and 111, the eleventh and twelfth months. Tschuprow once reported that the number of stillborn male children had been four times that of the female at the large maternities of Vienna and Budapest. By the age of 10, the mortality in girls everywhere exceeds that of boys; Australia seems to be the only exception to this rule. In the Netherlands, the mortality among boys from 10 to 18 does not average much above 80 per cent. of the mortality in girls. But with 18 it begins to run up again and keeps above the female mortality throughout the rest of life. One table shows that the mortality of unmarried men is 141 to that of 100 unmarried women, and 172 to that of 100 married men. The mortality of unmarried women is only 72 compared to that of 100 married women. These figures embrace the age period of 20 to 25. At 50: 129, 132 and 131. Other tables show that married men have a much lower mortality than married women (from 59 to 73 per cent.) up to the age of 40, but then the mortality excess changes and the men show a mortality of 120, 128 and 126 which gradually declines to 103 in the eighties. The excess mortality of married over unmarried women up to the age of 40 changes then abruptly, the mortality being much higher in the unmarried from 40 to 50, namely, 101, 130 and 131. Above this age it runs from 121 to 104, and drops to 100 at 70 and 80.

Hospitalstidende, Copenhagen

June 6, LX, No. 23, pp. 549-572

117 Case of Complete Masculine Pseudohermaphroditism. P. Møller.—p. 549.

Ugeskrift for Læger, Copenhagen

May 24, LXXIX, No. 21, pp. 813-854

118 Functional Tests of the Liver. J. P. Gregersen.—p. 813. To be continued.

119 *Morbidity under Prohibition. (Alkoholforbudets Virkninger paa Kommunehospitalets VI Afd.) H. I. Schou.—p. 823.

120 *The Question of Specialization in Medicine. T. Røvsing.—p. 828.

119. **Morbidity under Prohibition.**—In this communication from the Copenhagen public hospital, Schou compares the number of cases of delirium tremens and of trauma in drunken men during a period of municipal total prohibition and the period before it, and during a period of partial prohibition in that a supposedly prohibitive price had been placed on liquors. The cases of delirium tremens in the last four or five years have averaged five or six a week, but during the total prohibition period weeks passed without a case. During the partial prohibition period there were also weeks without cases of delirium tremens but the number of "drunks" was even higher than usual, the restrictive measures evidently failing in their purpose. Schou remarks that the weeks of peace and quiet in his service under total prohibition are now past, as drunkenness is as common as ever under the restrictive price, the so-called partial prohibition, but he does not expect the number of cases of delirium tremens to return to the old level, as it takes brandy to produce delirium tremens, and this is scarcely obtainable.

120. **Specialization in Medicine.**—Røvsing discusses this question from both the practical and the scientific standpoint. The Danish Medical Association is now engaged in revising the lists of specialists in Denmark, a general medical or surgical training being now regarded as indispensable as well as the training in the special branch. The only organization of Danish specialists who refuse to accept these views, he says, are the alienists. They insist that a broader training in medicine is not necessary as a basis for care of mental disease, but he adds that they too in time, will have to admit the necessity of what every one else regards to be right.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXIX, No. 6

CHICAGO, ILLINOIS

AUGUST 11, 1917

ESTABLISHMENT, MAINTENANCE, AND REINSTITUTION OF BREAST FEEDING *

J. P. SEDGWICK, M.D.

Professor of Pediatrics, University of Minnesota Medical School
MINNEAPOLIS

Persistent demand on the breast is a most important and continually neglected factor in the establishment, maintenance and reinstitution of natural or breast feeding.

Normally, the flow of breast milk in the puerperium is supposed to be brought about by the hormones set free just before the milk "comes in." I have had no personal experience in the establishment of lactation without a preceding pregnancy. Many dependable authorities, however, vouch for the possibility of such a phenomenon when proper demand is made on the human breast, either male or female. Pfaundler's report of a calf which was suckled by other animals and produced normal cow's milk may also be cited as supporting the correctness of the cases reported among human beings.

The premature infant is usually incapable of furnishing the physiologic sucking stimulus necessary to support the hormones. When the importance of the continued demand on the breast is underestimated, the breast feeding fails. This is entirely unnecessary.

In the method used in such cases in the University of Minnesota new-born clinic and my private work, no attempt is made, except in slight degrees of prematurity, to put the babe at the breast at first. Both breasts of the mother are expressed regularly five or six times daily.

The expression is carried out as follows: The breast is grasped about 1 or 2 cm. back of the colored areola, and a milking motion is carried out toward the nipples. The nurses and mothers soon gain a manual dexterity which is surprising. No massage of the breast proper is allowed, as it is of little, if any, value, and sometimes causes traumatic inflammatory reaction. If we consider the anatomy of the breast, we learn that the ducts which contain the milk extend but a short distance back of the areola. Any one who has ever seen a cow knows that the teats are milked and not the cow's bag, and yet we often find head nurses, physicians and even pediatricians giving instructions to milk or "massage" the breast gland itself. If our method is intelligently followed, it is possible to keep the mother of the premature infant from losing her

milk. I have seen some such mothers supply not only milk for their own babe, but also enough to supply a second infant.

I shall not discuss agalactia, as I have never seen such a condition and seriously doubt its existence. If the babe does not gain well at the breast, the trouble is practically always with the babe itself, or with the quantity, but not the quality of the milk.

Let me cite a case in which the trouble was supposed to be with the quality of the milk:

I was called in consultation to see a baby who, at 8 weeks, weighed less than at birth. We weighed the baby before and after nursing. It received but 5 c.c. (one teaspoonful) of milk. The baby nursed unsatisfactorily; the breast gland was not being stimulated. The babe had hypothyroidism; for that reason it sucked imperfectly. Instructions were given to put the baby at the breasts regularly. The babe was weighed before and after each nursing. The breasts were then carefully expressed manually. The expressed breast milk was given to the baby and instructions were left to make up the caloric requirement with a simple milk mixture. Desiccated thyroid was also administered. The milk secretion increased rapidly, the babe began to suck better and gained in weight, and after a short period the complementary feeding was dropped.

When, for any reason, the breast milk supply is low, the amount that the child gets should be determined accurately by a balance, not by a spring scale. The child should be put to the breast and the infant's food requirement supplied by complementary, not supplemental, feeding, that is, the required amount of extra food should be given immediately after a nursing, not in place of a nursing. The pernicious practice of dropping a nursing and replacing it with an artificial feeding is one of the most frequent causes of the breast drying up and the loss of milk. The breast is not stimulated; it is, in fact, the best method of weaning the infant.

Breast feeding can also be established at a much later date by the same method:

I saw a babe at the age of 1 month that had never been nursed. It was possible to express a few drops from the mother's breasts. The mother was told that with her cooperation the breast secretion could be reestablished. The babe was put to the breasts regularly. Of course, the infant did not take the nipples well. The milk was carefully expressed after each nursing. The babe's caloric requirement was met with a simple milk mixture, given after the nursings, and the expressed breast milk. The babe was weighed before and after each nursing. After a week or ten days, the scales and expression showed a definite and progressive increase in the amount of breast milk secreted. At the expiration of a month of this treatment, when the infant was 2 months old, the child's gain in weight was satisfactory and, as the amount of mother's milk was sufficient, everything but the mother's milk was discontinued, and a successful lactation was carried out.

* Chairman's address, read before the Section on Diseases of Children at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

In the maintenance of lactation the same attention should be given to keeping up the demand as in the establishment of lactation. The amount of breast milk obtained by the infant should be determined and the child's requirements met by complemental, not by supplemental, feeding. The breasts should be evacuated at least five times in twenty-four hours.

The success of relactation or reinstitution of breast feeding by making a demand on the breast furnishes more evidence in support of the importance of the demand which is made on the breast.

Zlocisti made a definite contribution to the subject of "relactation," as he terms it. He reported the reestablishment of lactation in several cases after the lapse of weeks and even after ninety days. I have no doubt of the correctness of his reports. I have tried his methods of putting the father to the breast, but feel that under our present social conditions we shall have more general success by the method we have used. It is unnecessary to give a list of cases at this time, but I cite one instance of success as typical:

A short time ago, I saw an infant, aged 4 months, which was having convulsions, spasmophilic in character, on unnatural feeding. The child had not had the breast for nine weeks. It had been taken from the breast because of illness of the mother. She had just returned from the hospital, in which she had had severe erysipelas followed by antrum trouble. The mother and babe were immediately taken to the hospital where the nurses had been properly trained in milking. The babe's spasmophilia was controlled by the daily administration of sufficient dosage of calcium chlorid, 75 grains daily, followed later by phosphorus in cod liver oil. The mother was assured that with her cooperation the milk could be brought back. The breasts were stimulated regularly by placing the babe at the breast. The babe refused to take the nipples at first. The milk was carefully and thoroughly expressed and the babe's nutrition was maintained by complemental feeding. For several days the results were discouraging, as but 3 or 4 drops were obtained. The number of drops gradually increased. Then the amount grew so that the product could be recorded in cubic centimeters. Lactation was finally established.

Confidence and technical skill are necessary in such cases. The end sought is, however, of enough importance to demand that the attending physician should exert as much patience and have as much skill as we expect of the surgeon who undertakes a major surgical procedure.

I have intentionally omitted reference to the other aids to the establishment, maintenance and reestablishment, and to the literature in order not to befog the main point of making the demand on the breasts. I do not pretend to have offered any new discovery.

We know enough now, from a physiologic standpoint, to save the breast milk for most of the babies that are now deprived of it. It has become a question of getting the information to the profession and the nurses and the public. It is largely a question of psychology now and not of physiology.

An Unbusinesslike Nation.—The merchant accepts past experience as a guide to the need of future supplies; the salesman counts on publicity and education to create a demand for his wares. Shall our cities or our nation ignore their greatest asset and fail to count the daily loss of lives as inexcusable? And yet—to our shame, be it said—we, who claim to be a civilized nation, have still so cheap a notion as to life and death that we are without a national registration law or uniform state laws demanding the reporting of births and deaths.—Haven Emerson, M.D., "Preparedness for Health."

THE TECHNIC OF WETNURSE MANAGEMENT IN INSTITUTIONS*

ISAAC A. ABT, M.D.
CHICAGO

A large number of the babies brought to infants' hospitals suffer from gastro-intestinal disease caused by food disturbances. Most of them are given hospital attention after various attempts have been made to correct the disorders by food and medicine. Consequently the condition of these babies, on admission into the hospital, may be correctly described as serious. Most frequently they are toxic, either from disease or food, usually from both, so that the problem of detoxication is the immediate and pressing indication. After undergoing the short preliminary period of starvation, these desperately sick infants require not only a detoxicating agent, but food as well to sustain life. For both these purposes, nothing can

TABLE 1.—DAILY QUANTITY OF MILK EXPRESSED BY WETNURSE R. F.*

Day of Month	Oct. oz.	Nov. oz.	Dec. oz.	Jan. oz.
1	42	39	34	36
2	38	37	42	38
3	43½	35	34	36
4	36	37	37	37
5	34¾	36	38	34
6	33½	38	38	33
7	40	37	38	37
8	37	42	35	35
9	35½	36	39	35
10	40	36	34¾	39¼
11	42	36	36	37½
12	43	36	37	38
13	41	35	40	39
14	42	38	41	38
15	37½	36	34	43
16	49	34	37	35
17	45	35	40	35½
18	45½	36¾	35	33
19	46	37	35	33
20	40¼	37	38	37
21	40½	41	36	38
22	43½	38	37	33½
23	41	40	28	45
24	39½	36½	26	35
25	40	38	38	34½
26	40	38	31	35
27	41	35	27	26½
28	41	38	29	24
29	42	37½	31	22
30	43	36	31	22
31	36½	..	30	22
Totals	1,256 (39.25 qt.)	1,112.5 (34.76 qt.)	1,086 (33.94 qt.)	1,067 (33.65 qt.)

* Total amount for four months, 4,521.5 ounces (14.6 quarts); average daily amount, 36.84 ounces; largest daily output, Jan. 23, 45 ounces; previous occupation, telephone operator; primipara; married.

compare in value to properly suited doses of breast milk. An infants' hospital, which necessarily must receive the babies who have been most neglected and who require the most expert treatment, should consequently have at hand an ample supply of breast milk.

Although there is in Chicago at present no directory for wetnurses such as exists in New York and in Boston, we rarely have any difficulty in procuring wetnurses for the Sarah Morris Children's Hospital. The various maternity hospitals and foundling asylums cooperate with us, and are glad to secure positions for their inmates, since wetnursing will not separate them from their babies.

It has been found advisable to select women whose ages range from 20 to 30 years, although more depends on the qualifications of the individual than on her age. A nurse of phlegmatic temperament and good morals is preferable, though it is needless to say that moral

* Read before the Section on Diseases of Children at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

qualities are not transmitted through the milk. At the time of admission to the hospital, the baby of the wetnurse should be at least 3 or 4 weeks old. Before admission, the wetnurse and her baby must undergo a complete physical examination. The mother is examined carefully for pulmonary tuberculosis, and diseases of skin, glands and bones. The Wassermann examination is made in every case, and the vaginal secretion is examined for gonococci. In examining the child, the weight and appearance are taken into account. One must assure himself, at this point, that the mother is presenting her own baby for examination. It has happened more than once that a woman desiring to engage herself as wetnurse has presented some other woman's baby borrowed temporarily for the purpose of successfully passing the test. We must above all, in the examination, satisfy ourselves that the breast milk is sufficient in quantity and proper in quality. In view of the lack of more scientific methods, the quantity of a nurse's milk is judged by weighing her baby before and after an ordinary nursing. It may also be roughly estimated by expressing the milk by hand. If pressure is applied to the breast in a proper manner, the milk is caused to jet from the nipples in numerous streams expelled with considerable force. If, however, the milk slowly drips from the breast, the quantity may be considered deficient.

The quality of the milk is best estimated by examining the baby of the wetnurse. If the baby is in good nutrition, shows gain in weight, and has normal bowel movements, we may naturally assume that the milk is of good quality. We place little reliance on the chemical examination of breast milk as an index of its quality. The composition of the milk as expressed in chemical analysis varies so much during one and the same feeding, and during different periods of the day, that little reliance can be placed on this test.

After the wetnurse has passed the physical examination, she is admitted to the hospital, where she and her baby are provided room and board. There she receives a wage of \$8 a week. She is required to do some light work, among other things, the laundry for herself and baby and the care of her own room. At the Sarah Morris Hospital it is insisted that she nurse her own baby, because by doing this she not only provides the best nutriment for the child, but also supplies a natural stimulation to her breasts. The wetnurse feeds her own baby at 7 and 11 a. m., and 3 and 9 p. m. Thus there is no chance for stasis to occur. The secretion of milk is reflexly stimulated by the sucking act. The more completely the milk is withdrawn the greater becomes the supply.

Since the foster babies in our institution are not put to the breast, the milk is procured for them indirectly. Breast pumps are not used because they have been found inefficient. The mother, shortly after her admission to the hospital, receives instruction from a trained nurse in the technic of expressing the milk manually. This method is rapid and results in no injury whatever to the breast. As much cannot be said of the pump when it is employed.

Milk is expressed every four hours during the day and night. All the wetnurses milk at the same hour under the supervision of a head nurse and assistants. Thus the operation is pretty well controlled. At the specified period, the nurse on duty brings to the wetnurses' apartment the required number of sterile medicine glasses, sterile bottles, and materials for cleansing the breasts. The nipples are first washed with

sterile water. Then after cleansing her hands, each wetnurse seats herself at a table on which the tray bearing the above described equipment has been placed, and begins the manipulation by which the milk is expressed. It is to be noted that not the whole breast but only that part which corresponds to the areola is compressed. As this portion is being compressed, the breast is at the same moment drawn downward and forward. Following this method, the wetnurse soon becomes expert in emptying her breasts, so that it requires but a short time to complete the work.

The milk is received in sterile medicine glasses designed with flaring top and stem similar to goblets. This shape adapts them nicely to catch the milk as it streams from the breast. As soon as filled, they are emptied into sterile half-pint bottles. The nurse on duty remains in the room during the entire time the milking process is going on. It is necessary to exercise watchfulness in supervising the operation, because

TABLE 2.—DAILY QUANTITY OF MILK EXPRESSED BY WETNURSE L. T.*

Day of Mo.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April
	oz.	oz.	oz.	oz.	oz.	oz.	oz.
1	39	35½	25	44	47	44	39
2	36	36	29	39	47½	38	40
3	39	37	26	40	56*	42½	39
4	46	37	33	49	43	45	41½
5	39	37½	38	48	44½	40	39
6	36	37	36	45	43	40½	39
7	42	37	39	44	43	39	40
8	45	38	38½	48	45½	41	39½
9	36	36	36	39	44½	39	39
10	37	33	39	46¾	41	39	40
11	36	39	40	..	45½	39	40
12	41	37	38	..	43	41	41½
13	39	37	35	44	44	..	41½
14	38	36	36	38	42	..	39
15	39	37½	37	36	..	..	40½
16	41	35	35	37½	44½	..	39
17	36	36	37	43	45	39	41½
18	36	..	38	36½	47½	39	39
19	39	33	37	39	45½	39	39
20	37	34	36	41	37	39	39
21	32	..	38	40	47	39	42½
22	33½	39	38	38	40½	39	39
23	37¾	39	40	37	48	39	42
24	36	39	40	41½	38	39	39
25	36¾	35½	41	38	42	39	38
26	35	34	38½	35½	43½	41½	35½
27	35	34	38	38	41	37½	38½
28	24½	29	44	39	39½	37½	41
29	36	27½	32	47	..	36½	40
30	39	27	40	50½	..	34	39
31	34	..	39	44	..	40	..
Totals ..	1,156.5 (36.14 qt.)	992.5 (31.01 qt.)	1,136 (35.5 qt.)	1,206.5 (37.7 qt.)	1,188.5 (37.1 qt.)	1,067 (33.4 qt.)	1,190.5 (37.2 qt.)

* Total amount for 7 months, 247.3 quarts; average daily amount, 38.5 ounces; largest daily output, Feb. 3, 56 ounces; previous occupation, housemaid; primipara; unmarried.

it has been our experience in times past that wetnurses have practiced deceit, either by diluting the milk or by substituting cow's milk for their own product.

In most instances the breast milk is used immediately after pumping. When an excess is obtained, it is transferred in sterile bottles to the refrigerator in the milk station, where it is kept until needed. The breast milk is reserved for those babies who are desperately ill and require to be tided over critical periods, for those suffering from marasmus, due to food disturbances or infection, to the premature babies, and to all who have been operated on for pyloric stenosis. The milk is administered in the same way that any formula is given. Those who are not too weak receive it from the bottle; those who are premature or too feeble to nurse are fed with the medicine dropper, the spoon, or by the Breck feeder; still others are fed by gavage.

We believe that the food for the wetnurse herself during lactation should be sufficient but not

excessive. It should consist, as nearly as possible, of the food to which she has been accustomed in her normal environment. It would be a mistake, for example, for a woman who had been previously fed on a simple diet of meat, potatoes and coarse bread, to be changed suddenly to a diet consisting largely of unaccustomed delicacies. It would be absurd to expect her to secrete milk normally under such conditions. The view that certain foods ingested by the mother derange the quality of the milk is probably fallacious. For instance, it has been shown experimentally, after feeding a wetnurse a large quantity of fat, such as bacon or cream, that the fat content of the milk remained unchanged. It was not the milk but the wetnurse herself that increased in fat.

At the Sarah Morris Children's Hospital, the wetnurse receives an abundance of good, wholesome food, taken at the regular meal times. In addition, she receives a glass of milk every four hours of the day and night. The following is the menu used in feeding the wetnurses:

8 a. m., cereal, fruit, milk, rolls, cocoa or tea and eggs.

12 m., soup, meat, potato and one green vegetable, cereal, pudding or ice cream, and occasionally cookies.

6 p. m., meat, vegetable, cereal, stewed fruit and tea or milk.

Fruit forms an important part of the diet. Raw fruit is permitted, though stewed fruit is usually preferred. The fruit counteracts the tendency to constipation and avoids the necessity for laxatives. The nurse is encouraged to drink an abundance of water.

Particular attention is paid to the hygiene of the apartments occupied by the wetnurses and their babies. The rooms are kept scrupulously clean; overheating is avoided and proper ventilation is controlled. The personal hygiene of the wetnurses is carefully supervised. It is insisted that they shall bathe regularly and that they shall be attired at all times in clean clothes. Aprons or dresses made of washable material are worn, designed so that the breast may be easily exposed without causing undue pressure. As it would be difficult for the hospital to keep on hand a supply of clothes which would be properly fitting to all, each wetnurse provides herself with cotton dresses, which in most instances consist of light bungalow aprons which open in front on one or both sides.

The wetnurse is given ample time to sleep. She retires at 9 p. m. and rises at 8 a. m. She arises late because it is necessary to disturb her during the night in order to obtain the milk. Her own baby sleeps in the apartment with her, though in a separate bed. We do not permit her to nurse her baby at night. If the baby requires food in addition to that supplied by the breast, artificial feeding is provided for.

Each wetnurse is given some leisure in the afternoon between the milking periods. During this time she may exercise or rest. She is required, however, to return to the hospital promptly at the hour at which the milking is done. If she goes out for a walk, she takes her baby with her; this precaution helps to keep her out of mischief. She is not allowed to leave the institution after dark, and is required to be in her room by 8 p. m. On the whole, the mother is usually well satisfied with her situation. She has her own baby with her and is learning to care for it properly. This increases the interest in her work and undoubtedly renders it less irksome.

It was formerly considered that the appearance of menstruation was a signal to wean the baby; but

our experience in this regard accords with that which is commonly stated, namely, that menstruation has little effect on lactation and none on the permanent quality of the milk. During the first day or two the baby may show a temporary disturbance; it may be restless, refuse the food, or show signs of mild dyspepsia, with vomiting and diarrhea. Statistics show that 50 per cent. of women are amenorrheic, 43 per cent. menstruate, and of these 20 per cent. have regular periods during lactation. In a word, then, many women menstruate during lactation without producing any permanent deterioration of the milk or any serious symptoms on the part of the baby.

The duration of lactation may continue for a long time, particularly if the stimulation to the breasts is maintained. As a rule, however, the milk tends to deteriorate toward the end of the first year, so that wetnurses usually are not retained after they have been with us for nine or ten months. At one time a wetnurse remained with us for eighteen months. The

TABLE 3.—DAILY QUANTITY OF MILK EXPRESSED BY WETNURSE B. R.*

Day of Mo.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April
	oz.	oz.	oz.	oz.	oz.	oz.	oz.
1	31½	41	42	42	47	40½	39
2	39	43½	40	40	40	39½	40½
3	39	40¾	42	41	40	41	41½
4	36½	41	43	40	44½	39½	39
5	37	43½	40	42	39½	39½	39
6	37	39	47	44	28½	41	39
7	46	42	50	49	38	39½	41½
8	44½	42	44	44	37½	39	39
9	41	42	45	44	37	40	39
10	41	40	45	40	39	39	39
11	42	37	40	41	36	39½	39
12	47½	41½	39	43	40½	39½	39
13	41	40	44	40	40	39½	39
14	47	40	40	49	40½	40½	42½
15	40	40	38	51	..	39½	39
16	48½	39	38	40	42	39½	39
17	43	41	43	41½	43¾	39	39
18	39	42	41	42	44	39	49½
19	39½	46	45	39	47½	39	39½
20	41	42½	39	41½	39½	41	39
21	46	41	43	40	43½	39	40½
22	39	41	38	37	43½	39	39
23	47	43	39	36	43½	39½	38½
24	41	41	38	42½	42	39	39
25	43	43	39	38	39½	39	41
26	43	41	43½	37½	41½	40	39
27	45	44	41	38	44	38	46
28	44½	42	40	39	40½	39	47½
29	45½	43	39	39	..	39	49½
30	45	43	39	40½	..	45	47
31	41	..	40½	40½	..	39	..

Totals .. 1,301 1,245.7 1,285 1,282 1,063 1,230 1,227
(40.67 qt.) (38.9 qt.) (40.16 qt.) (40.06 qt.) (33.2 qt.) (38.4 qt.) (38.3 qt.)

* Total amount for seven months, 270.2 quarts; average daily amount, 41.1 ounces; largest daily output, 51 ounces; previous occupation, housemaid; primipara; unmarried.

quantity and the quality of the milk were so exceptionally good that we hesitated to part with her at the end of the customary period. At the present time, one of the wetnurses at the hospital has been in service for eight months, and her supply shows no sign of diminishing. She produces as high as 56 ounces in twenty-four hours, in addition to that which she gives her own baby. The average daily amount which we obtain from each wetnurse, excluding that which she gives to her own baby, is about 37 ounces.

The accompanying tables indicate the daily quantity of milk expressed by the wetnurses which is available for use.

Civilization.—The prevalence of avoidable misery, and the direct encouragement afforded by society to all kinds of morally unworthy activities, are such prominent features of every modern community, that only a very strained use of the word "civilization" would make it truly applicable to such communities.—*Scientific American*.

PROBLEMS. CONNECTED WITH THE
COLLECTION AND PRODUCTION
OF HUMAN MILK*

B. RAYMOND HOOBLER, M.D.

DETROIT

The failure of many mothers to secrete a sufficient quantity of milk to nourish their babies has been the subject of much discussion. Little has been written on the ability of many mothers to produce milk far in excess of the need of their offspring. This ability to produce an excess quantity lays on us the responsibility for its utilization, especially in view of the fact that many infants would thrive much better if at least a portion of their food could be supplied by human milk.

In our country it is estimated that 2,500,000 babies are born yearly, and with each birth there is the potential mechanism for supplying the necessary nourishment during the first nine months or a year. We have here not only a great life-giving provision, but also one of great economic importance. It is reported by Lucas, in his recent work in Belgium, that he found that many more mothers were nursing their babies during the past three years than previously. It is also recalled that during the siege of Paris, it was reported that maternal nursing was the rule; hence under the stress of great economic necessity, such as insufficient or improper food for feeding their babies artificially, mothers have found their breasts adequate to the demand. We earnestly hope that no such economic situation in our country will be necessary to force our profession and our mothers to an appreciation of the great waste which is permitted, when a breast which can produce should be permitted to dry up, or when one which has the possibilities of abundant production is permitted to produce milk only for the mother's own offspring. It has always seemed to me that, taking into consideration the breasts that fail or perform their function inadequately, and those that produce normally or abundantly, if some system could be evolved, simple in its application, whereby these mothers with abundance could supplement those who have a scant supply, it would be a great factor in reducing infant mortality as well as preventing a great economic waste.

For hundreds of years the accepted medium for performing this service has been the wetnurse, this wetnurse in the early times being a good samaritan neighbor or friend, who out of pity and from her abundant supply, suckled a motherless babe. Later, the professional wetnurse came into being, who for purely monetary reasons was willing to allow another baby to nurse at her breasts. Wetnursing has always been an uncrowded profession, though one which offered unusual financial remuneration. This is so, no doubt, owing to the inborn modesty surrounding motherhood; and far be it from me to wish it to be otherwise. There seems to be as much hesitancy on the part of a mother to permit her babe to nurse at another's breast as there is on the part of the mother to permit another babe to nurse her breast.

The attempt of our profession to depend only on the wetnurse as a medium of this exchange has, I believe, greatly retarded the more general use of

mother's milk as a part of the diet of infants who do badly on artificial feeding. Often the home is not equipped to care for the wetnurse and her baby; often the home cannot afford the additional expense; many times the baby needs only a small amount of mother's milk daily; if the wetnurse is taken into the home she frequently disrupts the entire household. I believe there is a far better way of handling the situation. It does away entirely with the home difficulties and solves in a measure the economic problem.

Some years ago I conducted an investigation to determine whether or not mother's milk could be purchased on a purely commercial basis. Through the active cooperation of the social service department of Bellevue Hospital it was proved that such a thing was possible, and at the close of the investigation as much as 1,000 ounces per month was being purchased by Bellevue Hospital.¹

COLLECTION AND DISTRIBUTION OF MOTHER'S
MILK

I wish to describe briefly a method which I believe could be made available in every city or town which is equipped with a hospital, be it small or large. If several hospitals exist in a community the hospital conducting the largest obstetric service would be the hospital of choice for the establishment of a collection and distributing center.

In Detroit, in connection with the Woman's Hospital and Infants' Home, we believe we have an ideal place for conducting this work, having collected and distributed over 23,000 ounces of mother's milk in the last six months. It is important to have the milking of the breasts done under the supervision of a trained nurse. While in our work we have not detected any mothers attempting to make substitution or to water their milk, because of this careful supervision, yet it is related how a bottle of milk which was brought in, or milked without proper supervision, turned sour within an hour. If the milking had been done under the eye of a competent nurse, such an occurrence would have been impossible.

The hospital admits to its service, in addition to a large number of private obstetric patients, a number of young unmarried pregnant women who for a small fee are delivered and cared for during a period of three months following delivery. These girls are taught to take care of their own babies, and in addition perform light service about the home. It is the aim that every mother shall nurse her own baby. If she has more than sufficient milk, it is expressed and fed to babies of mothers who do not have sufficient. From among these mothers many are found who produce much more than is necessary for their babies, and this forms the basis of an excess quantity of human milk which is available for use outside of the hospital. All mothers are carefully tested as to their physical condition, Wassermann reactions are taken, and all expressing of breasts is done under the eye of a trained nurse who teaches the mother the technic of expression. The milk is collected in sterile bottles, measured, credited to the account of the mother, and then put in a refrigerator. During the period of stay in the hospital, the mother accumulates a neat sum to help her when she must go out into the world with two to support, and at the same time has been taught the value

* Read before the Section on Diseases of Children at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Hoobler, B. R.: Experiment in Collection of Human Milk for Hospital and Dispensary Uses, *Arch. Pediat.*, 1914, **31**, 171.

of her breast product and has lost the hesitancy of supplying it for other babies.

Through the active manipulation of the breasts, done as a rule every four hours, the breast secretes an increasing quantity of milk; and at the end of the three month period, if the mother has developed a good milk-producing capacity, that is, from 16 to 24 ounces above the amount necessary for her own baby, she is urged to continue in the hospital as a producing mother; or if she has suitable home surroundings in the city, she is urged to continue milk production as a means of earning her living, in which case she returns to the hospital two or three times daily for expressing her milk. In this way many mothers are able to support themselves and their babies until such time as they regain confidence, or their homes are again thoroughly established. Other nursing mothers not connected with the hospital are appealed to by advertisement in the daily press and by placards in dispensaries, in several languages, stating that mothers who have an excess of milk may find remunerative employment, while remaining at home, by applying at the distributing center.

These mothers are visited in their homes; and if the homes are found suitable and their physical examination and Wassermann test are negative, they are placed on the list as contributing mothers; they come to the hospital twice daily and have their breasts expressed; the milk supply is well maintained by two expressions, particularly if the breasts are suckled between times. The babies of the mothers are examined and weighed regularly. The homes of the outliving producing mothers are inspected regularly as to cleanliness and infections. The work of distribution is as important as that of collection. The milk collected was distributed in the following ways:

A portion of this milk was used to feed the babies in the hospitals whose mothers temporarily did not supply sufficient for them.

A large proportion was supplied to homes on orders of physicians, to whom it was sold at a price varying from 10 to 25 cents per ounce. Some was supplied without any cost to families who could not afford to pay for it. An advertising campaign was carried on through medical organizations to interest physicians in the use of mother's milk. No advertising was sent out except to physicians.

The residue left after supplying the private demand was sent to the Children's Hospital and hospitals having children's wards that were under contract to take all excess milk at a flat rate of 10 cents per ounce. Thus none was ever wasted.

The milk is sent for regularly by the families using it. Occasionally delivery is made by special messenger. Milk is never delivered to a house by the mother direct. Usually two distributions are made daily, at 9 a. m. and 6 p. m. The distributing center is always open, and milk may be obtained at any hour, day or night, the night superintendent of the ward acting as custodian during the night.

Under suitable circumstances, mothers are sent into the homes with their babies as occasion requires. If this is done, a negative Wassermann test must be obtained on the receiving baby, or in lieu of this, a statement from two physicians that the baby is free from disease; and a release of responsibility for possible infection of the wetnurse is signed by the parent of the baby receiving milk direct from the breast of the wetnurse. Occasionally a mother continues to live

at the hospital or in her own home, and spends the day at the home nursing the baby direct on the breast and expressing sufficient milk during the day so that the baby may be fed from the bottle at night. Every possible contingency is met by this versatile manner of conducting the bureau.

The organization necessary to carry out such a center may be very simple.

In a small hospital, a joint committee from the board of trustees and members of the hospital staff might be the functioning organization. In larger cities a joint board of pediatricians and social workers might cooperate in the establishment of such a center. There should be a paid social worker in charge if the work grows to any proportions.

The necessary qualifications for a producing mother are that she be healthy, with a double negative Wassermann test. Her own baby should be making average daily gains. Her home should be tidy and her personal habits clean. Analysis of her milk should occasionally be made. The period of her production may be prolonged to fifteen or eighteen months, Holt, Courtney and Fales² having shown that the average milk production between the ninth and eighteenth months varied very little from that produced between the sixth and ninth month. The milk of several mothers may be mixed, or milk from individual mothers may be supplied if requested by the attending physician.

A word from the standpoint of the pediatrician enjoying the privileges of such a human milk supply: During the past winter I have had occasion constantly to make use of this supply. I have found that it was often far more satisfactory to have the milk brought from the hospital than for a wetnurse to live in the home. I seldom fed the entire day's feeding in mother's milk, although in some cases this seemed necessary, particularly in premature infants who did not consume large quantities. It has been my experience that babies receiving mother's milk from the bottle did as well as those being fed directly from the breast. By bringing only the milk into the nursery, rather than the wetnurse, it seemed to me that the chances of introducing infections were lessened.

DIET OF THE MOTHERS

An important factor in keeping the milk production of these mothers to the maximum is diet. From the fact that these mothers remain in the hospital for a period of three months after delivery on a diet prescribed by the hospital, it is of great importance to outline a satisfactory diet for them. Many young mothers fail during the first two or three weeks.

This was brought forcibly to my attention in the infants' service of the Woman's Hospital, where opportunity was given for accurate weighings to determine the amount of milk produced by each mother; it was not uncommon to find a mother giving her baby as little as 10 ounces daily at the end of three weeks, with the result that the baby's weight was at a standstill, necessitating temporarily the giving of supplementary feedings.

A study of the diet and regimen of these mothers was undertaken, and it was found that with some modifications of the diet nearly all the mothers were

2. L. E. Holt, A. M. Courtney and H. L. Fales (Am. Jour. Dis. Child., October, 1915, p. 238), speaking of milk produced during the tenth to twentieth month of lactation, say: "As a group the milks for this period show no constant or essential differences in any of their constituents from those of the mature period" (first to ninth month).

able to supply all the milk necessary to keep their babies gaining the usual weekly amount.

In a large service such as is maintained at the Woman's Hospital where the mother remains for such long periods (three months or more after delivery), the problem of supplying a diet suitable for maintenance of the mother and production of sufficient milk to nourish the baby satisfactorily is one of considerable economic importance, particularly at this time. A study of the literature on this subject revealed what seemed to me to be a very inadequate fundamental knowledge regarding the quantity and kind of food—particularly protein food—best suited to the production of human milk. Studies such as are here described relating to the production of human milk have been carried on for some years past by the observers in animal husbandry, and a great amount of data on the proper feeding of cows for the maxi-

results, we observed several mothers over a period of three months using diets with varying quantities and kind of protein in connection with suitable fats and carbohydrates, and estimated accurately the nitrogen food intake, and the nitrogen excretion in the urine, feces and milk; also careful analyses of the fat, solids and caloric value were made and the quantity of milk was determined. The fluid intake and weight of the mothers was kept. The milk was expressed by the hand method and accurately measured. Each baby was fed on its own mother's milk given in a bottle, and the babies gained considerably in weight. The mothers were ideal for observation, accepting the diets willingly and cooperating in every way. At no time during the observation did anything occur to disturb the even tenor of their ways.

We elaborated several diets which, according to the most recent analysis, were estimated to contain pro-

TABLE 1.—DETAILS OF PRODUCTION

Diet	Ratio Protein Fat and Carbohy- drate	Ratio Fat and Carbohy- drate	Calo- ries Fed	Milk Pro- duced, C.c.	Calo- ries	Protein in Milk, per Cent.	Fat in Milk, per Cent.	Total Solids, per Cent.	Sp. Gr. of Milk	Nitrogen Effi- ciency, per Cent.	Food Calo- ries in Milk, per Cent.	Source of Protein in Diet, per Cent.
9	1:4	1:1	2,927	1,522	968	0.92	3.0	11.60	1.030	48.5	33	Meat, 40.5; cereal, 21.2; milk, 15.7; vegetable, 12.1; eggs, 10.5; hypophosphites
9	1:4	1:1	2,927	1,630	1,192	1.01	3.0	13.1	1.029	49.6	40	Same as above
7	1:5	1:1	2,842	1,486	962	0.89	3.0	11.80	1.029	13.9	33	Same as above except that malt extract was given instead of hypophosphites
7	1:5	1:1	2,842	1,751	967	1.03	3.0	12.0	1.030	26.4	34	Same as next above
10	1:5	1:1	2,670	1,758	1,096	0.97	3.6	11.80	1.027	5.3	41	Pure vegetable diet; nuts, 66.2; vegetables, 17.7; cereals, 14.8; fruits, 1.35
10	1:5	1:1	2,670	1,620	1,372	1.09	3.6	16.50	1.027	13.8	50	Same as above
1	1:6	3:2	3,767	1,475	1,042	0.83	3.9	13.10	1.029	38.8	27	Milk, 33.5; cereals, 33.55; meat, 21.5; vegetables, 11.5
1	1:6	3:2	3,767	1,445	1,071	1.18	3.0	16.00	1.029	43.0	28	Same as above
6	1:6	1:1	2,774	1,329	1,000	0.79	2.4	9.50	1.028	-3.0	35	Meat, 40; cereals, 21; milk, 15.7; vegetables, 12.1; eggs, 10.5
6	1:6	1:1	2,774	1,521	1,269	1.01	2.7	12.30	1.029	+2.3	45	Same as above
2	1:8	2:3	3,446	1,425	835	0.97	3.0	11.60	1.030	-1.4	24	Meat, 27.7; vegetables, 19.8; cereals, 18.1; milk, 14.5; nuts, 9.4; eggs, 8.5
2	1:8	2:3	3,446	1,375	698	1.04	3.4	10.00	1.028	+20.7	20	Same as above
3	1:9	1:4	3,503	1,370	824	0.84	3.3	11.10	1.029	11.1	23	Pure vegetable, exe. milk; cereal, 60.5; milk, 23.9; vegetables, 14.2; fruits, 1.4
3	1:9	1:4	3,503	1,174	766	1.02	3.9	12.00	1.030	22.0	21	Same as above
5	1:9	1:1	2,088	1,475	1,014	0.89	3.3	13.00	1.029	-104.0	48	Meat, 32.9; vegetables, 19.8; milk, 19.6; cereal, 14.8; eggs, 12.9
5	1:9	1:1	2,088	1,536	945	1.07	3.0	11.00	1.030	-70.5	45	Same as above
8	1:13	1:4	2,286	1,507	786	0.90	3.6	11.50	1.029	-8.6	34	Pure vegetable diet; cereal, 54.2; vegetable, 40.3; fruits, 5.5
8	1:13	1:4	2,286	1,586	973	0.98	3.6	12.8	1.030	-102.8	42	Same as above
4	1:15	2:1	3,634	1,362	970	0.89	3.6	13.1	1.028	-2.2	27	Milk, 37.1; cereal, 28.2; vegetable, 18.6; meat, 10.5; nuts, 5.6
4	1:15	2:1	3,634	1,416	1,059	1.04	3.9	13.5	1.030	-30.2	29	Same as above

imum milk production has been obtained; such knowledge has become the common property of all dairymen. It seemed, therefore, that a series of observations attempting to determine some fundamental principles involved in the production of milk in the human species might be undertaken.

The literature on the subject as it relates to human beings is exceedingly scant, but several careful pieces of research have been conducted on other species producing milk; the cow, the goat, the dog, for example, have been studied and a careful analysis made of the intake, excretion and retention, establishing for these animals certain facts which may generally be considered as true for the human being. E. B. Hart and G. C. Humphrey, working with cows, have added the most recent contribution to our information. They have shown that for cows not only the quantity, but also the biologic quality of protein has a marked effect on the milk production. Proceeding somewhat along the same lines they followed in obtaining their

tein to fat and carbohydrate in the ratio of 1 : 4, gradually widening this ratio until protein was to fat and carbohydrate as 1 : 15. These diets varied also in the number of calories fed in twenty-four hours and also in the biologic type of protein which was supplied. Certain diets were rich in meat protein; others in milk, cereal or nut protein. With these diets as a basis, we studied the milk production on each diet over periods of from four to seven days. Each mother was given identically the same food (all of the food was carefully weighed), but the quantity of water differed, each mother being allowed as much water as she desired.

The results as relate particularly to the nitrogen intake and output were reported at a recent meeting of the American Pediatric Society. This paper concerns itself particularly with the quantity and caloric value of the milk produced on these diets with especial reference to the biologic character of the protein best suited for human milk production.

That there is a biologic difference in the various proteins in their effect on growth has been shown by many observers, particularly by Osborn and Mendel³ and most recently by McCollum.⁴ That the same principles involved in growth might also obtain in milk production in cows was suggested by Hart and Humphrey,⁵ who have reported several admirable pieces of work which show conclusively that the biologic character of the proteins, as well as their quantity, has a marked effect on the milk protein production in cows. Observations on nursing mothers as similar as possible to those made on dairy cows were carried on, and in instances in which conditions could be approximated, the findings were in general the same as found by Hart and Humphrey.

The details of production are set forth in Table 1, and from these findings it is possible to estimate which proteins or groups of proteins were most efficient in milk production in the mothers observed. In attempting to determine the efficiency of any diet fed, factors which must be considered are: (1) quantity of the milk produced; (2) caloric value of the milk produced, and (3) loss or gain of tissue of the mother producing the milk.

In Table 1 are submitted the details of the observations which cover these points. From the standpoint of quantity of milk, Diet 10, made up of nut protein supplemented by vegetable protein only, produced an average of 1,234 calories, over a hundred calories above any other diet; also an average of 1.689 c.c. of milk in twenty-four hours. From the standpoint of protection of maternal tissues, one of the mothers showed a nitrogen efficiency of 5.3 per cent, and the other of 13.8 per cent. Thus in the three essential standards Diet 10 produced the best results. It is not intended to convey the impression that this diet would always accomplish the same good results, for while it produced the same general results in each of the mothers under observation, a much wider application of such a diet must be undertaken before a definite decision can be reached; but such were the findings in this observation, and it is for those interested to test it clinically.

The actual ingredients of the diet are given in Table 2. The diet contained approximately 2,670 calories. The ratio of protein to fat and carbohydrate (all reduced to basis of calories) was 1:5. The actual

TABLE 2.—INGREDIENTS OF DIET 10 (NUT DIET)

	Gm.		Gm.
Malted nuts	100	Chocolate	8
Protese (nut product).....	150	Bread	200
Pecans	25	Potatoes	200
Almonds	25	Lima beans	100
Walnuts	25	Peas	200
Peanut butter	50	Bananas	100
Cocoa	8	Apple sauce	50

grams of protein ingested was 104.68, yielding 16.75 gm. of nitrogen. Of this intake 89 per cent. was absorbed. The mothers took the diet readily, and in fact enjoyed it.

This diet demonstrates that the biologic character of vegetable protein, particularly if composed largely of nut protein, is not incompatible with a production of milk protein whose biologic character is entirely different.

3. Osborn and Mendel: Bull. 156, Pub. Carnegie Inst. Washington, 1911.
4. McCollum, E. V.: The Supplementary Dietary Relationships Among Our Natural Foodstuffs, THE JOURNAL A. M. A., May 12, 1917, p. 1379.
5. Hart, E. B., and Humphrey, G. C.: Jour. Biol. Chem., 1915, 21; 1916, 26, 457.

This does not hold true when a pure vegetable diet, such as Diet 8 from cereals, vegetables and fruits, is given. This may be suitable for building into human milk protein, but it is exceedingly difficult to feed a sufficient amount of protein in such a diet, although the insufficiency of these proteins for milk protein production was concealed by the mothers by their ability to metabolize their own tissue proteins and maintain secretion at a high level.

On a diet composed of corn and gelatin, both of which are deficient in certain of the amino-acids, the quantity, but not the quality of the milk production

TABLE 3.—INGREDIENTS OF DIET 9

	Gm.		Gm.
Oatmeal	150	Rice custard	100
Bread	200	Cocoa	4
Butter	25	Apple sauce	50
Round steak	150	Lima beans	100
Eggs	100	Sugar	50
Potatoes	200	Cream 20 per cent.....	100
Milk	500	Spinach, squash or carrots..	100

* A compound syrup of hypophosphites, ½ ounce, three times a day was given before meals.

was maintained. This diet, however, was accompanied by marked negative nitrogen balances, thus demonstrating the ability of the human being to compensate at least temporarily for the deficiencies in the biologic structure of the proteins fed.

Thus we may well conclude that the protein in a pure vegetable diet (not including nut diet) is both insufficient and inefficient for the maximum production of milk protein.

With the exception of the nut protein diet, the other biologic forms of protein best adapted to milk production were derived from animal protein, and consisted of a mixture of meat, milk and egg protein, with an added quantity of cereal and vegetable protein composing about one third of the available protein. This diet showed high efficiency from the standpoint of quantity, calories and maternal protection. The total quantity of milk was 1,576 c.c., calories produced 1,130, and both mothers remained in positive nitrogen balance. The diet is given in Table 3. It approximated 2,927 calories. It contained 130 gm. of protein yielding 20.64 gm. of nitrogen. The sources of the protein were: meat, 40.5 per cent.; milk, 15.7 per cent.; eggs, 10.5 per cent.; cereal, 21.2 per cent.; vegetables, 12.1 per cent.

As to the question of which of the biologic forms of animal protein is best suited to milk production, it would appear that milk protein has a particularly high value in this regard, as demonstrated in Diet 3. In a diet of a rather wide ratio, 1:9, milk protein was the only form of animal protein fed, and constituted 23.9 per cent. of all protein fed. Yet this quantity of animal protein was able to convert what would otherwise have been a marked negative balance into one with a positive nitrogen efficiency of 17 per cent. In another instance, a diet containing a small amount of milk protein with a nitrogen efficiency of 47 per cent. was increased to a nitrogen efficiency of 74 per cent. by the addition of 250 c.c. of milk.

Other factors, such as total number of calories, the proportion of protein to other ingredients, and also ratio of fat to carbohydrates are important.

The number of calories fed in the diets used varied from 3,764 to 2,088. Four of these diets varied from 3,400 to 3,700. The average amount of milk produced daily on these diets was 1,380, with an average of 1,033 calories in the milk. Four of the diets varied

from 2,600 to 2,900 calories. The average milk production in twenty-four hours on these diets was 1,576 c.c., with an average caloric value of 1,103 calories in twenty-four hours. The mothers were more frequently in nitrogen balance on the diets varying from 2,600 to 2,900 calories than when fed diets varying from 3,400 to 3,700. In two of the diets, calories varied from 2,088 to 2,286. On the average, the amount of milk produced in twenty-four hours was 1,501 c.c., but in caloric value it was decidedly below the average, being but 929. The mothers were in constant negative nitrogen balance. These low caloric diets were constructed to approximate diet lists obtained from several nursing mothers whose milk supply, while fairly abundant, did not satisfy the needs of their babies. It is evident that even though on a low caloric diet the quantity may be maintained, yet the quality of the milk must of necessity deteriorate as the reserve of the mother is used up. It seems to me that this is one of the frequent causes of failure of supply. In order to consume 2,600 calories in twenty-four hours a mother must devote herself to the task, while the consumption of from 2,000 to 2,200 may be easily accomplished on her part. I am convinced that the diet of the first three or four weeks of the puerperium is based too much on what might be called sick room specialties, broths, gruels and titbits of one kind or another which are not sufficient to support an increasing production of milk.

It seems to me rather that the mother should be considered as a normal individual whose diet must include sufficient for two. The fear of carrying over in the puerperium an ante partum albuminuria deters many mothers from eating as freely of a mixed diet as they should. It is true that the maternal tissue will give up of its protein and its fat and glycogen to supply the constituents, but when these are depleted it cannot be continued indefinitely, and the diet must be commensurate with the need. The proportion which the protein of the diet bears to the fat and carbohydrate of the diet also has much significance. It varied in the diets used from a ratio of 1:4 to one of 1:15. These ratios refer to the proportion of digestible protein to digestible carbohydrate and fat, the latter reduced to a carbohydrate basis.

The diets accounted the most efficient were based on a narrow nutritive ration of 1:6 or narrower. It is difficult to feed a diet containing a wide nutritive ratio, for example, 1:15, without either feeding too little actual protein or, if the protein requirement be maintained, overfeeding with fat and carbohydrate. The protein proportion of the diet is best supplied by animal protein and least satisfactorily by vegetable protein with the exception of nut protein, which seems in every way as suitable for elaborating milk protein as does animal protein. There seems to be considerable evidence that at least a certain amount of milk protein is an important ingredient of the efficient diet. In general, one may state that a generous mixed diet, including nuts, milk, meat, eggs, with cereals, vegetables and fruits constitutes a diet containing the potential factors for the maximum milk production.

SUMMARY

1. A diet to be efficient must produce a sufficient quantity of milk, containing nutrition adequate to cause an increase in growth of offspring without impairing the tissues of the mother.

2. Diets containing from 2,600 to 2,900 calories in twenty-four hours produced better results than diets containing from 3,400 to 3,700 calories. It is of no avail to overfeed in hope of maintaining or increasing the milk supply.

3. Diets containing 2,000 calories or less cannot protect maternal tissues and at the same time produce sufficient milk. A nutritive ration of less than 1:6 gave best results.

4. Animal protein is better than vegetable protein for purposes of milk production.

5. Nut protein is as efficient as animal protein in elaboration of milk.

6. The best form of animal protein to protect maternal tissue and increase milk production is cow's milk protein.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRs. SEDGWICK, ABT AND HOOBLER

DR. FRITZ B. TALBOT, Boston: Too much attention cannot be given to this subject, because until recent years there have been few hospitals that have had enough wetnurses for their babies. I believe every hospital with an infant's ward should have at least two wetnurses. I want to emphasize again what Dr. Abt said about watching wetnurses when they are expressing the milk. There should be some responsible person in the room at the time. In the directory for wetnurses of the Infants' Hospital, Boston, cow's milk and water have been added to bring up the amount of milk.

Our technic is the same as Dr. Abt's, except that the milk is strained through sterile gauze before being put in the bottle. After it is put in the bottle a stopper of sterile cotton is put in, and the stopper is sealed with wax. If there is any tampering with the bottle the wax will be broken. This is merely a safeguard.

I want to draw attention to something that impressed me in Schlossmann's clinic in Dusseldorf. When Schlossmann has more human milk than is needed, he freezes it and puts it in vessels where it is kept in a frozen condition until it is ready to be used. He says that it gives no untoward symptoms when it is melted, and its use has proved satisfactory.

There is often a great mistake made by the practicing physician in considering that breast milk is not good when the wetnurse's baby is over a year old. I want to emphasize what Dr. Abt said about continuing to use a wetnurse even if the baby is over a year old, because other babies do perfectly well on her milk, even up to eighteen months. In other countries, Japan in particular, women often nurse their children for three or four years. One important phase of the wetnurse problem is the social side of it. It is important to keep the baby with the mother, in order that the baby may have a fair opportunity to live. When separated from the mother, the child's chance for life is not very good, whereas of those kept with the mother at least 95 per cent. will live and thrive. Aside from the social element, the mother always secretes more breast milk when she has her baby with her, because she is happy. This is an important reason for keeping the baby of the wetnurse with her.

I should not like to have this discussion close without some one saying that every wetnurse should be examined for tuberculosis, and any other contagious disease ruled out. I am sure that every one present does that, but we want at least to say it in the discussion.

DR. LEWIS M. SILVER, New York: Regarding the age of the period of wetnursing, a cousin last summer took a trip through the Hudson Bay country, and when he returned he showed a picture of a Labrador woman nursing a baby of 4 years. He said that was a common occurrence up there. They nurse their babies sometimes up to 5 years.

DR. JACOB SOBEL, New York: My interest in the wetnurse problem is rather from the community standpoint. Being in charge of the baby welfare work of New York, and in control of fifty-nine baby health stations, I am interested in anything which makes for the reduction of infant mortality. We have met many obstacles in securing wetnurses for the people

who make demands on us. The result is that we have been compelled to resort to certain measures from a municipal standpoint, which, if applied to other communities, might result in increasing the number of wetnurses available. Our procedure is this: With the number of yearly births in New York 137,000, and some 40 per cent. of birth registration in the control of midwives, it becomes necessary that the midwives report every case of stillbirth. Immediately on notification, we visit the home of the mother who has given birth to a stillborn infant, and after examination, of course, ask her whether she would be willing to wetnurse an infant. In this way we have been able to establish a directory at the health department and to have a larger number of wetnurses available than ever before. The bureau of records, on receipt of notification that an infant under 1 year of age has died, communicates with the mother and makes a similar request. With these two methods of procedure we find that the monopoly of wetnursing in New York City is rapidly disappearing. I think a procedure of that kind if applied to other communities would increase the available number of wetnurses.

In New York City there is a neighborly feeling, which may not appear so evident to people who come from out of town; but among Italian and Jewish people it is not at all uncommon for a neighbor who has a large supply of breast milk, to be perfectly willing to give part of it to a neighbor's youngster who is suffering from one of a large number of conditions such as Dr. Abt brought out.

The question of maternal nursing is rather an important one from the baby health station point of view. We have been criticized, as have all baby health stations, as tending toward artificial feeding. I would like to say here that at the baby health stations of this city over 60 per cent. of the infants enrolled are exclusively breast fed, and some 19 to 20 per cent. more, partly on the breast and partly on the bottle; so that the efforts of the baby health stations are primarily educational, and they may endeavor always to encourage breast feeding.

We have had cases similar to those referred to by Dr. Sedgwick, in which mothers say they cannot nurse their babies. Sometimes they come to us after six or eight weeks and by insisting that the baby be applied to the breast, we have succeeded in numerous instances in materially increasing the supply.

I would like to ask whether any present have tried injection of breast milk subcutaneously as a galactagogue. We are trying it in a few cases—going about it very guardedly. While my experience is not sufficient to make any statement, I should welcome any information.

DR. L. E. CHAPPELLE, Grand Rapids, Mich.: I tried it once, with very encouraging results.

DR. JACOB SOBEL, New York: Dr. Chapin in his article on "Institution vs. Foster Mother Care" advocated "back to the home." I hope the contribution of this section to the mothers of the country will be "back to the breast."

DR. GEORGE DOW SCOTT, New York: Those of us who have been brought up in the hospitals of Europe and have studied pediatrics while in them, have noticed the great differences between the status of the wetnurse there and here. These conditions and differences were noticeable to me particularly in Vienna and Budapest, where the social status of the unmarried, impregnated woman—for a large part of these women are unmarried—aroused less observation and criticism. In the larger cities of this country, particularly in New York, Boston and Philadelphia, this criticism is less severe than in our smaller cities, and we therefore get better wetnurses.

DR. CHARLES HERKMANN, New York: There is one important point in the case of the wetnurse attached to the babies' ward. It is important to know just how much it costs.

DR. OWEN H. WILSON, Nashville, Tenn.: I have been using this method for over twenty years. I am glad to see expressed breast milk is coming into vogue. I find it easy enough to get a woman to go to a home twice a day. If enough cannot be secured from one, herd milk is just as good as individual. The wetnurses have to be watched, however. We have had them carry bottles of milk in their bosoms and empty them into the receptacle.

I have used one wetnurse on twelve babies in one season. I have her stay with each baby three or four weeks until we get it on some other food.

Twenty years ago we did not have the Wassermann, and the methods of determining syphilis have much improved. I do not believe, however, that breast milk can convey syphilis. I do not believe the spirochete will live in drawn breast milk, especially if kept cold. Of course I examine patients now; but I was speaking of pre-Wassermann days.

DR. CHARLES L. SUMMERS, Winston-Salem, N. C.: In reference to the age of the wetnurse, in Vienna and Berlin, where I worked in 1911 and 1912, we had several wetnurses over a year nursing in whom the quality and quantity of the milk were both satisfactory. At present, in the Garret Hospital in Boston where I am serving, we have a wetnurse with a child 10 months old, and she is regularly giving 57 ounces of milk a day. There is one feature I wish to call attention to, and that is that the milk under these conditions is usually high in protein and low in fat, and for this reason its caloric value decreases. The quantity of milk under such circumstances has to be increased.

DR. CARL G. LEO-WOLF, Buffalo: These interesting papers belong in the section on obstetrics, but unfortunately obstetricians are not interested in these cases. They keep experimenting with them, and when they are finally turned over to us it is often too late. This subject belongs to the accoucheurs, but they do not know anything about it, and the probability is they do not wish to know.

DR. J. P. SEDGWICK, Minneapolis: I want to take exception to that. I think the babies belong to the pediatricist as soon as the cord is tied.

DR. FRANK S. CHURCHILL, Chicago: I want to ask Dr. Abt to tell us what the mortality in these babies' wards now is, compared with four or five years ago.

DR. E. J. HUENEKENS, Minneapolis: For the past two years I have been experimenting with breast milk that has been preserved; that is, heated for one hour at 56 C. with concentrated hydrogen peroxid. We have used this in the outpatient department of the Infant Welfare Society. Mothers collected the milk themselves and brought it to the station, where it was sterilized by the nurse. I have been able to preserve milk three weeks during the hot summer months, and keep it in very good condition. Bacteriologically, breast milk would contain, when it reached us, 300,000 to 1,000,000 bacteria per cubic centimeter. We were not able to sterilize the breast milk, but we were able to keep it at about the same level for three weeks. This preserved milk seems to be as good as the fresh milk so far as results go. The time that it takes for this procedure makes it impractical for an outpatient clinic, but I feel it would be practical in a combined obstetric and pediatric hospital, and during the coming year I intend to try this at the University of Minnesota Hospital.

DR. L. E. CHAPPELLE, Grand Rapids, Mich.: In Grand Rapids we pay \$8 to \$12 a week for a wetnurse.

DR. ARTHUR D. HOLMES, Detroit: Some three years ago we had difficulty in securing wetnurses, and decided to establish a bureau and furnish wetnurses in suitable cases. We placed notices in the local papers and with the members of the profession, asking women who had had stillbirths or lost their babies to register at our bureau, guaranteeing them \$7 a week, board, room, and necessary laundry for themselves and child. We soon had quite a number, some of whom came only to have the milk expressed. Milk was sold at 20 cents an ounce and any oversupply was sold to the Babies' Hospital for 10 cents an ounce. By a careful supervision of the social service nurse the bureau has a balance in the treasury. The mothers were instructed, thoroughly examined, Wassermanized, and a guarantee was taken from the family in which the child was to be nursed, for the protection of the wetnurse.

DR. ISAAC A. ABT, Chicago: It is easier to employ a wetnurse in a hospital than in a private family, because in a hospital she is not hampered or worried. I think it is the experience of every one who knows anything of wetnursing in the home, that certain members of the family are apt to domineer and worry the nurse. The best policy is to leave her alone and to spare her all irritation.

Although I have had no experience with the injection of expressed milk as a galactagogue, I may say that I have tried almost every galactagogue and have never seen any beneficial effect from any of them. In my opinion, the only galactagogue is the stimulation of the breasts, and the best stimulant for the breast is the sucking of the baby.

I may say in regard to examining women for syphilis and tuberculosis, that I laid no stress on this phase of my subject because it is so elementary. We examine for syphilis and tuberculosis, of course, in every case. In any instance in which the Wassermann test has not been made, and we are in desperate need of milk, we boil the breast milk until the Wassermann test has proved it all right.

Replying to Dr. Wilson of Nashville, we must be extremely careful of the milk of unexamined women. Dr. W. T. Watson some four or five years ago read a paper in this section in which he gave an instance of one syphilitic nurse who had spread the disease among many institutional babies. It is probable that a specifically infected woman may convey infection through her milk if not through her breast.

We pay wetnurses \$8 a week. We do not like to have any one pay them more, for it is the middle and lower class people, of no great means, who need them most. It is very rare, however, for a woman to receive more than \$8 a week. In every instance of employment, her baby accompanies her.

In regard to the point about drawn breast milk being high in protein and low in fat and caloric values, I may say that as far as we are concerned the caloric value of the milk is of minor importance compared with its efficiency as a therapeutic agent. These babies are brought to the dispensary sick. We want to save them; we want to reduce the infant mortality; we want to make a record for our hospital. It makes no difference whether the milk is of high or low caloric value, it serves to bridge the baby over a very desperate period and saves its life—that is the point.

Dr. Churchill wanted to know about the specific mortality results. I cannot, at this moment, give specific results. I know this, that babies are brought in to us marantic, with cold extremities, on the very edge of the hereafter, and we give them a few teaspoonfuls of breast milk, and keep on giving it, and the babies revive. We do this day after day. I do not know what the mortality rate is, but I do know that without breast milk we would lose nearly every one of these desperately sick babies, and with it we are in a position to save most of them.

Dr. THOMAS S. SOUTHWORTH, New York: Dr. Chapin, in a discussion of an earlier paper, spoke of doing away with the institution in favor of having the children cared for in the home. That may come, but personally I believe for the time being in doing what we can in the institution to improve it. The mothers who give birth to babies there should receive such diet that they will be able to nurse their babies. This is a question much neglected in nearly all lying-in institutions. There is great difficulty in getting a sufficient amount of cow's milk for these nursing mothers to enable them to produce milk. We should wake up to the fact that we are starving the breast fed babies as well as the artificially fed babies, because the mothers do not receive the proper diet.

Dr. HENRY I. BOWDITCH, Boston: I want to accentuate Dr. Hoobler's paper and impress on the minds of all that it is an easy thing to produce a similar group of wetnurses. The Boston Floating Hospital was able to procure during the summer from mothers interested, breast milk at approximately 80 cents a quart. It is a possible thing to produce by the proper organization, backed up by tests of blood, etc.

Dr. WILLIAM P. LUCAS, San Francisco: One of the most vital questions which any section can deal with, and one which probably every pediatricist neglects more than any other, is the question of infant feeding. We have a service which I am glad to see growing—a combination of pediatric and obstetric service. Infants are turned over to the pediatricist as soon as they are delivered. We have had opportunity to study the milk production as never before. It is interesting to note the inequality in the early production of milk. Not only the food has an influence, but the psychologic and mental condition of the mother has a bearing. I have studied that very closely, because in all the literature we find it just barely

mentioned, that the mental or psychologic condition is a factor. I believe it is very important.

Take it in a ward where many mothers have illegitimate children. The home factor is very important in upsetting the milk supply. The social service department in relation with these mothers is very often able to correct these conditions; it can often do more good than the diet. If the mother is upset mentally, no matter what diet is given her, she will not have milk sufficient in quantity or quality.

As to the question of having a wetnurse directly, Dr. Hoobler very wisely said that he only advertised to the medical profession. It is rather a commentary that we should have to advertise to the medical fraternity. It is the most difficult thing to get medical men to take up the use of breast milk. We have attempted to have the same type of service that Dr. Hoobler has so successfully carried on. It takes a great deal of money to carry on an institution of that kind, but there is always on hand a sufficient amount of milk.

Dr. HERMAN SCHWARZ, New York: I have been interested in the problem of securing and distributing breast milk for many years, and have been surprised that there was any great difficulty about it. I may say I have been fortunate in being connected with a combination obstetric and pediatric service (outpatient department).

We have about thirty breast fed babies coming to our outpatient department every day. We know these babies from long before they are born. We know the families—whether there have been any stillbirths or abortions. If such is the case a Wassermann test is made on the mother long before the baby arrives. Thus, it is perfectly easy to get 20 to 30 ounces of breast milk in an afternoon. In summer we pasteurize or sterilize this milk if we wish to keep it any length of time. If the mother brings it herself, we simply use the Umkoff reaction to be sure it is human milk. We use the milk simply as a therapeutic measure if we need it.

I do not think we should go away with the impression that it is good for the health of the woman to nurse for twelve or fifteen months. It is not fair to have her nurse so long. Considering the effect of diet on milk, I have come to the conclusion that as long as the mother is given a well-balanced diet, with her digestion in good shape, if she gets enough rest, very little can be done to alter the composition of her milk.

Dr. LAWRENCE T. ROYSTER, Norfolk, Va.: The psychology of this condition, as has been mentioned, is very important. I want to bring out one thing along this line. Education plays such a very important part in the care of nursing babies, as well as artificially fed babies, that we should look to educational propaganda to accomplish something. There are two classes of people who need education—the mothers and the physicians; and in some cases the physicians need it more than the mothers. The mothers are being educated through popular articles. The bureau in Washington, over which Miss Julia Lathrop presides, is doing a wonderful work. The mothers are beginning to grasp the situation; they are demanding a more careful supervision of their babies. The mothers are educating the physicians—the general practitioner, I am talking about.

I should like to sound one note of warning: When the mothers are urged to nurse their babies from the standpoint of the babies' health, as well as for economic reasons, the importance of keeping track of that baby's weight is not emphasized sufficiently. Frequently mothers come to me with a baby which had weighed 8 or 9 pounds at birth, and at 3 or 4 months of age weighs less. As the milk declined in the mother, she became more frightened until she gave less and less milk. We know that the psychology has a great influence on the secretion of milk.

The popular magazine articles for mothers serve their purpose admirably if they are written by one who knows, and are properly censored. I recently saw an article in one of the most prominent magazines of the country, in a series of articles to the mothers about their babies, in which appeared a beautiful picture of that especial abomination, the white enamel spring scale, with a white basket on it, on which we all know there is no reliance to be placed, and in the basket was lying a beautifully dressed—completely dressed—baby.

This article was written by a woman who signed herself as a registered nurse. The sooner we get away from the ignorance of such a writer as that, and the appeal to the esthetic in the nursery, and come down to the common sense of a cheap, balanced scale and a nude baby, the sooner we will get results.

DR. L. R. DEBUYS, New Orleans: There is one factor which has not been sufficiently emphasized, namely, the use of the scales in connection with the nursing mother's weight. We are all familiar with the poor underfed mother who comes to the clinic who is trying to nurse her child. Frequently the baby thrives and gains satisfactorily at the expense of the mother, who is losing weight steadily. In these cases we are impressed with the importance of the mother receiving a sufficient amount of food, not only for her baby, but for herself as well if they both are to thrive. The use of scales for both should be employed in determining this.

DR. HENRY HEIMAN, New York: What Dr. Hoobler has told us is of great importance. It is well to remember that the salts of sodium, potassium and chlorine diminish gradually in mother's milk as lactation progresses, whereas calcium, magnesium and phosphorous salts remain fairly constant.

Regarding obtaining the milk, we sometimes find it extremely difficult, unless we instruct the nursing mother to express it properly. That is a matter about which people need instruction.

DR. R. R. FERGUSON, Chicago: Two interesting points have been brought out in the discussion of these papers. One is that the cost of the milk, unless used absolutely as a therapeutic agent, is entirely out of proportion to the status in life of most families who need this milk. According to one or two of the speakers, if the milk were used in pint quantities for several weeks it would be almost prohibitive. If used in quarts it runs up to \$30 or \$40 a week. These prices are prohibitive for the common run of people who most need it. One speaker said 80 cents a quart. It seems to me it is up to those of us who are studying this subject to see that the cost is reduced so that the people in moderate circumstances may be able to avail themselves of it.

As to the question of boiling the milk, it seems to me we should be at least as careful as in the use of cow's milk. The men who are collecting the milk and having a bacteria count of 100,000 should not be allowed to put such milk on the market, especially since it is mother's milk. Cleanliness in mother's milk is more important and more easily obtained than in cow's milk. Therefore, I urge on you the importance of keeping the bacteria count low enough so that you will not have to change the quality of the milk by boiling it.

DR. T. C. MCCLEAVE, Oakland, Calif.: Much has been said about maintaining the mother in good psychologic condition. For a great many years I have been connected with high grade dairy work and I have learned there that every dairyman knows how more or less to alter the constituents of the cow's milk at will—that he can so feed the cows as to get the maximum output of high-grade milk. The point brought out by the charts shown by Dr. Hoobler is of greatest importance. Apparently, heretofore, so far as my knowledge goes, the chief item considered in the feeding of the nursing mother is to give her a large quantity of food, especially milk and other fluids. I have found in my experience that one of the most annoying things to the mother, and one which is complained of bitterly, is the everlasting having to eat. I have had mothers say that they simply could not stand any longer this continual feeding—that they were nauseated with food. I think Dr. Hoobler, in laying down the limits beyond which it is unnecessary to go in feeding mothers for milk production, has brought out an important phase of this situation, and one that I hope to apply to the mothers coming under my care. Certainly if we can keep mothers supplying the necessary amount of milk on a diet of 3,000 calories or less, we will relieve them of the distress of overfeeding, and of a disadvantageous psychologic condition.

DR. JACOB SOBEL, New York: I think Dr. Ferguson sounded the keynote, so far as public health work is concerned. The cost makes it prohibitive for the tenement house patients—those who need it most. Far be it from me to say that the wealthy should not have all that money can buy; but in my

opinion the children of the wealthy do not need this milk as much as those of the poor, for the wealthy can buy so many other things that compensate; for instance, proper surroundings and good hygienic conditions, careful nursing, and other things which will be impossible for the tenement baby. The tenement child needs the best food obtainable, because it has to overcome the worst surroundings. We must devise some means by which the poor people will be able to secure a reasonable supply of pure breast milk.

I also want to corroborate the statement made by Dr. Royster as to the importance of the mother knowing the weight of the child. We know that the weight progress of the child is one of the most important indexes of its development, and if you will visit any of the baby health stations of the city—there are 59 of them—you will see the weight book which is given to the mother. If the weight of that child remains stationary or declines, it is recorded in red ink as a danger signal, calling attention to the fact that something is wrong.

DR. ISAAC W. FAISON, Charlotte, N. C.: I should like to ask Dr. Hoobler the best means of expressing the breast milk. I live in a country where there is no such thing as securing milk to feed a baby—mother's milk. Therefore I must appeal to you men who live in the larger cities to study out and make plain an easy plan of artificial feeding. It has got to be improved. I live in a country where we do not, among the white race, have as many illegitimate children as in some communities. These cases are among the colored in our district—a race that cannot be depended on as wetnurses. In the desperate cases, what do I do? I go to the best women in our community and get the milk without money and without price, by just asking for it. They will give it if they can. That is the plan on which I have to work. And you people in the large cities, who have a large population to draw from, do not know the problems of the small town in that respect. We need some plan of artificial feeding which will replace mother's milk. Still I know in some cases artificial feeding will not answer.

The expression of the milk has been one of the things that has been a nightmare to me. If there is a good breastpump on earth, I should like to find it. If there is any plan by which we can feed these children outside of mother's milk, I should like to know it; and if there is any plan by which we can get the milk from the mother without worrying her to such a point that she cannot give enough for her own child, much less another's, I will be glad to know it.

DR. OLIVER HILL, Knoxville, Tenn.: I come from Knoxville, a town no larger than Dr. Faison's home, and wish to come to the defense of the Southern negro woman as a wetnurse. I have at present a negro wetnurse feeding five babies.

A negro girl who passes a satisfactory physical examination, and has a negative Wassermann, is eligible. These nurses go to the house and nurse the babies two or three times a day, or more if indicated, purely as a therapeutic measure, or for nutriment of the babies. They can be cultivated until they are efficient.

I really think we have an advantage over you gentlemen in the Northern cities, because the negroes will come for a small amount of money, if you do not overpay them, or pay them in advance. And if you keep them in good physical condition, they give milk of a good quality. I have one who nursed three babies all summer, a girl about 22 years old. She apparently gave plenty of milk for all three babies, with some supplementary feeding the latter part of the summer.

DR. BERT R. HOOBLER, Detroit: Just a word about the expense of the milk. In my paper I said we sold it at from 10 to 25 cents an ounce. I also said we gave a good deal away to those who could not afford to pay at all. The amount received from those who can pay helps to equalize the cost of that which we give away. We say 10 cents an ounce as a minimum, because that about equals the amount paid to a wetnurse if we put her into the home. Take \$8 a week, and add to that the expense of the mother's food and other expenses, and it brings it up to about \$15 a week. Any home that can afford to pay \$15 a week can afford to pay 10 cents an ounce. In homes where there is more money, we get more, because they are willing to help pay for milk for those

who are less fortunate. Some persons become exceedingly interested in our bureau and have given freely and gladly to its support.

The technic of expression has been discussed by every one of the essayists and I am sure if Dr. Faison will interview any one of these men they will be glad to have a private conference with him.

ELECTROCARDIOGRAPHIC CHANGES ASSOCIATED WITH MYOCARDIAL INVOLVEMENT

WITH SPECIAL REFERENCE TO PROGNOSIS*

BERNARD S. OPPENHEIMER, M.D.

AND

MARCUS A. ROTHSCILD, M.D.

NEW YORK

Theoretical considerations have led us to investigate a certain type of electrocardiogram with a view to determining its relationship to myocardial involvement. We were struck by the fact that the electrocardiograms interpreted as due to bundle branch lesions in human beings differed considerably from those resulting from experimental bundle branch lesions in animals. Moreover, pathologically the occurrence of a lesion confined to either of the main bundle branches is a rarity. In fact there is scarcely a single absolutely convincing reported case, confirmed by pathologic examination, of bundle branch block. On the contrary, pathologic examination in cases diagnosed electrocardiographically as bundle branch block has for the most part failed to show definite bundle branch lesions.

However, it is common pathologic experience to find lesions in the lower third of the septum involving the wall of the left ventricle and, as will be shown, such lesions are the usual findings in cases diagnosed as bundle branch block.¹ Anatomically these lesions involve not only heart muscle but the arborizations of the conducting tissue (Purkinje fibers) as well.

THEORETICAL CONSIDERATIONS

The normal electrocardiogram is to be considered the result of the passage of an impulse at a normal velocity through the usual channels, that is, node of Tawara, main stem, bundle branches and arborizations, which consist of the so-called Purkinje fibers. The latter form a network covering practically the entire endocardial surface of the ventricles. The velocity of the impulse through Purkinje fibers is at least ten times faster than its rate through ordinary ventricular musculature. The impulse reaches the ventricle normally through the Purkinje fibers, stimulating the ventricular walls practically as a whole.²

It is conceivable that the passage of this impulse may be hindered at any point in the conducting system. An experimental injury of either right or left main branch may interrupt completely the passage of the impulse over normal channels to the corresponding ventricle, the spread then occurring through ordinary muscular connections. This gives a characteristic electrocardiogram differing in many respects from

those to which we shall devote our attention. But the theoretical possibilities are not limited to a complete block of one or both bundle branches. A lesion only partly involving either bundle branch, or an extensive lesion of the arborizations of a branch such as occurs in human pathology, would cause a delay in the transmission of the excitation wave to the area supplied by the damaged conduction fibers. Such a lesion, if sufficiently extensive, should give observable changes in the electrocardiogram, and it is probable that these changes will be distinguishable from the changes that are produced by most other cardiac abnormalities.

These *a priori* considerations lead us to believe that there is an electrocardiogram that is characteristic of lesions involving part of a bundle or its arborizations. The agreement of pathologic and clinical experience with theoretical considerations supports our belief that there is a more than accidental relationship between the two.

Many of the cases we shall discuss cannot properly be termed bundle branch block and therefore we are introducing the term intraventricular block. By intraventricular block we mean any delay in conduction below the main stem of the bundle of His. Intraventricular block includes: (1) bundle branch block, and (2) arborization or Purkinje block, by which we mean interference with the conduction beyond the two chief branches of the bundle of His.

This disturbance of conduction may be permanent or temporary. The permanent changes we consider indicative of a definite pathologic lesion, generally myodegeneration. There are cases in which the electrocardiogram is temporarily of the type to be described.³ Experimentally the changes can be produced by morphin, asphyxia, etc. Decompensation and agonal states do not as a rule produce these changes.

The criteria in the electrocardiograms that we have used are in general as follows:

1. Abnormal prolongation of the time interval of the QRS group beyond the normal limit of 0.1 second. This prolongation is most manifest in a widening of the R wave, so that its foot points are abnormally separated. The R wave no longer has its slender, tall, spike-like appearance, but is broader and sometimes blunter than normally.

2. Notching of the R wave. This notching may appear on the ascending or descending limb, on both limbs, or at the peak. It may be multiple, and its degree and location may vary slightly from beat to beat. In arrhythmias, the shorter the preceding intraventricular interval, the more pronounced is the evidence of disturbed intraventricular conduction.

3. Low voltage as expressed by a low amplitude of the waves in all three leads. This change is not uniformly present, but when it occurs it helps to differentiate this type from the electrocardiograms typical of bundle branch block.

4. Absence of the typical diphasic curves with huge T' waves found in experimental bundle branch block.

CLINICAL OBSERVATIONS

In the course of the past few years there have been observed sixty-two cases whose electrocardiograms indicated an intraventricular block. Four of these cases showed electrocardiograms more or less typical of bundle branch block. The other fifty-eight cases observed presented in their electrocardiograms the

* From the Electrocardiographic Laboratory, Mount Sinai Hospital.

* Read before the Section on Practice of Medicine at the Sixty-Fifth Annual Session of the American Medical Association, New York, June, 1917.

1. Carter has reported a series of cases diagnosed as bundle branch block most of which we believe to be cases similar to those which we are about to describe.

2. Lewis and Rothschild: The Excitatory Process in the Dog's Heart, Part II, Ventricles, Phil. Tr. Roy. Soc. London, Series B, 206, 181-226.

3. G. Canby Robinson has reported several such cases.

above mentioned criteria and were consequently interpreted as arborization block. The sixty-two cases presented the clinical pictures of cardiovascular renal disease, atherosclerosis, coronary artery disease, angina pectoris, myocarditis, syphilis, acute articular rheumatism, "grip," diabetes, gout, etc.

The ages of these patients summarized according to decades can be seen in the accompanying table:

AGES OF PATIENTS ACCORDING TO DECADES *

Age	Number
From 20 to 30 years	6
From 30 to 40 years	4
From 40 to 50 years	8
From 50 to 60 years	20
From 60 to 70 years	19
70 years or over	5
	<hr/> 62

* Average age 54.

An analysis according to sex shows that forty-eight were men and fourteen women.

Angina Pectoris.—Twenty-seven of the patients had definite attacks of angina pectoris, fifteen complained of precordial distress, and twenty gave no history of either symptom.

Blood Pressure.—It is interesting but not surprising that of the forty-eight patients on whom we had blood pressure determinations, twenty-five had a systolic pressure below 140 mm. of mercury; five between 140 and 160 mm.; seven between 160 and 180 mm., and eleven between 180 and 220 mm.

DISTURBANCES OF CARDIAC MECHANISM ASSOCIATED WITH INTRAVENTRICULAR BLOCK

1. There were thirty-five cases showing no arrhythmia; of these, twenty-four showed a left ventricular predominance according to the electrocardiogram, and one a right ventricular predominance. It is worth pointing out in this connection that in the presence of marked intraventricular conduction defects, the ordinary electrocardiographic criteria for hypertrophy may not hold.

2. Twelve cases showed auricular fibrillation.

3. Two cases showed auricular flutter.

4. Ten cases showed ventricular extrasystoles alone, and two others showed ventricular extrasystoles in combination with auricular fibrillation.

5. Five cases showed varying ventricular complexes.

Prognosis.—Special emphasis should be laid on the serious prognosis in patients showing electrocardiograms indicative of intraventricular block. Of the fifty-eight patients showing arborization block, twenty-two are dead, twenty-four are alive (and of these four are in a precarious condition) and twelve could not be traced. Of the patients whose fate is known, the mortality has been 48 per cent. within two years. It should be stated that only one of our patients is apparently well, but he has been under observation only five months. Of the four patients with more or less complete bundle branch block, three are dead, and one is in a precarious condition.

There have been twenty-two other patients suffering from angina that have not shown these electrocardiographic changes; of these, only one is known to be dead, seventeen are known to be alive, and sixteen of these seventeen are doing well or fairly well, and one, an old man of 77, is in a precarious condition. The average age of this group is 52 years.

On physical examination two signs have been especially noted: (1) a muffled, poor or practically absent

first heart sound, and (2) a gallop rhythm. One is often struck by the fact that the heart is hypertrophied, but that the first sound, instead of being booming, has a poor or muffled quality.

ASSOCIATION OF ATRIOVENTRICULAR AND INTRAVENTRICULAR BLOCK

Intraventricular block is frequently associated with various grades of atrioventricular (auriculoventricular) block. These are not included in our analysis of sixty-two cases. Of eighteen patients showing various grades of heart block, thirteen also presented evidence of intraventricular block. Only three of the eighteen patients are known to be dead, but these three had the combination of atrioventricular and intraventricular block.

PATHOLOGY

There have been necropsies in fourteen of the twenty-five known fatal cases. In eleven cases there has been an opportunity to examine the hearts grossly, as well as microscopically. In one case we secured only the septum including the atrioventricular bundle, and in two others, we have the necropsy reports and a single slide of heart muscle. Serial sections are being prepared.

1. At the present time we can report that eight of the cases showed coronary artery sclerosis with closure of the anterior descending branch of the left coronary. This artery gives off septal branches which supply the anterior part of the septum (the bundle of His and its two main divisions are supplied chiefly by branches from the right coronary artery). Four other cases showed a nodular sclerosis of the coronary arteries, but no actual occlusion.

2. Thirteen of the fourteen patients had a widely disseminated patchy sclerosis of the myocardium. Of the two that did not have coronary disease, one was a young girl aged 20, who had no known cause for the interstitial myocarditis except a recent "grip," the other was aged 30 and died of cardiac insufficiency resulting from valvular defects.

3. The pathologic changes, especially the sclerosis, predominate in the endocardial and subendocardial layers, that is, in the region of the so-called Purkinje network, as compared with the outer two thirds of the ventricular musculature.

4. In general, the changes were grossly more marked in the left ventricle than in the right.

Experimental work has been begun in collaboration with Dr. H. B. Williams, and at present it can only be stated that injury of the main branches or of the arborization produces changes in the electrocardiogram. It has already been shown by Eppinger and Rothberger⁴ that extensive experimental injuries to the external layers of the ventricular wall do not result in changes in the electrocardiogram.

CONCLUSIONS

1. There has been a discrepancy between previous electrocardiographic interpretation and pathologic findings.

2. Theoretical considerations and pathologic findings point to the existence of a hitherto undescribed type of disturbance which we have called arborization block.

3. We venture to state, therefore, that there is a definite clinical condition to be known as arborization

4. Eppinger and Rothberger: Wien. klin. Wchnschr., 1909, 22, 1091-1098.

block; that this condition can be diagnosed by the presence of a definite and permanent type of electrocardiogram; and that the condition has a very serious prognosis.

125 West Eighty-Sixth Street—930 Park Avenue.

ABSTRACT OF DISCUSSION

DR. H. B. WILLIAMS, New York: I have followed the work of Drs. Oppenheimer and Rothschild with interest because I have seen a number of cases of the same nature, but have been unable to secure necropsies in many of them. Dr. Rothschild has properly emphasized the fact that one cannot make a diagnosis of lesions of one main branch of the bundle of His when there is marked hypertrophy of a ventricle. The lesion referred to has often been made on the basis of the electrocardiogram without sufficient justification. I have seen but three cases in the last seven years in which I have felt reasonably secure in diagnosing this lesion.

The peculiar notched and deformed electrocardiograms which Dr. Rothschild has shown I have learned to look on as calling for a serious prognosis. Of a considerable number of such patients seen by me prior to 1915, only two are still living. One sometimes sees this type of electrocardiogram, however, in patients who get along tolerably well for a time. We should, therefore, make use of all the other available clinical evidence before making a decision.

DR. E. LIBMAN, New York: Apart from neuroses, aneurysm and pericarditis, the most common causes of severe attacks of cardiac pain are the following: hypertension, atherosclerosis of the arch with narrowing of the orifices of the coronary arteries or of their lumen, diffuse arterial disease in the coronary system, thrombosis of the coronary arteries and syphilitic lesions at the aortic valve or the root of the aorta. The cases with the classical picture of angina pectoris are mostly cases of coronary thrombosis. If one has had sufficient postmortem experience, it is very often not difficult to say whether there is a thrombosis of the coronary arteries, and at times it is possible to suspect whether the right or the left coronary artery is thrombosed. There are cases in which it is very difficult to say whether the patient is suffering from a gastric condition, such as ulcer, with reflex pain in the cardiac area, or whether the patient has coronary artery disease, or possibly both. In all such doubtful cases the electrocardiographic findings, as described by Drs. Oppenheimer and Rothschild, ought to be of value.

The cases in my own service at the hospital in which these findings were present were all cases in which I had assumed that the patient was suffering from organic heart disease of the coronary arteries—with the exception of one case of aortic insufficiency in a young man; this case did not come to necropsy, and it is therefore not known whether or not the patient had any disease of the myocardium. Complete closure of the coronary artery may occur very insidiously, and the patients make no complaint of any cardiac symptoms. Some of these patients can be recognized by a peculiar color of the face, an earthy color overcast by a leaden tint. In such cases an electrocardiographic examination might be of value in confirming the diagnosis. The diagnosis in such cases is particularly important if the question of operation on some part of the body has arisen. Such patients are apt to succumb within twenty-four to forty-eight hours after operation, although they have had no cardiac symptoms before.

DR. JAMES B. HERRICK, Chicago: I wish to add a word of commendation of this excellent work which has been done in the attempt to correlate the pathologic findings with the findings of the electrocardiograph. In Chicago we have been trying to get at this problem by experimental work on dogs, producing myocardial lesions by ligating branches of the coronary arteries. I think we will reach conclusions much like those presented to us today. Already we have begun to recognize in man curves which we have found in dogs which were operated on. In a man who had, as I believe, coronary thrombosis, the cardiogram was like that which we got in dogs by ligating the left branch of the coronary artery. The changes in the cardiogram described by Dr. Rothschild seem

to be associated with very definite clinical evidences of myocardial weakness. A large percentage of the patients who have shown anything like that have died in a short time.

DR. M. A. ROTHSCHILD, New York: I should like to emphasize one point again. In the twenty-two cases of classical angina that we have included in our series that did not show the electrocardiographic criteria of arborization block, we have been able to follow seventeen patients, and only one of the seventeen is dead. In the other sixty-two cases, with or without angina, whose electrocardiograms presented the criteria of arborization block, the mortality has been approximately 50 per cent. in two years. In our experience, therefore, the electrocardiogram gives valuable evidence in regard to prognosis, especially in those doubtful cases of angina.

HOOKWORM INFECTION AS A MEDICO-MILITARY CONSIDERATION

RECENT EXPERIENCES WITH SOUTHERN TROOPS
DURING MOBILIZATION ON THE
MEXICAN BORDER *

GEORGE B. FOSTER, JR., M.D., DR.P.H.

AND

CHARLES G. SINCLAIR, M.D.

Captain and First Lieutenant, Respectively, Medical Corps, United States Army

ATLANTA, GA.

Following the call of the President, June 18, 1916, approximately 10,000 men were mobilized at Nogales, Ariz. These troops, with the exception of 1,200 regulars, were composed of organizations of the National Guard from northern, eastern and Pacific states. They had very little sickness. The morbidity rates for August, September and the first three weeks in October varied from 14 to 35 per thousand for the regulars and from 7 to 29 per thousand for the National Guard. The average morbidity rate for regulars was 23.1 per thousand while that of the National Guard was somewhat lower, 17.9 per thousand.

During the last week in October, 1916, a brigade of the Alabama National Guard was mobilized at Nogales. This command consisted of headquarters, three regiments of infantry, an ambulance company, a field hospital and a company of Signal Corps troops. Shortly after the arrival of these troops the morbidity

TABLE 1.—INCIDENCE OF PNEUMONIA, NOGALES DISTRICT

Organization	No. Cases	No. Deaths	Per Cent. Mortality
First Alabama Infantry	63	17	26.9
Second Alabama Infantry	28	4	14.3
Fourth Alabama Infantry	28	6	21.4
First Alabama Ambulance Company	2	0	
Alabama Signal Corps (one company).....	2	0	
Total	123	27	21.9
Medical Department, U. S. Army.....	3	0	
Twelfth U. S. Infantry	8	1	12.5
Battery D, Sixth U. S. Field Artillery	1	1	100
First U. S. Cavalry (two troops)	1	0	
Battery C, First California Field Artillery...	1	0	
Second Squadron, First Utah Cavalry	2	0	
Second Idaho Infantry	1	0	
Total	17	2	11.6

rates began to soar. During November, acute respiratory infections—colds, grip and bronchitis—reached epidemic proportions, and the base hospital was taxed to its full capacity. In December, pneumonia and measles became epidemic and continued until March.

* From Department Laboratory No. 3, Southern Department, U. S. Army, Nogales, Ariz.

There were 140 cases of pneumonia with twenty-nine deaths. Two-thirds of the cases were of the frank, primary, lobar type, and the remainder complicated or followed measles. The incidence of pneumonia by organizations is shown in Table 1.

In addition to the pneumonia outbreak and the prevalence of less serious respiratory infections, measles became a serious sanitary consideration. The epidemic began in December, and continued until March. Several hundred cases, confined almost wholly to the Alabama troops, occurred during the epidemic. The curve of the epidemic showed three distinct outbreaks separated roughly by a period corresponding to the incubation period of measles. Over 400 cases occurred in the first outbreak. Complications and sequelae—notably pneumonia, sinus involvements and otitis media—were common, and a number of deaths resulted.

Official data submitted by the organization commanders of the First Alabama Infantry covering a four month period—Oct. 24, 1916, to Feb. 24, 1917—show that of the 963 men composing the regiment, February 24, 809, or 84 per cent., had been on sick-report for some cause at some time or other. Similar data, for the same period, submitted by company commanders of the Fourth Alabama Infantry, show that 859 reported sick, or 85.7 per cent. of the 1,002 men composing that command. Figures for the Second Alabama Infantry are not available; but it is believed that the morbidity approximated that of the other regiments. Such morbidity rates as these, were they to prevail throughout an army in campaign, would result in the breaking down of the most elaborate and splendidly equipped medical department conceivable; and the training, mobility, morale and efficiency of the forces would be so interfered with as to render them practically ineffective as combatant troops.

During this period there were no epidemics in the civil community. Measles was not prevalent, and data obtained from the civilian practitioners show that but thirty cases of pneumonia were encountered among 8,800 civilians—the combined population of Nogales, Ariz., and Nogales, Sonora. The morbidity rates for all other troops—both regulars and National Guard—were at times high, but never abnormally so. The environment and conditions under which the Alabama troops lived were identical with those of the other troops. All were furnished the same ration, the same clothing and bedding, the same type of shelter, an unimpeachable water supply, a uniform system for the disposal of excreta and wastes, and ideal camp sites. Comprehensive sanitary measures to decrease the morbidity were clearly defined by the district surgeon and sanitary inspector—a medical officer of experience, great force and resourcefulness; and these were promptly promulgated and made effective by an equally experienced and forceful commanding general. Despite every effort, the morbidity rates remained high.

It was apparent that factors not common to the other troops determined the high incidence of disease in the Alabama command. Comparison of their morbidity rates with those of the regulars might have led, offhand, to the conclusion that the sickness was due to inexperience in personal hygiene and camp sanitation. Comparison with the other National Guard troops—equally inexperienced, recruited from the same walks of life, and living under identical conditions—militates against the acceptance of any such

conclusion. Certain of their own medical officers believed that the climatic conditions exerted a determining influence. Nogales, however, is looked on as one of the most healthful points on the border, and its health record previously had been an enviable one. The town is situated in a hilly country at an elevation of 3,864 feet. The official climatologic data show that during the months of November and December, when much of the illness occurred, the maximum temperatures were 90 and 77 F., and the minimum temperatures 20 and 12 F., respectively. A bulletin of the Arizona Experimental Station states that to get the appreciable higher temperatures here, it is necessary to subtract from 15 to 30 degrees from the maximum. In other words, the extreme dryness of the air makes Nogales that much cooler than the “humid” east with corresponding temperatures. At the other end of the thermometer the appreciable temperatures are higher than those actually registered, from the same cause. The fact remains that a considerable fall in temperature—frequently 30 or 40 degrees—may occur between noon and midnight. While this change might be potent for harm in persons whose health had been undermined otherwise, the experience of troops stationed here previously indicates that it has no

TABLE 2.—INCIDENCE OF HOOKWORM INFECTION, FIRST ALABAMA INFANTRY

Organization	Num- ber Exam- ined	Num- ber Pos- itive	Num- ber Neg- ative	Per Cent. Pos- itive	Home Station
Hdqrs. Company..	41	12	29	29.3	Mobile, Mobile Co.
Det. Med. Dept..	15	2	13	13.3	Mobile, Mobile Co.
Supply Company..	24	6	18	25.0	Various places.
Machine Gun Co..	44	7	37	15.9	Mobile, Mobile Co.
Company A.....	41	13	28	31.7	Mobile, Mobile Co.
Company B.....	20	11	9	55.0	Bay Minette, Baldwin Co.
Company C.....	64	35	29	54.6	Geneva, Geneva Co.
Company D.....	33	16	17	48.4	Fort Deposit, Lowndes Co.
Company E.....	57	18	39	31.9	Mobile, Mobile Co.
Company F.....	51	26	25	51.9	Dothan, Houston Co.
Company G.....	62	26	36	58.0	Brewton, Escambia Co.
Company H.....	62	31	31	50.0	Troy, Pike Co.
Company I.....	65	37	28	56.9	Enterprise, Coffee Co.
Company K.....	62	39	23	62.9	Castleberry, Conecuh Co.
Company L.....	56	36	20	64.2	Slocumb, Geneva Co.
Company M.....	47	17	30	36.1	Mobile, Mobile Co.
Totals	744	342	402	45.7	

deleterious effect on persons of average robustness and resistance.

Lieut.-Col. Thomas C. Bratton, Medical Corps, the district surgeon and sanitary inspector, who had had experience with the same troops at Manassas several years previously, believed from the first that the high morbidity was due to hookworm infection and latent malaria. By Colonel Bratton's direction, each Alabama soldier admitted to the hospital was examined for malaria and hookworm infection. Later, as it became apparent that hookworm infection was exceedingly common, the survey was amplified so as to include Alabama soldiers in camp as well, and steps were immediately taken to treat those who showed infection.

Blood examinations in the cases of 236 Alabama soldiers admitted to hospital showed but 0.3 per cent. in whom plasmodia were demonstrable. It is probable that this does not represent the true malaria index, as many of the men took quinin before admission—a common custom of people from malarial districts—and demonstration of the plasmodium may have been obviated in this way in many cases. The findings did not indicate that latent malaria was unduly prevalent, however, and a general malarial survey was not deemed advisable.

The hookworm survey consisted of the examination of 1,259 men. The majority of these were from the First Alabama Infantry, in which regiment an attempt was made to examine every one. A little over one third of the Fourth Alabama Infantry were examined prior to their departure from Nogales. The data on

TABLE 3.—INCIDENCE OF HOOKWORM INFECTION, SECOND ALABAMA INFANTRY (INCLUDES SICK IN HOSPITAL ONLY)

Organization	Num-ber Exam-ined	Num-ber Pos-itive	Num-ber Neg-ative	Per Cent. Pos-itive	Home Station
HdQRS, Company..	3	1	1	33.3	Montgomery, M'gomery Co.
Det. Med. Dept...	0	0	0	...	Montgomery, M'gomery Co.
Supply Company...	6	2	4	33.3	Various places.
Machine Gun Co..	12	7	5	58.3	Andalusia, Covington Co.
Company A	5	3	2	60.0	Montgomery, M'gomery Co.
Company B	15	5	10	33.3	Birmingham, Jefferson Co.
Company C	7	1	6	14.2	Birmingham, Jefferson Co.
Company D	12	6	6	50.0	Montgomery, M'gomery Co.
Company E	5	4	1	80.0	Floral, Covington Co.
Company F	7	4	3	57.1	Tuscaloosa, Tuscaloosa Co.
Company G	19	6	13	31.5	Piedmont, Calhoun Co.
Company H	14	6	8	42.8	Andalusia, Covington Co.
Company I	11	8	3	72.7	Luverne, Crenshaw Co.
Company K	11	2	9	18.1	Sheffield Colbert Co.
Company L	11	3	8	27.2	Tallassee, Elmore Co.
Company M	11	7	4	63.6	Samson, Geneva Co.
Totals	149	65	84	43.6	

the Second Alabama Infantry include only patients admitted to hospital, and show but 149 examinations. Of the 1,259 men examined, hookworm ova were demonstrated in the feces of 503, or 39.9 per cent. The incidence of infection is shown in detail in Tables 2, 3 and 4.

Reference to these data and to a map of Alabama shows that the organizations in which the incidence of hookworm infection was greatest came from the low, flat, river-intersected portion of the state lying south of the thirty-third degree of north latitude. It was among troops from this section of the state, likewise, that the morbidity and mortality was highest. Capt. Thomas J. Flynn, Medical Corps, who has recently compiled the clinical data gathered during the pneumonia outbreak, informs us that 90 per cent. of the cases of pneumonia occurred in soldiers from the southeastern quadrant of the state, irrespective of the regiments to which they belonged. That portion of the state lying north of the thirty-third parallel is

TABLE 4.—INCIDENCE OF HOOKWORM INFECTION, FOURTH ALABAMA INFANTRY

Organization	Num-ber Exam-ined	Num-ber Pos-itive	Num-ber Neg-ative	Per Cent. Pos-itive	Home Station
HdQRS, Company ..	3	1	2	33.3	Montgomery, M'gomery Co.
Det. Med. Dept..	2	1	1	50.0	Birmingham, Jefferson Co.
Supply Company ..	0	0	0	...	
Machine Gun Co.	29	11	18	37.8	Montgomery, M'gomery Co.
Company A	42	8	34	19.0	Montgomery, M'gomery Co.
Company B	16	10	6	62.5	Abbeville, Henry Co.
Company C	19	5	14	26.3	Pell City, St. Clair Co.
Company D	15	7	8	46.6	Bessemer, Jefferson Co.
Company E	33	2	31	6.0	New Decatur, Morgan Co.
Company F	11	4	7	36.3	Gadsden, Etowah Co.
Company G	15	8	7	53.3	Ozark, Dale Co. (Co.
Company H	24	10	14	41.7	Alexander City, Tallapoosa
Company I	31	9	22	29.0	Opelika, Lee Co.
Company K	47	6	41	12.8	Birmingham, Jefferson Co.
Company L	48	5	43	10.4	Alabama City, Etowah Co.
Company M	31	9	22	29.0	Oxford, Calhoun Co.
Totals	366	96	270	26.2	

mountainous or hilly, and the lesser incidence of hookworm infection is readily explained by the less favorable soil and climate for the development of the hookworm larvae. Another interesting fact, that is in accord with the observations of numerous investigators, is that the incidence among troops from the large cities—Birmingham, Montgomery and Mobile—

was only approximately one-half as great as that among troops from the smaller towns and rural communities. This may be explained by the greater degree of soil pollution in rural districts and the relatively greater frequency with which rural people go barefooted. The comparative figures for cities and smaller communities, and for the sections of the state north and south of the thirty-third parallel are given in Tables 5 and 6.

SUMMARY AND COMMENT

It has been shown that 39.9 per cent. of 1,259 men, chosen at random from the organizations composing a brigade of the Alabama National Guard, were infected with hookworm. Furthermore, it has been shown that these troops proved exceedingly prone to infectious diseases—notably pneumonia and measles—when placed under conditions simulating those of field service. That this susceptibility was due to something inherent in this particular body of men, that was not common to other organizations, seems evident in view of the way in which the situation was controlled by the absence of any such degree of susceptibility in other troops living under identical conditions.

In addition to an untoward susceptibility to inter-current infections, there was an equally evident absence of resistance to infection once acquired. The

TABLE 5.—COMPARISON OF INCIDENCE IN LARGE CITIES AND SMALLER COMMUNITIES

	Examined	Positive	Per Cent. Positive
Birmingham	71	13	18.3
Montgomery	99	30	30.3
Mobile	245	69	28.1
Totals	415	112	26.9
Towns and rural districts	813	383	47.2

TABLE 6.—COMPARISON OF INCIDENCE NORTH AND SOUTH OF THIRTY-THIRD PARALLEL

	Examined	Positive	Per Cent. Positive
Troops from North	265	57	21.5
Troops from South	963	438	45.3

mortality from pneumonia was much higher than that of the other troops, and complications and sequelae were common. Measles ran rampant throughout these troops, and its complications were numerous and, in many cases, grave. Pneumonia exacts its greatest toll from the aged, the impoverished, the ill-fed, the alcoholic and the otherwise debilitated; while measles, a disease attended with a mortality of only 2 or 3 per cent. in private practice, causes great concern in institutions, among the poorer classes and in armies. In short, these diseases work great havoc only where the soil has been prepared previously by some debilitating agent. In the instance of the Alabama troops under discussion we are convinced that hookworm infections of considerable chronicity acted as the predisposing factor.

Whether the hookworm exerts its debilitating effect by abstraction of blood with a resulting anemia; by mechanical injury to the intestinal mucosa followed by infection, or by the production of a toxin are, we believe, still moot questions. In view of the susceptibility to pneumonia shown in this communication, and the well known susceptibility of these patients to tuberculosis, it is possible that the tissue resistance of the lung may be reduced by the mechanical traumatism induced by the passage of the larvae through the lung in their circuitous route from the skin to the intestine. At any rate, many of the men observed

here showed a very definite degree of debility, characterized by mental and physical apathy, malnutrition, underdevelopment and marked anemia. It is believed that these factors combined greatly to reduce or render nil the natural resistance to intercurrent infections, and that these individuals would have become virgin soil for any micro-organism with which they came in contact.

The high incidence of measles may be attributed in part to the fact that many of the men were from rural districts and had not, therefore, been exposed previously. But, that the devitalizing effects of hookworm infection were also factors is evident from the altogether untoward frequency and gravity of complications and sequelae. Many of the measles patients gave a history of having had measles previously, and a number of patients were readmitted with measles after having recovered from a typical attack shortly before. As reinfection in measles is extremely rare ordinarily, it seems not only that hookworm infection had sapped the natural resistance to infection but also that the degree of immunity conferred by an infection was also below par.

Another consideration in connection with this problem is the possibility, under favorable conditions, of troops from hookworm-infected districts spreading the disease broadcast throughout previously uninfected districts to which they may be sent. This danger from immigration has been anticipated in California by the establishment of rigid quarantine measures against certain classes of immigrants from the Orient. When one contemplates that a division at war strength recruited indiscriminately in any of the heavily infected hookworm districts of the South would contain approximately 10,000 potential soil polluters, the existence of a real rather than a fancied menace becomes apparent.

Hookworm infection is extremely prevalent in sections of Virginia, both of the Carolinas, Tennessee, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas and Kentucky. Cases have been reported from Oklahoma, California and Missouri. We believe it is the manifest duty of those charged with the physical examinations in these states to exercise the greatest care in the selection of recruits. In our opinion, only individuals in robust health should be accepted; and anemia, lassitude, underdevelopment, or complaint of digestive disorders, with a history of "ground itch" should constitute causes for "sight rejection." Examination of the feces of recruits from Southern States for hookworm ova, although not mandatory at present, should be a part of any thoroughly conducted examination.

Rosenau¹ states that the best part of a hookworm campaign is the collateral good it does. He cites the instance of Bilibid prison, Manila, where the annual death rate from all causes was 234 per thousand when the Americans took charge. This was reduced to seventy-five per thousand by general sanitary measures—boiled water, screening, disinfection, better food, less crowding, etc.—"but despite these sanitary improvements the death rate could not be hammered down below seventy-five per thousand." Then it was found that many of the prisoners were infected with hookworms. They were freed of their worms by treatment with thymol, and the annual death rate from all causes fell to 13.5 per thousand.

It seems probable that the inauguration of systematic hookworm surveys throughout the southern troops now in the service and in all mobilization camps in the Southern States, together with systematic treatment of those found infected, would not only reduce uncinariasis itself to a minimum, but would also reap incalculable collateral benefits.

Department Laboratory, 510 Hurt Building.

ACUTE PANCREATITIS *

JOHN B. DEAVER, M.D.

PHILADELPHIA

The pancreas is the most important of the digestive organs. Not until recently, however, have the frequency and importance of its diseases been recognized. The peculiarities of its situation, anatomy and function exercise a profound influence on the etiology and course of the inflammations which attack this organ and must be understood in order to treat these affections on rational lines.

It has been sufficiently emphasized that pancreatitis is in the majority of instances due to infection propagated from some adjacent focus, in most instances the biliary tract. For a time this close interdependence was thought to be due to the fact that the terminal ducts of the liver and pancreas either anastomose in the ampulla of Vater or lie in immediate proximity, thus affording an opportunity for descending inflammation of the one duct to become an ascending inflammation of the other. While this method of infection may be the correct explanation of certain cases of pancreatitis, in the majority of instances much doubt has been cast on this route of extension. The work of Bartels, Arnsperger, Franke, Deaver and Pfeiffer, and Sweet has seemingly established the fact that such extension commonly occurs by way of the lymphatics which form a rich anastomosing network in the retroperitoneal tissues about the pancreas. As the gallbladder is the upper abdominal organ most commonly affected by chronic infection it is but natural that pancreatic inflammation is most often secondary to that focus. However, sufficient clinical evidence is at hand to indicate that pancreatitis may in the same manner result from duodenal ulcer, particularly when situated in the second portion of the duodenum, and probably from colitis through the medium of the lymphatics leading off from the colon through the transverse mesocolon to the pancreas situated immediately beneath its attachment. Probably still more distant foci, such as the appendix and the pelvic organs, may in some instances succeed in transmitting infection retroperitoneally to the pancreas by way of the ascending lymph channels. I have met with two cases of small circumscribed abscess of the pancreas in perforative appendicitis, and one abscess of the pancreas in the presence of retroperitoneal diffusion of pus the result of an infection of the left lower extremity.

These considerations emphasize the importance of dealing promptly and efficiently with foci of infection within the abdominal cavity, and point to the danger of permitting lurking and latent infections to exist in a more or less quiescent state. In other words, the curative methods of surgery are enhanced in value as opposed to the palliative methods of medical treatment.

1. Rosenau, M. J.: Preventive Medicine and Hygiene, Ed. 2, New York, D. Appleton & Co., 1916, p. 132.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

So important and definite of late have been the evidences of metastatic systemic infection from some inconspicuous focus that it is not unlikely that we shall find certain cases of pancreatitis to be due to this type of infection. The analogy of the severe and sudden onset of hemorrhagic pancreatitis with other conditions of the sort, as for instance hematogenous infection of the kidney, is at least striking. As yet, however, this method of pancreatic infection is mere speculation. Since Fitz drew attention to the striking lesion of acute hemorrhagic pancreatitis we have learned that not all acute inflammations of the pancreas are accompanied by hemorrhage, but that here as elsewhere inflammatory lesions occur in varying degrees of severity. Hemorrhage is as variable in extent and degree as fat necrosis, and probably for a similar reason. The most important recent contribution to an understanding of the peculiarities of acute pancreatitis and its effects has to do with the ferments of the pancreas.

Since Balser first observed and wrongly interpreted the significance of certain grayish flecks in the abdominal fat the correct explanation of these areas of fat necrosis has been found in the action of the fat-splitting ferment, lipase, which finds its way into the tissues under the circumstances of acute inflammation of the pancreas and attacks the fat. The resulting areas of necrosis are now so well known to be connected with acute pancreatic inflammation as to furnish one of the most striking and reliable diagnostic guides to the surgeon.

The action of the protein-splitting ferment, trypsin, has escaped attention until recently. It is evident that any inflammation which causes a diffusion of lipase must also carry with it the remaining ferments which are always present in the pancreatic secretions. Trypsin as a factor in the syndrome of acute pancreatitis has escaped attention because it has given no such ocular evidence of its presence in the tissues as has lipase in the areas of fat necrosis. Possibly this should be qualified by saying that the hemorrhage which is so striking a feature of some cases is possibly due to the digestive action of the trypsin on the vessel walls.

Trypsin is one of the most powerful ferments elaborated within the body. In weakly alkaline solution it attacks protein with great activity, breaking it up into its lower constituent molecules. When this takes place within the intestinal canal the process is that of normal digestion and the end-products of such digestion are fitted for absorption and use in metabolism. Such an important and active agent, when directed against the tissues of the individual that produces it, is capable of much harm. Just why the pancreas escapes self-digestion under normal circumstances is too abstruse a problem for brief discussion, but at least one of the reasons is to be found in the fact that the ferment as secreted by the pancreas is inactive and is known as protrypsin. Pure pancreatic juice as obtained fresh and uncontaminated from the pancreatic duct will not digest protein. It requires for activation some substance or substances which will convert its latent properties into active energy. Normally this is supplied by the so-called enterokinase of the duodenum. Experimentally activation may be produced by the action of calcium salts, by the products of aseptic necrosis of tissues and by certain bacteria.

We see briefly, therefore, that it is possible for inactivated pancreatic juice to be extravasated into

the tissues without losing on them the destructive action of the trypsin on the tissue cells. If, however, the conditions are such that the trypsin is activated, its digestive action becomes apparent. Tissue cells are attacked and destroyed. The delicate vessel walls of the pancreas and surrounding structures are injured and permit the escape of blood and the result is acute hemorrhagic pancreatitis.

The consequences of this action of trypsin may be traced even further with a fair degree of certainty from inference and demonstration. Whipple, Stone and Bernheim, and others, in their work on the toxemia of intestinal obstruction, have shown the existence of a powerful toxin which is produced in acute obstructive conditions and proves fatal in exceedingly small doses. Whipple has shown that this substance answers all the characteristics of a primary proteose, a substance which is one of the earliest decomposition products of protein when acted on by trypsin. Sweet has called attention to the close resemblance of the toxemia of acute pancreatitis to that of high intestinal obstruction. It does not seem unlikely that the close resemblance is due to the fact that the toxemia of both conditions is either the same or is closely related, being due to the toxic derivations of tryptic action on protein materials.

I emphasize these apparently theoretical considerations because of the important bearing that these conceptions, if true, have on actual practice.

Acute pancreatitis, according to the severity of its onset and course, may be classified clinically as ultra-acute, acute and subacute. The ultra-acute variety is characterized by sudden onset of great severity with pain, shock and continued vomiting. Hemorrhage into the pancreas and its surroundings is profuse. Though the primary shock may abate, the subsequent course of the disease is progressively downward and death usually occurs within three days, the pancreas being found completely infiltrated, hugely swollen and in a condition of necrosis and gangrene more or less advanced, according to the time which has elapsed since the beginning of the seizure.

Acute pancreatitis differs from the above in the severity of the attack. The onset is usually sudden, but less severe, and the rallying power of the patient is more in evidence. Pancreatic hemorrhage is a feature, but the organ shows less swelling and may have escaped this process in some portion. If the early toxemia is not fatal general improvement gradually occurs, and it will be found that a portion of the organ has remained unaffected or will recover itself. The most affected part undergoes necrosis and gangrene and as a rule suppuration promptly ensues. In very rare cases pyogenic infection does not follow and recovery takes place with the formation of an aseptic hemorrhagic cyst. As a rule, sepsis supervenes and unless relieved leads eventually to the death of the patient.

Subacute pancreatitis, which is not uncommon, is usually an affection limited to the head of the organ. Occasionally an interstitial hemorrhage of small extent is present. More often no hemorrhage occurs, but the pancreatic head is swollen and tender, though not often distinctly palpable. The symptoms usually erroneously attributed to gastritis, gallstones, ulcer, or masquerading as "acute indigestion," are upper abdominal pain, nausea, and often vomiting. The pulse and temperature are but little affected unless complicating inflammation of the organ is present. Very often

cholecystitis accompanies and may have inaugurated the condition. A history of previous attacks is not uncommon and it is not uncommon to find that the subject of the acute or ultra-acute forms of the disease has had preliminary attacks of the subacute variety.

The treatment of the different forms of acute pancreatitis will naturally vary with the type of the disease.

In the ultra-acute and acute varieties immediate operation should be the rule. Under our modern conception of the mechanism of the production, course and effects of acute pancreatitis it is essential that the combined products of infection and ferment action should be afforded an exit from the body, in order to prevent the deadly effects of absorption. The prime object therefore is early and adequate drainage. The most satisfactory approach in this stage is through an anterior incision exposing the pancreas either through the gastrocolic omentum or the gastrohepatic ligament, depending on whether the stomach is situated high or low.

The pancreas should be freely incised in a longitudinal direction or numerous blunt punctures made in its substance, thus giving vent to the contained blood, lymph and obstructed secretions. Both gauze and tube drainage should be laid down to the surface of the organ and conducted to the surface through an enveloping sheet of rubber dam to minimize adhesions to the stomach and intestines.

The only exception to the rule of immediate operation are: (1) in case of severe shock, when sufficient time should be given for recovery under the aid of active stimulation and saline infusion; (2) when the patient at the time observed is obviously improving from the effects of the disease. In the first case the delay is a simple matter of surgical judgment. In the second case the course of events has fortunately demonstrated that the patient does not belong to the ultra-acute type and will be no worse and probably better for a shorter or longer period of observation.

That these symptoms are not theoretical only but accord with practice can be seen in the results of the last thirteen operations for acute pancreatitis made by me. Three cases resulted fatally, a mortality of 23 per cent. One of the fatal cases was of the ultra-acute variety. The woman, aged 38 years, had been sick only one day when operated on. Death occurred on the operating table before anything could be done. The second case was also a woman, aged 30 years. At operation stones were found in the gallbladder and common duct. The pancreas was enlarged and areas of fat necrosis were noted in the surrounding fat. The stones were removed by cholecystostomy and choledochostomy. The pancreas itself was not opened or drained. The postoperative course was stormy and septic in character. Three weeks later an inflammatory mass presented in the left loin and her condition was grave. An incision through the loin evacuated a quantity of bloody and purulent debris, but she succumbed from weakness and toxemia shortly after the operation. Postmortem examination showed the pancreas to be gangrenous and disorganized.

The third fatality occurred in the case of a man aged 29 years. His attack was typical and the operation was made two days after onset. The pancreas was swollen and numerous stones were present in the gallbladder, which was opened and drained. The pancreas was not incised or explored. The postoperative

course was progressively downward and he died in two weeks. Necropsy revealed hemorrhagic and suppurative pancreatitis.

The first case mentioned was beyond redemption by any treatment. Cases of pancreatitis occur of such severity that the patient is doomed from the onset. Experimental work has shown that the pancreas may be damaged in an instant by the forcible injection of bile or many other substances into the duct of Wirsung, following which acute hemorrhagic pancreatitis makes its appearance and runs a fatal course. It is apparent that a very brief space of time may suffice to inaugurate the combination of trauma, ferment and infection that will proceed inevitably to gangrene and disorganization of the pancreas. These are the true ultra-acute cases and are fortunately of rare occurrence.

In the remaining two cases it will be seen that drainage of the biliary tract did not prevent the further development of the pancreatic disease and a fatal outcome.

On the other hand, in five cases in which the pancreas was freely drained, all recovered. In one case pancreatostomy alone was made; in the remaining four, cholecystostomy for stones was done in addition. In the case of two other patients that recovered, besides a cholecystostomy, gauze drainage was carried down to the surface of the pancreas, which was not incised or punctured. I cannot but feel that in the two fatal cases primary pancreatic drainage would have greatly increased the chance of recovery. In the remaining three cases the only operation was a cholecystostomy. Of five cases therefore in which the pancreas was not drained and the only operation was removal of stones and drainage of the biliary tract, three patients recovered and two died. During the period covered by these cases there were observed in the medical wards of the German Hospital six cases diagnosed as acute pancreatitis, in which operation was refused. Two of these patients died and four recovered so that the mortality of expectant treatment was slightly less than that of operation without drainage of the pancreas. Körte from his large experience with this disease recommends free pancreatic drainage. It seems safe to conclude, therefore, both from our knowledge of the nature of the disease and on the basis of practical experience that this procedure is called for in acute pancreatitis.

In the case of circumscribed pancreatic collections, abscess of the lesser peritoneal sac and in peripancreatic suppuration, drainage of the abscess cavity alone is indicated. Such collections not uncommonly present in the left loin and may be advantageously evacuated at that point.

The advisability of supplementing drainage of the pancreas with operations on the biliary tract if stones or inflammation be present will be determined by the condition of the patient and the experience of the surgeon. Occasionally there are cases of such severity that it is unjustifiable to do more than the prime object of the operation, which we must regard as drainage. Usually there is ample margin of safety for the experienced abdominal surgeon to open, empty and drain the gallbladder and common duct if necessary. Stones in the common duct should certainly be removed if the condition warrants. In a number of instances I have removed the appendix.

The important practical points in connection with the subject of acute pancreatitis are: (1) the second-

dary relationship of the disease to preexisting intra-abdominal foci of infection; (2) the lethal character of the toxemia; (3) the necessity for prompt action, and (4) the value of direct and free drainage.

1634 Walnut Street.

ABSTRACT OF DISCUSSION

DR. RUSSELL S. FOWLER, Brooklyn: Pancreatic disease is dependent on infection, either hematogenous or lymphatic, secondary to a lesion in a neighboring organ. This latter I believe to be the more frequent.

Routine palpation of the pancreas in all laparotomies which permit of it leads to the conclusion that the majority of the cases of long standing gallbladder disease show palpable alteration in the structure of the pancreas.

The diagnosis of cholelithiasis complicated by acute pancreatic necrosis is made difficult, as the patient usually describes the symptoms of gallstone colic. The first thing thought of is a severe attack of cholecystitis and cholangitis.

When a patient with gallbladder disease suffers severe attacks of pain located more to the left, and when on palpation the left side is found more resistant than the right, the first thing to think of is acute pancreatitis. Of course there must be taken into consideration all the other symptoms, such as fever, rapid pulse, collapse and occasionally tympanites, and although the same symptoms may occur in cholecystitis and cholangitis, still the entire symptomatology of acute pancreatitis seen once leaves such an impression that should such a picture again present itself acute pancreatitis will at once be thought of, and this diagnosis will usually be correct.

Cases occur which are diagnosed as cholangitis and which are in reality pancreatitis; or a disturbance of the pancreas may be diagnosed which in reality is a cholecystitis. At all times acute pancreatic necrosis, in comparison with cholecystitis or cholangitis, is the more dangerous. Operative procedure for the pancreatic necrosis must be undertaken first. This consists of incision and tamponade.

1. Should the patient be very weak, a simple incision should be made and tamponade of the pancreas should be done. As a rule this is all that can be done in severe cases.

2. In cases not so severe, a cholecystostomy is performed in addition to incision and tamponade of the pancreas. The removal of the gallbladder and drainage of the common bile duct are left for a possible secondary operation.

3. If the vitality of the patient is good, operative procedure for the cure of the inflammation of the gallbladder and bile duct, as well as the cure of the acute pancreatitis, can all be undertaken. The ideal method is to expose the pancreas, liberally incise the area affected, tamponade and perform cholecystectomy and T-drainage of the common bile duct.

DR. R. H. C. GIBBONS, New York: In all cases of acute pancreatitis we cannot make a diagnosis until we open the abdomen, which should be done quickly; then sufficiently deal with conditions found. Remove gangrenous parts. Establish drainage through a rubber glove, into which carry the strong-gauze tape.

DR. WILLIAM LINDER, Brooklyn: As has been said, there are no pathognomonic signs or symptoms of acute pancreatitis. In the last two years we have been able to make a correct diagnosis in 70 per cent. of our sixteen cases. In the early stage, surgery is of benefit; in the very acute cases the patients may die before reaching the operating table. The pain in a severe case of acute pancreatitis is excruciating—severer than that of any other upper intra-abdominal condition.

Puncturing a Diet Dogma.—Another popular formula which has been elevated to the height of dogma is, "it is not what you eat but what you digest that is of importance." Since the normal person very completely digests all the common foodstuffs, there is little to concern one in this saying. Repeated ignorantly from mouth to mouth, such a remark, even though true, comes to cloak many dietetic absurdities.—Graham Lusk in *Science*.

NEPHRITIS FROM THE STANDPOINT OF UREA EXCRETION*

FRANKLIN C. McLEAN, PH.D., M.D.

NEW YORK

That nephritis, and particularly the form commonly known as chronic interstitial nephritis, is associated with alterations in the excretion of nitrogenous waste products, especially urea, has long been known. During the past few years the introduction of simpler methods for quantitative determination of the nitrogenous constituents of the blood has led to numerous clinical studies of the condition now known as urea retention. In its proper sense this term would imply a continuous positive nitrogen balance, with a constantly increasing amount of urea in the blood and tissues. In actual use, however, the term is applied to any condition associated with an increased concentration of urea in the blood, without reference to the nitrogen balance, and the finding of a blood urea concentration higher than the average normal is called urea retention and is taken to indicate disturbed renal function.

It is my purpose to attempt to make clear what actually happens in the condition of urea retention. Urea retention in the sense in which the term is now used is not a continuous process of piling up urea in the body, due to an inability of the kidneys to excrete the large amounts of urea formed in the body. As I shall show, the kidneys may be actually able to excrete far greater amounts of urea than they are ordinarily called on to do, even in severe cases of nephritis, while the condition known as urea retention exists in these cases at the lower levels of protein metabolism just as it does at the higher, even though in the former instance the blood urea figure may be used within normal limits.

The credit for the present conception of the mechanism of urea retention is due to Widal and Javal.¹ On their work were based the later studies of Ambard and Weill² and of myself.³

Widal and Javal kept a woman, aged 34, under observation for four months, during which time the nitrogen balance was carefully observed. The patient had been ill for one year with chronic nephritis. They found that she came into nitrogen equilibrium readily after changes in diet, though somewhat more slowly than a normal person. They also found that the concentration of urea in the blood bore a direct relation to the diet, and on a constant nitrogen intake was practically constant. After changes in diet, the blood urea could be restored to the former level by a return to the original diet. They succeeded in causing the concentration of urea in the blood to increase from 0.36 to 1.93 gm. per liter by increasing the nitrogen intake. As a result of their experiment, they concluded that the fluctuations in level of blood urea were due to the changes in diet, and that the increased concentration of urea in the blood, which occurred in

* From the Hospital of the Rockefeller Institute for Medical Research.

* Read before the Section on Practice of Medicine at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Widal, F., and Javal, A.: *Compt. rend. Soc. de biol.*, 1904, **57**, 301, 303.

2. Ambard, L.: *Compt. rend. Soc. de biol.*, 1910, **49**, 411, 506. Ambard, L., and Weill, A.: *Jour. physiol. et path. gén.*, 1912, **14**, 753.

3. McLean, F. C., and Selling, L.: *Jour. Biol. Chem.*, 1914, **19**, 31. McLean, F. C.: *Jour. Exper. Med.*, 1915, **22**, 212, 366; *Clinical Determination of Renal Function by an Index of Urea Excretion*, *THE JOURNAL A. M. A.*, Feb. 5, 1916, p. 415.

response to increased nitrogen intake, effected the elimination of increased amounts of urea through the kidneys. In other words, high nitrogen intake, relatively high blood urea, and high rate of excretion were found to be parallel and interdependent phenomena, as were low nitrogen intake, relatively low blood urea, and low nitrogen output. The foregoing hypothesis received further support from the work of Ambard and Weill,² who demonstrated that the rate of urea excretion depends primarily on the concentration in the blood. Numerous observers have confirmed the observation of Widai and Javal on the dependence of the concentration of urea in the blood on the level of protein intake.

We have carried out studies of two cases similar to the study made by Widai and Javal, but in addition we have studied the state of the urea excretion function, at various levels of protein metabolism, by the

experiments, but strict analysis was made of the protein-containing foods. The chlorid and fluid intake were kept constant. Urine and stools were collected in twenty-four hour periods and analyzed daily for nitrogen. Blood urea was determined about twice a week, with a simultaneous urine analysis on a carefully timed specimen, in order to compute the index of urea excretion.⁴

The chief findings included in the two studied are given in the accompanying charts illustrating the two cases.⁵

REPORT OF CASES

CASE 1.—C. P., man, aged 48, with general arteriosclerosis and chronic interstitial nephritis, first admitted to the hospital, Sept. 14, 1915, and kept under observation until June 5, 1916, complained of general weakness and loss of weight, which had been progressing for four or five years. There was found an advanced grade of general arteriosclerosis.

The urine was clear, straw-colored and neutral; the specific gravity was 1.011. There was a heavy trace of albumin, but no sugar. Hyaline and finely granular casts were present, but not in large numbers. No red blood cells were found. The total elimination of phenolsulphonaphthalein was 30 per cent. in two hours, September 15. Chart 1 shows the principal findings during a period of observation from October 26 to December 29.

CASE 2.—W. F., boy aged 17 years, with chronic interstitial nephritis and aortic and mitral insufficiency, admitted to the hospital, March 27, 1916, seemed quite well, but was brought to the hospital on account of albuminuria. This had been discovered about one year before, after a brother aged 18 years had died suddenly of uremia. The patient had had three attacks of rheumatism, six, four and two years before. Following the last attack he had heart failure, with edema of both legs. No history of scarlet fever, measles or diphtheria was obtained. On examination there were found the physical signs of mitral insufficiency, but there were no signs or symptoms of heart failure. The urine was clear, straw-colored and acid; the specific gravity was 1.012. There was a heavy trace of albumin and no sugar. The sediment contained hyaline casts, leu-

kocytes, and occasional red blood cells. Chart 2 shows the principal findings during a period of observation from March 28 to June 11.

COMMENT

The two cases are exactly similar. Both show the essential features described by Widai and Javal in their case; that is, a close parallelism between nitrogen intake, concentration of urea in the blood, and nitrogen output. A change in nitrogen intake was

index of urea excretion previously described.³ The findings of Widai and Javal have been duplicated, and their conclusions confirmed, and we have shown that the state of the function of urea excretion remained unchanged during the experiments, though great changes in the concentration of urea in the blood were observed.

METHODS OF OBSERVATION

The two patients studied had chronic nephritis, and were selected on account of an impairment of the function of urea excretion. Both were able to excrete large amounts of urine. They were both ambulatory patients, bore the strict dietary regimen well, and showed no change in general condition at the end of the experiment. Both are still alive, more than a year after the conclusion of the experiments, and are in practically the same condition as at that time.

On account of the length of the experiments, the diet was varied more than is usual in metabolism

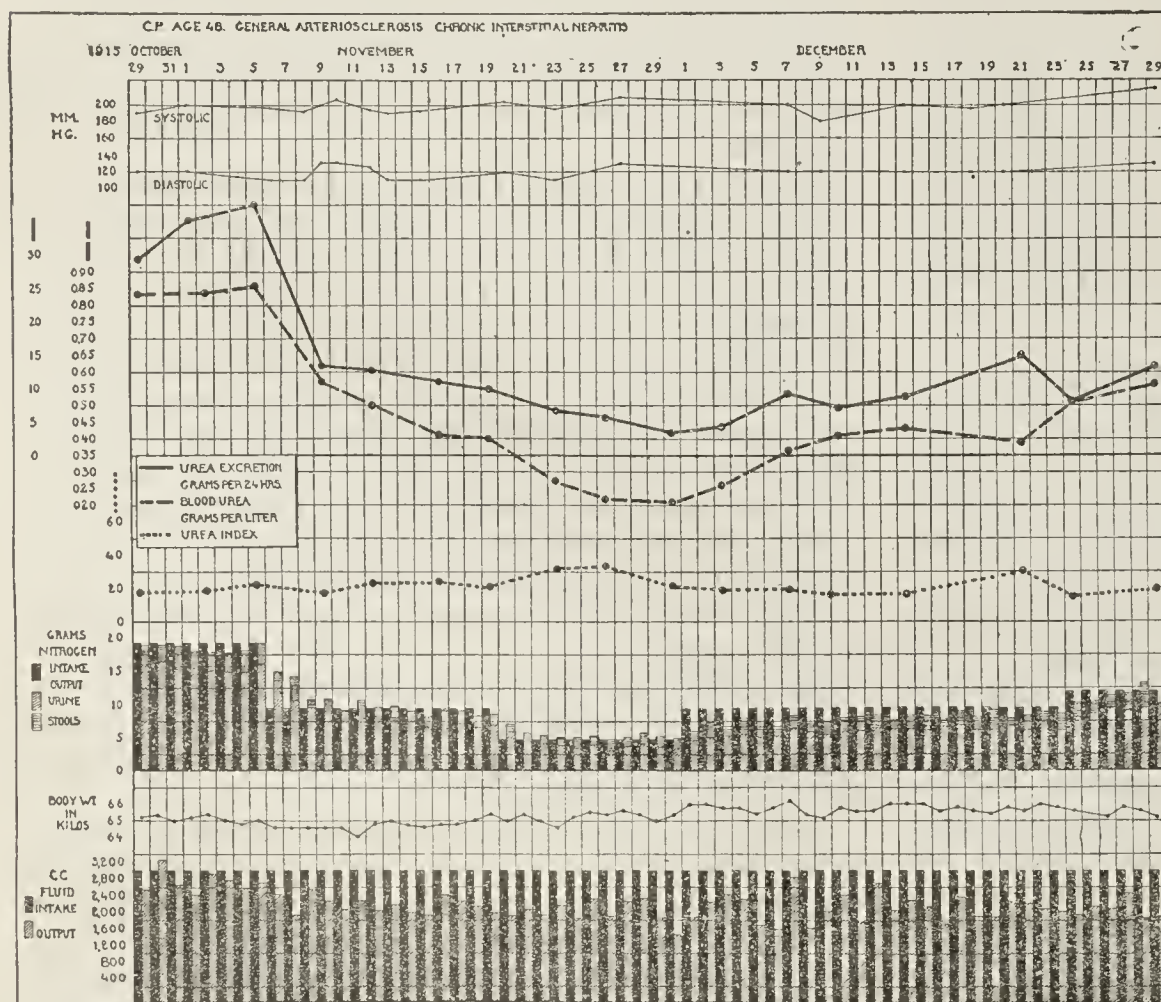


Chart 1.—Findings in Case 1.

4. The index of urea excretion is computed from the concentration of urea in the blood, the rate of urea excretion, the concentration of urea in the urine, and the weight of the patient, according to the following formula:

$$\text{Index of Urea Excretion (I)} = \frac{8.96 \times D \sqrt{C}}{\text{Wt.} \times \text{Ur}^2}$$

D, gm. of urea excreted per 24 hours;

C, gm. of urea per liter of urine;

Ur, gm. of urea per liter of blood;

Wt, body weight of individual, in kilograms. For further details consult the description of the index in previous papers.

5. Complete data in regard to the two cases here illustrated are given in a paper to be published in the Journal of Experimental Medicine, July, 1917.

always followed quickly by a change in the concentration of urea in the blood and in nitrogen output, so that nitrogen balance was reestablished on the new level. In Case 2 there were produced extremely wide fluctuations in the concentration of urea in the blood, from a minimum of 0.262 gm. per liter to a maximum of 2.542. This maximum is far above the level at which Hewlett, Gilbert and Wickett⁶ believe that toxic effects of urea appear. It would seem that this patient, having suffered for some time with chronic nephritis, should have shown uremic symptoms, if these symptoms are in any way referable to an increased amount of urea in the blood and tissues. As a matter of fact, no effect was noted beyond an increased fluid output, a slight loss in weight, and increased thirst.

The findings regarding urea excretion are of especial interest. In Case 1, with a variation in blood urea concentration from a minimum of 0.211 gm. per liter to a maximum of 0.855 gm., the index of urea excretion remained remarkably constant. In eighteen observations, with an average of 21.4, a figure below 16.4 is noted only once, and above 26.4 only three times. These variations must be regarded as insignificant when the complexity of the formula and the possibility of error in the various determinations are taken into account. In Case 2 there is a somewhat greater range of variation. The most significant variation is that seen June 2, when the blood urea reached 2.542 gm. per liter. On this day the urea index was 8.3 instead of about 20. It would seem that here the maximum capacity of the kidneys to excrete urea had been exceeded and actual accumulation had begun. This occurred, however, only when the nitrogen intake had been maintained at over 36 gm. per day for two days.

SUMMARY

The two cases confirm the findings of Widal and Javal, and add the fact that no essential variation in the ability of the kidneys to respond to even high concentration of urea in the blood at various levels of protein metabolism was demonstrable, until a very

high level was reached; that is, the quantitative relationship that existed between the concentration of urea in the blood and the rate of its excretion remained the same at all levels of protein metabolism.

It has been demonstrated, therefore, that a relatively increased concentration of urea in the blood follows the increased resistance with which diseased kidneys oppose the passage of urea. When, as the result of feeding an increased amount of nitrogen, the concentration of urea in the blood rises, a parallel increase in the rate of excretion of urea occurs. When a point is reached at which the rate of urea excretion is kept equal to the rate of formation by the organism, the level of urea in the blood ceases to rise, and the organism remains in nitrogen equilibrium. But when the

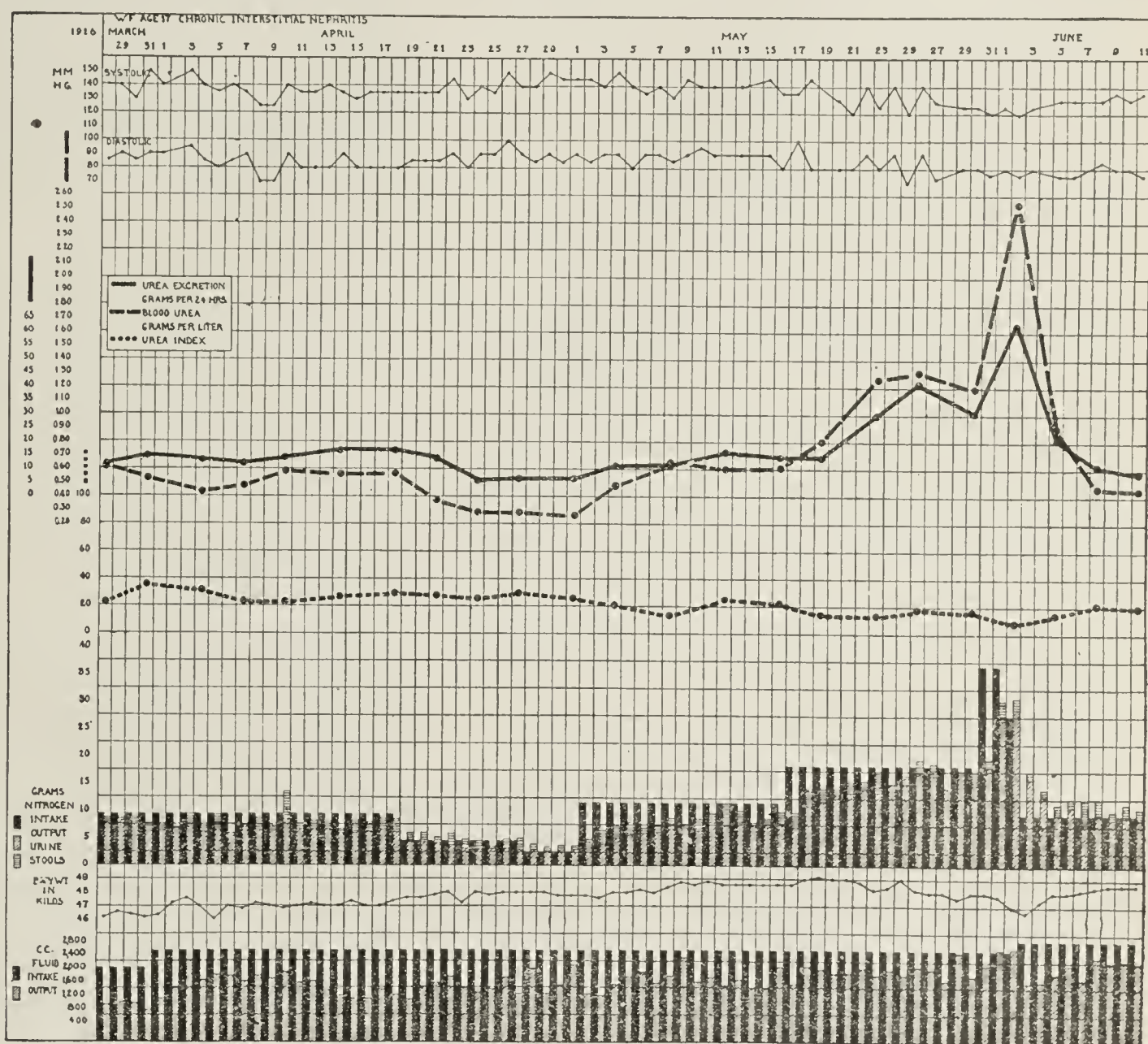


Chart 2.—Findings in Case 2.

nitrogen intake in the individual is diminished, urea is excreted for a time more rapidly than it is formed, until the level of urea in the blood falls, and reaches a point such that the rate of urea excretion is again equal to the rate of urea formation, and the organism is once more in nitrogen equilibrium. This experiment illustrates the events occurring in the so-called retention of urea.

CONCLUSIONS

1. Urea retention in the sense of a relatively increased concentration in the blood is the result of increased resistance to the excretion of urea through the kidneys.

2. The relatively increased concentration of urea in the blood overcomes the increased resistance to

6. Hewlett, A. W.; Gilbert, O. O., and Wickett, A. D.: The Toxic Effects of Urea on Normal Individuals, *Arch. Int. Med.*, November, 1916, p. 636.

excretion, and the organism is thereby maintained in nitrogenous equilibrium.

3. The laws formulated by Ambard in regard to urea excretion apply in the condition of urea retention under a widely varying range of conditions, as to nitrogen intake and excretion.

4. The numerical value of Ambard's constant changes in urea retention, but the relation of the variable factors to one another remains otherwise unchanged.

5. The occurrence of a high concentration of urea in the blood is not necessarily accompanied by any symptoms suggestive of uremia.

DIETETIC TREATMENT OF NEPHRITIS

CONTROLLED BY CHEMICAL EXAMINATION OF
THE BLOOD*

ARTHUR F. CHACE, M.D.

AND

ANTON R. ROSE, Ph.D.

Professor of Medicine and Associate in Pathological Chemistry, Respectively, New York Post-Graduate Medical School and Hospital

NEW YORK

It has long been recognized that the regulation of the diet is a very important part of the treatment of nephritis. The exact direction which such regulation should take depends on the form of involvement of the diseased kidney. In parenchymatous nephritis, where the normal elimination of water and salt is impaired, dietary restriction of these substances is designed to reduce the tax on the kidney to the lowest terms. The planning of the diet presents no special difficulties, since water is limited by excluding beverages and other fluid foods, and the chlorin intake is greatly reduced by the simple expedient of not adding salt to the food served to the patient and not including in the ration certain vegetables known to be conspicuously high in this element, such as lettuce and celery. The daily requirement for chlorin is very small, and the chief point to be emphasized is the maintenance of the patient's strength by an adequate energy supply. In interstitial nephritis the most characteristic phenomenon is the lowered permeability of the kidney for the nitrogenous constituents of the urine. The more protein there is in the diet, the more these substances accumulate in the blood, overtaxing the kidney and causing intoxication of the whole organism. Hence, the first dietary consideration in these cases is limitation of the nitrogen intake.

The present investigation has been conducted with persons suffering from interstitial nephritis. As already pointed out,¹ the intensity of this disease can be very accurately ascertained by estimating the amounts of the uric acid, urea and creatinin in the blood. The blood of normal persons before breakfast, on a moderate protein intake, contains approximately from 1 to 3 mg. of uric acid, from 12 to 15 mg. of urea nitrogen and from 1 to 2 mg. of creatinin per hundred c.c. of blood. If the blood analyses show a very appreciable excess over these figures, defective

kidney function is suggested, while a considerable increase in these nitrogenous waste products is positive evidence of interstitial nephritis. Reliable methods for the determination of these substances in the blood have recently been devised. With these methods a comparatively large amount of data has been accumulated in our laboratory, and it would seem that we have ample reason to trust blood analyses for diagnosis, prognosis and guidance in treatment of these cases of nephritis. As has been pointed out by Myers,² only advanced cases of interstitial nephritis show high values for the blood creatinin, thus lending valuable prognostic significance to this test. Creatinin, being almost exclusively of endogenous origin, is less influenced by the intake of protein than is urea, and constitutes the most satisfactory criterion as to the deficiency of the kidneys and the most reliable means of following the course of the disease, while urea, being largely of exogenous origin, is more readily influenced by dietary changes and constitutes a most sensitive index of the response to treatment.

The accumulating urea of nephritis is chiefly derived from the protein ingested, and the first consideration in planning the daily rations for a nephritic becomes the restrictions of his protein allowance. For short periods in chronic cases or for tiding over a crisis, simple starvation may be practiced or the customary lemonade and sugar diet employed, but eventually the patient will be weakened by such a treatment and his chances of improvement and recovery diminished. The actual minimum protein requirement of man is not very high, and in the early stages of the treatment, the nitrogen intake should be as little in excess of this as circumstances will permit. Men at severe muscular labor have been maintained in nitrogen equilibrium for months on from 0.5 to 0.75 gm. of protein per kilogram of body weight per day.³ This means that a mature man of average size need not consume more than 40 gm. of protein a day, and under stress of circumstances can get along on less. The exact amount of protein required varies with circumstances. With an increase of total fuel, the level on which protein metabolism can be maintained is proportionately lowered. This is due to the well known "protein-sparing" effect of carbohydrates and fats, a principle generally applied in agricultural practice in milk and beef production. For this reason a lemonade and sugar diet is better than simple starvation.

Another significant factor in the total nitrogen requirement is the chemical constitution of the individual proteins which enter into the food supply. Osborne⁴ has made an extensive study of the vegetable proteins, and has found that these differ markedly in the number and proportions of the amino acids which compose them. Osborne and Mendel,⁵ using isolated pure proteins in feeding experiments, have made some very significant discoveries, establishing definitely that each kind of protein has a value in nutrition dependent on the number and proportions of amino acids found in it; thus the absence or deficiency of lysin renders

2. Myers, V. C., and Lough, W. G.: The Creatinin of the Blood in Nephritis: Its Diagnostic Value, *Arch. Int. Med.*, November, 1915, p. 536.

3. A minimum nitrogen requirement has been determined in a number of laboratories. The work of Hinhede and his co-laborers may be specially mentioned. This work is compiled in a table by Rose, M. D. S.; *Jour. Biol. Chem.*, 1917, **30**, 202.

4. Osborne: *The Vegetable Proteins*, London, 1909; Abderhalden's *Biochemisches Handlexicon*, Berlin, 1911, **4**, 1-52; 1914, **9**, 1-11; Carnegie Institute of Washington, 1907, Pub. 84.

5. Osborne and Mendel: Carnegie Institute of Washington, 1911, Pub. 156. Mendel, L. B.: Nutrition and Growth, *THE JOURNAL A. M. A.*, May 8, 1915, p. 1539.

* From the Department of Medicine and the Laboratory of Pathological Chemistry, New York Post-Graduate Medical School and Hospital.

* Read before the Section on Practice of Medicine at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Chace, A. F., and Myers, V. C.: The Value of Recent Laboratory Tests in the Diagnosis and Treatment of Nephritis, *THE JOURNAL A. M. A.*, Sept. 23, 1916, p. 929.

the protein inadequate for the support of growth; the absence of tryptophan makes it incapable even of maintaining the adult organism. Such incomplete proteins must be supplemented either by the lacking amino acid or by another protein whose amino acid content is such as to supply the missing constituent. The foods as we eat them contain more than a single kind of protein. An inadequate protein may be supple-

TABLE 1.—OUTLINE OF DIETS *

Morning	Noon	Evening
Citrus fruit Cereal: Farina, oatmeal or banana Cream Toast Beverage	Cream soup: Plain, rice, celery, as- paragus, spinach Chief vegetable: White potato, baked or mashed with butter, sweet potato, banana Lettuce salad with oil Cocoa	Rice, steamed, with cream or baked banana, or as pudding Cornstarch blanc mange and cream Banana Milk

* Other food may have been included in this outline, and of those included, not all are to be considered on a par. Farina should be given more often than oatmeal. Of the soups, the plain soup or cream of rice or potato are preferable, but to break the monotony celery or asparagus may be served on rare occasions. In green vegetables the spinach and string beans are the best and the other two listed to be used as an occasional indulgence.

mented in a satisfactory fashion by another in the same foodstuff, or it may require the addition of something not represented in that particular food material. Feeding experiments on growing animals conducted in a manner similar to those of Osborne and Mendel, but with single foodstuffs instead of isolated proteins, reveal the possible disastrous consequence of monotony in the diet if the proteins in the food are incomplete.⁶ Thus oats, as the sole source of protein in a diet otherwise adequate, will not support growth in young animals, but the addition of casein renders the oat ration satisfactory. Casein is a protein of high biologic value, excelled in efficiency only by lactalbumin. Gelatin, on the other hand, has a very low value when used alone, being unable to support either the young or adult organism. However, McCollum⁷ reports that it takes less gelatin to supplement a given amount of oats satisfactorily than it does of casein. In our present state of knowledge it is unsafe to predict as to the biologic efficiency of any untested combination of proteins in food. Even the highly regarded navy bean has been shown by McCollum⁸ to be deficient in capacity to sustain the nitrogen metabolism, as evidenced by stunted growth of young animals fed on diets in which beans are the sole source of protein. It would seem prudent to consider that our nutritional safety lies in the use, in a restricted ration, of proteins whose efficiency has been well demonstrated, as those of milk, eggs or meat, or in a *variety of proteins* from vegetable sources, preferably combined with milk proteins.

In recent years we have also come to realize that the mineral metabolism is a very important factor in nutrition. McCollum⁹ fed young animals a diet of corn and purified casein, and found that they soon ceased to grow. When a suitable salt mixture was added, they made rapid progress and soon attained normal weight for their age. Wheat, oats and beans have also been shown to require some adjustment of their ash content before they will support normal growth.

In monotonous feeding of single kinds of food or a limited number of foods of certain types, pathologic conditions set in which are due to other factors than inadequacy of protein or mineral content. These are attributed to minute quantities of certain organic substances known as food accessories or vitamins. McCollum¹⁰ has shown that there are two substances required for growth, one soluble in water, the other associated with the ether-soluble fraction of the food. Besides these we have a third accessory whose absence manifests itself by the symptoms of scurvy. A liberal variety of fruits and vegetables eliminates the danger of omitting this element of an adequate diet.

In feeding animals, excellent results can be obtained from a simple monotonous dietary, provided all the essentials of a well-balanced ration are represented, that is, a full energy supply, protein and ash in suitable kinds and amount, sufficient ballast, and food accessories. In feeding the human subject, there are also psychologic considerations which cannot be altogether disregarded, and some provision must be made for variety to secure the best results. Our work has been based on the assumption that the patient should be given a minimum amount of medication, and kept at rest and as cheerful and contented as circumstances permit. As the meals are generally the patient's chief diversion, they should be made agreeable and interesting by suitable variety in choice of food and manner of serving.

The food should supply the full quota of nutrients for a person at rest, while the load on the kidney should be reduced as much as is compatible with physiologic well-being. The average man, at rest, will require about 2,000 calories per day. Nephritics, with-

TABLE 2.—DISTRIBUTION OF MINERAL ELEMENTS IN SOME HIGH AND LOW PROTEIN FOODS *

Food	Pro- tein, per Cent.	Cal- cium, per Cent.	Phos- phorus, per Cent.	Chlorin, per Cent.	Iron, per Cent.	Ash Bal- ance in Terms of Normal Solution, C.e.
Asparagus.....	1.8	0.029	0.039	0.040	0.0010	Base 0.81
Bananas.....	0.4	0.007	0.024	0.200	0.0006	Base 5.6
Butter.....	1.0	0.014	0.013	0.00X		
Carrots.....	1.1	0.055	0.044	0.036	0.0008	Base 10.8
Celery.....	1.1	0.071	0.044	0.170	0.0005	Base 7.8
Citrus fruit.....	0.5	0.036	0.017	0.010	0.0004	Base 7.0
Lettuce.....	1.2	0.036	0.039	0.050	0.0010	Base 7.4
Potatoes, white....	2.2	0.011	0.061	0.036	0.0013	Base 7.7
Potatoes, sweet....	1.8	0.018	0.039	0.120	0.0005	Base 6.0
Prunes, dried.....	2.1	0.043	0.011	0.010	0.0029	Base 25.6
Raisins, dried.....	2.6	0.057	0.123	0.070	0.0050	Base 23.7
Spinach.....	2.1	0.064	0.057	0.010	0.0032	Base 27.1
Cream (18.5%).....	2.5	0.100	0.079	0.100	0.0002	Base 1.3
Milk.....	3.3	0.121	0.095	0.120	0.0002	Base 1.3
Barley pearl.....	8.5	0.018	0.200	0.020	0.0013	Acid 10.3
Corn meal.....	9.2	0.011	0.142	0.020	0.0011	Acid 3.7
Oat meal.....	16.7	0.093	0.381	0.035	0.0036	Acid 10.6
Rice.....	8.0	0.009	0.087	0.050	0.0009	Acid 8.4
Rye flour.....	6.8	0.050	0.339	0.020	0.0040	
Wheat flour.....	11.2	0.019	0.081	0.070	0.0015	Acid 9.6

* The data from which this table has been compiled are taken largely from Sherman: Chemistry of Food and Nutrition, New York, 1912.

out edema, do not differ from normal persons in their fuel requirement.¹¹ In severe cases the protein intake should be placed low at first, not exceeding 30 gm. per day. Later it may be raised to 50 or 60 gm. The diet has been salt-free in the sense that it includes only the sodium chlorid naturally occurring in the food materials used; none has been added for seasoning

6. McCollum, E. V.: The Supplementary Dietary Relationships Among Our Natural Foodstuffs, THE JOURNAL A. M. A., May 12, 1917, p. 1379.
7. McCollum, Simonds and Pitz: Jour. Biol. Chem., 1917, 29, 343.
8. McCollum, Simonds and Pitz: Jour. Biol. Chem., 1917, 29, 521.
9. McCollum, Simonds and Pitz: Jour. Biol. Chem., 1916, 28, 154.

10. McCollum, Simonds and Pitz: Jour. Biol. Chem., 1917, 30, 13.
11. Aub, J. C.; Du Bois, E. F., and Soderstrom, G. F.: Respiratory Metabolism in Nephritis, Arch. Int. Med., May, 1917, p. 865.

purposes.¹² The meals have been selected as to insure the adequacy of the protein, ash and food accessories. The general plan of the dietary is as follows: A warm, cooked cereal, generally farina served with milk, is given for breakfast. This is sometimes replaced by oatmeal or a baked banana, and toast and a citrus fruit are occasionally added. The noon meal consists of a plain soup made from milk, flour and butter, given mainly to supply an agreeable hot dish, though it is also utilized as a medium for introducing variety, by adding celery, asparagus or spinach; a

TABLE 3.—THE FIRST TWO DIETS FOR SEVERE CASES

Juice from 1 lemon, 2/3 cup water, 6 tablespoons lactose. (1 tablespoon cane sugar) Calories 1,424			Serve 4 times a day			Iron, 0.8 mg.		
Morning			Noon			Evening		
Banana.....	300 gm.		Cream soup	200 c.e.		Banana.....	300 gm.	
Cream.....	100 c.e.		Banana.....	300 gm.		Cream.....	100 c.e.	
Cocoa.....	200 c.e.		Milk.....	200 c.e.		Cocoa.....	200 c.e.	
Calories, 1,585			Protein, 35.4 gm.			Ash, alkaline, 15.6 n.		
						Iron, negl.		

main dish consisting of baked potato, now and then replaced by baked half-ripe banana and steamed rice; a liberal portion of green vegetable and a lettuce salad with oil dressing, flavored with lemon or vinegar. The evening meal is composed of such articles as ripe bananas, rice pudding, cornstarch blanc mange, steamed rice with baked bananas and stewed fruit. Milk and cocoa in limited quantities are served as beverage. This general plan is outlined in Table 1. From this outline some twenty diets have been prepared. These diets have been used in our experi-

TABLE 4.—HOW MENUS ARE CONSTRUCTED FROM TABLE 1 *

Morning	Noon	Evening
One half orange Oatmeal..... 200 gm. Toast, butter. 1 slice Cream, 18.5%.. 50 c.e. Milk..... 100 c.e.	Cream of asparagus soup..... 200 c.e. Potato, baked and mashed with butter (30 gm.)..... 200 gm. Green vegetable, spinach Milk..... 200 c.e.	Banana, ripe.. 400 gm. Milk..... 240 c.e. or Cornstarch blanc mange. 200 gm. Cream..... 50 c.e. Bread and butter..... 33 gm. Cocoa..... 200 c.e.

* Between meals, 1 slice buttered toast and 200 c.e. cocoa
Calories, 2,348 Protein, 53 gm. Alkaline, ash, approx. 50 n
Iron, over 15 mg.

Cream of wheat..... 150 gm. Banana..... 200 gm. Bread and butter..... 33 gm. Cream..... 100 c.e.	Cream of celery soup..... 200 c.e. Baked potato..... 200 gm. Butter..... 1 tbsp. Spinach..... liberal portion Cocoa, 1/2 milk..... 200 c.e.	Banana..... 400 gm. Steamed rice.. 100 gm. Cream, 18.5%.. 100 c.e. Milk..... 200 c.e.
Calories, 2,085 Protein, 39.7 gm. Ash, alkaline, 86 n. Iron, 15.5 mg.		

* The recipe for the lemonade in Table 3 and the data for this table are taken from Rose, M. D. S.: Feeding the Family, New York, 1916, and Laboratory Hand-Book of Dietetics.

mental work, and for this reason have been given more monotonously than would ordinarily be required or desirable. By careful arrangement they can be made to furnish considerable variety without unduly taxing the cuisine of a hospital or sanatorium. No dietary program of this sort should be considered as fixed, but made sufficiently elastic to meet the market conditions and, what is more important, the patient's digestive conditions. It seems to be a common experience that the nephritic patient is particularly sus-

12. In nephritis, when there is no tendency to edema, the salt restriction need not be so severe.

ceptible to gastro-intestinal disturbances, and the dietary should irritate the alimentary tract as little as possible. The individual's peculiarities and gastro-intestinal conditions are to be considered in prescribing a diet.

TABLE 5.—BLOOD FINDINGS IN INTERSTITIAL NEPHRITIS *

Date, 1915	Creatinin, Mg. per 100 C.e. Blood	Urea Nitrogen, Mg. per 100 C.e. Blood	Remarks
February 24	8.3	55	Standard parenchymatous diet
March 1	6.5	63	
March 6	5.3	89	
March 19	6.5	51	
March 25	6.1	51	
April 8	8.0	61	
April 16	11.0	144	

* J. W., aged 34; sickness fifteen months prior to admittance to hospital; edema, nausea, vomiting, constipation; blood pressure, 222-132; albuminuria, casts; phenolsulphonephthalein test, 2 per cent.

The diet scheme includes grains (seeds), tubers and stems (including leaves) of plants, and therefore supplies all necessary food accessories or vitamins.¹³ Several kinds of plants are drawn on, and these, together with the amount of milk allowed, will insure

TABLE 6.—BLOOD FINDINGS IN INTERSTITIAL NEPHRITIS *

Date, 1915	Creatinin, Mg. per 100 C.e. Blood	Urea Nitrogen, Mg. per 100 C.e. Blood	Remarks
January 22	7.8	60	1,200 c.e. lemonade Cereal (200 gm.); bread and butter, 5 slices; potato; cocoa (400 c.e.)
January 27	10.0	67	
January 30	8.9	77	
February 6	8.4	72	Same diet plus 240 c.e. cream soup, 2 glasses milk, matzoh, sugar and syrup Patient given free choice as to diet
March 9	11.0	97	
March 16	11.4	120	
March 19	14.1	131	
March 23	20.5	152	

* T. D., aged 34; sickness six months prior to admittance to hospital; eyesight impaired, epigastric pain, nausea; blood pressure, 225-130; small amount of albumin in urine; casts; phenolsulphonephthalein test, 2.2 per cent.

the supplementing of all the proteins of low biologic value. Greens are liberally supplied, in part, to furnish fiber for ballast, but more for the important mineral matter which they carry. In many instances the patient's stomach is sensitive to these vegetable foods when fed in natural form, as they should nor-

TABLE 7.—BLOOD FINDINGS IN INTERSTITIAL NEPHRITIS *

Date, 1916	Creatinin, Mg. per 100 C.e. Blood	Urea Nitrogen, Mg. per 100 C.e. Blood	Remarks
February 11	8.5	55	Standard interstitial nephritic diet
February 18	11.9	60	
February 23	12.5	76	
March 3	11.4	74	Standard parenchymatous diet
March 7	10.4	60	
March 28	10.8	48	
March 31	9.6	45	
April 7	9.5	39	
April 14	8.2	34	Lemonade
April 25	10.0	45	
April 28	10.0	43	
May 10	11.4	56	
June 9	9.6	68	

* W. W., aged 30; edema, poor eyesight, polyuria, heart displacement; blood pressure, 208-155; pronounced albuminuria; hyaline casts; phenolsulphonephthalein test, 1 per cent.

mally be consumed and it becomes desirable to purée them. When constipation results from too little inert matter in the food, liquid petrolatum is prescribed in

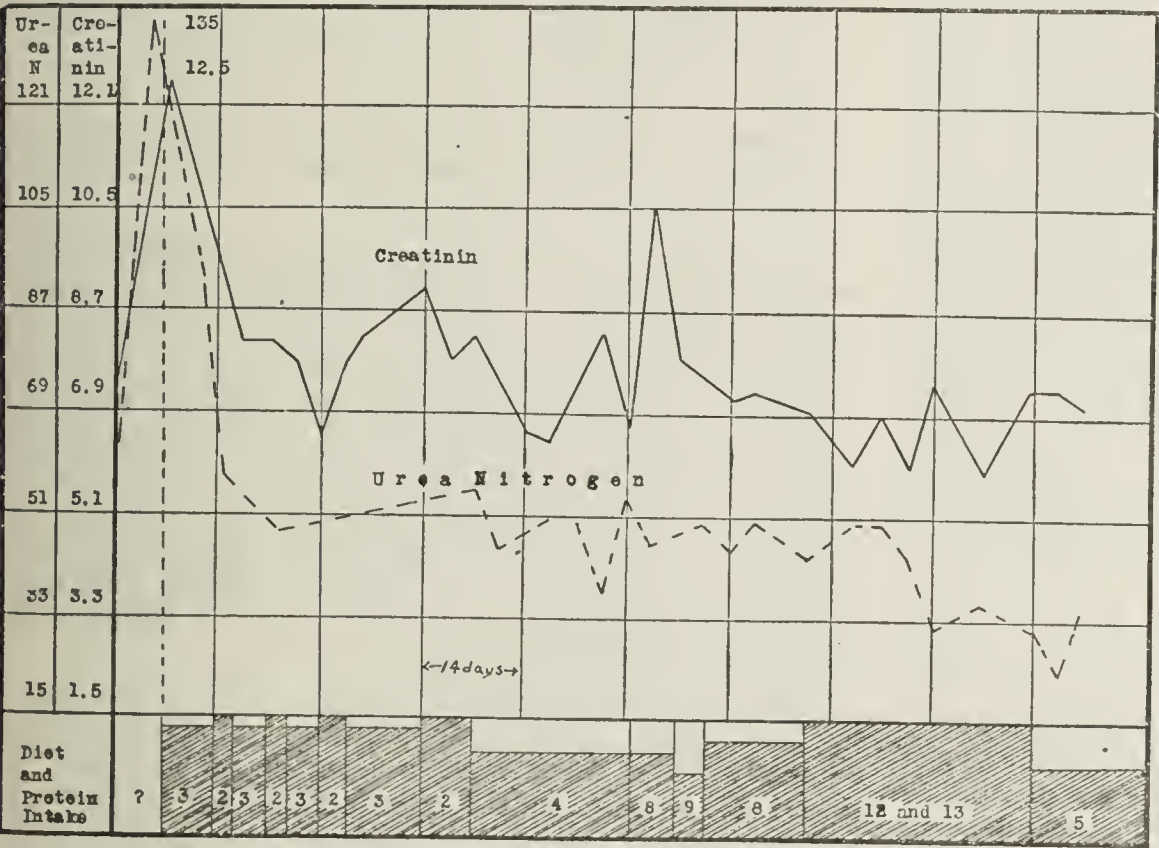
13. McCollum (Footnote 6); McCollum, Simonds and Pitz (Footnote 10).

preference to salts or other drugs. The distribution of the ash elements in the vegetable foods is indicated by Table 2, and the desirability of the inclusion of greens is emphasized. The most conspicuous food element supplied by these is the iron. This substance is particularly needed in abundance to help diminish the anemic condition so conspicuous in these cases. Normally, an adult's requirement is reckoned at 15 mg. per day,¹⁴ and nephritis certainly should not have less. Another characteristic of interstitial nephritis is a tendency to acidosis. Besides having a sufficient amount of ash constituents present, these should be so grouped quantitatively that their reaction does not aggravate, but, as far as possible, tends to neutralize the acid condition. Sherman¹⁵ and his co-workers have made a study of the reaction of the food ash, and the last column of Table 2 is compiled from data which they have gathered. It is to be noted that roots, tubers, stems and pericarps, grouped at the top of the table, are predominately alkaline, whereas the seeds, grouped at the bottom, are strikingly of the opposite reaction, due to their higher phosphorus content and

TABLE 8.—RECENT CASES OF INTERSTITIAL NEPHRITIS

Patient	Date, 1917	Creatinin, Mg. in 100 C.c.	Urea Nitrogen, Mg. in 100 C.c.	Remarks
H. G. Aged 21	May 9	4.9	45	Gastric symptoms, first diagnosed as peptic ulcer. Placed on diet consisting mainly of cooked cereals, milk toast, cocoa, and occasionally banana; phenolsulphonphthalein test 5/18, 35%
	May 15	3.0	45	
	May 18	4.6	39	
	May 22	3.1	26	
	May 25	2.6	30	
	May 29	5.7	70	
	June 1	4.7	60	
	June 8	3.3	48	
J. W. C. Aged 60	June 15	2.5	23	Kept on diets similar to Table 4 with a protein intake not over 52 gm.; phenolsulphonphthalein test. 5/18, gave an elimination of 8.7 %
	April 24	2.8	38	
	May 1	2.1	35	
	May 8	6.1	41	
	May 15	5.2	20	
	May 22	3.3	28	
	June 1	3.1	36	
	June 8	4.5	26	

H. G., pain in umbilical region; no nephritic symptoms; loss of weight; anorexia; blood pressure, 135-80; trace of albumin in urine; few casts; phenolsulphonphthalein test, 35 per cent.
J. W. C., asthma; nocturnal dyspnea; edema; polyuria; blood pressure, 190-90; small amount of albumin in urine; few casts; phenolsulphonphthalein test, 9 per cent.



Influence of the diet on the creatinin and urea in the blood in J. B., man, aged 34.

the sulphur from their abundant protein. The diet should, therefore, be arranged to contain more of the former than of the latter. The diets, as planned, have a relatively high calcium content, desirable not only to meet the daily requirements for this element, but also to divert the elimination of phosphorus from the kidney to the intestine, as this element is sometimes eliminated with difficulty by an impaired kidney. Phosphorus is strikingly essential in cell life and its absolute restriction for a protracted period would hardly seem wise. But since the elimination of the phosphorus is not confined to the kidney, occurring also by way of the intestine in the form of dicalcium and tricalcium phosphate, appreciable amounts of the phosphate intake may be shifted from the kidneys to the intestine by having an alkaline ash rich in calcium.¹⁶ In this connection it is needless to

suggest that for such cases the bread supplied should not be raised by phosphate baking powder. In severe cases it is well to begin the dietary treatment with a ration that is free from protein, such as lemonade, and follow this with a mild food easy to take and low in protein. Ripe bananas have been found very serviceable for this purpose. Lemonade and banana diets are shown in Table 3. In the lemonade the sugar is added more for sweetening than for its calories, and may well be replaced, wholly or in part, by lactose, which is to be preferred to sucrose, in that it is apt to be less irritating and will add materially to the fuel value of the ration. In ripe bananas we are fortunate in having a fruit which is mild in flavor and can, therefore, be taken in quantity for a number of days without creating aversion; it has also a high caloric value with very low protein content and an alkaline ash. Because of the small margin between its alkaline earths and phosphorus, it should be served with a little milk to increase the calcium. Table 4 shows how diets may be

TABLE 9.—FINDINGS IN INTERSTITIAL NEPHRITIS*

Date, 1916-17	Creatinin, Mg. per 100 C.c. Blood	Urea Nitrogen, Mg. per 100 C.c. Blood	Protein Intake	Diet
Dec. 22-26.....	7.4	61		
Jan. 5.....	9.7	135		
Jan. 9.....	12.5	110	49	Banana and milk The same alternated with Diet 2
Jan. 12.....	11.1	110	49	
Jan. 15-23.....	8.8	75	49-51	
Jan. 23-Feb. 6....	7.5	50	49-51	
Feb. 9-20.....	8.4	54	49-51	
Feb. 23-27.....	7.7	53	49-51	
Mar. 2-9.....	6.7	50	49-51	
Mar. 13-16.....	7.4	45	49-51	
Mar. 20.....	10.6	46	40	Diet 4
Mar. 23-30.....	7.4	47	25-40	Diet 3-9
Apr. 13-17.....	6.4	45	52	Diet 12-13
Apr. 20-30.....	6.8	41	52	Diet 12-13
May 8-22.....	6.6	31	52	Diet 12-13
May 29-July 15...	6.8	33		

* J. B., man, aged 34; edema, headache, dyspnea; blood pressure, 204-130; albuminuria, hyaline and granular casts; phenolsulphonphthalein test, 3 to 19 per cent.

14. Sherman: Chemistry of Food and Nutrition, New York, 1912.
15. Sherman and Sinclair: Jour. Biol. Chem. 1907, 3, 307. Sherman and Gettler: Jour. Biol. Chem., 1912, 11, 323.
16. Forbes and Keith: Ohio Agric. Exper. Sta., Tech. Series Bull. 5, p. 203, 1914.

constructed from Table 1. Bananas may with profit enter frequently into the subsequent diets; but bananas, if served raw, must be thoroughly ripe.¹⁷ For convenience and economy, especially in an institution, it is desirable to purchase the fruit by the bunch. If, however, consumption is delayed until the bananas are fully ripe, some loss is apt to occur through the rapid ripening. Investigations in this laboratory afford convincing evidence that the bananas can be used with perfect success if they are cooked; hence use of a bunch may begin as soon as yellowing commences. This will tend to increase the variety of the diet, since they may be served warm. When baked, they have a distinctive texture and flavor, which further varies with the degree of ripeness.

The blood findings in three typical severe cases of interstitial nephritis are shown in Tables 5, 6 and 7. These patients were kept on monotonous low protein diets. It has hitherto been an almost invariable rule that patients with such unfavorable creatinin content in the blood have succumbed in comparatively short time. In Table 8 are given the most recent cases of advanced nephritis in this hospital. After the first week these patients have been kept on a dietetic system conforming to the ideas expressed in this paper. There has not been as prompt and favorable response to this treatment as one could wish, but the trend is in the right direction. A detailed study has been made of the case represented by Table 9 and the chart. This patient was in a very critical condition when he arrived at the hospital, with the creatinin and urea rising rapidly. He was placed on bananas and milk alternately every three days with cereal, potatoes, cornstarch and milk. There was an apparently immediate response as to urea, and a later response as to the creatinin. The patient was anemic, with a blood count of red cells of some 3,300,000 and hemoglobin at 55 per cent. These have since increased to 4,200,000 and 65 per cent., respectively. The physical condition of this patient is at present much improved. The figures in the table are in most instances averages. These, and the inclination of the curves, though not striking, are nevertheless encouraging, and although there is no immediate sign of arrest or recovery from the disease, it indicates a possibility of treatment which may well be of importance in earlier stages and milder cases. It is not strictly fair to draw conclusions as to mild cases from these severe ones, but in the former we have no such tangible means of noting progress. From the foregoing considerations and the findings of the blood analyses here reported, as well as the cases mentioned in a former paper,¹⁷ we feel justified in thinking that a rational system of dietetics in cases of interstitial nephritis, which are not too advanced, may lead to a material reduction of fatal eventualities.

SUMMARY

A scheme of dietetic treatment for nephritis, based on the more recent advances in the field of nutrition, and tested in advanced cases of interstitial nephritis in this hospital, has had encouraging results thus far. The patients used in the test have been followed not only by the usual clinical observations at the bedside, but also by frequent chemical examination of the blood. The determination of creatinin and urea nitrogen affords an excellent and convenient means of gaging

the kidney's capacity to eliminate nitrogenous waste products and noting the response of the nephritic to treatment. The plan provides a diet adequate in calories, protein, mineral elements and food accessories. To attain this, a variety in the menu has been insisted on. This insures a happier and more content attitude on the part of the patient, the inclusion of all the requisite vitamins and the complementing of biologically incomplete proteins. At least one hot dish is provided each day by giving a bowl of cream soup. Green vegetables are given to bring the iron intake in excess of 15 mg. per day. The sum total of the day's ash constituents should be decidedly alkaline in reaction and rich in calcium. Foods high in phosphorus are discriminated against, though not strictly barred, as are also foods of striking flavors. The day's energy requirement should add up to at least 2,000 calories, and the protein should not exceed 60 gm.

525 Park Avenue.—303 East Twentieth Street.

THE NATURE AND TREATMENT OF CHRONIC PARENCHYMATOUS NEPHRITIS (NEPHROSIS) *

ALBERT A. EPSTEIN, M.D.

Adjunct Attending Physician and Assistant in Physiological Chemistry,
Mount Sinai Hospital

NEW YORK

The term "chronic parenchymatous nephritis" is ordinarily applied to a variety of renal diseases which pathologically may be widely different in character. Thus cases of chronic diffuse nephritis, of amyloid kidney and of chronic nephrosis are grouped under a single heading. According to modern conceptions, chronic diffuse nephritis constitutes an inflammatory process involving all the kidney structures—glomeruli, tubules and interstitium; the other types represent degenerative processes, in one of which (chronic nephrosis), the lesion chiefly affects the tubules, and is not at all inflammatory.

The reason for the use of a single term in designating such distinct pathologic conditions is the fact that clinically these cases have a number of features in common: the oliguria, the intense albuminuria, and the edema. Certain diagnostic criteria have been established for differentiating one variety from another.¹ Thus in chronic nephrosis, it is said, the urine is free from formed blood elements and the blood pressure is not elevated. In practice a differentiation on these criteria is not always feasible; for cases are encountered in which the basic disturbance resembles that of chronic nephrosis, whereas in other respects the existing conditions do not fulfil the requirements of the classification.

It is stated also that, etiologically, chronic nephrosis differs from the other varieties in that its origin is obscure or unknown. It bears no definite relation to the known infectious diseases. The kidney of pregnancy is often cited as an example of this type of renal disease; and in view of the fact that certain anatomic peculiarities in diseased kidneys are characteristic of different causes, it is surmised that the degenerative process in the kidneys in this affection is due to an

* From the service of Dr. N. E. Brill.

* Read before the Section on Practice of Medicine at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Volhard and Fahr: Die Brightsche Nierenkrankheit, Berlin, Julius Springer, 1914.

17. Myers and Rose: The Nutritional Value of the Banana, THE JOURNAL A. M. A., April 7, 1917, p. 1022.

intoxication, because of the similarity of the lesion to that produced by certain mineral poisons.

From a comprehensive study of the blood, of effusions, and of the urine, in this and other forms of renal disease² some light was gained concerning the morbid processes of this peculiar affection. In a series of 193 cases representing various renal conditions, which I have had occasion to observe in the past few years, the type of disease under discussion has been encountered in fifteen individuals. It appears from these observations that the pathologic and chemical basis of the cases now termed "chronic nephrosis" is that of a nutritional or constitutional disorder. Furthermore, the evidence acquired also points to the probability that certain cases of diffuse nephritis represent a form of renal disease in which some of the morbid phenomena correspond to those found in chronic nephrosis, whereas others are secondary to or associated with inflammatory changes in the kidneys.

The most striking phenomenon in this group of renal diseases is the intense and persistent albuminuria. The quantity of albumin excreted in the urine is often great. Its daily output for weeks and months may amount to as much as 50 gm. The source of the albuminous substances in the urine is the blood serum or plasma. In view of the fact that the total quantity of protein in the blood serum, in a normal individual of average weight and size, is approximately 210 gm., the daily loss incurred by the blood in this manner may constitute a large percentage of that present in the circulation.

Whether the excretion of these substances is due primarily to an altered protein utilization, or is the result of an unusual permeability of the renal epithelium, is a question which cannot be answered at the present time. The fact remains, that as a result of the intense and prolonged albuminuria, profound changes take place in the composition of the blood. The development of a state of malnutrition is evidenced by a number of facts. Whereas normally the blood serum contains from 6.5 to 8.3 gm. of protein to the hundred c.c., of which a little more than one third is globulin; in disease the quantity of protein may be much reduced and the globulins show a relative increase. The characteristic change in the blood serum in cases of chronic nephrosis is a reduction in the total protein content with a marked relative increase in the globulin, which in certain instances constitutes nearly all of the protein present.

TABLE 1.—TYPES OF COMPOSITION OF BLOOD SERUM IN CHRONIC NEPHROSIS

Total Protein Gm.	Incoag. Gm.	Per 100 Cc.		Cholesterol Gm.	Globulin in Protein Per Cent.
		Globulin Gm.	Chlorid Gm.		
3.611	0.065	2.038	0.404	0.760	59.0
2.731	0.101	2.598	0.390	1.226	95.0

A discussion of the causes which lead to this remarkable change in the blood serum must be left for another occasion. It is known that infections and intoxications of various sorts lead to an increase in the proportion of globulin in the blood. Hurwitz and Meyer³ have found that the increase in globulins may result from the toxic action of infecting agents on the body tissues. On the basis of other changes which occur in the blood, such as the accumulation of fatty substances, the increase in the globulin content indi-

cates a tissue disintegration. The quantity of fats and lipoids, which accumulate in the blood in this disease is extraordinary.⁴

In no other condition of renal disease are such changes in the blood serum encountered. What concerns other substances in the blood, namely, non-protein nitrogen and the chlorids, it might be said that these often range within normal limits or may be slightly elevated. One reason for the low concentration of nonprotein nitrogen in the blood may be a large distribution of this constituent throughout the body in the edematous tissues. That this is so is illustrated by the following clinical observation:

The blood of a patient suffering from a severe nephritis, with symptoms of impending uremia (visual disturbances, violent headaches, vomiting) and a generalized edema, was examined and found to contain 0.070 gm. of nonprotein nitrogen per hundred c.c. Ten days later, when many of the symptoms disappeared and the edema partly subsided, the blood contained 0.210 gm. of nonprotein nitrogen per hundred c.c. Finally two weeks after the second examination, when the patient was much improved and the edema had entirely subsided, the nonprotein nitrogen of the blood was 0.70 per hundred c.c.

It is usually stated that, in cases of chronic nephrosis, the urine may have a high specific gravity; that it may contain normal quantities of nitrogenous urinary substances, but that it is deficient in chlorids. According to Widal⁵ this is one of the characteristic features of the disease.

In discussing the classification of this group of nephritic conditions, I stated that there are certain cases of diffuse nephritis in which some of the manifestations resemble those found in chronic nephrosis, while others are referable to inflammatory changes in the kidneys. Examples of this type are found particularly in two groups of conditions: first, during or after pregnancy, and second, in association with diabetes mellitus. The first occurs in relatively young women who, in the course or directly after a pregnancy, develop renal disease. I have had occasion to observe six cases of this type. Not only do such cases show evidence of malnutrition as proved by the changes in the blood, but they also indicate the occurrence of disturbances in certain of the internal secretions. As in the cases of chronic nephrosis, the albuminuria is very intense; but formed blood elements may occasionally be found. The urine is scanty and of varying specific gravity; it is deficient in chlorids and may also show diminution in the nitrogen output. The blood shows changes similar to those observed in chronic nephrosis; namely, the reduction in the protein content of the serum, the relative increase in the globulins and an excessive increment in fatty material. Extensive edema develops; notwithstanding this fact, the nonprotein nitrogen of the blood in these cases may be considerably elevated.

TABLE 2.—TYPES OF COMPOSITION OF BLOOD SERUM IN CHRONIC DIFFUSE NEPHRITIS (MILD AND SEVERE CASES)

Total Protein Gm.	Incoag. Nitrogen Gm.	Per 100 C.c.		Cholesterol Gm.	Globulin in Protein Per Cent.
		Globulin Gm.	Chlorid Gm.		
4.919	0.130	3.440	0.397	0.460	70.0
3.958	0.084	2.594	0.404	1.150	66.00

The blood pressure in the latter group of cases rises very high (240 mm. of mercury). The other clinical features which suggest a disturbance of the internal

2. Epstein, A. A.: Jour. Exper. Med., 1912, **16**, 719; 1913, **17**, 444; 1914, **20**, 334. Rowe, A. H.: The Albumin and Globulin Content of Human Blood Serum, Arch. Int. Med., September, 1916, p. 455.
3. Hurwitz and Meyer: Jour. Exper. Med., 1916, **24**, 515.

4. Epstein and Rothschild: Am. Jour. Physiol., 1917, **42**, 586.
5. Widal: Jour. méd. français, 1911, **5**, 13.

secretions are the cessation of menses (in four out of six cases), or the development of menorrhagia; loss of hair, pigmentation of the face (light coffee brown), exophthalmos, and varying degrees of enlargement of the thyroid.

The kidney of pregnancy, as stated before, is believed to represent a typical example of nephrosis. The cases just mentioned stand in etiologic relationship to pregnancy, and from the character of the changes in the blood they resemble the cases of chronic nephrosis; but, unlike those, they show a high blood pressure. This circumstance, however, does not militate against the assumption that the intrinsic nature of the disturbance is similar to that of chronic nephrosis. The early cessation of the menses in the majority of the cases suggests that the rise of blood pressure may, to a certain extent, be the result of the associated disorder of the internal secretions, like that which occurs in the normal menopause.

The other pathologic condition, as stated before, with which this type of renal disease is sometimes associated is diabetes mellitus. I have observed three such cases, two of which occurred in men. The ages of the three persons were 52, 58 and 59 years, respectively. In two of the cases the glycosuria and the albuminuria were discovered at the same time. In the remaining one, the albuminuria antedated the diabetes by three years. In these cases, some of the clinical findings differed from those of the preceding group.

While the glycosuria was present, the quantity of urine excreted was very large, from 4 to 6 liters a day. The albuminuria was intense and the specific gravity of the urine varied largely with the amount of sugar excreted. The chlorid and nitrogen elimination was high while the glycosuria lasted. In two of the cases, a subsidence of the glycosuria caused a moderate reduction in the polyuria, and a marked fall in the specific gravity. The chlorid and nitrogen elimination also became diminished. In the third case, cessation of the glycosuria caused a reduction of the polyuria and finally normal quantities of urine were eliminated, the specific gravity of which was normal.

In consequence of the polyuria, the edema in these cases was insignificant. Puffiness of the eyelids and a slight swelling of the feet was all that could be observed. Elevated blood pressure was present in all. In the two cases with persistent polyuria, the blood pressure ranged between 220 and 250 for a period of over two years. In the third case, while the glycosuria lasted, the blood pressure was 170 and over; control of the glycosuria, however, brought the blood pressure down to 130 mm.

Blood analysis in these cases showed changes similar in character to those already described, but of less degree. There was a reduction of the protein with a predominance of globulin; the lipoids were also high. Nonprotein nitrogen was not elevated in two cases during the glycosuric period; subsequently it rose progressively until uremic coma set in. In the third case, no rise in the nonprotein nitrogen was observed at any time.

That both the ordinary nephrosis and the special type of diffuse nephritis just described are associated with profound nutritional disturbances is supported by the recent studies of Aub and Du Bois.⁶ These authors find that in cases of nephritis with marked edema, the general metabolism is much reduced. On

the other hand, in nephritic patients without edema, there is no reduction in metabolism. In contrast to this, edematous cardiac patients, as a rule, show an increased metabolism.

From a consideration of the facts presented, it seems probable that the morbid processes in chronic nephrosis and in some special cases of chronic diffuse nephritis represent a general constitutional disturbance, and not merely a disease restricted entirely to the kidneys. No other variety of renal disease gives rise to such changes as those found in this group of cases.

Barring the special cases in which renal disease and diabetes coexist, another striking clinical manifestation in this group of cases is the edema. According to Widal,⁵ whose views are now generally accepted, the edema is the result of a failure on the part of the kidneys to eliminate salt and water. On a previous occasion,⁷ I discussed the question of the causation of edema, and offered evidence in support of the view that the retention of salt and water is not necessarily the result of a disturbed elimination of these substances by the kidneys. The forces which prevent their excretion are extrarenal. The hypothesis is briefly this:

The loss of protein incurred by the blood serum through the continuous albuminuria causes a decrease in the osmotic pressure of the blood. Through this condition and the additional circumstance that large quantities of fats and lipoids accumulate therein, the physicochemical state of the blood is disturbed to such an extent that it loses much of the power which it normally possesses to withdraw fluids from the tissues. Consequently deposition of fluid in the tissues occurs. In other words, the edema in this type of nephritis is not necessarily the result of a lessened permeability or diminished functional power of the kidneys to eliminate salt and water, but is the result of a change in the character of the blood. It is noteworthy that the edema fluid in these cases, unlike that present in any other condition, is composed almost exclusively of inorganic and nitrogenous salts and water.⁸ The view here presented is amply supported by experimental and clinical facts.⁹

In considering the treatment of the types of cases presented here, it is essential to remember that conditions of nutritional disturbance are present; that the retention of fluid and the edema which develops are closely associated with definite changes in the blood. The object of the treatment must therefore be primarily to overcome the disturbed condition of the blood and to improve nutrition. The methods heretofore practiced in the management of such cases have been rather ill calculated to improve the nutritional state of the patients. Aub and Du Bois,⁶ in the investigations referred to, find "that the edematous nephritics, kept on low diets, show a reduction in food requirements similar to that found usually in prolonged undernutrition. Other nephritics have approximately the normal food requirement." The degree of wasting, from which the patients described suffer, becomes evident only after the edema subsides and they improve otherwise, for they are often reduced to a condition of skin and bones.

7. Epstein, A. A.: Concerning the Causation of Edema in Chronic Parenchymatous Nephritis; Abstr., New York Med. Rec., 1917, **91**, 128.

8. Epstein, A. A.: Jour. Exper. Med., 1914, **20**, 334.

9. A full exposition of it will appear shortly in the American Journal of the Medical Sciences.

6. Aub, J. C.; Du Bois, E. F., and Soderstrom, G. F.: The Respiratory Metabolism in Nephritis, Arch. Int. Med., May, 1917, p. 865.

On the basis of the views expressed, the methods pursued in the treatment of these cases are the following:

In the less severe cases, the patients are put on a high protein diet (from 80 to 200 gm. of protein daily), with a small quantity of carbohydrate and a total restriction of fats. The total food value of the diet ranges between 1,200 and 2,400 calories.

In the very severe cases, repeated transfusions of blood are resorted to, simultaneously with the administration of a high protein, fat-poor diet. At each transfusion (about 500 c.c.) an equal amount of the patient's blood is first removed. The effect of this procedure is threefold: (a) It ameliorates the anemia. (b) It increases the protein content of the blood serum. (c) It diminishes the fat content of the blood. These effects are illustrated by the example given in Table 3.

TABLE 3.—THE EFFECT OF PHLEBOTOMY AND TRANSFUSION ON THE COMPOSITION OF BLOOD *

Cell Vol. Per cent.	Total Protein Gm.	Incoag. Nitrogen Gm.	Per 100 Cc. Globulin Gm.	Chlorid Gm.	Cholesterol Gm.	Globulin in Protein Per Cent.
20	3.958	0.084	2.594	0.404	1.150	66.0
27	4.594	0.119	3.360	0.404	0.810	73.0
33	5.275	0.108	2.887	0.404	0.765	54.0

* The transfusions were done one week apart.

As is to be expected, the effects of transfusion are temporary, but they serve to initiate the desired changes in the composition of the blood serum. Chief reliance is placed on a high protein diet. The chlorids and the water are only moderately restricted. Thus far eight patients of the type described were treated. Of these, three received transfusions of blood in addition to the high protein diet; the others were treated simply by dietary measures. The results appear extremely encouraging. Many of the symptoms were thereby relieved, particularly the edema. The effect on the elimination of water, chlorid and other urinary substances is typified in Table 4. The most marked features in this table are the large output of water and chlorids.

TABLE 4.—THE EFFECT OF TREATMENT ON THE URINARY EXCRETION

Date	Quantity C.c.	Urinary N. Gm.	Chlorids Gm.	Total Prot. Gm.	Globulin Gm.
1916					
March 1	425	4.455	.....	17.73	3.68
March 9	660				
March 10	590	8.425	2.178		
March 12	540	8.425	.....	5.84	
March 13	525	4.93			
March 16	1,050	5.984			
March 17	1,250	9.084	.....	9.94	4.78
March 18	1,500	7.686	9.585	14.4	4.14
March 19	1,340	6.415	15.983	14.8	4.15
March 20	2,450	9.947	35.485	20.1	5.95
March 21	1,680	5.738	21.200	14	5.06
March 22	2,260				
March 23	2,000	4.200	.....	39.2	6.65
March 24	2,300	5.345	27.434	41.2	5.88
March 25	2,100	4.645	24.154	35.6	4.48
March 26	1,900	4.096	23.474	39.9	3.34
March 27	1,420	.....	18.349		
March 28	2,500	9.100	29.820	13.1	..
March 29	2,500	8.400	27.060	9.2	3.06
March 30	2,760	9.660	27.826	4.8	2.93
March 31	3,000	9.492	.....	12.6	5.77
April 1	2,600	.....	27.690		
April 2	2,500	.....	22.010		

Associated with the general improvement which takes place, one finds marked changes in the composition of the blood serum (Table 3), which in some instances return to normal. This is particularly well illustrated by the reduction in the fat content of the blood, as shown in Table 5.

It is realized, of course, that the use of a high protein diet in the treatment of nephritis is contrary to

established rules; but on the grounds presented the procedure is in stricter compliance with both pathologic and clinical indications than the methods heretofore employed. We possess no definite evidence that protein food is per se deleterious to the kidneys. Eichhorst states that the protein in the diet does not affect the albuminuria in nephritis one way or another. My own experience is in accord with this

TABLE 5.—THE EFFECT OF TREATMENT ON THE CHOLESTEROL CONTENT OF THE BLOOD SERUM*

Date	Cholesterol Gm. per 100 C.c.	Remarks
1916		
Jan. 20	0.625	
Jan. 26	0.665	Transfusion Jan. 29, 700 c.c. blood
Feb. 14		Transfusion 500 c.c. blood
Feb. 15	0.307	
Feb. 22	0.610	
Feb. 24		Transfusion 500 c.c. blood
Feb. 26	0.532	
March 3	0.625	
March 20	0.470	
April 7	0.465	
June 16	0.320	
Oct. 1	0.206	

* This patient was kept on a high protein diet from February 26.

opinion. Large quantities of protein, however, are necessary to restore the tissue waste and to replenish the depletion of the protein constituents of the blood. In practice the use of a high protein diet in the type of cases under discussion leads to improvement in general nutrition. This is evidenced by an increase in the protein content of the blood serum and by reduction of lipoids.

The employment of transfusion is a useful accessory, particularly in the severe forms of the disease. It initiates the very changes in the blood that it is desired to produce. From the experimental work of Rabens¹⁰ we know that blood transfusion does not impair the functional activity of the kidneys. Burmeister,¹¹ on experimental and clinical grounds, states that transfusion of blood preceded by copious venesection inhibits the degenerative changes in the kidneys that are ordinarily produced, for example, in mercurial poisoning. My own observations show that the replacement of diseased blood, such as is found in these patients with healthy blood, is a beneficial therapeutic measure.

Improvement in the nutritional state of the patient is associated with the restoration of normal physico-chemical conditions in the blood, by virtue of which a proper exchange of fluid between the tissues and the blood is reestablished. This leads to the elimination by the kidneys of retained water and various organic and inorganic salts.

995 Madison Avenue.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. MCLEAN, CHACE AND ROSE, AND EPSTEIN

DR. H. O. MOSENTHAL, Baltimore: These three papers represent types of investigation which are bringing us nearer our goal of a more efficient and rational therapy in nephritis. The dietetic therapy of this condition may be divided into three subheadings: a period of depletion, a period of maintenance, and a period of assimilation. Dr. Chace has taken up the problem of depletion of the patient from the point of view of nitrogen retention. Other questions, of course, present themselves when it is desired to have the patient rid himself of retained salt, water, acid substances or other metabolic end-products. The diets which best accomplish the elimination of retained nitrogenous material are those which embody a low nitrogen intake and a high carbohydrate content. The latter is just as important as the former, as the

10. Rabens: Am. Jour. Physiol., 1914-1915, 36, 294.
11. Burmeister: Jour. Lab. and Clin. Med., 1917, 2, No. 7.

carbohydrates are the most effective nitrogen spacers at our command. By diminishing the protein destruction through the administration of such food, naturally the amount of nitrogenous end-products presented to the kidney for elimination is diminished, and the impaired renal function can cope more efficiently with the task demanded of it. Alcohol, contrary to the accepted standards, has proved itself of value in these cases. It raises the calories of the diet, does not furnish end-products which must be excreted by the kidney, and apparently produces no untoward symptoms.

Dr. Chace has discussed many of the neglected factors of what constitutes a maintenance diet for these cases. The hardest, and I think the most important problem of them all is the period in which we desire to build up our patients. There is no great skill required in depleting these patients, or any great difficulty in giving them a maintenance diet; but to change the anemic, weakened sufferer with Bright's disease into a healthy, strong person is a different matter.

As the result of increasing the protein food, we have been unable to note any effect whatever of increasing the blood pressure. At times, headaches of an intense nature may be produced, and have to be guarded against. The greatest problem in this field today is to determine a method of feeding by which we may not only nourish, but also build up the patient suffering with nephritis. The efforts of Dr. Epstein constitute a step in this direction. We must recognize, however, that many of the factors involved have as yet not been investigated, and, we may justly say, have scarcely been thought of.

DR. E. F. DU BOIS, New York: The most significant point in Dr. Chace's paper is the rational method of planning a diet for a disease. The striking thing is that in most diseases there are comparatively small disturbances of the metabolism; of course, in diabetes there are profound changes, and in nephritis there is disturbance of the nitrogen elimination. Most people neglect the fact that carbohydrate and fat metabolism are not changed, and also that the total caloric requirement is comparatively little influenced in most diseases. For instance, the nephritic has about the same caloric requirement as the normal man. Although the disturbance in the disease may be small, the disturbance in diet is tremendous; that is, the patient is put on a diet neglecting the palate and the stomach and the racial peculiarities in appetite. It is true that one can keep a nephritic on a restricted diet for a long time without developing any of the so-called deficiency diseases, but, on the other hand, one must consider the possibility of developing not a physical scurvy, but a kind of mental scurvy as the result of a diet which deprives the man of the articles of food he likes. The caloric needs differ with the size of the man and the character of the nephritis. Most nephritics have about the same requirement as a normal man lying in bed; a few with parenchymatous nephritis have a lowered requirement, perhaps because of the lowered activity of the tissues. For instance, if a man is on a diet of less than 1,200 calories, he is being undernourished. If he is on a diet exceeding 2,000 calories he is overnourished and making up for previous loss.

One fact in nitrogen metabolism which has escaped attention in this country is that Carl Thomas found that he could reduce his nitrogen excretion to about 3 gm. a day and stay in nitrogenous balance if he took an exactly equivalent amount of nitrogen in his food in small divided doses. This is suggestive, because the nephritic who is on a diet containing nothing but sugar certainly has an endogenous protein metabolism which is equivalent to 3 or 4 gm. of nitrogen a day, and it is possible that this may be replaced by proper protein in the food in such a way that no extra work is thrown on the kidneys. I do not know of any experimental evidence in nephritis in regard to this point, but if the nitrogen in the food could be administered so that it merely replaced the wear and tear of the body, it would be a distinct advantage to the nephritic.

DR. VICTOR C. MYERS, New York: Dr. McLean has presented some painstaking observations on urea, but his charts unfortunately did not give data for the blood creatinin as well. The creatinin, on account of its endogenous origin,

gives us a truer picture of the condition of nitrogen retention than the urea, and our experience has been that the blood creatinin and urea together give more information of value than the index of urea excretion. Most of us have been so much interested recently in the common interstitial nephritis that we have given little thought and attention to the much less common parenchymatous nephritis. I venture that most of us agree, in general, with the deductions that Dr. Epstein has drawn regarding this general condition. Dr. Epstein, several years ago, called attention to the disturbance in the relation of the blood proteins apparently resulting from marked albuminuria. His present work would appear to be the natural outcome of these earlier investigations.

Dr. Epstein referred to the association of diabetes with parenchymatous nephritis. Dr. Epstein's views regarding the relation of blood to edema are interesting, but the protein molecule is so large that it would not seem that the change in the protein itself could affect the osmotic pressure, although it might do this indirectly. The high protein diet would appear to be logical in selected cases of parenchymatous nephritis. I should like to ask Dr. Epstein concerning the exact type of diet employed, and what influence, if any, this diet had on the blood urea in these cases. Dr. Epstein has apparently taken the cholesterol as a simple index of the changes in the blood lipoids. This constitutes a very satisfactory criterion. I judge from his figures, however, that he has employed the Bloor method, which gives results that are probably too high.

DR. H. A. CHRISTIAN, Boston: The chief value in the contributions of Drs. Chace, McLean and Epstein lies in the facts, not theories, that have been presented. In the whole question of nephritis, fancy, not fact, dominates the situation. With the exception of the pathologic anatomy and histology and the observed clinical phenomena, about 90 per cent. of book discussion on nephritis is fancy. It is hypothesis, largely developed from the innermost soul of the writer and not from facts accurately observed and recorded. That is particularly true in the discussion of the treatment. Read in any of the systems of therapeutics or any of the systems of medicine the chapters on the treatment of nephritis and you end them feeling perfectly certain that the writer really had very little confidence in the methods that he advised you to use. Dr. McLean's idea of the relation of the excretion of urea in the urine to the urea in the blood has taught us that sometimes when there is a considerable accumulation of the nitrogenous substances in the blood, the kidney is still capable of doing good work. It has also shown us that sometimes when there is no great accumulation of nitrogenous substances in the blood the renal function is at a low level and conditions are much worse than would be anticipated from a study of the blood factors alone.

The real difficulty in the question of nephritis is that the important thing, the toxic element that produces the symptoms, is unknown. Yet if we give controlled diets, as these essayists have done, and observe the effects on the known substances such as creatinin, uric acid, urea and so on, we are approaching nearer to a conception of what is going on with the unknown substances. It is the study of the few cases accurately observed by numerical methods of observation of all sorts that is going to bring us nearer and nearer to the solution of the problem.

I should like to emphasize that the cases Dr. Epstein has dealt with are the unusual forms of nephritis. The results which he has obtained in that group may or may not be applicable to the common type of nephritis, the chronic interstitial type. As I take it, he has not so far particularly observed that group. I feel very confident from the basis of my own observations that, as has been emphasized by Dr. Mosenthal, it is advisable to limit not too much the protein intake in the ordinary type of nephritis. On the other hand, I am perfectly aware of the fact that a too great increase in the protein intake brings on a severe headache, and I have seen uremic manifestations appear from such an intake. I think that comes from increasing the protein too much, not simply from increasing the protein. I have seen patients improve by having more protein than they usually had, and

that makes up a larger group than the patients who are harmed by the increase. Like Dr. Mosenthal, I have seen very little effect on the blood pressure from reduced protein intake.

The diet of patients on the basis of anaphylaxis and protein immunization has been discussed a great deal, but here again we have very few facts; there has been surprisingly little work carried out on the protein sensitization in these cases. The work that Dr. Walker carried out on bronchial asthma could be carried out in these cases.

There is still one other thing which we ought to bear in mind, and that is that nephritis is a chronic disease; it occupies in many cases years of the patient's life. A week's observation and study of such a disease is only a partial investigation.

DR. L. F. BISHOP, New York: I like Dr. McLean's recognition of chronic nephritis as a general disease. Professor Ophüls of the University of California said that entirely too much attention is paid to the kidney, meaning by that that its diseases are part of a general disease. I do not agree with Dr. Christian that the laboratory is the main thing. I think that the physician with the patient on a diet can by observation reach valuable conclusions. I do not think that a week's laboratory study of a case of nephritis is of as much value as five years' observation under treatment. I agree with him in that. I agree with the chairman that the study of anaphylaxis is of value. I do not wish to emphasize it so much at this time, but I do not think we ought to go over this whole subject of nephritis while neglecting the importance of food idiosyncrasies. I was much interested in the speaker who said his patient got a headache when he was given a meal with meat. It shows the specific effect on a patient of some article of diet to which the patient is idiosyncratic. My own practice is to cut out of the diet as many proteins as I can and give them as much of a particular protein as they desire. I believe that the qualitative relation of proteins is the important one. Some patients get along with one protein very well when one has cut out the protein which is unfriendly to them. The point is to study the individual. Adequate feeding is a very simple matter, and I always says to the patient, "If your weight, the color of your blood and your endurance is satisfactory, you are getting enough to eat." It is a simple matter to weigh patients and to determine the color of the blood and to find how much they can walk without being exhausted; that does not require a laboratory. So that the only point that I wish to add is again to emphasize the importance of investigating this question of the particular relation of each protein food to the special patient, and whether I am right or not in my theory that arteriosclerosis is the result of a long continued series of anaphylactic reactions does not matter. Clinically I know that these people are better if I succeed in eliminating from their diets the proteins which are particularly unfriendly to them as individuals.

DR. N. ROSEWATER, Cleveland: Every individual requires 100 per cent. each of protein nutrition and carbohydrate. What that is we must ascertain. Less must result in general or local bankruptcy of lungs, heart, brain, kidneys, etc. I have had one case seemingly of eyes—the patient reduced from 170 to 123 pounds without discoverable cause or improvement until given twelve eggs daily. Her eyes at once improved and are now about normal. Increasing food gradually in starvation is continuous starvation, because to give less than 100 per cent. is still minus. To prove constructive the nutrition must be above 100 per cent. to restore lost essential vitality. We should not fear proteins, but rather the character of protein given. In the case reported, a severe headache soon followed eating meat, but meat contains toxic matter not yet excreted from the kidneys. Why give nephritics, with delicately balanced excretory power, the slightest surplus of toxic intake avoidable? Dr. Chace's diet is similarly objectionable. Why give cocoa, which contains two purin substances? Why asparagus? What good do they yield the patient? Pawlow demonstrated that, eaten without appetite, foods are digested perfectly by the various relays of digestive mechanisms; therefore, in desperate cases, why wait on appetite to secure digestion of required foods? Why

not give what they need instead of what they like? I prefer eggs, especially raw, because the raw eggs contain not only protein, but every element necessary for initiating interactivating functions of every organ, all the hormones, ductless and all the other gland organs, constructive and protective substances, fresh and uninjured by cooking, requiring only body heat to bring into coordinate life. Compared to milk, this food is more complete, concentrated, bland, and taxes the digestive processes less in time and motility. Because buttermilk is finely curdled and malted milk curds similarly, I prefer these and raw eggs when the heart and stomach must be saved from overwork. In selecting carbohydrates such as alcohol or sugar, alcohol, according to von Noorden, prevents destruction of toxic material by the liver, whereas sugar gives the desired readily utilizable carbohydrate without that danger. In the etiology of kidney diseases from the infections, diphtheria, syphilis and all the rest, the germs and their toxic products cause impairment; but where due to damage from intake and exit of avoidable material, those avoidable, such as alcohol, meat, purin foods, lead, etc., should be avoided.

DR. ALBERT A. EPSTEIN, New York: It was found that even when the kidneys are completely destroyed, as in chronic interstitial nephritis or surgical diseases of the kidneys, when a minimum of kidney tissue remains, no such changes as those found in chronic parenchymatous nephritis are ever encountered.

The question of association of diabetes with nephritis is of particular interest because it offers a suggestion of a possible method of treating the edema which develops in parenchymatous nephritis. I said in my paper that in cases of nephritis and diabetes the edema is very slight indeed, provided no heart complications are present. Furthermore, it appears from the studies on hyperglycemia in experimental and clinical diabetes that the accumulation of sugar in the blood leads to a dehydration of tissues. On the basis of these facts, it appears possible to find some means of preventing accumulations of fluid in the body. This subject is at present under consideration.

The substances which are reputed to be responsible for the edema in nephritis, namely, the chlorids, do not account fully for the occurrence of edema in chronic parenchymatous nephritis, for we find them retained in the intervariety of nephritis. The French have described a condition of chlorid retention in interstitial nephritis which they call a "dry" retention as opposed to the retention of chlorid in chronic parenchymatous nephritis, which is associated with edema ("wet" retention); but there must be some factor which causes the retention of water and salts other than the fanciful state of "dry and wet retention" suggested by the French investigators. Starling has found that proteins in the blood serum have an osmotic pressure equivalent to 4 mg. of mercury for every gram of protein. We know that the exchange of fluid between the tissues and the blood takes place as two balanced forces; one is the intracapillary pressure tending to force fluid from the blood stream into the tissues, and the other is osmotic pressure of the protein and other substances, as well, tending to draw fluid from the tissues into the blood stream. When an increased intracapillary pressure is present the composition of the fluid which exudes into the tissues is like that of the blood serum, as evidenced by chemical examination of the effusions in cases of venestasis from any cause. On the other hand, the fluid which accumulates in the tissues as the result of a lowered osmotic pressure, due to reduced protein content in the blood serum, is practically a solution of salts in water. This is demonstrated by examination of the composition of the various fluids which accumulate in chronic parenchymatous nephritis. The character of the diet which should be given to patients suffering from chronic parenchymatous nephritis is, first, white of egg and skimmed milk; this is then increased by the addition of lean meats, poultry and fish.

The cholesterol figures given in this paper were obtained largely by Bloor's method, and it is recognized of course that these figures are higher by about 10 per cent., but in a comparative study, such as this, they are sufficiently accurate.

A COMPARISON OF THE PERCUSSION AND ROENTGEN-RAY FINDINGS AFTER INJECTION OF THE PERICARDIUM *

ROGER S. MORRIS, M.D.

Professor of Medicine, University of Cincinnati, College of Medicine
AND

ELLIS R. BADER, M.D.

Resident Roentgenologist, Cincinnati General Hospital
CINCINNATI

There is no more difficult problem in physical diagnosis, at times, than the recognition of pericardial effusion. This is particularly true when a patient is first seen after the effusion has occurred. The frequency with which the diagnosis is missed is known to all pathologists and to clinicians who are able to follow their cases to necropsy.

The physical signs of fluid in the pericardium are much less distinctive than the signs of pleural effusion. There are no pathognomonic signs, and there is no constancy in the grouping of physical signs.



Fig. 1.—Tracings made from a series of roentgenograms in Case 1. From within outward, the alternating continuous and broken lines represent the heart shadow. The inner outline is the control before injection. The successive lines represent the picture after injection of 250, 500, 750, 1,000, 1,250 and 1,500 c.c.

One of the most generally emphasized findings in pericardial effusion is a pear-shaped or pyramidal area of dulness, with the apex upward. This is not, however, a constant finding, as Shattuck¹ and West² showed, and its absence is of no importance in a diagnostic way. It is, too, a relatively late sign of effusion, one which becomes manifest only after the effusion is rather extensive and has distended the pericardial sac under considerable pressure. Calvert³ maintains that with fluid under slight pressure the dull area tends to be more quadrangular.

A sign quite as generally associated with pericardial effusion is an obtuse cardiohepatic angle. Rotch⁴ first

drew attention to this in 1878 as the result of experiments on cadavers. He injected the pericardium post-mortem in sixteen infants and four adults, using melted oil of theobroma (cacao butter, specific gravity 0.90) for injection. The cadavers were placed in a position of orthopnea, the trunk being flexed on the thighs at an angle of about 120 degrees. (The cadavers were not examined when the body was flat on the

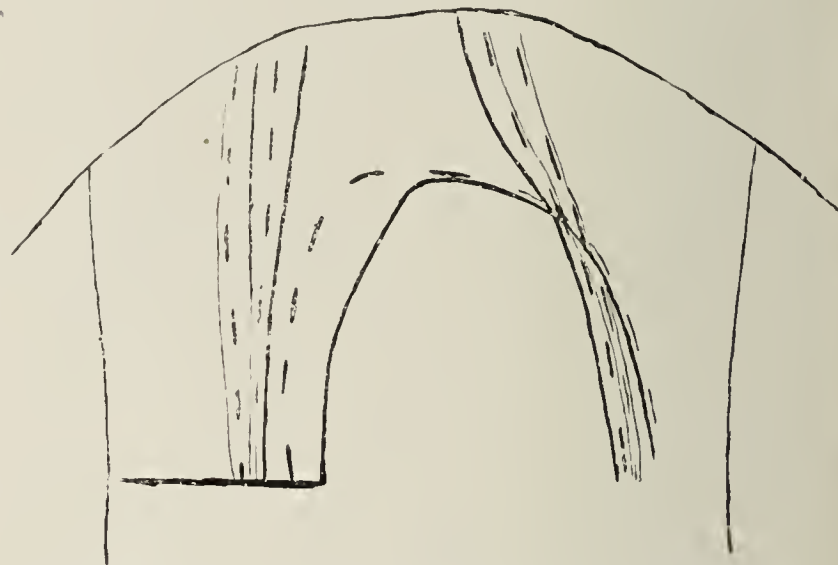


Fig. 2.—The lines represent tracings from roentgenograms of the area of percussion dulness in Case 1. The inner line represents the dulness before injection. The other succeeding lines are after injection of 250, 500, 750, 1,000, 1,250 and 1,500 c.c. (Gastric tympany and infiltration of the left lung made percussion unsatisfactory in this case.)

back, as West² says.) The peritoneal cavity was then opened, and the oil of theobroma was injected through the diaphragm into the pericardium. The area of cardiac flatness was percussed before and after injections. Rotch found that flatness extending from 2 to 3 cm. from the right edge of the sternum in the fifth intercostal space was encountered in adults after the injection of from 70 to 80 c.c. of the fluid, and considered this an important sign of pericardial effusion. He did not determine the extent of relative cardiac dulness.

The studies of Rotch stimulated interest in the percussion findings in pericardial effusions, and numerous



Fig. 3.—Tracings made from a series of roentgenograms in Case 2. From within outward, the alternating continuous and broken lines represent the heart shadow. The inner outline is the control before injection. The successive lines represent the picture after injection of 250, 500, 750, 1,000, 1,250 and 1,500 c.c.

observers, on living material, have shown that Rotch's experimental observations on the area of flatness often hold good; furthermore, it appears that the area of relative dulness is even more reliable than the area of flatness, and attention has been directed to the obtuseness of the cardiohepatic angle, which is nor-

* Read before the Section on Practice of Medicine at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Shattuck, F. C.: Pericarditis: Some Points in its Diagnosis and Treatment, Tr. Assn. Am. Phys., 1897, **12**, 185-204.

2. West, S.: Pericardial Effusion: Its Diagnosis and Treatment, Lancet, London, 1910, **1**, 560-564.

3. Calvert, W. J.: Position of the Heart in Pericarditis with Effusion, Bull. Johns Hopkins Hosp., 1907, **18**, 403.

4. Rotch, T. M.: Absence of Resonance in the Fifth Right Intercostal Space Diagnostic of Pericardial Effusion, Boston Med. and Surg. Jour., 1878, **99**, 389; 421.

mally about 90 degrees. Ebstein⁵ found this sign helpful in a series of forty-nine cases.

An obtuse cardiohepatic angle is, however, not diagnostic of pericardial effusion, and, as West² emphasizes, it is an unreliable sign. Cabot⁶ refers to large pericardial effusions (proved postmortem) in which the cardiohepatic angle was acute by roentgenoscopy and by percussion. Such a finding is probably not exceptional, and it was similar experiences which led to the observations about to be reported.

The study was undertaken with two main objects in view, (a) to determine the shape of the cardiohepatic angle, and (b) to fix roughly the least amount of fluid in the pericardium which can be recognized by percussion and by roentgenoscopy with patients in the recumbent dorsal position.

Cadavers from two to six hours after death, still warm, were used. Extremely fat or edematous subjects were discarded. As pericardial effusions do not usually cause orthopnea till the quantity of fluid is great, and sometimes not then, we assumed that it would be more useful to examine the subjects in the dorsal position. It is probable that smaller amounts of fluid in the pericardium can be detected when the posi-

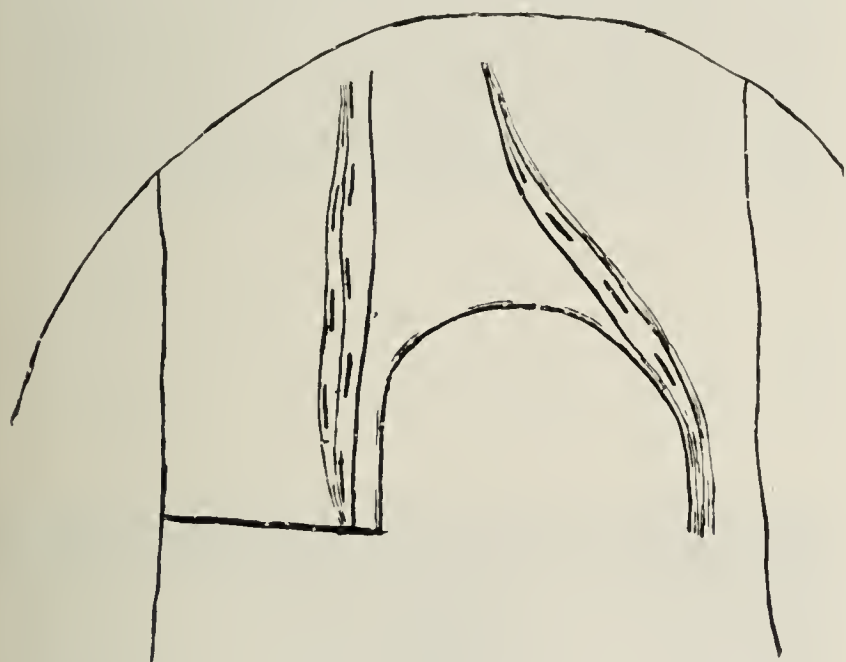


Fig. 4.—The lines represent tracings from roentgenograms of the area of percussion dullness in Case 2. The inner line represents the dullness before injection. The other succeeding lines are after injection of 250, 500, 750, 1,000, 1,250 and 1,500 c.c.

tion of the patient is shifted, but we were interested rather in finding the earliest changes we could detect with the patient on his back. This more closely approximates the conditions in clinical work, particularly in those febrile cases in which attention is not directed to the pericardium by a friction rub.

Serous ascitic fluid was used for the injections. The needle was thrust into the pericardium in the fourth left intercostal space, close to the sternum. The needle was retained in situ till the injections were completed.

The percussion findings relate solely to relative dullness. Both threshold percussion and moderately strong percussion were employed, with no difference in results. The area of dullness was marked out before the fluid was injected, the boundary lines were covered with strips of lead, and a teleroentgenogram was then made. After each injection, the same procedures were carried out. The line marking the original area of dullness was kept in place for comparison. The tube was

elevated so that it was about 6 feet above the anterior thoracic wall. The plate was placed at the back of the cadaver. The large end of the teleroentgenoscopic cone rested on the chest, and its location was marked with skin pencils. By means of marks on the floor, the positions of the cadaver and plate holder were kept constant. Four bodies were studied.⁷

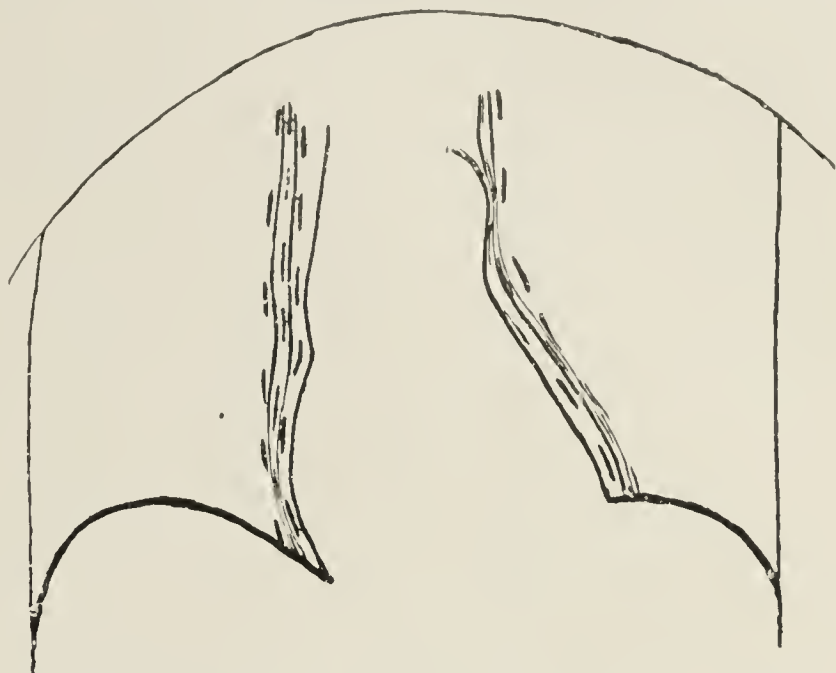


Fig. 5.—Tracings made from a series of roentgenograms in Case 3. From within outward, the alternating continuous and broken lines represent the heart shadow. The inner outline is the control before injection. The successive lines represent the picture after injection of 250, 500, 750, 1,000 and 1,500 c.c.

Fluid was injected in 250 c.c. amounts, with observations after each injection, until from 1,250 to 1,500 c.c. had been injected in each case.

The earliest important change noted by percussion was an *increase in the dull area upward*. This was constant in all four cases. It occurred after injection of variable amounts of fluid. In one case, after the injection of 250 c.c. of serous fluid, relative dullness rose from the third to the second rib, without change

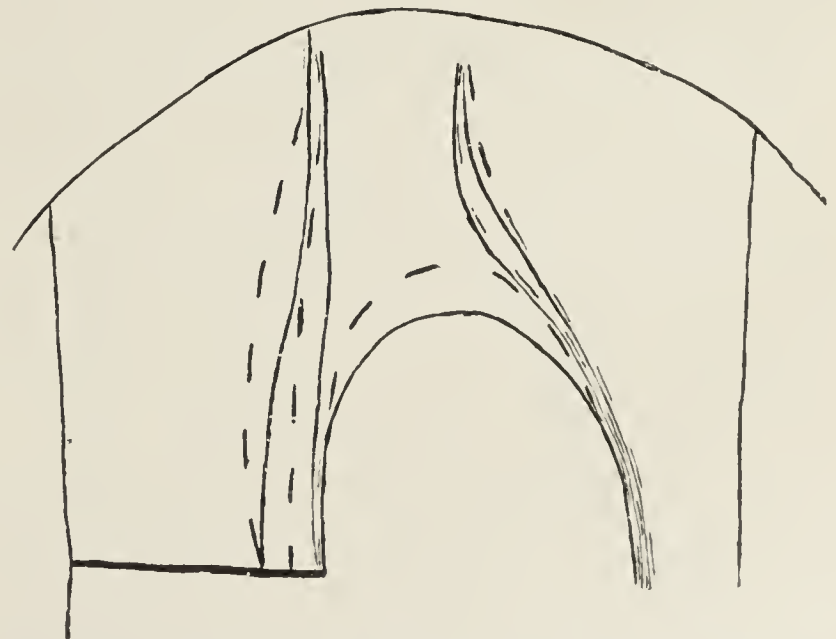


Fig. 6.—The lines represent tracings from roentgenograms of the area of percussion dullness in Case 3. The inner line represents the dullness before injection. The other succeeding lines are after injection of 250, 500, 750, 1,000 and 1,500 c.c.

in the dull area to the right or left. Distinct retrosternal dullness appeared after the pericardium con-

5. Ebstein, W.: Ueber die Diagnose beginnender Flüssigkeitsansammlungen im Herzbeutel, Virchows Arch. f. path. Anat., 1892, **130**, 418-443.

6. Cabot, R. C.: Physical Diagnosis, 1915, Ed. 6, 238.

7. The study was interrupted early in the spring, owing to the absence of one of us (E. R. B.) in England. As the examinations were largely made at night, when the Roentgen-ray laboratory was available, and as we insisted on having warm bodies, free from anasarca or obesity, a large series was not obtained. The close agreement of results, we feel, justifies reporting them.

tained 500 c.c. of fluid. In two instances there was no demonstrable change after injection of 250 c.c.; but after 500 c.c. of fluid had been introduced there was retrosternal dulness, while in the fourth case this appeared only after the injection of 750 c.c. With the appearance of retrosternal dulness and its subsequent gradual increase, there was a progressive widening of

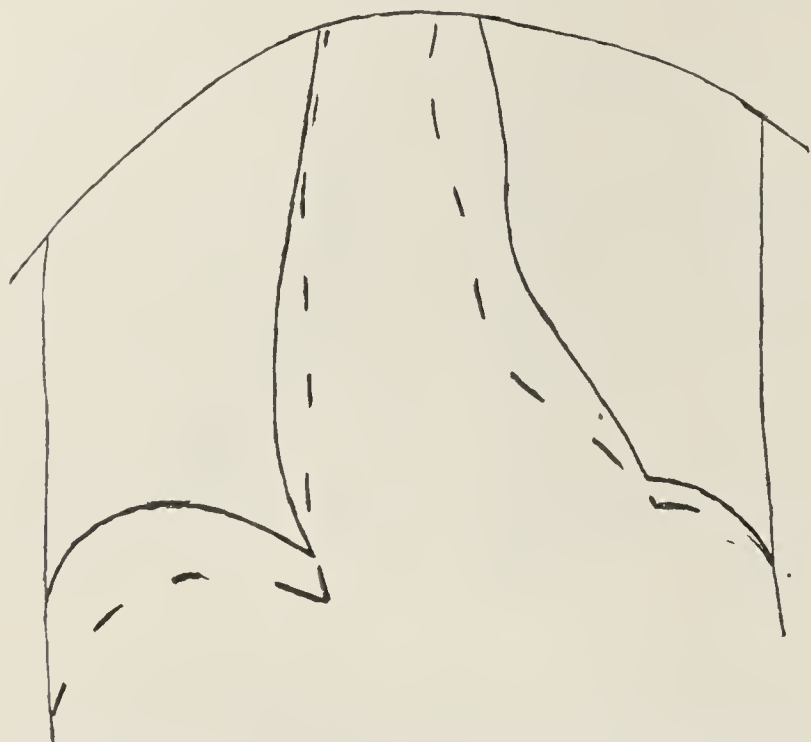


Fig. 7.—Tracings of the Roentgen shadows in Case 3 after injection of 1,500 c.c. of serous fluid. The continuous line is the outline of the shadow in the recumbent posture. The broken line represents the shadow in the erect posture. (See Figures 8 and 9.)

the shadow in the roentgenograms (Figs. 1, 2, 3, 4, 5, 6, 10 and 11).

The cardiohepatic angle was determined after each injection with the patient on his back. In no instance were we able to demonstrate an obtuse cardiohepatic angle by percussion or by roentgenoscopy. Indeed, the cardiohepatic angle became slightly acute by percussion in three of the four cases after injection of 1,000, 1,000 and 1,250 c.c., respectively, and remained so till the injection was discontinued at 1,500 c.c. In the fourth case, the angle remained a right angle by percussion throughout. In no instance was an obtuse angle found in the roentgenograms.

The earliest percussion change consisted in a widening of the area of dulness to the right; in three of the four cases this was noted after the injection of 250 c.c., in the fourth only after 500 c.c. had been introduced. Nothing characteristic or even suggestive of fluid in the pericardium was seen in the form of the dull area.

The fact that retrosternal dulness was the most striking change noted leads us to believe that this finding deserves more importance than has previously been attached to it. Sibson⁸ was one of the first to call attention to it, and demonstrated that it followed injection of fluid (water) into the pericardial sac. Roberts⁹ says: "As the patient lies on his back, the increase of dulness is first observed toward the base of the heart. It may extend as high as the second (left) costal cartilage or the first interspace or even above the clavicle." Sansom, says Roberts, maintains that whenever marked dulness extends above the third rib, there is a strong probability of pericardial

effusion. Aporti and Figaroli¹⁰ have shown, by injections of agar solutions into the pericardium, that in the horizontal position the great vessels are surrounded by a small quantity of fluid which falls away in the erect posture.

Though we have had opportunity as yet to test it on only one living patient, we are inclined to believe that retrosternal dulness should prove to be an especially helpful early sign, for it may be present with relatively small amounts of fluid (from 500 to 750 c.c. or less). Unless extensive pericardial adhesions exist to lessen its capacity, such an amount of fluid in the pericardium could be under no great tension, and the retrosternal dulness with widened roentgenographic shadows should, therefore, barring adhesions, disappear or become less with the patient sitting, owing to gravitation of the fluid to the bottom of the sac. The change is capable of demonstration not only by percussion but also by roentgenoscopy (Figs. 7, 8 and 9). With a tensely distended pericardium, marked shifting dulness could not be expected.

Less importance should be attached to the constant absence of an obtuse cardiohepatic angle. In all instances it happened that we were dealing with pericardia which were macroscopically normal (necropsy). Sibson showed that the normal pericardium does not stretch or bulge laterally to the extent that it does in disease, and our roentgenograms would seem to bear this out. The bulging (and, hence, the pyramidal dull area) is much less evident than in most roentgenograms we have seen of patients with pericarditis with effusion. Still, the injections agree with our clinical findings in some patients in proving that an obtuse cardiohepatic angle is by no means a constant finding. While the cadavers were percussed only in the dorsal position, we have observed patients in whom an obtuse angle was not demonstrable in the dorsal, erect or right

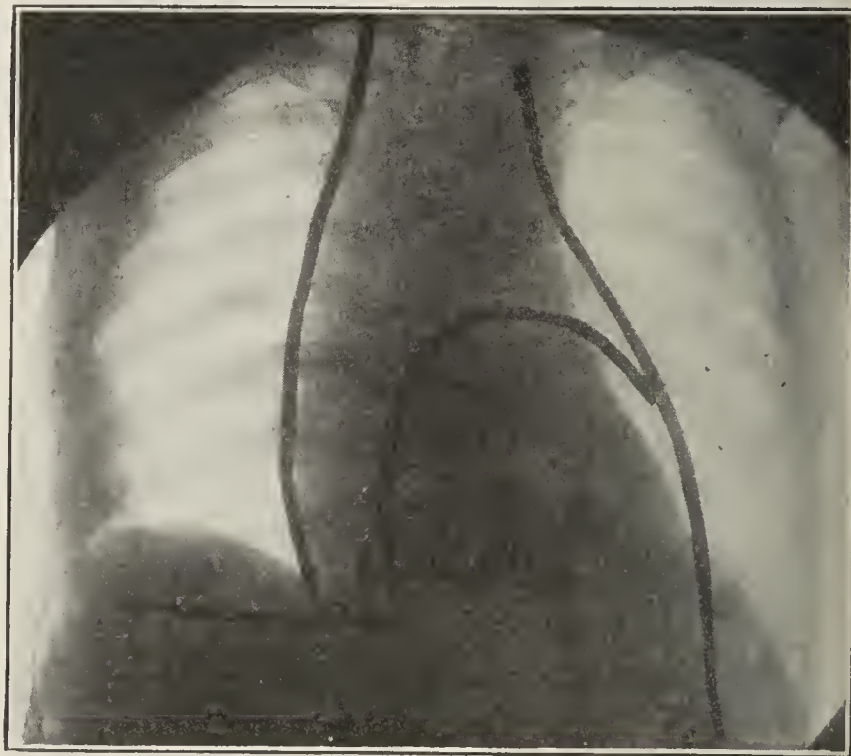


Fig. 8.—Roentgenogram of Case 3 in recumbent posture after injection of 1,500 c.c. of fluid. The dark lines represent strips of lead in the same position as in Figure 9 for comparison. Note the acute cardiohepatic angle in Figures 7 and 8 and depression of right side of diagram in Figure 8.

lateral position, by percussion or roentgenoscopy, and in whom, at necropsy, pericardial effusion without adhesions was found.

8. Sibson, F.: Pericarditis, in Reynold: A System of Medicine, Philadelphia, 1877, 4, 186-437.

9. Roberts, F. T.: Pericarditis, in Allbutt: System of Medicine, 1900, 5, 762.

10. Aporti, F., and Figaroli, P.: Zur Lage der akut entstandenen Ergüsse im Herzbeutel: Experimentelle Untersuchungen Zentralbl. f. inn. Med., 1900, 21, 737-749.

The quantity of fluid which may collect in the pericardium varies within wide limits. Thayer¹¹ reported the aspiration of 1,250 c.c. from the pericardium, and Shattuck removed about the same amount. It is unusual to obtain more through the aspirating needle, and yet Verney¹² found at necropsy 4,000 c.c. of fluid in a pericardium—the largest effusion recorded.



Fig. 9.—Roentgenogram of Case 3 in erect posture after injection of 1,500 c.c. (Compare with Figure 8.)

Sibson⁸ said the pericardium of an adult man with healthy heart is capable of holding from 14 to 22 ounces (420 to 660 c.c.); yet we had no difficulty in injecting from 1,250 to 1,500 c.c. Probably more could have been introduced, had we pursued the matter.

There are few figures available as to the least amount of fluid which can be detected in the pericardium. Cabot says not less than 150 c.c. can be recognized. Rotch's injections indicate that half this amount may produce percussion changes. In patients, however, such amounts are practically negligible. Aporti and Figaroli found no change in the area of cardiac dulness until about 400 c.c. of fluid were injected. In the recumbent posture, our findings seem to indicate that 500 c.c. of fluid or less must be present to produce findings indicative of fluid.

We realize that the conditions in acute pericarditis with effusion have not been reproduced. The loss of tonus in the muscles, the absence of the heart beat and of respiration, and the lack of inflammation in the pericardium are serious defects. Hydropericardium is more closely approximated.

CONCLUSION

Our findings in fresh cadavers show that retrosternal dulness, with increasing retrosternal shadow in roentgenograms, is a relatively early phenomenon after injection of the pericardium with serous fluid, and suggest that shifting retrosternal dulness (loss or marked decrease in dulness, with decrease in the shadow in the fluoroscope or in plates) may be a relatively early sign of pericardial effusion. With fluid under great pressure in the pericardium, on the other hand, marked shifting dulness will probably largely disappear.

11. Thayer, W. S.: Observations in Two Cases of Tuberculous Pericarditis with Effusion, *Bull. Johns Hopkins Hosp.*, 1904, **15**, 149.

12. Verney, cited by Thayer (Note 11).

ABSTRACT OF DISCUSSION

DR. CHARLES SPENCER WILLIAMSON, Chicago: I have been trying to attack the problem from a different point of view. It seemed to me that the injection of coagulable substances, such as gelatin and agar, had certain advantages because it enabled one, after the injection (I made them always through an incision in the abdominal wall and the diaphragm), to remove the pericardium and heart intact, after freezing the body. Then a modeller can make a cast of the entire mass and also of the heart, and the space between when filled up gives a cast of the exudate. The results of this work I read at Chicago, and they are in general similar to those that Dr. Morris has indicated.

The first thing we found was that with small exudates the fluid accumulated around the apex. The exudate that accumulates in the sternodiaphragmatic angle is thickest at the apex, then up behind on the diaphragmatic surface of the heart, and particularly over the great vessels. This corresponds to the findings of Dr. Morris that the retrosternal dulness is a definite thing. Many times we accidentally perforated the heart. The method has another thing in its favor, in that one knows the exact amount of the exudate. The first point I would make is that fluid in the pericardium tends to accumulate at the apex and on the diaphragmatic surface of the heart, and the first thing one notes clinically is a little dulness on the left and a pushing of the liver downward. I regard that as a valuable symptom of early pericarditis, together with retrosternal dulness. In regard to the cardiohepatic angle, my conclusions are the same as those of Dr. Morris. I was never able to demonstrate anything like an obtuse cardiohepatic angle. The pericardium softens up, as is well known. The diaphragm is pushed down, and this occurs in early cases and is a valuable sign of early pericarditis.

Why is the heart not covered by the exudate in front in every case? The answer can be summed up in these words: it is purely a question of the space between the sternum and the vertebral column as compared with the anteroposterior diameter of the heart. If the heart is relatively big, it impinges against the anterior part of the sternum and there is no effusion in front. The place to tap the pericardium is

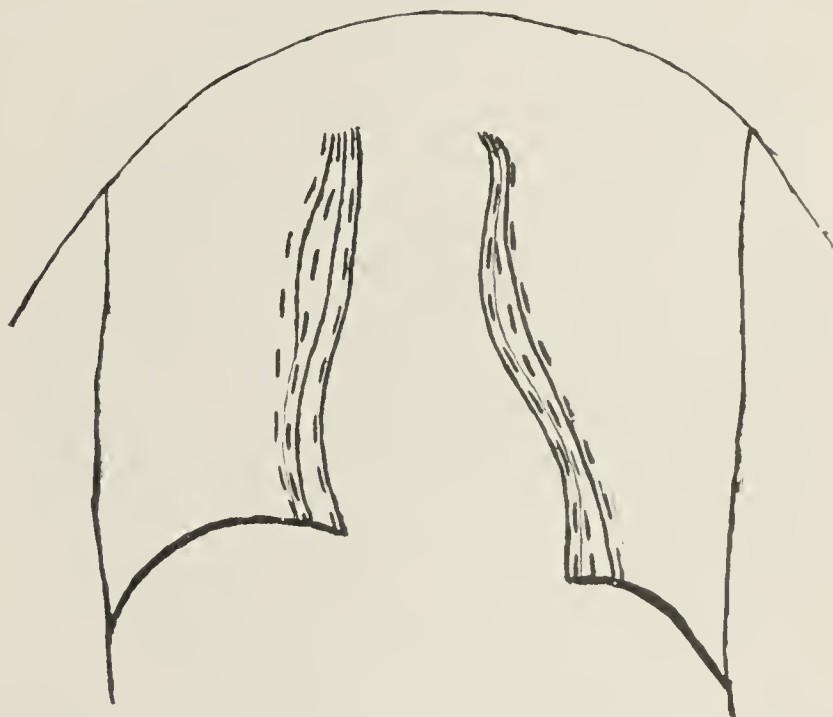


Fig. 10.—Tracings made from a series of roentgenograms in Case 4. From within outward, the alternating continuous and broken lines represent the heart shadow. The inner outline is the control before injection. The successive lines represent the picture after injection of 250, 500, 750, 1,000 and 1,500 c.c.

invariably at the apex area, far enough out to be sure one is outside of the apex, inserting the needle either in the fifth or sixth interspace. One certainly takes a grave chance in going in to the right or left of the sternum. It seems to me we should go in at the apex in the fifth or sixth interspace, going upwards, backwards and inwards with the needle.

DR. ALFRED MEYER, New York: A patient came into my service at the Mount Sinai Hospital recently with a hemato-

pericardium of obscure origin. I aspirated the pericardium, withdrawing 1,350 c.c. of bloody fluid. In view of this being the third time of its accumulation, I decided to inject nitrogen gas in place of some of the withdrawn bloody fluid. I think that this is the first case in New York, possibly in the United States, of the making of an artificial pneumopericardium. The nitrogen gas pushed out the edge of the thickened (?) pericardium. With the patient leaning over to one side, the bloody fluid kept a horizontal level. There was a pericardial succussion sound when the patient was shaken. No spontaneous

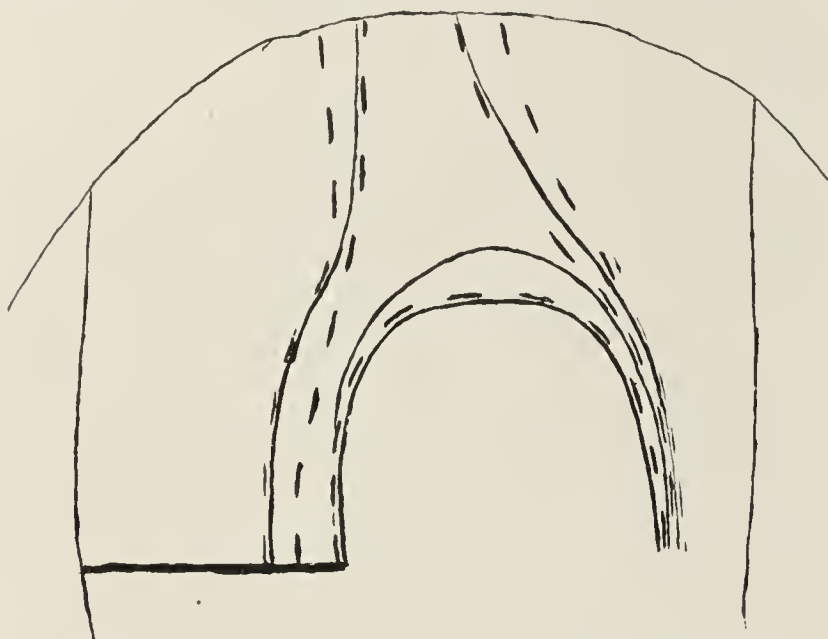


Fig. 11.—The lines represent tracings from roentgenograms of the area of percussion dulness in Case 4. The inner line represents the dulness before injection. The other succeeding lines are after injection of 250, 500, 750, 1,000, 1,250 and 1,500 c.c.

pericardial succussion sound was heard, in all probability because the systole lacked vigor. The succussion sound continued for four days after the operation of aspiration and nitrogen injection. I injected only 180 c.c. of nitrogen as a substitute for the 1,350 c.c. of withdrawn fluid, because I felt I was on new territory and wished to be conservative. Unfortunately the fluid has reaccumulated. Later I shall put in more nitrogen gas, up to one-half or two-thirds of the fluid withdrawn. Whether the patient has a new growth in the pericardium is an open question.

EVOLUTION OF CANCER OF THE BREAST*

PARKER SYMS, M.D.

Fellow of the American College of Surgeons
NEW YORK

I do not believe we are in a position today scientifically to assert that there is such a thing as evolution of cancer of the breast. If cancer of the breast does occur as the result of a progressive series of processes, there have not as yet been made sufficient investigations definitely to demonstrate it as a fact.

My object in this paper is to review a certain amount of investigation which has been made by others in this direction and to attempt to correlate certain facts and thoughts, and if possible to initiate a standardized form of investigation, so that the future may give us data which we are at present lacking.

If we are to find that cancer of the breast develops by a process of evolution from the normal, I believe it will be found in a study of that complex disease, which, for want of a better name, I shall speak of as chronic cystic mastitis.

The life history of the breast is one of constant changes, both as to function and as to structure. There are times of quiescence when the true glandular elements—the acini and ducts—are so undeveloped as to be scanty and insignificant. Then there are times of activity when these glandular units are developed to an astounding degree. It would be impossible to recognize sections of the same breast taken at different periods. The breast of childhood is entirely different from the breast of adolescence. The breast during pregnancy takes on an entirely different character. Again, at the period of childbirth, the breast has changed completely. The period of lactation shows an entire change again. When lactation ceases an involution sets in, the glandular elements are decreased in size and diminished in numbers. Coincident with the menopause, after the period of function, the breasts become atrophic, and involution sets in. Now all these changes involve a complex variety of changes in the epithelial cells; in their structure, in their function, in the numbers, and in their relations to themselves and to their surrounding tissues. There is no other organ in the body in which the epithelium is in such an unstable state, its equilibrium so frequently disturbed.

As disturbed equilibrium of epithelium is one of the essential characteristics of chronic cystic mastitis, and as disturbed equilibrium of epithelium is the essential characteristic of carcinoma, one can readily understand the prevalence of these two diseases, their close association with each other, and one can almost believe that carcinoma of the breast is the end of a logical sequence—that it is the last stage of a progressive process.

Perhaps the best way to start this discussion is, first, to state in terms of histology a definition of the normal breast; secondly, to state in terms of pathology important structural changes which are found in chronic cystic mastitis; thirdly, to state in terms of pathology a definition of cancer of the breast; fourthly, to see if we are justified in tracing pathologic changes from the normal through the abnormal (in chronic cystic mastitis) to the condition which shall correspond to our definition of cancer, and finally, to see if we

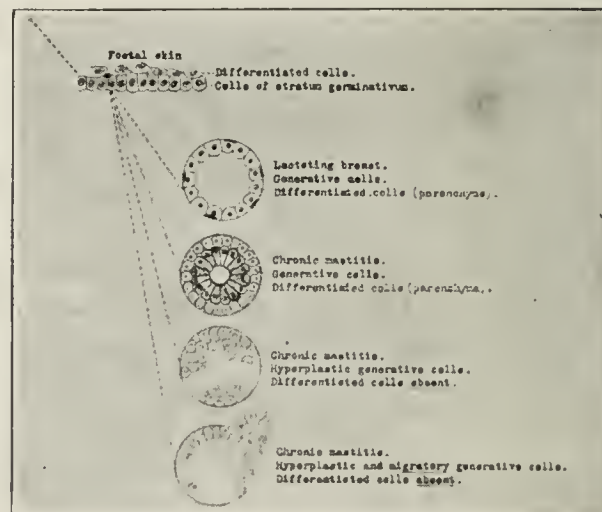


Fig. 1.—MacCarty's diagram illustrating his hypothesis as to the differentiated cells and the cells of the stratum germinativum.

can demonstrate that these changes take place in a more or less consistent sort of sequence. In other words, let us see if we can prove that the transition from the normal into the final development of cancer takes place through a progressive series of processes which may be called stages, in which case cancer would be recognized as the last stage, or if we may feel that those cases which finally become cancer do so by a

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

progressive series of changes which have taken place according to certain tendencies, which after all would amount to the same thing.

HISTOLOGY OF THE BREAST

For our present purpose we may set this forth in very simple terms. Embryologically the breast develops from the ectoderm, starting from the same cells that give origin to the skin. In this connection

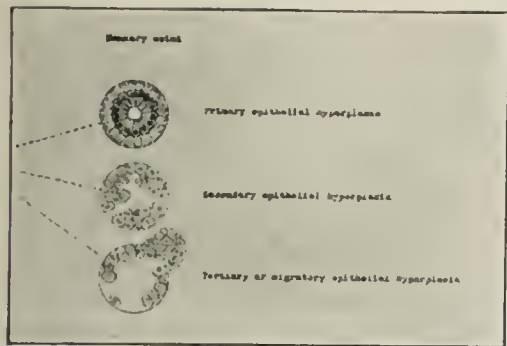


Fig. 2.—MacCarty's diagram illustrating his conception of primary, secondary and tertiary cytoplasia.

the breast may be considered as an inverted portion of skin which has been differentiated and evolved into a gland whose function is the secretion of milk. The breast consists of a fibrous tissue stroma or framework (enclosing lobules of fat), and

the true glandular portion, which consists of a series of acini which are grouped together into lobules, groups of these lobules forming lobes. The acini are terminations of minute channels or ducts; these ducts empty into larger and larger ducts until finally those of a given lobe empty into one large duct, the galactophorous duct, which terminates at the nipple. Of these there are fifteen or twenty.

The smaller ducts and acini are lined with a basement membrane, the tunica propria, which is covered by a single layer of cuboidal epithelium. In the larger ducts this epithelium is found more flattened and cylindric, but in the terminal ducts and acini it is distinctly cuboidal in character. Between the cuboidal epithelium and the basement membrane are to be found certain cells concerning whose morphology there may be said to be a certain amount of doubt. Most observers class them as basket cells which anastomose with each other; some regard them as connective tissue cells; some regard them as a form of endothelium; and some regard them as muscle cells derived from the smaller capillaries. MacCarty¹ of Rochester has quite a different conception of these cells. He believes them to be undifferentiated epithelial cells (cells from the stratum germinativum) which he calls germinal cells. According to MacCarty, it is these cells which become the cancer cell by the process of atypical and migratory proliferation. For our present purposes it is not necessary to dwell at length on all the structural elements of the breast, for it is the behavior of the epithelium which most concerns us.

The breast is a very peculiar organ which is not fully developed during a very large part of an individual's life. As its function is the secretion of milk, the gland is only fully developed during its period of active function, that is to say, for a more or less brief period after the completion of pregnancy. Strange to say, in the new-born infant the breast is more or less fully developed for a short space of time, and during this time it is not only capable of forming milk, but it actually does produce milk. This activity of function, which is accompanied by a corresponding structural development, is said to be activated and produced by

the same internal secretion that activates the mother's breast at full term. A few days after birth, an involution takes place and the child's breast becomes quiescent and is essentially an undeveloped and rudimentary organ until the age of puberty, when it takes on a new activity and growth. During this period of latency the breast is devoid of acini; the glandular elements consist of a comparatively few branching ducts with cylindric ends. They are not dilated into true acini. After puberty, even the female breast continues in a more or less undeveloped form until the first pregnancy. Then for the second time in the individual's life the gland is a functioning organ. There is a great increase in the parenchyma of the gland, a great increase in the number and size of the acini; these are formed by a process of budding. The interlobular fat is absorbed and the whole breast is made up very largely of groups of acini with their ducts. Of course this means that there is great activity and proliferation of the true epithelium. At the time of childbirth the breast has taken on the state of colostrum production. This rapidly gives place to the true lactating state. At this time the acini are lined by more than one layer of cuboidal epithelium. The cells are hypertrophied as well as increased in number, and assume characteristics entirely different from those of the resting breast. After the function of lactation has ceased, an involution takes place, and the breast goes back more or less to the condition of that of the virgin, though the virgin condition is never fully resumed.

These cycles recur with each pregnancy, and finally with the menopause comes the true involution, the breast having ceased to have an active function. This final involution should really be considered as an atrophy. The glandular elements become deficient,



Fig. 3.—Lactating breast of normal stillborn infant, showing all the characteristics of an adult functioning breast. This illustrates the normal condition of the breast of the new-born babe, male or female. It is a fact not generally known that the breasts at this period are fully developed functioning organs.

not only in number but also in size. Unless the breasts are invaded by an excess of fat they become shrunken and atrophic. I consider this a condition entirely of atrophy, and not one of hyperplasia of any one of the elements.

1. MacCarty, William: Collected Papers of the Mayo Clinic, 1915, 7, 903-919.

Thus it will be seen that throughout life the breast is undergoing a constant change. Its epithelium is in a condition of unrest; it has no definitely recognized equilibrium.

CHRONIC CYSTIC MASTITIS

The pathology of this disease for our present purpose may be stated briefly. This complex condi-

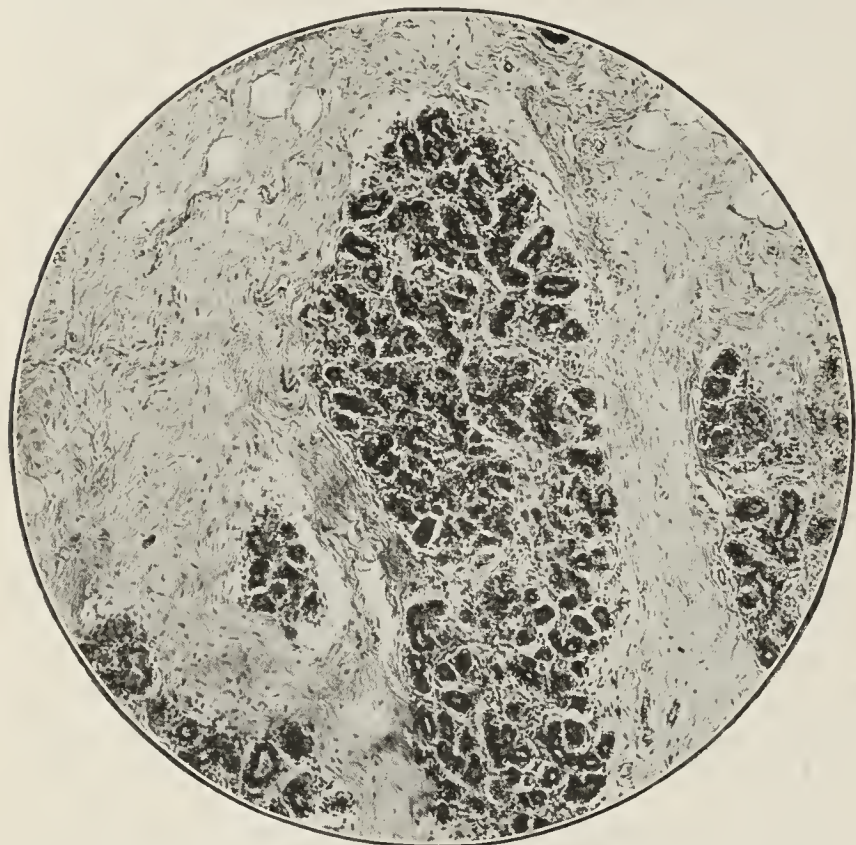


Fig. 4.—Normal adult breast, showing typical lobule with the normal proportion of fat cells, and with ducts of normal size. There is some increase of the fibrous stroma, no more than may be found in a normal adult breast. Figures 4 to 10 inclusive show sections of one breast. There was one section of this breast which definitely showed cancer; unfortunately this slide has been lost. These seven pictures illustrate some of the many pathologic changes which take place in chronic cystic mastitis. This one breast showed the various stages of the disease ranging from normal breast tissue to fully developed cancer. It aptly illustrates certain points which I attempted to bring out in this paper.

tion, which is almost without analogy in the body (if we except the prostate), consists of one series of phenomena which belong to the domain of inflammation; it consists of another series of phenomena which must be classed with hyperplasia; these again may be subdivided into forms of neoplasia, for they are evidenced by the production of tumor-like masses (fibro-epithelial). One point I wish to emphasize is that these neoplasias are not true tumors. A so-called adenofibroma or a fibro-adenoma thus produced is not a true isolated encapsulated tumor. It is a tumor-like mass, which is part of a disease of the whole organ. In cases of this disease we find hyperplasia of the connective tissue elements; a fibrosis, in other words. We find hyperplasia of the epithelium of the parenchyma. This may be more or less an atypical hyperplasia; this hyperplasia up to this point taking place within the acini and ducts. When migratory hyperplasia has taken place, that is to say, when the epithelial cells have penetrated the basement membrane and have infiltrated the stroma, a cancer has developed. If migratory hyperplasia is the last stage of chronic cystic mastitis, then the last stage of chronic cystic mastitis is cancer.

CARCINOMA

For the purpose of this study we may state the pathology of cancer of the breast almost in the form of a definition. We cannot do better than take Adami's:

We regard as cancer all cases in which there is infiltrative and apparently independent growth of epithelium or gland cells in the surrounding tissues, and this whether of only slightly atypical or markedly atypical cells.

Our present conception of cancer is that it is a growth of more or less atypical epithelial cells, the distinctive feature being the fact that these cells are growing in the stroma outside of the basement membrane. These cells to constitute cancer need not be very atypical in their morphology. It is their infiltrative growth that is the factor. Today we believe that a cancer cell is an otherwise normal functioning epithelial cell which for some reason or other has taken on the faculty of independent growth. Practically all authorities are agreed that cancer of the breast is made up of cells from the true parenchyma of the gland. MacCarty's theory that these cells are really undifferentiated cells which have displaced and replaced the differentiated cells, it seems to me has not the support of authority; and it also seems to me that it is not of material importance at the present time.

Though an extensive search through the literature has not revealed what we may regard as a conclusive proof of this question, still it shows that many leading authorities recognize the close relationship between these two diseases, and some state a quite definite belief in the idea that chronic cystic mastitis is the cause of cancer in a large percentage of cases. Let me state briefly the views of some prominent authorities as bearing on this subject:

Billroth² (1880) has been credited with making a more or less pertinent statement, in effect, that cancer does not seem to develop in an otherwise normal breast.

Heidenhain,³ in 1889, and again in 1915, stated that cancer is always associated with precancerous changes.

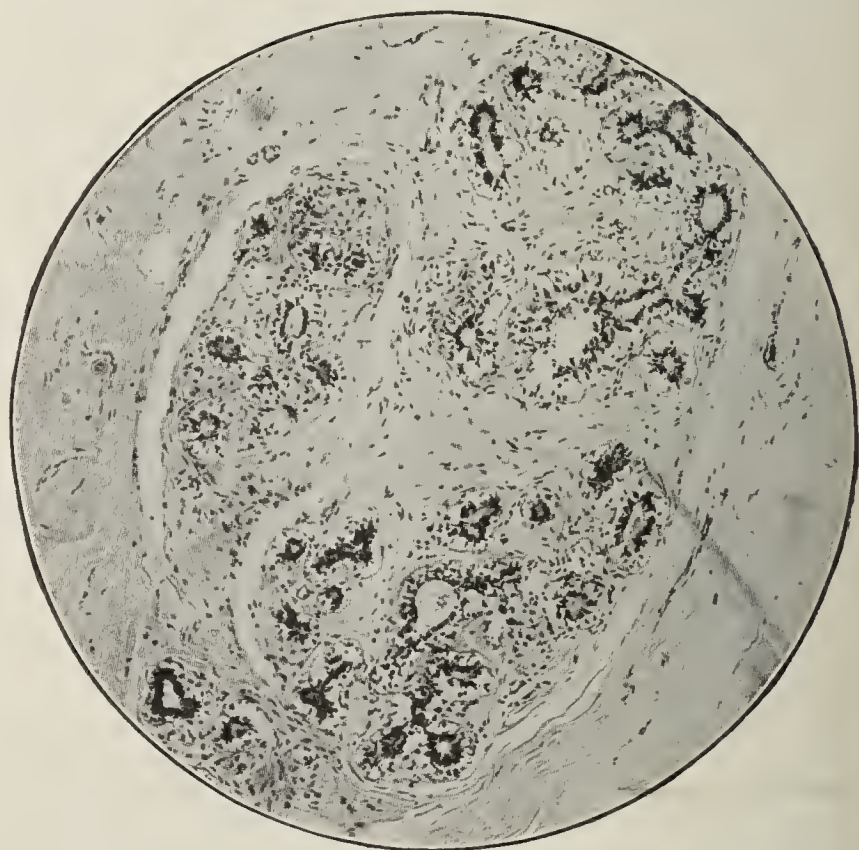


Fig. 5.—Section from same breast showing distinct fibrosis—abnormal involution. The glandular elements are compressed by the markedly increased acellular fibrous tissue.

Long ago (1889) he made a thorough study of a small number of breasts, as a result of which he stated that in cases in which even a small cancerous nodule existed, the entire breast was found to be abnormal.

2. Billroth, R.: *Die Krankheiten der Brustdrüsen*, Deutsch. Chir. Lfrg. 1880, 41, 110.

3. Heidenhain, L.: *Verhandl. d. Deutsch. Gesellsch. f. Chir.*, 1889, 18, 1.

He found in every portion of the breast atypical proliferation of epithelium which even at that early date he considered a precancerous condition. He evidently believed that this precancerous condition was one which would probably end in cancer, for he argued that the entire breast must be removed in order to prevent the development of cancer.

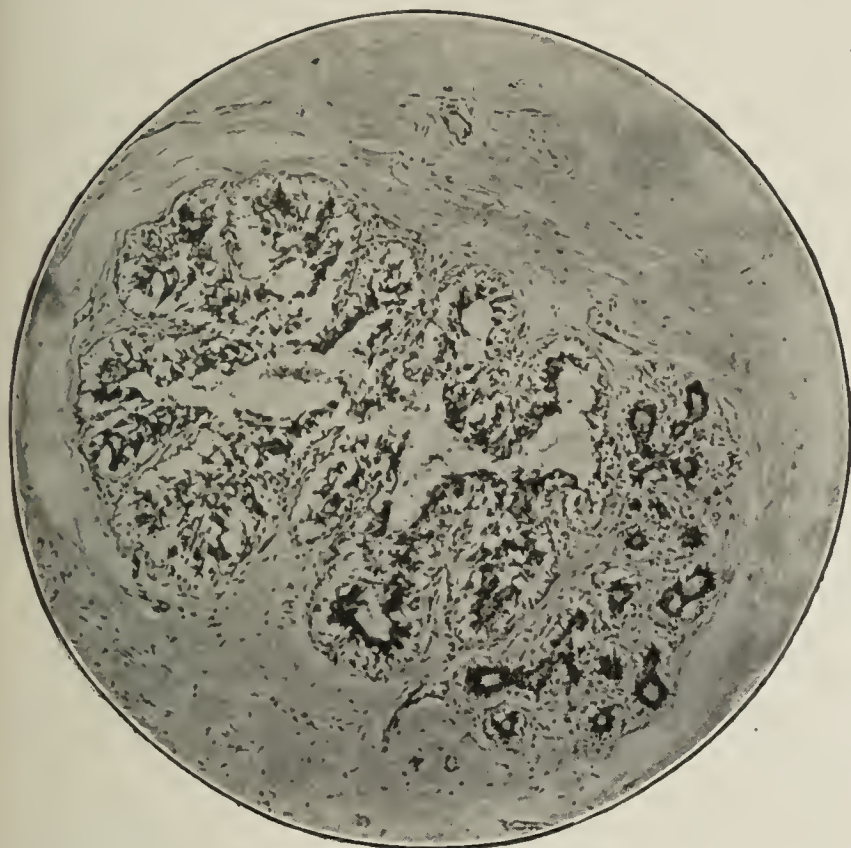


Fig. 6.—Section from same breast showing distinct fibrosis and a diminution of fat cells, a large duct showing atypical proliferation of the lining epithelium.

Stöhr⁴ states that the epithelium consists of a single layer. He regards the underlying cells as basket cells, not epithelium.

Verga⁵ considers chronic cystic mastitis as occurring in two different types: first, an inflammatory type which particularly affects the stroma, and second, a type which is characterized by proliferation of the epithelium. This second type is most frequently found in association with carcinoma. He states there are no clinical signs to indicate the transition into cancer, and that the diagnosis of chronic cystic mastitis with carcinomatous metaplasia can only be made by means of a microscopic examination of many parts of the gland.

Cornil⁶ describes the breast epithelium as occurring in a single layer of cuboidal or slightly flattened epithelium, except during the latter part of pregnancy and the period of lactation, when it occurs in two layers.

Krause⁷ describes a single layer of cuboidal cells and another layer of basket cells on the membrana propria, that is, branching cells which anastomose with each other.

Todyo⁸ describes chronic cystic mastitis as occurring in three stages (not three varieties): first stage, infiltration; second stage, cystic retention, and third stage, epithelial proliferation.

Kurn⁹ describes the epithelium as occurring in a single layer. He regards the subjacent layer of cells as basket cells. He points out a difference in the gly-

cogen content, the epithelium having abundant granules of it, and the basket cells containing very little. He takes Nagel's view of these basket cells, namely, that they are a form of muscle cells derived from the capillaries. Nagel pointed out the fact that these cells have different starving properties like muscle cells. Kurn regards senile involution as a form of atrophy. There is atrophy of the glandular epithelium and a collapse of the acini. The ducts are left but the epithelium more or less disappears. According to Kurn, the epithelium may grow in more than one layer under certain circumstances, first, in newly formed glands; second, in the course of certain inflammatory processes (tuberculosis), and third, in atypical proliferation. He states that this may be the first stage of cancer. According to Kurn, under the single layer of epithelium we find another layer of basket cells. The latter, he thinks, are probably muscle cells or endothelial cells coming from the capillaries. They are absent during the period of development and in the period of lactation when their place is taken by vascular capillaries. He assumes multicentric origin of cancer developing in fibro-adenomas. He describes the membrana propria as consisting of two layers, (a) the homogeneous, and (b) a layer of basket cells probably from the capillaries. He recognized the fact that multiple layers of cells constitute atypical proliferation and that these may become the preliminary stage of cancer formation.

Adami's¹⁰ statement is clear and positive:

There are obviously individual differences in reactive and regenerative powers, and these differences, in other words, the tendency to excessive cell growth, is an all-important factor in determining whether a given insult to the tissues leads merely to an orderly regeneration or to tumor growth. But



Fig. 7.—Section from same breast showing fibrosis, atypical proliferation of epithelium, and early stages of cyst formation.

it is equally clear that simple irritative and regenerative hyperplasia, adenomatous growth, and carcinoma, are stages which can be manifested in succession by the same tissue; that the differences are those of degree and not of kind.

One of the most striking articles on this subject is that of MacCarty,¹ in which he analyzed the study of

4. Stöhr, P.: *Lehrbuch der Histologie*, Ed. 16, Jena, 1915, p. 405.
5. Verga, G.: *Societa Med. Chir. di Pavia*, 14, 1907; *Zentralbl. i. allg. Path. u. path. Anat.*, 1908, 19, 562.
6. Cornil, V.: *Les Tumeurs du sein*, Paris, 1908.
7. Krause: *Kursus der Normalen Histologie*, 1911, plate 98, figs. 207-208, pp. 427, 428.
8. Todyo, T.: *Arch. f. klin. Chir.*, 1914, 104, 440.
9. Kurn, H.: *Deutsch. Ztschr. f. Chir.*, 1909, 98, 415.

10. Adami: *Principles of Pathology*, p. 721.

1,373 cases of chronic cystic mastitis. I have found no other large series of cases which have been studied in like manner, and if this paper can stimulate others to work up their breast cases along similar lines I think we shall soon be able to accumulate a very important mass of material.



Fig. 8.—Section from same breast: precancerous condition; fibrosis; atypical proliferation of epithelium, producing definite epithelial plugs in dilated alveoli.

Usually in cases of breast cancer the pathologist has studied the tumor itself, and has not studied the rest of the gland. MacCarty states that in these 1,373 cases of chronic cystic mastitis there were 967 cases of cancer, and 406 cases of mastitis without cancer. He states that he found no case of cancer without chronic cystic mastitis, and that two thirds of the cases of chronic cystic mastitis were associated with cancer.

I might similarly quote from many other valuable contributions to this subject, but I must be content with referring the reader to the literature. Let me say, however, that with few exceptions, each author who has made a definite statement on this subject has set forth his belief that there is a very close relationship between chronic cystic mastitis and cancer of the breast.

Let us consider for a moment a few of the facts which we today recognize concerning cancer. First, it is conceded that there is no such thing as a specific cancer cell. Our present day conception is that cancers develop from normal preexisting cells which for some reason or other have taken on abnormal activity as to growth and as to function. Secondly, we believe that cancer is at first an absolutely local process. Thirdly, we believe that certain diseases and certain conditions act as precursors of cancer and may be considered as potential causes of cancer.

Prolonged irritation is recognized as one of the most frequent contributing causes of cancer. As instances we may mention the obsolete chimney sweep cancer; the clay pipe cancer; the Roentgen-ray cancer; the kankri cancer of the Thibetans, caused by the irritation due to heat, and mouth cancers in India caused by chewing betel nuts. There is no longer any doubt in

the minds of our profession on this point. The question to be cleared up, however, is just why, and just how, prolonged irritation results in cancer. If we go back to our former proposition that a cancer originates in a normal body cell and that cancer is evidenced by a change in both the structure and the function of a cell, we may readily speculate as to whether these changes thus produced are not a response on the part of nature to the stimulus engendered by irritation, and whether they do not after all represent nature's attempt along the line of defense just as we see analogous processes represented by the phenomena of inflammation. This would perfectly agree with Adami's statement quoted above.

We have abundant evidence to prove the association of cancer with chronic cystic mastitis. Finney,¹¹ quoting others, placed the proportion of cancer as from 10 to 50 per cent. Greenough and Hartwell¹² place it at 10 per cent.; Warren¹³ at 13 per cent.; Verga⁵ found five cases of cystic mastitis with cancer among twenty-eight cases of tumors in the breast; Lockwood¹⁴ in forty cases found eight cases of cancer, and three which he marked as suspicious, making more than 20 per cent. Taylor¹⁵ found it in 50 per cent. of his cases; MacCarty¹ found it in about 70 per cent.

In this connection, if we study the etiology of chronic cystic mastitis we will find that it is due to some form of irritation. Let me quote from an article of my own:¹⁶

Being an inflammation, we must assume that the phenomena are really a series of responses to some form of irritation, either mechanical, bacterial or chemical.

I have long felt that chronic cystic mastitis is a complex process, that the various changes in structure represent definite stages of the disease, that abnormal



Fig. 9.—Section from same breast: precancerous condition; fibrosis; atypical proliferation of epithelium; epithelial plugs in dilated ducts and alveoli with papillary overgrowth of epithelium in ducts.

11. Finney, J. M. T., in Keen: *Surgery*, 1910, **3**, 568.
12. Greenough and Hartwell: *Jour. Med. Research*, 1903, **9**.
13. Warren, J. C.: *Surgical Observations on Tumors*, Boston, 1837, p. 279.
14. Lockwood: *Cancer of the Breast*, 1913.
15. Taylor, W. J.: *Tr. Phila. Acad. of Surg.*, 1911, **13**, 90; *Ann. Surg.*, **52**, 250.
16. Syms, Parker: *Chronic Cystic Mastitis or Abnormal Involution of the Breast*, *Ann. Surg.*, 1916, **64**, 696.

hyperplasia and hypertrophy of the epithelial cells resulting in penetration of the basement membrane and infiltration of the stroma is the last stage, and this is cancer. If this is true, we may restate it by saying that chronic cystic mastitis is a progressive disease which will proceed to the production of cancer unless its progress is arrested before it proceeds to its logical conclusion. A demonstration of this will take us a long way toward the elucidation of the evolution of cancer of the breast.

If sufficient investigation will prove, as MacCarty¹ has found, that cancer of the breast does not occur without chronic cystic mastitis, shall we not have strong support for the hypothesis that cancer of the breast is caused by some form of irritation which first results in chronic cystic mastitis, and which finally results in cancer by a form of transition from one stage to another until the final stage of infiltrative cellular hyperplasia, which is cancer?

With this in view I strongly urge practitioners to examine not only the tumor but also the whole breast in the future, and to publish their findings, so that we can throw much needed light on this important question.

If we can prove that cancer develops by a process of evolution, and if we can learn just what are the precancerous stages, we can certainly apply that knowledge for the prevention of cancer. Curing or removing precancerous conditions will, of course, prevent the development of cancer.

361 Park Avenue.

ABSTRACT OF DISCUSSION

DR. DANIEL N. EISENDRATH, Chicago: The relation of chronic cystic mastitis to cancer of the breast is the most important one in this field of surgery at present.

Some of the statements made by Dr. Syms, I am afraid, assume conclusions before the proof has been accepted by both sides, and are apt to lead to the belief that every case of chronic cystic mastitis is a potentially malignant one and should be subjected to a radical procedure. I refer especially to his statements that because both this disease and cancer show disturbed equilibrium and are associated at times, there is a close connection between the two diseases. Again, he assumes that migratory hyperplasia is the last stage of chronic mastitis, hence this last stage is cancer. Now such statements are misleading and many breasts will be amputated uselessly unless these deductions are made less general. He quoted authors who report finding chronic cystic mastitis associated with cancer in from 10 to 70 per cent. of their cases, but no one has ever seen such a direct transmutation of one into the other. In many cases the proliferation of epithelium may be very advanced without any invasion of the connective tissue. I am willing to grant, and my experience amply confirms the necessity of impressing on every general practitioner, as well as surgeon, the fact that every case of chronic cystic mastitis must be most constantly watched for the possible development of signs of malignancy. This means that we must adopt a certain standard of procedure toward the cases, which present

themselves more frequently in single than in married women as localized or diffuse areas of induration or cysts, usually painful, especially during menstruation, without enlarged axillary glands, as a rule, and often with such hard lumps that we feel certain we are dealing with a carcinoma, only to find at operation a tense cyst. In this class of cases I would also include those with bloody, serous or milky discharge from the nipple, no matter at what age they present themselves, because these are due to papillomatous formation within the cysts, whether we call it chronic cystic mastitis or abnormal involution. Its protean clinical character demands treatment according to its salient pathologic features as follows: 1. In very young unmarried women one can safely wait until after marriage and then caution them to be examined from time to time. 2. Every breast with many cysts and considerable induration in women above the age of 35 should be examined by a transcutaneous incision in its upper half and a plastic operation in its lower half. If the surgeon believes from the area seen that it is cancer (every operator must have sufficient training in pathology to tell this from the naked eye appearance), he should make radical removal of the breast, adding to it a supraclavicular dissection if the area was in the upper half. If frozen sections show epithelial hyperplasia but nothing definitely carcinomatous, it is best to perform a conservative amputation.

DR. PARKER SYMS, New York: It is one of the most difficult questions for a surgeon to decide just what he should do with these cases. Each one should be treated individually. Personally, I believe I have been very conservative in my operations in this class of cases. I have removed very few breasts for this condition where I have not had a suspicion of cancer, and in some of these I have found that there was taking place a transition into cancer. We know there are no symptoms which definitely indicate such a transition. Dr. Eisendrath must have misunderstood me, though I thought my expression was clear enough. I did not say that the last stage of chronic cystic mastitis must be cancer. I said it may be.

I said chronic cystic mastitis is a complex process, evidenced by signs of inflammation, of hyperplasia of the different elements; by cyst formation, etc., and that I believed that its last stage was carcinoma; if so, that it would reach that point provided it proceeded to its logical conclusion, just as there is only a proportion of human beings who go on to 80 years of age. I feel that a most important thing is to make a distinction between the hard, tumorous masses we find in this disease, and true tumors. These so-called tumors are not tumors at all, though they may have a typical appearance under the microscope. They are part of a disease, and they are a peculiar form of neoplasia. You cannot remove them without cutting through breast tissue. The frozen section is unreliable. I believe that Dr. Ewing, who is one of our highest authorities on carcinoma, refuses to employ frozen sections in these cases. Sometimes it is only after twenty, thirty or forty sections that one will run across one that shows cancer. Among the illustrations there are seven taken from one breast. They range from the normal through various stages of abnormality. There was one section that showed cancer and it was not found until this breast had been examined by several pathologists. In closing I wish to urge surgeons to examine breasts in toto as MacCarty has, and as Heidenhain did in 1889.



Fig. 10.—Section from same breast: typical intracanalicular adenofibroma.

INTUBATION OF THE LARYNX

AN ANALYSIS OF THREE HUNDRED AND FIFTY CASES
IN PRIVATE PRACTICE *

HENRY JAMES CARTIN, M.D.

Pediatrician, Conemaugh Valley Memorial Hospital and Mercy Hospital
JOHNSTOWN, PA.

Laryngeal diphtheria, requiring intubation, has been considered by most pediatricians as a disease for hospital treatment. It is because of this belief that I decided to present an analysis of 350 cases occurring in my private practice in the hope that results obtained under the most adverse conditions may lead to more general use of this operation when hospital facilities are lacking.

Johnstown, Pa., is the center of vast steel and mining industries which attract a large population of laboring people of both native and foreign birth. The homes of many of these are overcrowded and living conditions are unhygienic, resulting in many of the children having chronic catarrhal conditions of the upper respiratory tract. There is concealment of disease through fear of quarantine, and exposure to disease through ignorance of contagion and indifference to it. These conditions made a fertile field for epidemics of laryngeal diphtheria in our community during the years 1905-1917. The increase in the number of cases intubated is due primarily to the epidemics and secondarily to increasing knowledge among my fellow

TABLE 1.—NUMBER OF PATIENTS PERSONALLY INTUBATED
IN DIFFERENT YEARS

Year	Cases	Year	Cases
1905	1	1912	106
1906	0	1913	48
1907	4	1914	66
1908	6	1915	21
1909	13	1916	13
1910	28	1917	11
1911	33		
		Total	350

physicians of the success of the operation so that each child was given the chance of intubation if needed.

I am indebted to sixty-five of my colleagues for 295 of this series, one of them having thirty-eight cases. All of the cases in the series developed within a radius of 15 miles. One hundred and fifty-two patients were of foreign parentage, 198 of native parentage. There were 182 males and 168 females. The conditions for operation were far from satisfactory. In six cases I was called when the child was moribund, having had no previous medical attention; in many others the operation was delayed until the child's condition became desperate. With a child urgently in need of operation, time had to be taken to gain the consent of the parents, in foreign families through the aid of interpreters. For operating we used the kitchen table, bed or two chairs; in one case the floor. The light was always poor. A parent, neighbor or physician was pressed into service to hold the patient. The physician, through interest in the operation, frequently failed to hold the child properly. The other helpers failed through nervousness.

After operation I had little control of the patients in families in which I was called by another physician. In many cases the physician made the daily visit, reporting to me by telephone each day. Sometimes we arranged to visit the patient together daily. At other times the case was referred entirely to me until

discharged. The patients had no nursing care, bathing, or special diet, except in eighteen instances in which the nurse had had no previous experience in this work. Many of the patients were not kept in bed but played as usual with the children of their own and neighboring families in spite of quarantine. I have nothing new to offer as to technic. I use O'Dwyer's instruments with hard rubber tubes, having found nothing that is an improvement over them. I have never had occasion to use specially constructed tubes. I intubate

TABLE 2.—AMOUNTS OF ANTITOXIN GIVEN

Units	Patients	Units	Patients
0	6	16,000	7
2,000	1	17,000	7
3,000	3	18,000	3
4,000	1	19,000	2
5,000	22	20,000	42
6,000	10	22,000	1
7,000	12	23,000	1
8,000	18	24,000	1
9,000	10	25,000	11
10,000	73	30,000	3
11,000	11	32,000	1
12,000	13	35,000	1
13,000	2	50,000	1
14,000	1		
15,000	86	Total	350

with the child in the dorsal position. Since several unpleasant experiences I always remove the string; if it is not removed the child must be restrained. The string irritates the pharynx, causing persistent coughing. There is also danger of the child biting it off. Since this routine was adopted, only one patient has been lost by the tube blocking and death resulting before aid could be secured. I always use the tube indicated for a child from 6 to 12 months older than the patient, because it is less liable to be coughed up from the first to the third day. After this time the accident is not feared.

Fifty-seven per cent. of the patients received from 10,000 to 20,000 units. Early in the series, difficulty was experienced in obtaining a sufficient amount of antitoxin because of its high cost, and also because the prejudice and ignorance of the parents often prevented its use in sufficient quantities. This was before the day of free antitoxin furnished by the state. It was my practice at that time to administer from 2,000

TABLE 3.—NUMBER OF PATIENTS RECEIVING ANTITOXIN

Age, Years	Neither Before Nor After	Before Only	After Only	Before and After
1	1	1	2	7
1½	1	5	6	29
2	1	3	6	23
2½	0	10	7	19
3	0	5	9	32
3½	0	0	1	2
4	0	5	5	25
4½	0	0	0	1
5	3	7	16	37
5½	0	0	1	0
6	0	4	5	13
7	0	3	6	14
8	0	4	2	11
9	0	3	0	11
10	0	1	0	0
14	0	1	0	1
34	0	0	0	1
Totals	6	52	66	226

to 10,000 units and repeat it in from six to twelve hours if necessary. This method required repeated injections, kept the patient in constant fear and pain, and caused the parents to interpose strong objections. During the past few years, with free antitoxin and less prejudice against the remedy, I estimate by the severity of the case the probable total needs, and inject this quantity in one dose, anywhere from 15,000 to 50,000 units.

* Read before the Section on Diseases of Children at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

The first and greatest advantage of this method is that it furnishes the patient with antitoxin when he most needs it. The antitoxin is given intramuscularly, the gluteal muscles being the location of choice. Sixty-five per cent. had antitoxin before and after intubation. Six patients had no antitoxin, and all died within two hours after intubation, being in fact moribund when the physician arrived. Fifty-four per cent. of the patients were ill from one and one-half to two days before intubation. The tube was worn five days by 223 patients. It was noted that those wearing the tube for this length of time were less likely to require reintubation than those extubated earlier.

After removing the tube I always remained with the patient until all danger of returning stenosis was past. The usual time was two hours. Rarely did a case require reintubation after this time. However, I was always ready to return if the child's condition grew worse. The diet prescribed depended largely on the condition of the patient and the character of the home. Liquids and soft solids were allowed as soon as the patient was able to swallow. It was impossible to control the patients in most cases. In spite of orders, some patients ate at the table within twelve hours after intubation.

I have never had occasion to use the Casselberry method of feeding or to resort to gavage. For stimulation I relied mainly on caffein sodium benzoate. In septic cases mercuric chlorid was used together with whisky or brandy.

TABLE 4.—DAY OF ILLNESS

Days	Cases	Days	Cases
1/2	1	5	9
1	57	6	2
1 1/2	64	8	2
2	124	10	2
2 1/2	23	12	1
3	52		
4	13	Total	350

In this short paper it is impossible to do more than point out the prominent features of this series. The tables will show all the essential facts. The complete history of each case is available, but I can use it only to verify and amplify statements made in this sketch. Some of the striking incidents and results noted are:

In 350 cases there were no chronic tube cases. There was no case requiring tracheotomy. A curious opinion prevailed among the people. The results of tracheotomy were confused with those of intubation, and the latter procedure was believed to be followed by the same distress and fatality as the former. Much explanation and pleading was required to convince some parents of this mistake. Two patients coughed up the tube and cast. Both recovered. One family had three cases requiring intubation. Ten families had two cases each. The youngest patient intubated was 7 months old. The eldest was a woman aged 34 years. Only one patient was intubated twice. The interval between the two attacks of the disease was two years. Many patients complained of earache. In three cases the tube blocked and casts were coughed up immediately after extubation.

Many cases of laryngeal diphtheria were secondary to pharyngeal cases in other members of the family. The reverse occurred only a few times. In 350 patients only thirty-two required reintubation. Twenty-eight required 1 reintubation; one, 2; one, 3; one, 4, and one, 5. In the latter case phonation was imperfect for a time, but became clear after seven months. Permanent disturbance of phonation did not occur in a single case.

Kidney complications did not occur or were overlooked. The latter is quite possible, as both my own and the attending physician's connection with the case terminated with extubation. With the return of the child to apparent health, the parents did not believe medical services were necessary, and for them the case was at an end.

Marked anemia was observed in only a few cases when, after from five to seven days, stenosis developed following pharyngeal diphtheria. Of 350 patients forty-eight died, a mortality of 14 per cent. If we

TABLE 5.—DAYS TUBE WAS WORN

Days	Cases	Days	Cases
1/2	4	5	223
1/2	6	6	6
1	5	7	1
1 1/2	2	9	2
2	5	10	15
2 1/2	0	11	5
3	16	15	1
3 1/2	2	21	2
4	47	No time	5
4 1/2	3	Total	350

deduct thirteen dying within six hours after intubation, we have a total left of 337 cases with thirty-five deaths. a mortality rate of 10 per cent. One child died of postdiphtheric cardiac paralysis seven days after extubation. One patient was in excellent condition when extubated, but instantly developed spasm of the glottis and died within one minute, before the tube could be replaced. In one case the tube became blocked with membrane and death resulted before aid arrived.

A child 1 year old had frequent convulsions before its attack of diphtheria. It was intubated and did well for five days. One hour before the tube was to be removed it had a convulsion and died within twelve hours. The tube was clear at all times. One child while playing in the yard on the fourth day coughed up the tube and was dead before the mother was aware of the accident.

In the cases of death from heart failure some were due to septic diphtheria in which stenosis was the late secondary complication. Some had a severe type of scarlet fever with septic throat and late stenosis. One patient had pertussis when laryngeal diphtheria developed. Threatening stenosis was relieved by intubation. At each extubation extreme paroxysms of

TABLE 6.—CAUSES OF DEATH

Heart failure	8
Sepsis	5
Diphtheritic pneumonia	27
Scarlet fever	2
Pertussis	1
Pulling out tube	1
Spasm of glottis	1
Tube blocked	1
Convulsions	1
Coughed up tube	1
Total	48

coughing and stenosis required immediate reintubation. The operation was repeated three times but exhaustion finally caused death. The most frequent cause of death was diphtheritic pneumonia. Twenty-seven patients developed this condition and none survived, accounting for 56 per cent. of the deaths.

At the beginning of this series, my practice was to operate when symptoms threatened life. Following this plan lives were lost that might have been saved because the attending physician or parent could not interpret the danger signals. As a result I now operate when the diagnosis is clear and positive, as indicated

by the voice and cough, beginning dyspnea and the gradually increasing distress in spite of treatment. I never wait until conditions become alarming. I admit that, in these days of antitoxin, many would recover without operation; but I feel that my low mortality is due wholly to early operation.

The necessity of reintubation did not add to the gravity of the prognosis, none of the thirty-two patients needing reintubation having died, unless one excepts the case complicated by pertussis, referred to above. The better the patient's general condition the less likelihood of returning stenosis. There was no way of telling how long a patient could go before needing intubation. Each case was different. The comfort of the patient depended largely on how high the tube rested in the larynx.

I never found that sedatives helped to prevent reintubation. I gave all a fair trial. The confidence of the patient was the greatest aid in this matter. The temperature rose sharply after intubation when stenosis had threatened life. No patient was lost in which intubation was performed early. The duration of the illness was no gage of the severity of the case. Contrary to the prevailing opinion, I have found extubation easier to perform than intubation.

intubation. It has been said that by giving large doses of antitoxin, these young children are able to do without intubation. I have not found that to be true. I do not think antitoxin works quickly enough in laryngeal diphtheria to justify us in delaying either intubation or operation.

DR. H. L. WHITNEY, Plymouth, Pa.: I do not think that every case of stenosis of the larynx is diphtheria. Those that are diphtheria are more amenable to intubation than those that are not. It has been my experience with diphtheria patients that they do not have to wear the tube more than three or four days on an average, while in other cases it is often several months.

I prefer using one large dose of antitoxin, and not repeating it on account of anaphylaxis, which occasionally occurs when several successive doses are given.

In regard to feeding, of course milk and liquids are to be given. After giving milk, I always find it advantageous to give a drink of water, as there will be a drop or two of milk collect in the tube, and this may be a nucleus for blockage. We know after a child drinks there is always a little cough. If a child drinks continuously, without intermission, there will be no cough until cessation of the drinking.

I disagree with Dr. Cartin about extubation being easier than intubation. Occasionally it is difficult to extubate. If the child does not get in just the right position, we may miss the tube. When I first began intubation, I secured one of the original intubation sets. I found difficulty in extubation. I had an extractor made about 1½ inches shorter than

TABLE 7.—GENERAL SUMMARY

Age	Number	Neither Before Nor After	Before Only	—Antitoxin—		Reintu- bations	Recoveries	Deaths	Recoveries, Per cent.
				After Only	Before and After				
1	11	1	1	2	7	3	8	3	73
1½	41	1	5	6	29	4	39	2	95
2	32	1	2	6	23	6	24	8	75
2½	36	..	10	7	19	2	34	2	94
3	47	..	6	9	32	4	41	6	87
3½	3	..	..	1	2	1	2	1	66
4	33	..	3	5	25	3	27	6	82
4½	1	..	..	..	1	..	1	..	100
5	64	3	8	16	37	2	54	10	84
5½	1	..	..	1	..	1	1	..	100
6	24	..	6	5	13	1	22	2	90
7	23	..	3	6	14	1	20	3	81
8	17	..	4	2	11	1	16	1	94
9	14	..	3	..	11	2	11	3	80
14	2	..	1	..	1	..	1	1	50
34	1	..	..	..	1	..	1	..	100
Total	350	6	52	66	226	32	302	48	86

In Table 7 I have condensed the foregoing tables, giving facts and records in order that comparisons and study can be more easily made. I trust they will be of benefit to the future of laryngeal diphtheria as treated in private practice.

CONCLUSIONS

1. No patient needing intubation should be denied the chance to live because of lack of hospital facilities.
2. Overcrowding of homes, unhygienic surroundings, concealment of disease, and exposure to contagion are responsible for the epidemics.
3. Lack of trained assistants need not deter one from operating.
4. The use of a tube larger than that indicated for a given age gives better results.
5. Early intubation with large doses of antitoxin reduces the mortality.
6. Wearing the tube five days resulted in fewer reintubations.
7. It appears that special diet and methods of feeding are unnecessary.
8. Reintubation does not seem to affect phonation permanently.

ABSTRACT OF DISCUSSION

DR. J. F. HOGAN, Baltimore: We have found, especially in younger children, that the administration of antitoxin in laryngeal diphtheria will not dispense with the necessity for

the usual extractor. This facilitated extubation in infants. I often find the first tube drops out. I put them in according to the ages in the beginning. If the tube drops out, I put in the larger size next time. We have difficulty with the foreign population; they run around and eat everything. One child ate popcorn, the tube became blocked and the child died before my arrival.

The average physician is afraid to push the tube down far enough; he is afraid he will lose it. It requires quite a little force to get it properly seated beneath the epiglottis.

DR. A. J. BELL, Cincinnati: I have charge of the contagious group at the Cincinnati General Hospital. There are several remarkable features about Dr. Cartin's series. One is to have so many cases in private practice, and another, to have such good results. Those of us who have had our cases in the hospitals are getting constant reports about how the tube was coughed up or pulled up, and if the intefn had not arrived that minute, etc., the child would probably have died. Only one death in this large series from coughing up the tube is remarkable. We will all agree, of course, that the ideal place for an intubation case is the hospital, where it may receive prompt attention in emergency. As to the dose of antitoxin, the subcutaneous method has been practically given up entirely, and only the intramuscular and intravenous routes are being used.

The maximum absorption curve of antitoxin in the intravenous, intramuscular and subcutaneous methods is approximately eighteen, thirty-six and seventy-two hours.

DR. ISAAC A. ABT, Chicago: Dr. Cartin's paper emphasizes a point we have known for a long time, that the men who do the most operations and become the greatest experts in

intubation are not the specialists, but the men in general practice who are out in the field doing the work. I have intubated in both the sitting and recumbent positions, and while every man must work out his own technic from experience, it has always seemed to me that the more favorable position was when the patient was sitting up.

As to the use of a slightly larger tube than is indicated by the age of the child, I have the feeling that there is increased danger of trauma in both introduction and extraction. It seems to me that results will be better if one uses the tube that is indicated—one that does not fit too snugly.

I am surprised that Dr. Cartin's youngest patient, intubated at the age of 7 months, recovered. My experience, which is in agreement with statistics, has shown that the majority of babies under a year do not recover after the operation of intubation.

I wonder whether the patient with convulsions, whom Dr. Cartin referred to, and who died, really had diphtheria. I am merely suggesting this for the purpose of discussion. Is it not possible that this was a case of laryngismus stridulus?

My experience in regard to intubation in scarlet fever is that scarlet fever does not offer a fair prognosis for intubation. Cases of scarlatinal laryngitis are of the phlegmonous type; the membrane descends rapidly, producing a fibrous exudate all through the bronchial tree, terminating in pneumonia. They are unfavorable cases for intubation.

Should we accept categorically the statement that we should operate early, before symptoms have become severe? I can readily imagine that in rural practice operation should be performed on the slightest indication, but in hospital practice I think it will be permissible to delay operation until there is severe dyspnea, with manifest retraction of the thorax, and with accompanying cyanosis and other definite signs.

Concerning the use of force in introducing the tube, an operator should be very gentle. Force is very likely to cause perforation of the larynx or ulceration. This means severe complications, possibly death.

DR. LAWRENCE T. ROYSTER, Norfolk, Va.: There is a vast difference between intubation in a hospital and outside. To a man like myself, trained in the Willard Parker Hospital, where intubation received its first impetus, going out into private practice and performing intubation on a patient when we do not know whether or not we will ever see that patient again, is a serious thing.

It seems to me Dr. Cartin has secured a remarkable series of statistics. I do practically all the intubation in my section—in the city itself, and from twenty to thirty miles around the city—and yet I rarely see more than seven or eight cases during the winter. Undoubtedly, when one is not in the city, but goes miles into the country, one had better err by performing intubation where it is not necessary, rather than delay until it is too late. My cases have averaged perhaps seven or eight a year for eighteen years. I have had two deaths; one in a child under 1 year of age. Two days after intubation the mother picked it up, and, in a moment of pleasure at its improved condition, tossed it into the air, and it fell back dead. The other was in a case with deformity of the larynx.

He who uses force does not know how to intubate. A man who has never put in a tube, if in doubt had better do a tracheotomy than an intubation.

As to early intubation, the watchfulness Dr. Abt speaks of is entirely proper under trained observers. Only two of my patients were with trained nurses, and the period of intubation in all of them has averaged five days, with not a single reintubation, except in the case with the deformed larynx. I prefer the supine position.

DR. HENRY J. CARTIN, Johnstown, Pa.: I disagree with Dr. Whitney about the use of force. I must confess that I have never used any position except the dorsal, being trained in that position only. I believe the chronic tube cases depend entirely on one condition, and that is trauma on the first intubation, or trauma occurring on reintubation. As to the case of convulsions with laryngeal diphtheria, there is some force to Dr. Abt's reasoning. The family, however, were noted in their neighborhood for having convulsions at any time.

As to early operation, of course I had particular reference to a practice in communities in which hospital facilities are lacking. In a number of sad cases in which I procrastinated for even an hour or two, I returned to find crape on the door.

A CASE OF HEMIHYPERTROPHY WITH INCREASED SUGAR TOLERANCE*

HYMAN COHEN, A.M., M.D.

Assistant Admitting Physician, German Hospital

NEW YORK

There are no reports of cases of hemihypertrophy in the literature until the beginning of the nineteenth century. In 1869 a treatise was published in which

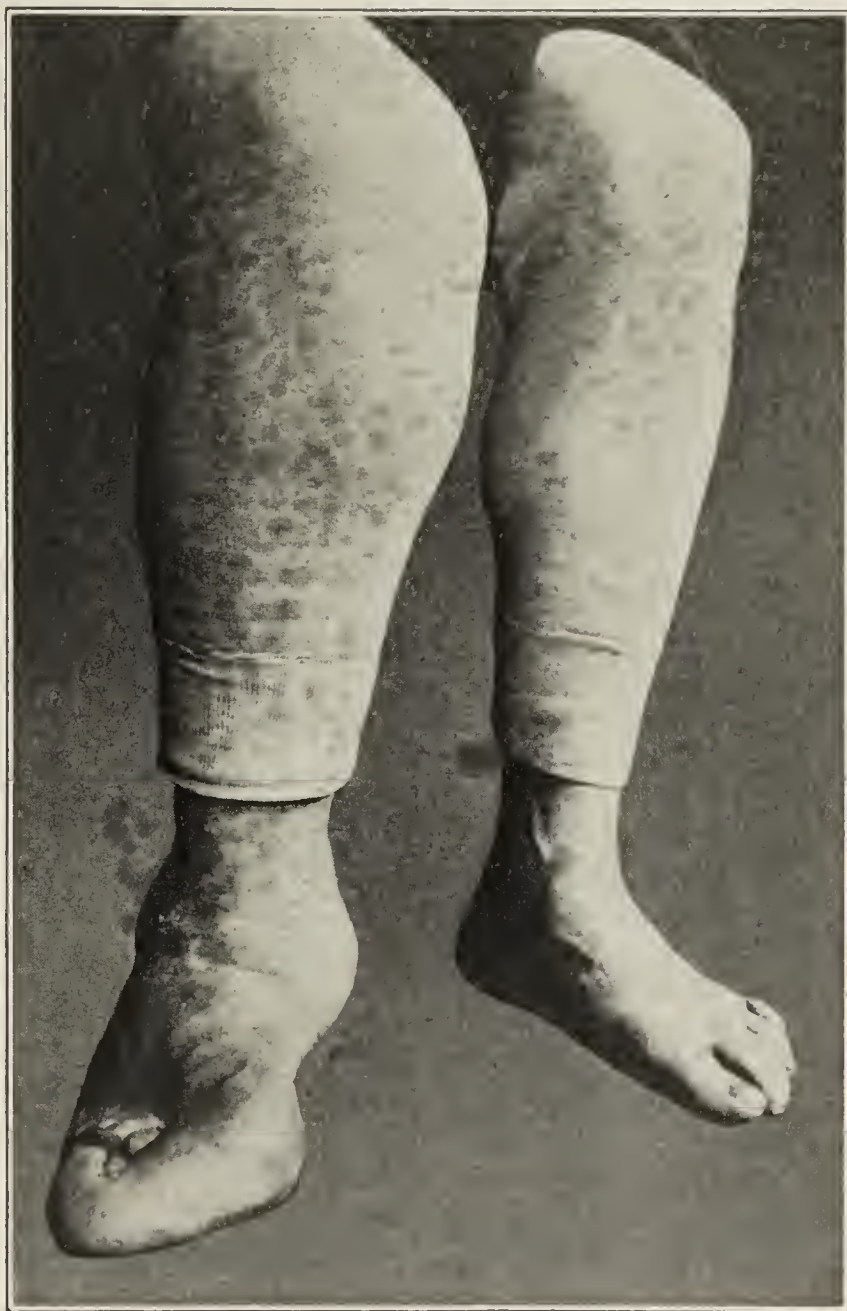


Fig. 1.—Hypertrophy of right leg and foot.

twelve cases were cited. In 1897 LeBlanc collected reports of seventy-eight cases, giving a summary of their features and suggesting a theory as to their causation. Recently Fortescue-Brickdale reported an interesting case.

According to Adams there are two types of this condition—the true hypertrophy, which is always congenital and unilateral and not associated with other deformities, and the false hypertrophy, which may or may not be congenital. The hypertrophy involves all the tissues, but more so the soft parts. It affects the girth more than the length. The right side is more

* From the Medical Service of Dr. O. M. Schwerdtfeger, German Hospital and Dispensary.

often involved than the left, and the lower extremity more frequently than the upper. Seldom is there a family history of any congenital deformity.

REPORT OF CASE

History.—Man, aged 56, tailor, married, no children, was admitted to the medical division of the German Hospital, complaining of a throbbing sensation in the abdomen. There was also a feeling of discomfort in the back of the neck and lower extremities. These symptoms had been present for the past eight years, becoming more pronounced during the past six weeks, so that he was forced to give up his occupation. The disturbances referred to would invariably occur while the patient was at rest. Strange to say the enormously hypertrophied leg gave him no discomfort whatever. The leg had slowly increased in size from birth to adolescence. There



Fig. 2.—Roentgenogram of right foot.

were never any pains or other sensory disturbances. In fact, the hypertrophied leg had been of greater service to him than the sound limb. The patient was operated on for a glandular tumor of the neck at the age of 18, and had never been sick since. The history was entirely negative.

Physical Examination.—The patient was exceedingly well developed and nourished, and showed no organic disturbances. There were no glandular enlargements or palpable thyroid. The right side of the chest was slightly less developed than the left; the development of the arms was equal, but the right leg from the middle of the thigh down was enormously hypertrophied. The measurements of the right leg as compared to the left were:

	Right Leg, Inches	Left Leg, Inches
Three inches above the patella.....	18	17½
At the patella	19¾	15¾
Three inches below the patella	18½	14¾
About the ankle	14	8½

No tenderness was elicited over the affected leg. A large lipoma was present at the ankle.

Roentgen Examination.—Marked changes were present in the shadows of the outlines of the bones around the knee, ankle, tarsal articulation and tarsal phalanges. The process was characterized by extensive production and deformity. The head of the first metatarsal and phalanges of the first toe, as well as the soft parts, showed great production and deformity almost to the extent of gigantism. The left leg was normal in all respects. Examination of the chest and head showed no enlargement of thyroid, thymus or pituitary.

Clinical and Laboratory Findings.—The systolic blood pressure was 180; diastolic, 96. The pulse rate was 72 per minute. The blood count was normal in all respects. The Wassermann reaction in the blood and spinal fluid was negative. Analysis of the urine revealed: total nitrogen, 10 gm. in a twenty-four hour specimen; ammonia nitrogen, 6 per cent.; urea nitrogen, 66 per cent. No sugar, albumin or casts were found. Bence-Jones protein was absent.

Chemical examination of the nitrogenous constituents of the blood revealed, per hundred c.c. of blood: nonprotein nitrogen, 21 mg.; urea nitrogen, 10 mg.; uric acid, 1 mg.; creatinin, 1 mg. Sugar as dextrose was 0.1 per cent. The carbon dioxid combining power was 85 volumes per cent. per hundred c.c. of serum. The phenolsulphonephthalein elimination in two hours was 75 per cent.

Gastric analysis showed no retention, free and total acids being present in the usual percentages.

There were no thyroid or thymus disturbances. Injection of one-tenth grain of pilocarpin produced no perspiration, salivation, increased general nervousness or perceptible changes in blood pressure. The instillation of 1 drop of a 1:1,000 epinephrin solution into the eye caused no changes in the pupil. The pulse rate was not affected when the eyeball was pressed. The sugar tolerance test was done as follows: The patient was given 150 gm. of glucose in coffee by mouth twelve hours after the last meal, the urine was tested for sugar in the specimen the following hour, and for the next five hours and in the complete twenty-four hour specimen. The amount was increased 50 gm. daily until 650 gm. had been given at one time. No sugar could be detected in the urine. Following the last test, the sugar content of the blood was 0.088 per cent. For obvious reasons the amount of glucose could not be increased.

COMMENT

Several theories have been advanced concerning the etiology of hemihypertrophy. Among the older hypotheses may be mentioned paralysis of the vasomotor system; arrested development of the different coats of the arteries; intra-uterine meningitis of the brain and cord; faulty development of the cord; enlargement of one side of the cerebrum, and lesions in the central nervous system. More recent views ascribe the condition to some alteration in the character of the internal secretions—possibly a hyperpituitarism. Numerous postmortem findings fail to establish a definite cause.

152 East Eighty-First Street.

Care of Expectant Mothers.—The New York Milk Committee has recently published a report on the care of expectant mothers covering its work for the past four years; 3,145 expectant mothers were enrolled and given care and supervision averaging three and one-half months before and one month after confinement; 3,192 babies were born, of which 115 were still birth, and eighty-six others died during the first months after birth. The stillbirth rate per thousand of these cases was thirty-six against forty-six for Manhattan, or a reduction of 22 per cent. The rate per thousand of deaths under one month was twenty-eight against thirty-nine for the borough, or a reduction of 28 per cent. Out of this whole group of mothers only five died, giving a rate of 1.5 per thousand mothers against a rate of 4.9 in the city at large.

THE SURGICAL SIGNIFICANCE OF
GASTRIC HEMORRHAGE *

DONALD C. BALFOUR, M.D.

ROCHESTER, MINN.

From a surgical standpoint, hematemesis is caused by, or occurs with, first, primary lesions in the stomach and duodenum, such as ulcer, cancer, tuberculosis, syphilis and benign tumors; and second, certain diseases and infections which are not necessarily associated with recognizable changes in the gastric mucosa.

In the first group, namely, those cases in which there is a chronic gastric or duodenal lesion, both diagnosis and treatment are on a relatively satisfactory basis, and the general surgical principles applicable in the treatment of the most common cause of hematemesis in the group, that is, gastric or duodenal ulcer, are more or less accepted. These bleeding ulcers may be conveniently divided into two groups, namely, those ulcers in which there has been a history of bleeding, and those in which active bleeding is taking place.

1. The indications for surgical treatment of the patient with a history of single or recurring gastric hemorrhages in whom a diagnosis of ulcer can be established are positive. It has been our experience that to depend on gastro-enterostomy alone for the treatment of ulcer which has been associated with bleeding is to court recurrence of the hemorrhage, and that to obviate further hemorrhages, excision, preferably by cautery or resection of the ulcer, is imperative.

2. The management of the ulcer which is the cause of continuous, active bleeding has been the subject of considerable controversy. There are no means of estimating the size of the bleeding vessel. As a single gastric ulcer hemorrhage is rarely fatal, the margin of safety usually permits delay until lowered blood pressure has allowed clotting to take place. Death due to hemorrhage from gastric ulcer has usually been the result of repeated hemorrhages at comparatively short intervals. A recurrence of bleeding, therefore, a few days after a serious hemorrhage is more than a sufficient indication for operating during the active hemorrhage, rather than to risk further delay. In repeated or continuous small hemorrhages, which do not threaten the life of the patient, transfusion has proved of the greatest value, not only in controlling the bleeding by the introduction of the necessary elements for clotting, but also adding greatly to the safety of later operative measures for the ulcer.

In the second group of cases of hematemesis, namely, the cases in which there is no surgical lesion in the stomach, a variety of diseases and conditions call for consideration, and they may advantageously be divided into groups as follows:

1. Cases in which there are recognizable changes in the liver or spleen or both; a group in which hepatic cirrhosis and splenic anemia are representative.

2. Cases in which a chronic infective focus, such as a diseased appendix or gallbladder, is apparently responsible for the bleeding.

3. A group which includes, in the main, such acute infections as typhoid, pneumonia, etc.; multiple hemorrhagic erosions; cases in which no changes can be demonstrated either at necropsy or operation, and the cases of "gastrostaxis" of Hale White.

The differential diagnosis of these various groups is not made without difficulty, and the ordinary difficulties are exaggerated by the fact that many conditions such as hepatic cirrhosis, appendicitis, or gallbladder disease are associated with disturbances in gastric digestion, which may easily be misinterpreted as due to ulcer. Hematemesis added to such a syndrome has not infrequently resulted in unnecessary and unsuccessful operations based on an erroneous diagnosis of gastric ulcer.

Hepatic cirrhosis and splenic anemia are relatively often the cause of hematemesis in this extrinsic group, and if one bears in mind the ease with which mucosal hemorrhages take place in these diseases, and the fact that such hemorrhages have the same characteristics as those associated with the other more or less obscure causes in the group, it seems to be suggested that the liver or spleen or both offer a key to the explanation as to the manner in which many, if not all, these mysterious hemorrhages take place.

The close association of the spleen and the liver, both in the normal physiologic and anatomic relationship, and in disease processes, necessitates the most careful consideration of the spleen in all conditions which involve the portal circulation. It must be remembered, too, that the spleen, or liver, or both, may be responsible for gastric hemorrhage, and yet themselves not exhibit any evidences of disease. I recently published the history of a case in which I removed a slightly enlarged spleen, chiefly on an empirical basis, from a patient who had had various operations, mainly gastric, in an effort to find the cause of, and to prevent, gastro-intestinal bleeding. This patient has had no bleeding since the splenectomy. Various writers, particularly Rolleston,¹ have attributed gastric hemorrhage in such cases to a "latent" hepatic cirrhosis.

The treatment by splenectomy of moderately advanced hepatic cirrhosis is as yet in the experimental stage. The disease is usually so slowly progressive that even though the immediate results have been satisfactory we do not feel justified in drawing conclusions from the cases in which we have performed splenectomy. Nevertheless, there appears to be a definite group of so-called primary hepatic cirrhoses produced by toxins originating in, or elaborated in, the spleen. So in those cases in which hematemesis occurs in what might be termed the precirrhotic stage of hepatic cirrhosis, that is, when the cirrhotic changes are scarcely visible either grossly or microscopically, splenectomy may be indicated, if the spleen is large. Under such circumstances the operation may be looked on as probably a curative measure.

It is a significant fact that in those cases of gastric hemorrhage which show only slight erosions in the mucosa of the stomach, micro-organisms may be obtained from the depths of the erosions and the same organisms may be obtained from the spleen (Rosenow²); moreover, it has been shown that various forms of encapsulated bacilli will produce gastric and intestinal hemorrhages. These bacteria, although differing in some respects, have one power in common, namely, the power to exert a "specific effect on blood vessels and produce changes in the blood itself." Letzenberg early reported the recovery of the bacillus of Friedländer from hemorrhagic areas in the mucosa of the stomach and intestine of a child dying from gastro-intestinal hemorrhage. We know also that in

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Rolleston, H. D.: *Diseases of the Liver, Gallbladder and Bile Ducts*, London, Macmillan, 1914, p. 268.

2. Rosenow, E. C.: Personal communication to the author.

certain cases of syphilis associated with anemia, the spleen contains spirochetes in large numbers (Giffin³). The liver, deriving as it does a large quantity of its blood from the spleen, has every opportunity for picking up toxins and bacteria from the spleen. Thus the spleen must also be recognized as a possible causative factor, not only of changes in the liver, but directly or indirectly, of gastric hemorrhage.

In recurring gastric hemorrhage in which demonstrable lesions in the stomach or duodenum are not present, and other extrinsic causes have been excluded, the rôle of the spleen should be investigated. It is even possible that in such cases when bleeding is sufficient to endanger the patient's life and when the primary focus of infection is not determined, splenectomy (if the spleen is enlarged) may be an indication by reason of the mechanical influence of lessening the venous return to the stomach.

The group of cases in which there is an obvious focus of infection includes cholecystitis, pancreatitis, salpingitis, tuberculous peritonitis, and appendicitis. In these and other conditions, gastric hemorrhage may occur, and not only is a positive diagnosis usually possible, but treatment as a rule is successful.

Several cases of gastric hemorrhage have been observed in our clinic in which there was well-marked appendicitis, and appendectomy seemed to show that the appendix had been the primary cause of the bleeding. Moynihan² early drew attention to this fact. Eusterman⁵ has shown that about 2 per cent. of appendix cases and about 5 per cent. of gallbladder cases with marked reflex gastric symptoms gave a history of previous bleeding. The spleen also may act as a primary focus of infection, although our present knowledge would indicate that it acts rather as a medium through which infection from a distant focus is transmitted to the liver.

The group of cases in which fatal or serious gastric hemorrhage occurs and no cause can be demonstrated has been the subject of much controversy. Unless the primary cause for such hemorrhage is found surgical treatment is not clearly indicated, and the same statement is true regarding those acute infections such as typhoid, pneumonia, and in cases of mucous erosions which are so often multiple and occasionally seen at necropsy.

In reviewing these various groups, there are several facts which strongly suggest that gastric hemorrhage may be produced through the same channel in all, namely, the portal circulation. We know, for example, that hepatic cirrhosis is a frequent cause of hematemesis; that hematemesis is often toxic in origin (Adami⁶); that a large part of the blood of the body is transmitted through the liver; and that toxic foci which are associated with gastric hemorrhage are found, especially in the abdomen. Is it not possible that these various focal infections produce chemical or physiologic changes in the liver, changes which, if the cause is not eradicated, progress to the cirrhotic liver? It would seem further possible that the liver under such circumstances may in some manner sufficiently lower the resistance of the gastric

mucosa to permit the bacteria, which are consistently present in both true gastric ulcer and in mucous erosions, and which may reach the stomach either by the blood stream or by the food, to set up those diffuse or localized tissue changes.

In other words, it is probable in many of these gastric hemorrhages in which a primary causative focus is established, that the conditions which result in hematemesis are largely under the control of the liver; and since the spleen is so intimately concerned in the functions of the liver, it, too, must be looked on as an important factor.

RECAPITULATION

It should be emphasized that the surgical significance of gastric hemorrhage demands:

1. The proof that a gastric hemorrhage has taken place.
2. The determination and eradication of the originating cause, whether chronic surgical lesions in the stomach, or extrinsic foci.
3. The treatment of the hemorrhage per se, the general indication being to carry out operative treatment during the interval between hemorrhages.
4. The recognition of the possibility that many of the extrinsic causes of gastric hemorrhage are toxic in nature, and that the infection takes place by means of the portal circulation through the liver.
5. That not only is the liver of first importance in these heretofore unexplained hemorrhages, but the spleen, by reason of its close association with the liver, is probably an important factor in the problem.⁷

ABSTRACT OF DISCUSSION

DR. FRED B. LUND, Boston: The recognition that the condition of the spleen may be of importance in repeated acute gastric hemorrhages seems to me destined to be of distinct value. I do not know anything more worrisome to the surgeon than to be called to a case of acute gastric hemorrhage at a distance in the country—a case that has not been studied, or blood examinations made—where he is tempted to employ operative measures to stop the hemorrhage. I have learned that it is poor practice, when the patient is depleted by hemorrhage, to open the stomach and try to grasp the artery in the bottom of an ulcer; also, when hemoglobin is down to 20 per cent. to try to do extensive resection is foolish. Even if the patient dies of hemorrhage, he is more sure to die if we operate than if we let him alone, and the majority of hemorrhages are not fatal. Even the question of a transfusion ought to be put off for a time, because one does not want to increase the blood pressure. The cases most benefited by transfusion are repeated small and frequent hemorrhages from a gastric ulcer. In these cases we must never forget extrinsic causes.

DR. DONALD C. BALFOUR, Rochester, Minn.: I wish to thank Dr. Lund for drawing such particular attention to the treatment of gastric hemorrhage per se. That is a subject worthy of a separate paper. I have desired to emphasize the possibility that many of these mysterious hemorrhages are more or less directly concerned with the liver and the portal circulation, and that the spleen, though it may possibly be a focus of infection, is more likely a medium through which the necessary infection takes place to produce gastro-intestinal hemorrhage.

7. In addition to the references cited in the text, the following will be found of interest:

3. Giffin, H. Z.: The Treatment by Splenectomy of Splenomegaly with Anemia Associated with Syphilis, *Am. Jour. Med. Sc.*, 1916, **152**, 5-16.

4. Moynihan, B. G. A.: Appendix Dyspepsia, *Brit. Med. Jour.*, 1910, **1**, 241-244.

5. Eusterman, G. B.: Incidence and Diagnostic Value of Blood or Hemorrhage in Gastric and Intestinal Lesions, a Clinical and Statistical Study, *St. Paul Med. Jour.*, 1913, **15**, 587-593.

6. Adami, J. G., and Nicholls, A. G.: Principles of Pathology, Philadelphia, Lea and Febiger, 1909, **2**, 408.

Balfour, D. C.: Splenectomy for Repeated Gastro-Intestinal Hemorrhages, *Ann. Surg.*, 1917, **65**, 89-94.

Armstrong, G. E., and Mullaly, E.: Fatal Gastro-Intestinal Hemorrhage, *Am. Jour. Med. Sc.*, 1914, **147**, 803-809.

Litzenberg, J. C.; discussion, McClanahan, H.: Hemorrhage in the Newborn, *THE JOURNAL A. M. A.*, Oct. 13, 1906, p. 1147.

Mayo, W. J.: Ulcer of the Stomach and Duodenum, with Special Reference to End-Results, *Ann. Surg.*, 1911, **54**, 313-320.

White, W. H.: Gastrostaxis, or Oozing of Blood from the Mucous Membrane of the Stomach, *Lancet*, London, 1910, **2**, 1125-1189.

Clinical Notes, Suggestions, and New Instruments

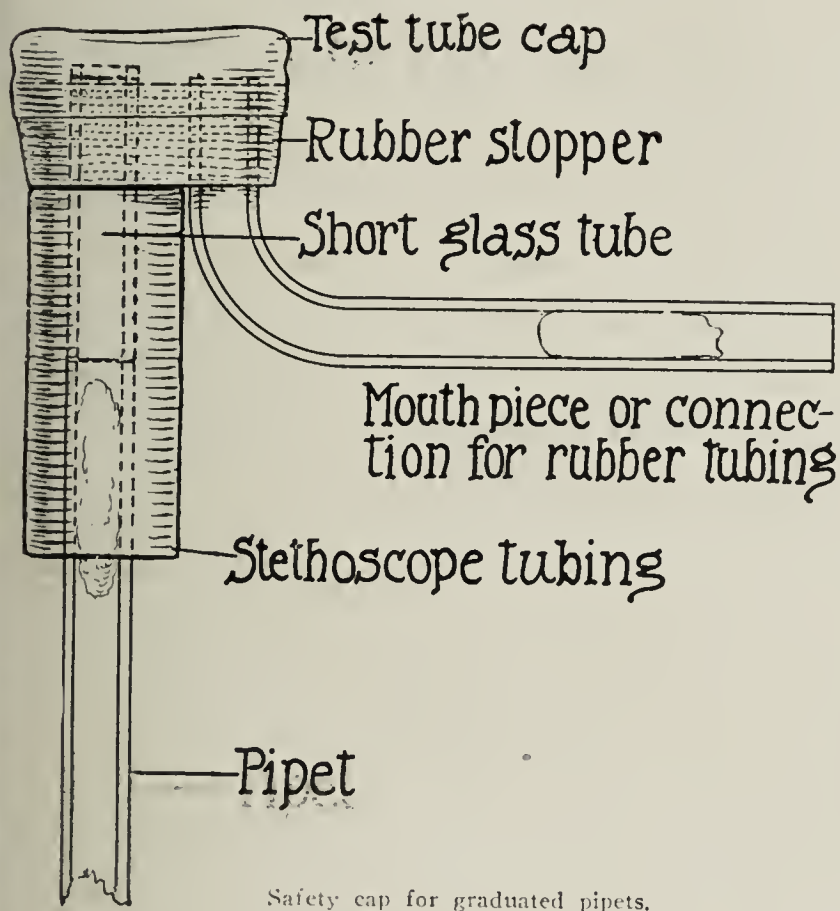
A SAFETY CAP FOR GRADUATED PIPETS*

FREDERICK L. GATES, M.D., NEW YORK

A certain number of laboratory infections are traceable to the handling of pathogenic micro-organisms in pipets which are filled by suction with the mouth and emptied gradually by the admission of air under the ball of the finger. Such accidents may occur either from infection of the end of the pipet by a contaminated finger or from sucking organisms into the mouth, an occurrence against which cotton plugs are not a sure protection.

Rubber bulbs and other simple vacuum and pressure devices are not sensitive enough for use with graduated pipets when accurate control of the meniscus is desired. Even when carefully handled, the elasticity of the contained air is a disturbing factor.

With semifluid cultures also, such as are used in the cultivation of spirochetes, the negative pressure of a collapsed



Safety cap for graduated pipets.

rubber bulb is not sufficient to cause the medium to be forced into a capillary pipet.

The safety cap illustrated herewith obviates the danger mentioned, and yet gives accurate control of the delivery of liquid from the pipet. It consists of a section of two-hole rubber stopper (No. 0 or 1), 1 cm. thick, over which a flat rubber test tube cap¹ is slipped. It may be cemented in place, although that is not necessary. An L of glass tubing forms an easily sterilized mouthpiece, which may be further safeguarded by a cotton plug.

Two cotton plugs and the space in the cap are almost a sure protection against the aspiration of liquid. Connection with the pipet is made by a stub of straight glass tube, which projects into the cavity of the cap and carries a short length of heavy rubber stethoscope tubing. This is more elastic than a rubber stopper, and admits various sizes of pipets.

To give a stiff resistance to pressure from above, the pipet should be pushed into contact with the short glass tube. The

finger, pressing the smooth, thin rubber cap down on the end of this tube, controls the delivery of liquid with perfect sensitiveness. Fractions of a division on the pipet may be measured, and the column of liquid is obedient at any speed of delivery.

If from strong suction in filling the pipet the cap tends to collapse over the glass tubes it may be held away by pressure of the forefinger against its rounded edge.

An additional advantage of the safety cap is that the pipet is held at an angle with the line of vision, so that the meniscus is easily visible as it rises in the bore. When several pipets are in use at one time, it is convenient to fit each of them with a cap.

LIQUID AGAR-AGAR IN CONSTIPATION

ORVILLE HARRY BROWN, M.D., AND WILLIAM OSCAR SWEET, M.D.,
PHOENIX, ARIZ.

Constipation may be caused by any one of a number of factors. In certain cases it is imperative that a tumor be removed, that adhesions be destroyed, or that other maldevelopment be eliminated before the desired improvement can be obtained.

As constipation increases in severity, there is a tendency for the development of a vicious circle. The longer fecal material lies in the colon, the more inspissated it becomes, and hence the less likely will an ordinary peristaltic wave dislodge it. As fecal material accumulates in the colon, the weight drags the colon lower and lower. The feces become molded to the wall of the bowel and fail to stimulate to peristalsis.

Even in those cases in which there is a definite mechanical constriction of the lumen of the bowel, some good may be expected by keeping the fecal material soft. To do this, agar-agar has been used with noteworthy success. It works by absorbing water and softening the bowel contents; it is indigestible. In the main the agar has been administered with breakfast foods, sauces, etc., by simply mixing the dry powder or shreds with the food.

It occurred to each of us that if liquid agar were taken into the body, greater good might occur. In order for agar to be liquefied, it must be boiled in water, usually for ten minutes or longer. But it stays liquid until cooled almost to blood temperature; and then it is gelatinous until cooled a number of degrees below body temperature. Therefore if the agar is taken into the stomach while liquid, the body heat will prevent it from solidifying past the jelly stage. We reasoned that if a sufficient amount of the liquid agar were taken, and with enough water, the feces would be softened more efficaciously than when the same amount was taken dry.

The taste of the liquid agar, slightly flat and insipid with perhaps a little musty suggestion, is as a rule not disagreeable; but to some its taste is highly displeasing. To mask the taste, we have advised various procedures. Taste is an individual matter, and hence the preparation pleasing to one may be disagreeable to another. In order to hope for benefit from the use of the agar, it must be prepared so palatable that the patient will willingly take it in sufficient quantity, frequency and duration.

The directions we ordinarily give for its preparation are as follows:

Take 2 heaping tablespoonfuls of the agar powder, flakes or shreds; add to 1 quart of water and boil till the agar is thoroughly liquefied; sweeten and add juice of one lemon; then drink the entire quart while hot.

A quart is a considerable quantity of liquid for some persons to consume in the course of a few minutes. Heating the agar over or preparing smaller amounts several times a day is a laborious task. We have met this problem by having the patient provide himself with a quart vacuum bottle. The quart of hot agar lemonade can be prepared in the morning, poured into the vacuum bottle, and taken leisurely during the day. We have become convinced that the material is most efficacious when taken between meals.

We have had patients make use of orange, grape fruit, vanilla, maple or other flavoring in place of the lemon. A coffee, chocolate or tea may be prepared and be most pleas-

*From the Department of Pathology and Bacteriology, the Rockefeller Institute for Medical Research.

1. Eimer and Amend; Catalogue C, Fig. 6026, $\frac{3}{4}$ inch.

ing. Again a bouillon agar may please. We have one patient who preferred to take the hot agar with only a pinch of salt added. Another takes it cooked with a cereal; this should not be allowed to cool before it is eaten.

As each patient has his own idiosyncrasies as regards taste, he will be disposed to guide the flavoring of the agar.

The liquid agar will not have its beneficial effect usually until used several days. Commonly, however, some good will be apparent within a week if a quart of hot agar is taken daily. At the end of a few weeks, it may be that a tablespoonful of the agar or even less to a quart will suffice for the day's supply.

In case the 2 tablespoonfuls of agar to a quart of water daily is not productive of benefit within two weeks, the amount of agar should be increased. We have had patients who took more than double this amount before good results were

Special Article

AT FORT OGLETHORPE

The medical officers at Ft. Oglethorpe, Ga., believe that the War Department merits special praise for selecting that place for their training camp. Many of the physicians from the Eastern and New England States, who were dreading the ordeal of spending a summer in the Southland, are now sympathizing with their less fortunate brethren who are detained in the hot northern cities. The customary morning greeting here is, "How many blankets did you require last night?"

The camp is located in beautiful Chickamauga Park. It is a veritable gold mine of historic interest. There are scores



INSTRUCTORS AND STUDENT OFFICERS.—This rank has no reference to the rank held by the men in the service, but is given hats are captains in the student officers' companies. The first and second lieutenants are indicated by white badges over

FRONT ROW, LEFT TO RIGHT: 1. First Lieut. Llewellyn Powell; 2. First Lieut. Allen H. Walker; 3. First Lieut. Richard S. Spahr; 4. First George M. Piersol; 9. Capt. Thomas R. Chambers; 10. First Lieut. Charles S. Flagler; 11. Capt. James F. Coupal; 12. First Lieut. Conrad Alexander D. Parce; 18. Capt. Calvin D. Cowles, Jr.; Major Raymond C. Turck; 20. Lieut.-Col. Henry Page, M. C.; 21. Major Roger Brooke, M. C. Walter R. Weiser; 28. First Lieut. Damon B. Pfeiffer; 29. Major William Pepper.—SECOND ROW: 1. Capt. Albert E. McEvers; 2. First Lieut. Roscoe 7. First Lieut. Edward D. Ellis; 8. Capt. Richard Hirsch; 9. First Lieut. William H. Barrow; 10. First Lieut. Arthur R. Weed; 11. First Lieut. Devron; 16. First Lieut. Robert E. Siebels; 17. Capt. Frank Fogle, 9 M. Corps; 18. Capt. Dunning S. Wilson; 19. First Lieut. William W. Jarrell; Lieut. Eugene J. McCarthy; 25. Capt. Henry S. Beckford; 26. Major George F. Keenan.—THIRD ROW: 1. First Lieut. Theodore Le Boutillier; 2. First 7. Capt. Elliott Edie; 8. First Lieut. George Dorsey; 9. First Lieut. Widner E. Doremus; 10. First Lieut. T. Z. Cason; 11. Capt. William E. Butler; Lieut. Henry T. Nicolle; 17. Capt. Eugene Davis; 18. First Lieut. Frederick J. Quigley; 19. First Lieut. Gustave P. Grabfield; 20. First Lieut. William 25. First Lieut. Charles J. Cole; 26. First Lieut. William H. McLain; 27. Capt. John T. Halsell; 28. First Lieut. Thomas V. Williamson; 29. First

obtained. We have had a very few who have apparently used the agar faithfully and yet have received no benefit.

SUMMARY

We recommend agar-agar for constipation; it seems to be most efficacious when taken hot. It is most readily taken as a hot lemonade, chocolate or bouillon. Other therapeutic measures directed at the removal of mechanical obstructions should also be employed.

of monuments on every hand, which relate the stories of valor and bloody struggles of the days of Sixty-Three. Occasionally one is surprised to find how much fighting can be done without large casualty lists. One of the officers ran across a monument erected to a battery of artillery, which bore an inscription relating how it fought for twelve hours before it was compelled to retire, and suffered a loss of one man wounded, and one mule killed.

Every man is beginning to realize that it requires more than a thorough knowledge of medicine to make a competent military surgeon. The work is made easier and the attention of the men held more firmly by giving map readings, war games, etc., connected with the various battles fought in this vicinity, among which are the battles of Missionary Ridge and Lookout Mountain. The latter was the first battle ever fought above the clouds. Field hospital, ambulance companies and regimental units are formed and men assigned to work in them, which is a great factor in the training. Everyone knows that actual experience is a much better teacher than all the correspondence schools combined.

From the smallest town practitioner to the nationally known surgeons who are here, no one would forego the opportunities afforded of playing a part in the greatest drama the world has ever staged. The enthusiasm and spirit shown

recreation of the men during their off hours. Their comforts are well provided for, and if war had no greater hardships than they are undergoing at the present time, it is to be feared that the civilian population would be in dire need of physicians, as there would be nothing but military surgeons. Many of the men have brought their families, and each week end is filled with teas, dinner dances and other social gayeties.

The health of the men is excellent, and about the only things the camp surgeon has had to treat thus far have been minor ailments, associated with healthful recreation.

The following is a list of the men at Fort Oglethorpe on August 1:

ALABAMA

Grace, Frank G., Birmingham
Scott, Walter F., Birmingham
Hudnall, J. R., Coalmont
Robbins, Wm. J., Ensley

CONNECTICUT

Poole, Lawrence E., Bridgeport
Sprague, Charles H., Bridgeport
Braude, Samuel Henry, New Haven



to student officers to indicate that they have obtained proficiency along certain lines. Those wearing white bands on their the left pocket and by red badges which do not show in this picture.

Lieut. J. Harry Collins; 5. First Lieut. Guy B. Denit; 6. First Lieut. John T. MacDonald; 7. First Lieut. William E. Wilmerding; 8. First Lieut. Wesselhoeft; 13. First Lieut. Russel R. Jones; 14. First Lieut. John A. Rogers; 15. Capt. David W. Parker; 16. Capt. Royal Reynolds; 17. Capt. 22. Major Robert L. Carswell; 23. Major Seartus J. Owen; 24. Major Bial F. Bradbury; 25. Capt. Mahlon Ashford; 26. Capt. Howard Fox; 27. Capt. L. Perkins; 3. First Lieut. Fred H. Bloomhardt; 4. First Lieut. William Bates; 5. Capt. Frank R. Maura; 6. First Lieut. Charles W. Comfort, Jr.; Henry F. Sawtelle; 12. First Lieut. Joseph R. Helff; 13. First Lieut. Newgate M. Owensby; 14. Capt. Elias M. Duffield; 15. Major John A. 20. First Lieut. James R. Wells; 21. First Lieut. Robert A. Kilduffe; 22. First Lieut. Walter B. Martin; 23. First Lieut. Ivy A. Pelzman; 24. First Lieut. Don Preston Peters; 3. Capt. William W. Babcock; 4. Charles E. Maxwell; 5. Capt. Edward J. G. Beardsley; 6. First Lieut. G. C. Tillman; 12. First Lieut. James J. O'Connor; 13. First Lieut. John H. Musser, Jr.; 14. First Lieut. Burr Ferguson; 15. First Lieut. John A. Farrell; 16. First A. Newbold; 21. First Lieut. Henry P. Brown; 22. First Lieut. J. R. Hudnall; 23. First Lieut. Frank Freeland; 24. First Lieut. Deslia H. Harris; Lieut. Charles H. Fait; 30. First Lieut. Edward A. Pitcairn.

in performing the duties assigned is something to be marvelled at. Every day spent here is an epoch in a man's life. An example from the many that could be given is the review held here a few days ago in which probably the greatest number of military surgeons ever assembled at one place were on parade.

Home talent vaudeville shows, golf tournaments, medical societies, etc., are among the many things arranged for the

Ferguson, Burr, Fairfield
Kilpatrick, Geo. C., Irvington
Armistead, John R., Jackson

ARKANSAS

King, Harry C., Ft. Smith

CANADA

Walker, Allan H., Toronto, Ont.

CALIFORNIA

Brooke, Roger, San Francisco

Butler, W. E., New Haven
Wilda, Edwin, New Haven
Comfort, Chas. W., New Haven
Weed, Arthur R., New Haven
Ganey, Joseph M., New London
Lawler, Daniel H., Windsor Locks

DELAWARE

Elliott, J. Roscoe, Laurel

DISTRICT OF COLUMBIA

Collins, J. H., Washington

Heller, Joseph M., Washington
Marks, Wm. G., Washington
Maxwell, Chas. E., Washington
Ralph, Charles E., Washington
Sawtelle, Henry F., Washington
Whitson, Wm. E., Washington

FLORIDA

Brigham, P. H., Alton
Hoggatt, Wm. W., Bradentown
Davidson, James W., Clearwater
Howe, Roy, Daytona
Hubbard, Roscoe C., Ellenton
Tillman, G. C., Gainesville
Boyd, John E., Jacksonville
Cason, T. Z., Jacksonville
McKay, W. G., Jacksonville
Parramore, James B., Jacksonville
Leffers, Richard, Lakeland
Maura, Frank R., Myakka City
Izlear, Arthur L., Ocala
Watt, Harry F., Ocala
Hixon, Frank P., Pensacola

Castle, Leo F., Pocatello
Poole, Francis H., Pocatello

ILLINOIS

McEvers, Albert E., Chicago

INDIANA

McCausland, John W., Ft. Wayne

KENTUCKY

Moss, Morton M., Bowling Green
Veal, Marvin S., Daniel Boone
Henthorn, Arthur C., Garrison
Bedinger, John Van D., Louisville
Lanahan, Chas. R., Louisville
Carman, Wm. L., Paint Lick
Wilson, Dunning S., Waverly Hill

LOUISIANA

Roberts, James J., Baton Rouge
Adiger, David, New Orleans
Devron, John A., New Orleans

Shorkley, Thornton M., Kensington
Lamkin, E. E., Vienna

MASSACHUSETTS

Barrow, William H., Boston
Coupal, James F., Boston
Dunn, Joseph H., Boston
Grabfield, G. P., Boston
Hornor, Albert A., Boston
Sheehan, Edward B., Boston
Wesselhoeft, Conrad, Boston
Carter, Paul C., Chelsea
Johnson, Herbert L., Hadley
Rodger, James Y., Lowell
McCarthy, E. J., Malden
Pierce, Renel A., Taunton
Colwill, Albert W., Worcester

MICHIGAN

Bender, Fredk. Paul B., Caro
Coll, Charles A., Detroit

Newbold, Wm. A., Belmar
Conroy, John S., Burlington
Bull, William S., Cranbury
Gilpin, Friend B., Cranford
Vannatta, Geo. W., East Orange
Livingood, Horace R., Elizabeth
Reeves, John F., Elmer
Ruch, Valentine, Jr., Englewood
Brundage, Phillip E., Grantwood
Lewis, Livingstone L., Hoboken
Von Deester, Henry L., Hoboken
Mathesheimer, Jacob L., Jersey City
Sobin, Julius, Jersey City
Freeland, Frank, Maywood
Dodd, Samuel W., Montclair
Crawford, David H., Newark
Bernardinelli, Carvine, Newark
Go'ann, Daniel L., Newark
Maudeville, Frank N., Newark
Martland, Harrison S., Newark
Meeker, John L., Newark
Russell, Leslie C., Newark



MEDICAL OFFICERS' TRAINING

Mixon, Jos. A., Pensacola
Godard, Robert F., Quincy
Griffin, James B., St. Augustine
McClane, John W., St. Petersburg
Efird, Lester J., Tampa
Mitchell, Lucien B., Tampa

GEORGIA

Miller, Walter A., Arabi
Swafford, J. H., Athens
Horne, George Turner, Augusta
Bradbury, —, Ft. Oglethorpe
Cowles, —, Ft. Oglethorpe
Owen, —, Ft. Oglethorpe
Page, Henry, Ft. Oglethorpe
Parce, A. D., Ft. Oglethorpe
Pepper, William, Ft. Oglethorpe
Reynolds, Roval, Ft. Oglethorpe
Turk, —, Ft. Oglethorpe
Weiser, Walter, Ft. Oglethorpe
Jarrell, Wm. W., Thomasville
Morton, Hebar J., Waynesboro

IDAHO

Arntzen, Julius L., Paris

Huhner, Ed. J., New Orleans
Nicolle, Henry T., New Orleans
Sentell, Newton W., Shreveport

MAINE

Haskell, William L., Lewiston
Allen, Harold M., Norway

MARYLAND

Chambers, Thomas R., Baltimore
Dew, William, Baltimore
Dorsey, G. H., Baltimore
Hayward, Eugene H., Baltimore
Kloman, E. H., Baltimore
Linthicum, Edgar S., Baltimore
O'Connor, J. J., Baltimore
Ostro, Marcus, Baltimore
Owensby, Newdigate M., Baltimore
Peters, Don B., Baltimore
Richards, Walter L., Baltimore
Rosenthal, Lewis J., Baltimore
Sandrock, Edgar P., Baltimore
Conrad, Thomas K., Chevy Chase
Cawley, Wm. D., Elkton

MINNESOTA

Stickney, Henry L., Rochester

MISSISSIPPI

Donald, Robt. M., Hattiesburg
Walley, David, Richton
Edwards, Chas. R., Vicksburg

MISSOURI

Marshall, Benjamin J., Agricultural College

NEW HAMPSHIRE

Helff, Joseph R., Keene
Parker, David W., Manchester
Rogers, John A., Nashua

NEW JERSEY

Doremus, Widner E., Arlington
Guion, Edward, Atlantic City
Schvich, George, Atlantic City
Failing, Brayton E., Atlantic Highlands

Young, James J. L., Newark
Zehnder, A. C., Newark
Cole, Blase, Newton
Sands, Ord L., Orange
Duffield, Elias M., Pitman
Vroom, William, Ridgewood
Beardsley, Edward J. G., Spring Lake Beach
Kirkpatrick, Murray B., Trenton
Mitchell, Chas. H., Trenton
Potts, Morris Le Roy, Trenton
Rogers, Laurence H., Trenton
Seibert, Raymond S., Trenton
Quigley, F. J., Union Hill
Bising, Albert G., Weehawken

NEW YORK

Sherman, D., Brooklyn
Vose, Royden M., Ithaca
Downtin, Ernest W., Kirkwood
Moore, A. H., New Rochelle
Crandal, John K., New York
Derby, Richard, New York
Edgar, J. C., New York
Felderman, Leon, New York

Fox, Howard, New York
Groff, Parker A., New York
Hicks, Ernest L., New York
Le Comte, John R., New York
McCain, Gilpin M., New York
Rosenberg, Jacob, New York
Walsh, James J., New York
Young, C. H., New York
Shaul, E. B., Richfield Springs
Sprague, John T., St. George
Farrell, J. A., Saranac Lake

NORTH CAROLINA

Orr, Claude V., Andrews
Miller, John F., Ashboro
Cocke, Eugene R., Asheville
Aberneathy, Eric A., Chapel Hill
Bangle, James A., Charlotte
Caldwell, Jos. H., Charlotte
Townsend, Maurice L., Charlotte
Shull, J. Rush, Cliffside
Flowers, Chas. E., Columbia
Buchanan, Sidney E., Concord

PENNSYLVANIA

Bloomhardt, Fred H., Altoona
MacDonald, John T., Blooms-
burg
Kilduffe, R. A., Chester
Edie, E. B., Connellsville
Brant, Noss D., Crafton
Lohr, F. D., Derry
Jones, Russel R., Edgewood
Cole, Charles J., Elkins Park
Roberts, Silvia J., Etters
Coover, Carson, Harrisburg
Perkins, Roscoe L., Harrisburg
Calvin, Webster, Hollidaysburg
Keilty, Robert A., Lansdowne
McKenna, John A., Lansdowne
Ober, Bert F., Latrobe
Simpson, Frederick P., Mapleton
Depot
Gorman, Henry A., Mont Alto
Makler, Jacob S. P., Mont Alto
Vates, Charles W., Mt. Oliver
Davidson, Carlton H., New Salem

Pfeiffer, Damon P., Philadelphia
Piersol, G. M., Philadelphia
Reynolds, Charles B., Philadelphia
Skillem, Samuel Ruff, Jr., Phila-
delphia
Sommerville, Caleb W., Phila-
delphia
Strotz, Chas. M., Philadelphia
Tait, C. H., Philadelphia
Tunnell, S. Wilmer, Philadelphia
Watt, C. C., Philadelphia
Wells, J. R., Philadelphia
White, Howard K., Philadelphia
Baker, Moses H., Pittsburgh
Penz, Ferdinand L., Pittsburgh
Buka, Alfred J., Pittsburgh
Calhoun, John C., Pittsburgh
Katzenstein, Milton B., Pittsburgh
Kennedy, David D., Pittsburgh
Gibbons, Leo P., Scranton
Jones, Orlando A., Sharon
Flagler, Charles S., Stroudsburg
Prowitt, Homer P., Washington

Sellers, Robert R., Erwin
Hill, Lucius D., Knoxville
Porter, Arthur R., Jr., Memphis
Walker, Howard L., Memphis
Watkins, Edwin D., Memphis
White, Jos. M., Memphis
Elmore, William T., New Market
Shelton, Joseph R., Oliver Springs
Horton, George E., Wartrace

TEXAS

Davis, Arthur E., Arbala
Fields, Knight W., Dallas
Ashford, Mahlon, Harlingen
Hill, Julius H., Heath
Halsell, John T., Laredo
Dinwiddie, Robert L., San An-
tonio
Carswell, R. L., Texas City
Stagner, George H., Waco

VERMONT

Ellis, Edward D., Poultney



CAMP, FORT OGLETHORPE, GA.

Smoot, Marvin Le Roy, Fayette-
ville
Boyles, Jos. H., Greensboro
Dees, Ralph E., Greensboro
Henderson, Thomas B., Henderson
Burrus, John T., High Point
McAnally, Wm. J., High Point
Sloan, David B., Ingold
Vernon, J. W., Morganton
Winstead, John A., Nashville
McKay, William P., Red Spring
Wilmerding, W. E., Selma
Sherril, Coite L., Statesville
Thompson, Alex F., Troy
Blair, Wm., Wilmington
Hunter, Wm. B., Wilmington
Thames, John, Wilmington
Lockett, Everett A., Winston-
Salem

NORTH DAKOTA

Brown, Frederick K., McClusky

OHIO

Brhm, Gilbert W., Columbus
Walker, Chas. S., Plymouth

Edgar, Joseph C., Oakmont
Halligan, John B., Petersburg
Albrecht, Herman E., Philadel-
phia
Aronson, Jos. D., Philadelphia
Ashton, Wm. E., Philadelphia
Babcock, Wm. W., Philadelphia
Bates, William, Philadelphia
Bernd, Leo H., Philadelphia
Bowne, Charles J., Philadelphia
Bready, Wm. R., Philadelphia
Bunting, Josiah T., Philadelphia
Burns, Stillwell C., Philadelphia
Farr, Clifford B., Philadelphia
Ferris, Francis H. S., Philadelphia
Gaskill, Henry K., Philadelphia
Hancock, Frank, Philadelphia
Laws, Geo. M., Philadelphia
Le Boutillier, Theodore, Phila-
delphia
McConaghy, Albert, Philadelphia
Mintzer, Geo. S., Philadelphia
Moore, Allen H., Philadelphia
Newcomet, Wm., Philadelphia
O'Drain, Thomas I., Philadelphia

Sample, Clyde W., Wilkinsburg
Monroe, Harry S., Wind Ridge
Weaver, Louis S., York

PHILIPPINE ISLANDS

Hugh, George B., Manila

RHODE ISLAND

Harrop, Daniel S., Cranston
Bertholet, George P., Pawtucket
Fickett, Francis H., Providence
Brown, H. F., Jr., Providence

SOUTH CAROLINA

Parker, Francis L., Charleston
Mobley, Marion R., Florence
Harrison, John D., Greenwood
Major, Everett C., Latta

TENNESSEE

Feaster, Orion O., Chattanooga
Hillas, William J., Chattanooga
Ingalls, Albert T., Chattanooga
Long, Samuel H., Chattanooga
Roberts, Gilbert M., Chattanooga

VIRGINIA

Motley, J. C., Abingdon
Powell, L., Alexandria
Ramsey, Alvah, Burkeville
Wood, Thomas M., Hampton
Firebaugh, Thos. C., Harrisonburg
Dodd, Thomas F., Lincolnia
Williamson, Thos. V., Norfolk
Haller, David A., Pocahontas
Roper, Lonsdale J., Portsmouth
Denit, Guy B., Radford
Ezekiel, Gerald A., Richmond
Peple, Wm. L., Richmond
Rollings, John A., Roda
Harris, Wm. A., Spotsylvania
Chewning, Wm. J., The Plains
Shackleford, Robt. S., The Plains

WEST VIRGINIA

Davis, Eugene A., Charleston
Mendeloff, Morris J., Charleston
Powell, Rawley H., Fairmont
Irving, Chas. R., Hansford
Clay, Calvin C., Martinsburg
Fogle, Fred M., Rowlesburg
McLain, Wm. H., Wheeling

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address "Medic, Chicago"

Subscription price Five dollars per annum in advance

*Contributors, subscribers and readers will find important information
on the second advertising page following the reading matter*

SATURDAY, AUGUST 11, 1917

THE EFFECT OF STARVATION ON INTESTINAL BACTERIA

The prevalence of micro-organisms in the alimentary canal is a well recognized feature of the manifestations of the digestive functions. It is generally known that much of the dry matter of the feces consists of the bodies of bacteria, most of which are dead. How large a contribution to the excrement is furnished by those micro-organisms that have found their way into the alimentary tract, or have been developed within it, cannot readily be estimated. As might be expected from the varying nature of the diet of adults, carrying with it quite unlike amounts of indigestible matter, the admixture of bacterial bodies must be widely different under different regimens. When one reads, in the textbooks, that probably about one third of the dry substance in the stools of normal adults is bacteria, it must be borne in mind that the statistics reported by different investigators range from 9 to 42 per cent. It is even stated that in infants with pronounced constipation two thirds of the dry substance of the feces has been found to consist of bacteria. In some cases over 50 per cent. of the total nitrogen of feces has been reported to be of bacterial origin.¹

There has been considerable discussion concerning the factors which may alter the character of the intestinal flora; and the possible effects of changes in diet in this respect have been reviewed from time to time in THE JOURNAL. Less information is available regarding variations in the number of micro-organisms that inhabit the alimentary tract. The bacteria-free condition in which this starts its functions prior to the discharge of the meconium after birth is soon followed by a practically permanent state of bacterial invasion to the very end of life. The hope of effecting a sterilization of the long gastro-intestinal canal has often been awakened, only to fade away before the realization of the impossibility of accomplishing such a result without destruction to the living tissues amid which the micro-organisms are harbored.

The output of fecal bacteria has been found to undergo a decrease under the influence of water drinking with meals.² In animals, Cushing and Livingood³ found that, after a period of twenty-four hours' starvation, a relative amicrobism of the small intestine results. This has been verified recently by Sisson⁴ in the Department of Pediatrics and Bacteriology, Johns Hopkins University. Examination of the intestinal contents after periods of starvation shows definite changes in the number of organisms, contrasting with the profusion of bacterial growth normally found. Changes in the kinds of organisms persisting after periods of starvation were not noted. The greatest diminution was observed in the duodenum; in some instances, however, but few organisms were present in the contents of the ileum. The contrast between the paucity of organisms at this level and the large number present in the cecum was striking. Although the number of organisms is, to a great extent, dependent on the food residue present, absolutely sterile specimens were never obtained, even after the food residue was undoubtedly absent. Thus the condition produced by starvation is, as Sisson expresses it, one of relative amicrobism.

FOOD POISONING, WITH SPECIAL REFERENCE TO BOTULISM

There are but few persons who have not suffered from more or less severe attacks of acute gastro-intestinal disturbance which could be reasonably ascribed to something eaten shortly before. By far the most of such attacks are mild and quickly overcome, and it is only when the attack is serious and affecting many persons at the same time that it attracts particular notice, and becomes perhaps the subject of public record. In his valuable little book on food poisoning, Jordan⁵ points out that as cases of food poisoning are not required to be reported, we possess only imperfect information as to its occurrence, casual press reports being the only available source of information as to its prevalence. Through press-clipping bureaus and other sources, from October, 1913, to October, 1915, Jordan learned of 657 group and family outbreaks and 375 individual cases in this country. The group and family outbreaks involved over 5,000 persons. He believes that at present probably the majority of instances escape notice and that the number of persons affected by food poisoning in the United States in the course of a year is much larger than indicated by the figures he obtained. Until we have a larger amount of dependable data, any

1. MacNeal, Latzer and Kerr: Jour. Infect. Dis., 1909, 6, 123.
Blatherwick, Sherwin and Hawk: Jour. Exper. Med., 1911, 14, 433.
Blatherwick and Hawk: Biochem. Bull., 1913, 3, 28.

2. Mattill, H. A., and Hawk, P. B.: Jour. Am. Chem. Soc., 1911, 33, 1999. Blatherwick, N. R., and Hawk, P. B.: Biochem. Bull., 1913, 3, 28.

3. Cushing, H., and Livingood, L. E.: Contributions to the Science of Medicine by Pupils of Welch, 1900, p. 543.

4. Sisson, W. R.: Experimental Studies of the Intestinal Flora, Am. Jour. Dis. Child., February, 1917, p. 117.

5. Jordan, E. O.: Food Poisoning, University of Chicago Press, 1917

general conclusions of value as to the exact causation, frequency, and immediate and remote results cannot be drawn. As ordinarily understood, food poisoning is due to the composition, contents or contamination of food. It includes intoxication by organic poisons in normal animal or plant tissues; the results of eating food into which poisons, mineral or organic, have been introduced by accident or in order to improve the appearance or keeping qualities; infections from the ingestion of bacteria and other parasites present in foods, the most important food-borne bacterial infections being typhoid fever, cholera, tuberculosis, paratyphoid infections and milk-borne diseases, such as diphtheria, scarlet fever and streptococcus sore throat; and poisoning due to the development of toxic substances in food by the growth of bacteria and other micro-organisms.

At this time, when domestic canning of vegetables is being taken up on a large scale, it may not be without interest to mention some of the chief facts known about botulism, the best established form of poisoning by means of toxic bacterial products in food. This poisoning was described in 1820 by Kerner, German poet and medical writer, who cited 174 cases with seventy-one deaths, in most instances connected with the use of smoked sausage (hence the name botulism, from *botulus*, sausage). Paratyphoid infections may be conveyed by sausages also, and such infections must be distinguished from botulism, which has a characteristic set of symptoms and a distinct cause. Quite a number of instances of botulism have been recorded in this country, and traced to ham, beans and other foods, so that the name "sausage poisoning" is hardly appropriate any longer. In botulism the nervous system is strikingly involved. Dizziness, double vision, difficulty in chewing and swallowing, and other nervous symptoms occur; there is no fever, and in contrast with the traditional type of food poisoning there may be only slight or no gastro-intestinal symptoms. Stiles⁶ thus describes his own attack, most likely due to minced chicken:

Vertigo and nystagmus developed [a few hours after eating] in a startling degree, the car [in which I was being taken to my house] seemed to be ascending an endless spiral, the stars made circles in the sky, and the houses by the wayside reeled. The lighted doorway of my house seemed to approach and surround me as I was carried in. My bed for the moment presented itself as a vertical surface which I could not conceive to be a resting place. . . . Whenever I opened my eyes on this day [the next day] the impression of gyration of the room was appalling. . . . To turn my head even very slowly from one side to the other brought an accession of the overpowering giddiness. . . . [Eight days after the beginning of the attack] the nystagmus now became limited to momentary onsets, but in its place I became aware of a peculiar diplopia. The image of one retina was not merely displaced from the position of its fellow, but was tilted about 15 degrees from parallel. . . . This fantastic diplopia gradually gave place to the familiar variety, and this occurred

less and less often as my convalescence proceeded. From [this date] my recovery pursued a course which was dishearteningly slow, but free from any setbacks. Among the persistent symptoms were . . . the visual difficulties mentioned. The left pupil was usually smaller than the right, and I thought I detected a slight failure to relax accommodation with the left eye. Reading was difficult for several weeks, and the ability to write, as requiring closer fixation, was still longer in returning.

The interval between eating the guilty food and the onset of symptoms usually is from twelve to forty-eight hours, but may be less. There are no distinct changes in the organs, the nervous symptoms being perhaps explainable as due to disturbances of the cerebral circulation with hemorrhages and thromboses in medulla and pons.⁷ The botulism poison is a toxin produced by the spore-bearing bacillus discovered by Van Ermengem and named by him *Bacillus botulinus*, a strict anaerobe, which does not grow in the human body, being limited in its pathogenic rôle to the toxin it develops in foods outside the body. Hence botulism is a strict intoxication, not an infection. We do not know anything about the distribution of this bacillus in nature. Its poison is a true bacterial toxin, which reproduces the clinical picture of botulism in animals, and when injected in small nonfatal doses it evokes the elaboration of a specific antitoxin. The bacillus apparently is widely distributed, but it seems as if the conditions for its entrance and multiplication in human food are not often present. Jordan states that practically all cases of botulism have been caused by food which has been given some sort of preliminary treatment, as smoking, pickling or canning, then allowed to stand for a time, and eaten without cooking. The growth of the bacillus in a food does not necessarily alter it in such a way as to arouse suspicion; meat that has caused botulism seems to have always come from sound animals, and beans causing botulism have also been noted as natural in appearance, taste and smell. It seems that meats and vegetables prepared in the home are more likely to give rise to botulism than those prepared in large canning factories in which steam under pressure is used. It would be a wise precaution always to heat thoroughly the food in canning and to reheat all prepared foods before eating, because *B. botulinus*, its spores and its toxin are destroyed by relatively slight heating. Foods like salads should not be allowed to stand over night before being served. When visual disturbances and other symptoms of botulism appear, the stomach should be emptied and cathartics given, because the poisoned food may remain for a long time in the digestive tract.

We probably have much to learn still in regard to the causes, varieties and symptoms of food poisoning. It would not be surprising if careful clinical study of cases would result in the differentiation of new forms not yet recognized as distinct. The progress of knowl-

6. Stiles, P. G.: A Case of Apparent Food-Poisoning of the Type Known as Botulism or Allantiasis, *THE JOURNAL A. M. A.*, Dec. 27, 1913, p. 2301 (cited by Jordan).

7. Wilbur, R. L., and Ophüls, William: Botulism, *Arch. Int. Med.*, October, 1914, p. 589.

edge of food poisoning would be furthered greatly if it were made reportable to our health authorities; this would lead to closer investigation, which eventually would result in better means of treatment and prevention.

NO NEED FOR DRAFTING THE MEDICAL PROFESSION

It is to be regretted that there has been so much hysteria in regard to procuring the medical force of the new National Army. It is still more to be regretted that this hysteria—absolutely undeservedly—has reflected unfavorably on the medical profession. As late as August 1 the Associated Press sent out a statement to the effect that a petition was being circulated which

declares that the method of recruiting the Medical Corps of the Army by commissioning reserve officers in that Corps who volunteer has proven a failure and asks that in behalf of the welfare of the nation a draft for physicians be made.

This is merely an echo of what many men with the best motives have advocated. It is based on the assumption that the newspapers have had correct figures regarding the number of men who have accepted commissions in the Medical Reserve Corps, and that the medical profession was not responding to the call. Even within the last two weeks, statements have appeared in the newspapers, apparently from authoritative sources, to the effect that less than 3,000 physicians have accepted commissions in the Medical Reserve Corps.

What are the facts? On August 4 approximately 16,000 physicians had offered their services and had made application for commission in the Medical Reserve Corps. Of this number, nearly 14,000 had been recommended for commission. Some of the remaining 2,000 applications were pending; others had been rejected for cause. Of the 14,000 commissions recommended, nearly 9,000 had been accepted. This leaves about 5,000 applications which may be accounted for as follows: 1,300 were pending in the Adjutant-General's Office; an uncertain number had been sent out too recently to allow for the acceptance to be returned; some who had received commissions were delaying—for various causes—in sending in the acceptances. What proportion of this group will finally accept their commissions is problematical; but based on information which we believe to be reliable, we confidently assert that there are at the present time at least 13,000—probably 14,000 is nearer the correct number—physicians ready when called on for active service. These figures do not include physicians who have entered the regular Medical Corps during the last few months, or those connected with the National Guard, the latter at least 1,000 in number. Moreover, from 100 to 150 new applications are reaching the Surgeon General's Office

daily. To advocate a special draft of physicians under these circumstances is an insinuation against the medical profession which should be insistently resented.

We repeat: The physicians of this country have been and are offering their services, at tremendous sacrifices in many instances, and are doing their full duty without compulsion and without a special draft. We are confident that not only the present, but every future need which the country may have for medical men, will be supplied by our profession, without coercion or threats.

BIOCHEMICAL RELATIONSHIPS IN METABOLISM, PARTICULARLY IN RESPECT TO CHOLESTEROL

In speaking of what he naively calls the world of biochemical fact and error, von Fürth¹ says, "Not without feelings of decided rebellion, at a single stride the darkly yawning chasm of intermediate metabolism must be passed, with the vast number of unsolved enigmas it harbors, and attention directed to the end-products of metabolism." Among these problems, for example, is the question as to what extent definite organs are especially concerned with specific metabolic performances. For a long time the function of urea production was ascribed almost solely to the liver, and many attempts were made to demonstrate that a perversion of the hepatic activities would be indicated by inability of the organism to produce urea. Decrease in urea output, to be sure, was sometimes found associated with liver disease; it is clear now, however, that this outcome was due, not to inability of the body to synthesize urea, but to the "deflection" of nitrogenous end-products of metabolism for the formation of ammonia to counteract the acidosis of hepatic disorders. It is understood that the liver can be largely excluded from normal functioning without a disappearance of the urea-producing capacities of the body. Presumably urea formation is a fairly common property of active cells—a reaction prominent in the liver because of its dominant glandular features, but no more confined to that organ than the fundamental capacity of oxidizing nutrients appears to be.

It is a true factor of safety for the organism that significant biochemical reactions are not easily perverted in the body even when it is invaded by disease. The tendency of these reactions is to proceed in a normal way as far as possible. So far as nitrogenous metabolism goes on at all, amino-acids tend to be utilized and urea tends to be produced. Organs of digestion or excretion may become impaired; an imperfect circulation may fail to bring oxygen in adequate measure or remove carbon dioxide and other metabolic products; but the intermediary processes go on with

1. Von Fürth, Otto: *Chemistry of Metabolism*, translated by A. J. Smith, Philadelphia, 1916, p. 97.

an almost unexpected precision of reaction, making anomalous products a decided rarity.

Bloor and Knudson² have recently expressed the same idea, asserting that the metabolic habits of the individual are not easily upset even by severe disease. In illustration they cite their findings in respect to the constancy of relationship between free and bound cholesterol in the blood, even in many pathologic conditions. The blood contains both cholesterol and its esters with fatty acids; the latter now appear to be almost as generally distributed in the body as the cholesterol itself. Bloor³ has suggested that there is some connection between cholesterol and fat metabolism. In their most recent observations on the constant relation or balance between free cholesterol and cholesterol esters, and likewise between these esters and other blood lipoids, not only in normal human blood but also in many pathologic cases, Bloor and Knudson² find added support for the assumption previously made that cholesterol participates in an active degree in the metabolism of fats. In any event there is evidently an efficient regulation of the lipoids, permitting little variation from normal relationships even in abnormal conditions. The same is true of many other blood constituents.

In view of the interest lately aroused in the problems of the biochemical occurrence of cholesterol, reference may be made here to estimations by Denis⁴ of the content of this compound in the blood of many persons suffering from a variety of more common diseases. Among the pathologic conditions examined, hypercholesterolemia was found to exist only in diabetes, and in a relatively small number of cases of this disease. Low cholesterol values are not characteristic of any special pathologic condition, but are invariably found in conditions in which marked prostration or cachexia exists. Denis asserts that cholesterol determinations in the blood are therefore at present of no value in the clinical diagnosis or prognosis of disease. Perhaps it is too soon, however, to accept this as a final dictum in the absence of more searching experimental inquiries.

2. Bloor, W. R., and Knudson, A.: Cholesterol and Cholesterol Esters in Human Blood, *Jour. Biol. Chem.*, 1917, **29**, 7.

3. Bloor, W. R.: The Distribution of the Lipoids ("Fat") in Human Blood, *Jour. Biol. Chem.*, 1916, **25**, 577; The Lipoids ("Fat") of the Blood in Diabetes, *ibid.*, 1916, **26**, 417.

4. Denis, W.: Cholesterol in Human Blood under Pathological Conditions, *Jour. Biol. Chem.*, 1917, **29**, 93.

Sanitation in the Dutch West Indies.—In 1916 the Dutch government sent a specialist to Curaçoa, one of their colonies in the Caribbean region, to study sanitary conditions. A public health department at Willemstad has been the result of his visit; steps have been taken to clean the streets daily, to eradicate mosquitoes, to lessen and prevent the spread of venereal diseases by building a hospital for their treatment, and a well equipped bacteriologic laboratory has been established. A quarantine law modeled after the American measures in Panama and at gulf ports has also been passed. According to the report of U. S. Consul George S. Messersmith, Curaçoa (*Commerce Reports*, July 17, 1917), the general health of the colony was good during the past year.

Current Comment

MEDICAL STUDENTS AND CONSCRIPTION

In our issue of July 28 we called attention to the fact that no provision had been made by the War Department whereby medical students would be enabled to complete their medical training, and requested that all students send the facts regarding their draft numbers and numerical order of their call. A double postal card was also mailed to all students whose home addresses were available. There were all told 13,764 medical students enrolled during the last session, of whom 3,379 graduated, leaving 10,385, made up of 4,107 freshmen, 3,117 sophomores, 2,866 juniors, and 295 seniors who were not graduated. Tabulated statistics regarding 5,909 or 56.9 per cent. of all undergraduate medical students are as follows:

Class	Total Replies	Total to be Drafted		First Call		Second Call		Later Calls		Age Ex-empt	Aliens	Enlisted
		No.	%	No.	%	No.	%	No.	%			
Freshmen....	2,016	1,579	78.3	412	26.0	283	20.3	884	55.9	384	14	39
Sophomores..	1,935	1,697	87.7	460	27.1	347	20.4	890	52.4	204	11	23
Juniors.....	1,458	1,356	93.0	418	31.2	275	20.3	663	48.1	77	6	19
Seniors.....	201	193	96.0	77	39.8	40	20.7	76	39.3	7	1	..
Not stated...	299	228	72.9	99	43.8	34	14.9	95	41.6	57	..	14
Totals.....	5,909	5,053		1,466		979		2,608		729	32	95
Percentages..	.....	85.5		29.0		19.4		51.6		12.4	0.5	1.6

This table is based on the replies received up to the time of preparing for the press. The replies are still pouring in. While the table represents only a little more than 56 per cent. of the whole, it gives those interested an opportunity to estimate the effect of the draft on the different classes. As shown in the table, 5,053, or 85.5 per cent. of the students who have already replied, are subject to the draft, and of these 29 per cent. are included in the first call; 19.4 per cent. in the second call and 51.6 per cent. in later calls; 12.4 per cent. are exempt on account of age, 0.5 per cent. are aliens, and 1.6 per cent. have already enlisted. As will be noticed, 729 are exempt on account of age; of these 606 are under age, and 123 over the age limit. Unless some arrangement is made, therefore, whereby these students are enabled to complete their medical training, classes in medical schools will be seriously depleted; the supply of physicians for the future will be seriously reduced, and this country will suffer from an error similar to that made in England and France where medical students were sent to the front. Furthermore, failure to exempt medical students from the draft will be a serious injustice to many, since a few months ago the Council of National Defense, with the apparent agreement of the War Department, urged medical students not to enlist in the Officers' Reserve Corps but to remain in college and complete their medical training. Had not that request been made, many students would have voluntarily enrolled in officers' training corps, where many of them would doubtless have been successful. Even though less than a third of the medical students of draft age will be included in the first call, a much larger proportion will be lost to the medical schools,

since, in the absence of a definite understanding, many of the others will enlist voluntarily in the ranks, in ambulance corps or in officers' training corps. A definite decision on the part of the War Department relative to medical students is imperative. Unless such decision is made, not only will our civil hospitals lack adequate intern service, but the government will lose by the fact that those capable of skilled service will have been deflected to work which can be as well done by others.

CAMOUFLAGE

Camouflage, as most of our intelligent readers know, is not the name of a Swiss cheese, but of a military measure. It is reminiscent of the little jingle:

Little dabs of powder
Little specks of paint
Make the girls' complexions
Look like what they ain't.

Camouflage has been extensively used in France to make spies and investigators believe that a hidden battery possessed of the power of completely annihilating several regiments of hostile troops is merely an inoffensive arboreal retreat or a part of the surrounding landscape. Used with reverse English it causes an old keg to resemble a trench mortar capable of hurling tons of steel. But camouflage is not wholly confined to the war zone. The word fits so aptly many aspects of our daily life that it will soon be a part of our daily conversation. For instance, when a newspaper says that the death rate among the doctors is higher than that of any other part of the service, some camoufler has been camoufling. When it is announced that the army needs 34,000 additional doctors, that's camouflage. But it's psychic not physical camouflage. Even so it may mislead.

"THE DOCTOR'S DILEMMA"

Among the many interesting developments in connection with the mobilization of the new National Army, there is one which has a particular interest to physicians. It is best illustrated by an example: A Canadian by birth, well educated and doing good work in medicine, who had recently taken out his first papers, made application for admission to the Medical Reserve Corps. Because he was not a fully naturalized citizen, he was informed that he was not qualified for this corps. Now he writes that he is within conscription age, was drawn on the first call, and has been ordered to report for examination. If he is physically fit, he will be told to await orders as to when he shall report to the cantonment camp. "What will become of me?" he asks. "Am I to go into the line as an ordinary soldier? It certainly looks that way." From the communications we are receiving, a large number of physicians are in the same predicament. We regret that we cannot answer the questions; the problem probably will be solved by the proper authorities in due course. But the condition is a peculiar one. According to one law, an alien physician who has taken out only his first citizenship papers is not eligible for the Medical Reserve Corps;

another law makes him subject to conscription. The problem applies to other than the medical section of the Officers' Reserve Corps—to the quartermasters', engineers', ordnance, signal, judge-advocate and other sections of the Officers' Reserve Corps. This conflict between laws relating to practically the same proceeding undoubtedly will be overcome either by regulation or by new legislation.

THE EXPERIMENTAL PRODUCTION OF CANCER

A few weeks ago THE JOURNAL commented on the fact that Yamigawa and Ichikawa¹ had been able to produce cancer at will on the rabbit ear by protracted irritation with applications of tar. Recently these investigators have reported further experiments with this method.² In the newer experiments, a cancerous degeneration became evident by the one hundred and third day as the shortest interval and by the five hundred and sixty-fifth day as the longest interval in the successful cases. In three instances, metastasis was found in regional lymph glands. Tumor thrombosis in the small veins was detected in many cases, but metastasis in internal organs by way of the blood stream has not yet been encountered. These experiments confirm the previous statement that protracted stimulation alone, without an inherited tendency or any specific agent, is able to induce cancer with typical cancer metastasis. They demonstrate further that on cessation of the irritation the carcinoma may retrogress and be crowded out by proliferation of connective tissue. In these cases the cancer cells do not return to normal, but are prevented from further growth by the pressure of the proliferating connective tissue, which finally replaces them completely.

THE ROLL OF HONOR

In a few weeks we hope to publish the data regarding what the profession of each state and of each county of each state has done toward providing physicians for the Army. At that time the names of those who have accepted commissions in each county will be given, together with the number of physicians in the county and the population. Thus it may be known what states and what communities have supplied their quota of physicians.

NOT YET TIME TO RELAX

We can be proud of the fact that there is an ample supply of physicians for the immediate needs of our Army, but we must not cease recruiting. An analysis of the needs of our Army made on June 1 indicated that 20,000 medical officers would be required to complete the program for the raising of the Army outlined by Congress and the President, that is, the regular Army, the National Guard and the full National Army. This is a liberal allowance since the maximum

1. The Experimental Production of Cancer, Editorial, THE JOURNAL A. M. A., June 16, 1917, p. 1818.

2. Yamigawa and Ichikawa: Japan. Ztschr. f. Krebsforsch., 1917, 11, 19.

Army in the field as at present defined by law is 1,700,000 men. Adopting the minimum estimate that there are now 13,000 medical officers commissioned in the reserve corps, we should continue our efforts not only until the full 20,000 physicians are provided but also a surplus. It is well to have a big reserve.

Medical Mobilization and the War

Red Cross Commission to Italy

The Red Cross War Council has announced the appointment of a special Red Cross War Commission to Italy which will advise how American Red Cross activity can best be exerted to meet the needs of the soldiers and civil population of that country. This is the fourth Red Cross Commission to go to Europe, the others having gone to France, to Russia and to Roumania. The Commission to Italy is headed by George F. Baker, Jr., vice president of the First National Bank of New York City. With him go John R. Morron, president of the Atlas Portland Cement Company; Dr. Thomas W. Huntington, San Francisco, president of the American Surgical Association; Dr. Victor G. Heiser of the United States Public Health Service, and Nicholas F. Brady of the Central Trust Company, New York. Professor Chandler R. Post of Harvard University, an authority on Italy, has been detailed to assist the commission.

Physicians Recommended for Commission in the Medical Reserve Corps

During the week ending July 28, 577 physicians were recommended for commission in the Medical Reserve Corps, the proportion being 13 majors, 96 captains and 468 lieutenants.

During the week ending August 4, 714 physicians were recommended for commission in the Medical Reserve Corps, the proportion being 4 majors, 78 captains, 632 lieutenants.

The Cantonment Hospitals

At each of the cantonments for the new national army hospital provision will be made for 3 per cent. of the troops. At each cantonment a complete hospital containing at least 1,000 beds will be constructed, with a space reserved for extensions. Sixty acres have been allotted to each hospital and its auxiliary buildings. The hospitals will cost approximately \$500,000 each. One type is being used in all the hospital construction work done by the army. The buildings are 24 feet wide, the length varying to meet the special needs. The wards are usually 157 feet long, which is the size needed for 32 beds. There will be a diet kitchen for each ward, a porch at one side and end of each ward, and a corridor connecting with the buildings on either side which will be covered in the case of the northern cantonments. About seventy buildings will be comprised in each cantonment hospital. Each hospital will have a well equipped laboratory for bacteriologic and pathologic work. There will also be an infirmary for each regiment.

Hospital Provisions for the Army

The provisions for caring for the health of the soldiers now being made by the Medical Department of the Army include the construction of thirty-two hospitals at National Guard and National Army camps, the enlargement of some thirty hospitals used in connection with officers' training camps, the taking over or the construction of at least two general hospitals at ports, increasing the size of two general hospitals behind these and the building or taking over of general hospitals to be used for special treatment work. A further step will be the establishment of so-called "reconstruction hospitals." In these artificial limbs will be made, repair surgery done, artificial limbs fitted to patients and the reeducation of cripples begun. It is aimed to have hospital provisions for 5 per cent. of the enlisted force by October 1, and then to proceed to extend that to 10 per cent. Facilities for 20 per cent. of the American expeditionary forces are to be provided abroad.

Baggage for Reserve Officers Ordered to Duty

Inquiries have been received as to whether an officer of the Medical Reserve Corps ordered to active duty should take with him his own instruments and books. This depends largely on the type of service to which the physician is ordered. An officer reporting for field service should take with him the prescribed field equipment and nothing more. Under present circumstances, most reserve officers will be ordered to one of the following duties: to training camps for medical officers, to the cantonments for the National Army and National Guard, or for service abroad. On any of these services the officer should take with him only such books as he feels certain will be of great utility to him, that is to say, books on military subjects. Instruments and medical supplies are furnished. A good rule is to take along only as much personal baggage as can be accommodated in the regular army trunk or locker.

Medical Reserve Corps Men on Active Duty

At the present time there are a little over 3,000 men at the various training camps. In addition, a number who have been at these training camps have been assigned to other active duties, for instance, to base hospitals and other duties in France, to foreign service in our dependencies, to army posts in this country, to special recruiting work, and to mobilization of the National Guard. We understand that 1,000 more men are to be assigned to various training camps for training by August 15. It is quite evident that when the National Army is mobilized the medical corps for that Army will be ample in number and equipped for its work.

Schools of Instruction in Military Roentgenology

At the direction of Surgeon-General Gorgas a conference of Military Roentgenologists was held at Cornell Medical College, New York City, June 11-25, 1917. The Surgeon-General ordered this conference with a view toward standardizing Roentgen-ray apparatus and arranging courses of study in military roentgenology.

Major Arthur C. Christie from the Surgeon-General's office and Major P. W. Huntington from the Army Medical School represented the Army. The instructors, who will have charge of the several schools in various parts of the country, were present with members of the Committee on Preparedness of the American Roentgen Ray Society.

Schools of instruction have been established in Boston, Major A. W. George, M. R. C.; New York City, Majors L. G. Cole and L. T. LeWald, M. R. C.; Philadelphia, Major W. F. Manges, M. R. C.; Baltimore, Major F. H. Baetjer, M. R. C.; Richmond, Major A. L. Gray, M. R. C.; Pittsburgh, Major G. C. Johnston; Chicago, Capt. E. S. Blaine, M. R. C.; Kansas City, Capt. E. H. Skinner, M. R. C., and Los Angeles, Capt. W. B. Bowman, M. R. C.

The government has established these schools for the purpose of giving instruction in Roentgen-ray work to selected officers in the Medical Reserve Corps. They will be ordered to active duty on pay according to rank for the period of instruction. The length of the course will be about three months, but officers who have had considerable experience in Roentgen-ray work or those who become proficient before this time will be certified to the Surgeon-General as soon as they become qualified. Those who show lack of adaptation or application will be relieved of this detail and assigned to other duties or discharged by order of the Surgeon-General.

Physicians desiring to take this work will proceed as follows: (1) Write a letter to the nearest school immediately indicating your preference for this Roentgen-ray course, stating your experience in the work. (2) Make application for a commission in the Medical Reserve Corps, through the nearest medical recruiting officer. (3) Write a letter to the Surgeon-General, attention Major Christie, asking to be placed on this Roentgen-ray instruction detail at the nearest school and attach this letter to the papers which are sent in at the time you take your examination for the commission. (4) When you have received your commission, accept it and write a letter to the nearest school, stating that you have received and accepted your commission and are ready for active duty.

The government is going to the expense of training these selected officers as military roentgenologists and will, therefore, be desirous of using them in this capacity in the field, base hospital or other detail, to the greatest extent possible.

Enlistment in Red Cross Ambulance Service Not to Exempt From Draft

The Provost-Marshal General has ruled that service in Red Cross ambulance companies is not military service within the meaning of the law and is not a valid claim for exemption or discharge.

Sanitation Around the New Cantonments

The American Red Cross has appropriated \$800,000 to aid in controlling sanitary conditions in the civilian areas surrounding army cantonments. This work will be done under the instruction of a newly created Bureau of Sanitary Service headed by Dr. W. H. Frost of the Public Health Service.

To Increase Pennsylvania Base Hospital

Additional nurses and enlisted men are needed for the base hospital unit of the Pennsylvania Hospital, now in France. This unit, at the request of the British government, was sent to France to take over a British base hospital of 2,000 beds. The unit was raised to care for a hospital of 500 beds, so has been doing increased work, and Major Harte has sent a request to the Surgeon-General that the Pennsylvania Hospital send more men and nurses. The following physicians have been selected to go with the unit: Drs. J. Paul Austin, Germantown; Richard C. Beebe, Lewes, Del.; William L. Cunningham, Philadelphia; Michael M. Nolan, Birmingham, Ala.; George W. Outerbridge, Philadelphia; I. B. Roberts, Llanerch; William Whitaker and H. B. Wilmer, Germantown; Hersey E. Orndoff, St. Louis.

Virginia Base Hospital Organized

Base Hospital Unit No. 41 is being organized at the University of Virginia, University, Va. Dr. William H. Goodwin, associate professor of surgery, is to be the director. Fifty of the sixty-five nurses required have enrolled, and about all of the enlisted personnel have been secured. The members of the staff, thus far, are as follows: Dr. Lomas Gwathmey, Norfolk; Dr. Minor Carson Lile, New York City; Dr. Kyle B. Steele, Richfield Springs, N. Y.; Dr. Leroy W. Hyde, University; Dr. Joseph S. Hume, Norfolk; Dr. John W. Burke, Washington, D. C.; Dr. Robert E. Pound, New York City; Dr. Gordon L. Todd, Princeton, W. Va.; Dr. Herbert F. Jackson, New York City; Dr. Hugh P. Nelson, Charlottesville; Dr. Dan H. Witt, New York City; Dr. Edward C. Ashby, Greensboro, N. C.; Dr. John D. Barnwell, New York City; Dr. Claude C. Caylor, Washington, D. C.; Dr. Lucius G. Gage, University; Dr. George C. Parry (dentist), Philadelphia; Dr. Edward B. Broocks, Charlottesville; Dr. Walter E. Miller, Norfolk, and Dr. George Y. Gillispie, Bryn Mawr, Pa.

University of Pennsylvania Hospital Unit Completed

Maj. John B. Carnett, Philadelphia, medical director of Base Hospital Unit No. 20, announced that his personnel is completed and his equipment ready. Major Eldridge L. Eliason is chief of the surgical section and Major George M. Piersol, chief of the medical section. The other members of the staff are as follows: Captains Damon B. Pfeiffer, surgeon; De Forest P. Willard, orthopedic surgeon; B. Franklin Baer, Jr., ophthalmologist; Floyd E. Keene, surgeon; James H. Austin, physician; John H. Musser, Jr., physician; Jay D. Zulick, chief of Roentgen ray and laboratory section; Fred H. Leavitt, neurologist; F. Thomson Edwards, registrar.

The following on the staff are first lieutenants: Seth A. Brumm, laryngologist; Alexander Randall, genito-urinary surgeon; Edmund B. Piper, surgeon; William Bates, surgeon; Benjamin M. McIntire, physician; Richard D. Hopkinson, physician, Jenkintown; R. N. Goldsmith, physician, Scranton; Edward L. Clemens, physician; Philip F. Williams, pathologist; Alfred C. Woods, bacteriologist; J. D. Owens, dental surgeon, Camden; F. P. K. Barker, dental surgeon.

First Impressions of a Base Hospital

Major Frederick A. Besley, M. R. C., director of Base Hospital No. 12, U. S. Army, now in France, writes: We have now been at this hospital a month and I am taking this opportunity to write some of my early impressions. The hospital is made up partly of huts and partly of tents and acts as a general hospital occupying the place between the casualty clearing station, where most of the urgent and early

operations are done, and the permanent base hospitals in England. In a word, it is a kind of segregating station. The patients whose conditions are serious are cared for as well as possible and then sent on to England. The minor cases are kept here until they recover and they are then sent to large convalescent camps or to their base details.

The British personnel has gradually left us until this morning our good Commanding British Officer, Colonel ———, took his departure and Major Collins is in complete control of the unit. Unfortunately, our force of nurses and the number of enlisted men is quite inadequate to cope with so large a hospital. We had expected to find a hospital of 850 beds and much to our surprise it is capable of caring for 2,000 patients, and our average number is from 1,200 to 1,300. During the last week we received a convoy practically every day of from 150 to 200 new patients. Evacuations are taking place every day. Each individual case requires the exercise of medical or surgical judgment, so the task is not a small one.

We are one of five similar hospitals in this immediate vicinity, and there are six or seven other hospitals about four miles from us. Dr. Cabot's Harvard unit, under British control, adjoins us; and adjoining him, about one-fourth of a mile away, is Major Patterson of the regular army with Major Harvey Cushing and the new Harvard unit under American control.

We cannot commend or praise the attitude of the English medical officers too much. They have all been most courteous and friendly in all their relations. We were met before we left the ship and have been shown every attention since that time. Major Collins and I are receiving the most loyal and willing support from every member of the unit, and up to date we have not encountered the slightest friction. The citizens of Chicago should be proud of the spirit which is being shown by these fine boys who make up our enlisted force. They work at the most arduous menial and oftentimes disagreeable tasks with a cheerfulness which is little short of wonderful.

Psychiatrists and Neurologists Instructed on Examination of Troops

The Committee on Clinical Methods and Standardization of Examination and Reports, a subcommittee of the Mental Hygiene War Work Committee of the National Committee on Mental Hygiene, has submitted, at the request of the Surgeon-General, an outline to be followed in determining which men should be excluded from military service on account of mental and nervous diseases. This committee is composed of the following physicians: August Hoch, Ward's Island, New York; Adolf Meyer, Johns Hopkins University, Baltimore; Thomas W. Salmon, New York; Pearce Bailey, New York; E. E. Southard, Boston; Albert M. Barrett, Ann Arbor, Mich.; William A. White, Washington, D. C.; Walter E. Fernald, Waverly, Mass.; Joseph Collins, New York; T. H. Weisenburg, Philadelphia, and Robert M. Yerkes, Cambridge, Mass.

Because of its practical character, this outline is given herewith in full:

I. NERVOUS DISEASES

(a) On the Basis of Disease

1. Tabes. (Look for Argyll Robertson pupils, absent knee and ankle jerks, ataxia of station and gait.)
2. Multiple sclerosis. (Look for absent abdominal reflexes, nystagmus, intention tremor.)
3. Progressive muscular atrophy and syringomyelia. (Look for fibrillary tremors; atrophy in the small muscles of the hand and of the muscles of the shoulder girdle; scars on forearm and fingers caused by burning; deformities of feet.)
4. Epilepsy. (Look for deep scars on tongue, face and head; voice. Where diagnosis depends only upon history of epileptic attacks given by the patient, the latter should be asked to give the address of the physician who has treated him. This history must then be verified by a letter from the physician.)
5. Hyperthyroidism. (Look for persistent tachycardia, exophthalmos, tremor, enlarged thyroid.)

(b) On the Basis of Symptoms or Combination of Symptoms or History

1. Unequal pupils; irregular pupils; Argyll Robertson pupils.
2. Nystagmus (in one not an albino); absent abdominal reflexes; intention tremor.
3. Absent knee jerks associated with some one other organic neurologic symptom.
4. Exaggerated tendon jerks; Babinski.
5. Disorders of station or gait.
6. Disorders of speech (on test phrases); facial tremor; one other organic neurologic symptom. (Stammering and stuttering per se is not significant of an organic neurologic condition. Stammerers and stutterers are rejected by regulations. See form No. 94777.)

7. History of epilepsy. (Ask the recruit to give the address of the physician who has attended him; this information to be verified by letter.)

II. MENTAL DISEASES

(a) On the Basis of Disease

1. General paralysis. (Look for Argyll Robertson pupils, speech defect consisting of distortion of words, writing defect consisting of distortion of words, facial tremor in showing the teeth, euphoria and marked discrepancies in giving facts of life.)
2. Dementia praecox. (Look for indifference, ideas of reference, feelings of the mind being tampered with [e. g. ideas of hypnosis], auditory hallucinations, bodily hallucinations such as electrical sensations or sexual sensations, meaningless smiles; in general, inappropriate emotional reactions, lack of connectedness in conversation.)
3. Manic depressive insanity. (Look for mild depressions with or without feeling of inadequacy or mild manic states with exhilaration, talkativeness and overactivity.)

(b) On the Basis of Symptoms or Combinations of Symptoms or History

1. History of previous mental illness (Ask the recruit to state when and where he had such illness, in what hospital he was observed or treated or by what physician he was attended; this information to be verified by letter.)

III. PSYCHONEUROSES AND PSYCHOPATHIC CHARACTERS

Look for phobias, morbid doubts and fears, anxiety attacks, fatigability, hypochondriasis, compulsions, homosexuality, grotesque lying, vagabondage.

IV. CHRONIC ALCOHOLISM

Look for suffused eyes, prominent superficial blood vessels of the nose and cheek, flabby, bloated, reddened face, purplish discoloration of the mucous membrane of the pharynx and of the soft palate; also ashen complexion and clammy skin, muscular tremor in the protruded tongue and extended fingers (noticeable also in lack of control when the applicant attempts to sign his name), emotionalism, prevarication, suspicion, auditory or visual hallucinations, paranoid ideas.

V. MENTAL DEFICIENCY

Look for defect in general information with reference to native environment, ability to learn, to reason, to calculate, to plan, to construct, to compare, weights, sizes, etc.; defect in judgment, foresight, language, output of effort, suggestibility, stigmata of degeneration, muscular incoordination (consult psychometric findings).

VI. DRUG ADDICTION

Look for pallor, dryness of skin; flippancy, mild exhilaration (if under the influence); cowardly, cringing attitude; restlessness, anxiety (if without the drug), distortion of the alae nasi, contracted pupils (morphine) or dilated pupils (cocaine), dirty deposit at junction of gums and teeth, bluish and whitish needle scars on thighs and arms.

Orders to Officers of the Medical Corps

Major Clarence Le R. Cole, M. C., to Fort Sam Houston, Texas, for duty in charge of the department laboratory, S. D.

Capt. James E. Baylis, M. C., from command of Ambulance Co. No. 5, Camp Funston, Leon Springs, Texas, and assigned to command Field Hospital No. 5, same station, vice Capt. George W. Cook, M. C., relieved.

First Lieut. Charles M. O'Connor, Jr., M. C., to Honolulu for duty.

Capt. Glenn I. Jones, M. C., is designated as cantonment surgeon at the N. A. Cantonment, Camp Devens, Ayer, Mass.

Lieut.-Col. Jere Black Clayton, M. C., to Washington for examination for promotion.

Capt. R. Reynolds, M. C., to Pittsburgh, Pa., for duty in command of Base Hospital No. 27.

Capt. A. P. Clark, M. C., assigned to Fourth Reserve Engineers permanently.

Capt. H. H. Sharpe, M. C., from Fort Davis, Alaska, to Chicago.

Orders to Officers of Medical Reserve Corps

ALABAMA

To FORT SAM HOUSTON, TEXAS, to report to commanding general Southern Dept., for duty, Lieut. R. C. Speir, Furman.

CALIFORNIA

To CHICAGO for duty, Capt. Sidney E. D. Pinniger, Tracy.

To FORT DES MOINES, IOWA, for duty, Lieuts. L. Stovall and W. A. Tarleton, Los Angeles.

To TECATE, CALIF., for duty, Lieut. Samuel C. Leonhardt, Oakville.

To report in person to commanding general, Western Dept., for duty, Capt. Alex. Patterson and Lieut. C. E. Mordoff, San Francisco.

Honorably discharged, Capt. John M. Armstrong, Alhambra.

CONNECTICUT

To CAMP KELLY, SOUTH SAN ANTONIO, for duty, Lieut. Michael J. Sheahan, Derby.

DISTRICT OF COLUMBIA

To WALTER REED GENERAL HOSPITAL, TAKOMA PARK, D. C., for duty, Lieut. Earle G. Breeding, Washington.

To report in person to Surgeon General of Army for duty in office of the attending surgeon, Capt. H. P. Parker, Washington, D. C.

FLORIDA

To CHICKAMAUGA PARK, GA., for duty, Lieut. Julian E. Gammon, Jacksonville.

GEORGIA

To SOUTH SAN ANTONIO, to accompany two aero squadrons to Mount Clemens, Mich., Lieut. Elmer E. Mansfield, Pavo.

ILLINOIS

To BELLEVILLE, IND., as post surgeon, Lieut. Harry L. Logan, Salem.

To duty in connection with examination for tuberculosis of National Guard at their armories in Chicago, Lieut. S. M. Marcus, Chicago.

Resignation of Lieut. J. E. Marshall, Chicago, accepted.

INDIANA

Honorably discharged, Capt. Blanchard B. Pettijohn, Indianapolis.

KENTUCKY

To FORT SAM HOUSTON, TEXAS, to report to commanding general, Southern Dept., for duty, Lieut. E. A. Campbell, Carlisle.

To PADUCAH, KY., for duty in connection with examination of applicants for appointment in the Medical Reserve Corps of the Army, Lieut. Frederick D. Cartwright, Bowling Green.

LOUISIANA

To FORT SAM HOUSTON, TEXAS, to report to commanding general, Southern Dept., for duty, Lieut. O. J. Gee, Shreveport.

MAINE

To BOSTON in connection with the examination for tuberculosis of National Guard at armories, Capt. Nelson E. Nichols, Hebron.

To EL PASO, TEXAS, to make psychiatric and neurologic examinations, Capt. Henry M. Swift, Portland.

MARYLAND

To ANNAPOLIS JUNCTION, MD., as sanitary officer of cantonment of N. A. Lieut. Frank N. Hoffmeier, Hagerstown.

To FORT OGLETHORPE, Lieut. W. R. McKenzie, Baltimore.

From further active duty, Lieut. Montrose T. Burrows, Baltimore.

MASSACHUSETTS

To BOSTON for duty, Lieut. Harry P. Cahill, Worcester.

To FORT LEAVENWORTH, Disciplinary Barracks, Lieut. R. M. Chambers, Westboro.

To FORT LOGAN H. ROOTS, ARK., Major Fred B. Lund, Boston.

To his home, Capt. Harvey A. Kelly, Winthrop.

MICHIGAN

To DETROIT and assume command of Base Hospital No. 36 and enlist and muster in additional personnel, Major Burt R. Shurley, Detroit.

MINNESOTA

To FORT LEAVENWORTH for duty, Lieut. F. P. Frisch, Kimball Prairie.

MISSOURI

To FORT DES MOINES, IOWA, Lieut. Fenton N. Goodson, St. Joseph.

To FORT SAM HOUSTON, Lieut. G. L. Kerley, Kansas City.

NEBRASKA

To FORT OGLETHORPE, Capt. Frank M. Conlin, Omaha.

NEVADA

To FORT DOUGLAS for duty, Capt. E. D. Giroux, Winnemucca.

NEW JERSEY

To FORT LEAVENWORTH, Lieut. F. H. Thorne, Greystone Park.

To FORT OGLETHORPE, Lieut. Floyd C. Shugart, Orange.

NEW YORK

To FORT TERRY, N. Y., for duty with Provisional C. A., Lieut. Edgar W. Beckwith, Bronxville.

To GETTYSBURG NATIONAL PARK, PA., for making psychiatric and neurologic examinations, Lieut. Sanger Brown, White Plains.

To NEW YORK for duty, Capt. Bernard S. Oppenheimer, New York.

To CORNELL MEDICAL COLLEGE, Lieut. Samuel Brown, New York.

To ROCKEFELLER INSTITUTE of Medical Research, New York, Capt. Francis R. Lyman, Hastings upon Hudson; Lieuts. C. G. Burdick, H. E. Meleney and A. M. Wright, New York.

To duty in connection with examination for tuberculosis of National Guard at their armories in New York and Brooklyn, Capt. W. J. Hammer, New York.

To report in person to commanding general, Eastern Department, for duty, Lieut. David Bovaird, New York.

To report in person to commanding general, Eastern Department, for duty in Transport Service, Lieut. E. J. Davin, New York.

To SYRACUSE, N. Y., for duty, Capt. G. B. Campbell, Utica.

Honorably discharged, Capt. J. B. Gere, New York.

NORTH CAROLINA

To FORT OGLETHORPE, Capt. Charles S. Lawrence, Winston Salem; Lieuts. W. E. Brackett, Caroleen, and John T. Benbow, East Bend.

OHIO

To FAIRFIELD, OHIO, Flying School, Aviation Section, for duty as post surgeon, Capt. Courtney P. Grover, National Military Home.

To FORT SAM HOUSTON, Major Frank E. Bunts, Cleveland.

OKLAHOMA

To FORT RILEY, Lieut. Ross D. Long, Oklahoma City.

To FORT SAM HOUSTON, Lieut. S. R. Evans, Stilwell. To report to commanding general, Southern Dept., for duty, Capt. R. L. Kurtz, Nowata; Lieuts. J. E. Parramore, Antlers; B. T. Bittings, L. L. Bunker, Enid; W. W. Rucks, Guthrie; H. DeW. Shankle, Hastings; C. M. Ming, Okmulgee; S. D. Beville, Poteau, and F. C. Myers, Broken Arrow.

PENNSYLVANIA

To ALLENTOWN, PA., for duty, Lieut. C. J. Cavanagh, Philadelphia.

To ARMY MEDICAL SCHOOL, Washington, D. C., as professor of ophthalmology, Major William T. Davis, Dunmore.

To FORT LEAVENWORTH, Lieut. G. R. Moffitt, Harrisburg.

To FORT SAM HOUSTON, TEXAS, to report to commanding general, Southern Department, for duty, Lieuts. W. C. Browne, Burnside, and F. L. Patterson, Imperial.

To DES MOINES, IOWA, for duty, Lieut. L. L. Rodgers, Kingston.

To MONMOUTH PARK, N. J., for duty, Major W. P. Barndollar, Pittsburgh.

To PHILADELPHIA, Lieut. James W. Levering, Philadelphia.

Honorably discharged, Major Melvin M. Franklin, Philadelphia.

Retired, Lieut. Thomas W. Moran, Latrobe.

TENNESSEE

To ALLENTOWN, PA., Capt. W. A. Brewer, Memphis.

To DES MOINES, IOWA, for duty, Lieut. J. L. Leach, Nashville.

TEXAS

To FORT DOUGLAS, for duty, Lieut. C. T. Smith, Canton.

To FORT SAM HOUSTON, TEXAS, to report to commanding general, Southern Department, for duty, Capt. C. M. Hendricks, El Paso; T. L. Kennedy, J. S. Jones, Galveston; J. T. Moore, Houston; M. Duggan, F. L. Paschal, San Antonio; Lieuts. C. H. Brownlee, Burnet; G. S. Woods, Devine; F. A. Haggard, Fort Worth; E. R. Townsend, Fredericksburg; E. A. Freehet, Frisco; M. D. Levy, H. L. McNeil, Galveston; J. J. Handley, Greenville; R. M. Fancher, J. C. Michael, M. V. Moth, J. F. Gamble, Houston; R. K. Lowry, Hubbard; R. A. Gordon, Lorena; J. F. McDonald, Meridian; T. R. Burnett, Mission; L. S. Johnson, Richmond; W. C. Hirzel, C. B. Kitowski, W. H. Cade, San Antonio; Arthur W. Bergfeld, Seguin; W. H. Lyon, Tracy; L. D. Parnell, Waxahachie; L. Frazier, Westville; R. H. Coleman, Whitesboro; and G. Graham, Oak Forest.

UTAH

To FORT DOUGLAS, Lieuts. Arthur A. Bird, Magna, and Lorin F. Rich, Ogden.

WASHINGTON

To SEATTLE, WASH., to conduct the preliminary examinations of applicants for appointment in the Medical Corps of the Army, Capt. Ira C. Brown, Seattle.

WEST VIRGINIA

To DES MOINES, IOWA, for duty, Lieut. C. H. Laws, Elkin.

To ROCKEFELLER INSTITUTE, New York, for duty, Lieut. John C. McCoy, Queens.

WISCONSIN

To FORT SAM HOUSTON, to duty with two aero squadrons and to accompany these troops to Fairfield, Ohio, Lieut. Will G. Merrill, Grand Rapids.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Physicians Win Suit.—Drs. N. J. Brown and N. N. Brown, Bakersfield, have been awarded \$5,000 in the suit which they brought against the estate of the late E. J. Boust for professional services rendered the deceased for one year, when he was injured in an automobile accident.

Municipal Appointments.—Dr. Shelby P. Strange, surgeon of the San Francisco Emergency Service, and Dr. J. Montague Rose, resident physician of the San Francisco Tuberculosis Hospital, have resigned.—Dr. Solomon Bauch has been appointed resident physician of the municipal tuberculosis hospital, succeeding Dr. Rose.

Personal.—Major Philip S. Chancellor, M. R. C., U. S. Army, Santa Barbara, has requested that he be demoted to captain, in order that he may go to France with the San Francisco City and County Hospital Unit.—Dr. Saton Pope, San Francisco, has succeeded Dr. Alanson Weeks as chief surgeon of the San Francisco Emergency Hospital.—Dr. D. W. Zirker, Merced, has resigned as county physician of Merced to accept a position in the Medical Reserve Corps.

FLORIDA

Eclectic Examiners Appointed.—Governor Catts has appointed the following board of eclectic medical examiners: Dr. George A. Munch, Tampa; Dr. John A. McDonald, Century, and Dr. Jerome D. Stuart, Miami.

New State Board Officers.—The recently appointed state board of health met at Tallahassee and organized by electing Mr. Charles T. Frecker, president. Dr. William H. Cox, Brooksville, was elected state health officer, succeeding Dr. Joseph E. Taylor, Live Oak; Dr. Hiram Byrd, Princeton, was appointed scientific inspector; Dr. William R. Warren

was appointed to succeed Dr. Joseph Y. Porter at Key West, and Dr. F. Lothair Tatum, De Funiak Springs, was appointed to succeed Dr. Clinton W. D'Alemberte, Pensacola, as custodian and supervisor of the state bacteriologic laboratories and Isolation Hospital, Pensacola, and to be in charge of all matters pertaining to the public health in western Florida.

Personal.—Lieut.-Col. Joseph Y. Porter, Jacksonville (retired), has been placed on the active list, and assigned to duty in the office of department surgeon, Southeastern Department, Charleston, S. C. The Rotary Club of Key West, at its meeting, June 20, adopted resolutions laudatory to Colonel Porter.—Dr. Edward G. Birge has resigned as director of the state bacteriologic laboratory at Jacksonville, and has been succeeded by Dr. Burdett L. Arms, Montgomery, chief bacteriologist of the Alabama State Board of Health.—Dr. Iva C. Youmans, Melrose, has resigned as bacteriologist in the state laboratory at Miami, and will enter private practice at Jacksonville. She has been succeeded by Dr. Harold H. Fox, Tallahassee.—Dr. Herbert R. Mills, Tampa, bacteriologist in charge of the state board of health laboratory, has resigned, and has been succeeded by Dr. Claude P. Fryer, New Orleans.

ILLINOIS

Examining Board Appointed.—A board to exercise the examining functions under the administrative code, formerly performed by the state board, has been appointed as follows: For medical practitioners, Dr. L. C. Taylor, Springfield; Dr. Carl E. Black, Jacksonville, and Drs. John H. Robinson, G. M. Cushing and William L. Noble, Chicago.

Menard County Wins Red Cross Flag.—Menard County, of which Petersburg is the county seat, has been announced as the winner of the Red Cross flag, made by the wife of the governor, to be awarded to the county obtaining the greatest proportional membership for the American Red Cross. Menard County, with a population of 12,796, has enrolled 3,780 as members.

Personal.—Dr. Charles F. Read, formerly superintendent of the Watertown State Hospital, has been appointed superintendent of the Chicago State Hospital, Dunning, to succeed Dr. George Leininger.—Dr. Edward S. Godfrey, Jr., has resigned as director of the bureau of communicable diseases of the state board of health, to accept a position in the sanitary department of the New York State Department of Health. He has been assigned to the district comprising Albany and Rensselaer counties.

Chicago

Personal.—Dr. Arthur Lederer, formerly of the Sanitary District of Chicago, has been appointed director of the State Hygienic Laboratory of West Virginia, Morgantown.—Dr. Walter H. Watterson, Oak Forest, has been appointed medical superintendent of the Municipal Tuberculosis Sanatorium.—Dr. D. S. Hager has completed the annual reexamination for sight, color-sense and heart of the trainmen of the Santa Fe System, on the eastern and western lines.

MARYLAND

Fort McHenry for Base Hospital.—The federal government has reclaimed Fort McHenry, which was loaned three years ago to Baltimore for a park, and will use it as a base hospital for the army. The old fort buildings will be renovated and made available for this purpose, and the new immigration station buildings now nearing completion will also be used in the plans for the establishment of a large base hospital in Baltimore. The new buildings cost \$500,000, and include a modern equipped hospital building for the treatment of sick immigrants landing at the port of Baltimore. This now, however, will be used solely for the army.

Personal.—Dr. Alexander D. McConachie, Baltimore, has been operated on for appendicitis at the Church Home and Infirmary. His condition is reported as favorable.—Dr. William Kelso White, Baltimore, who is connected with the Maryland University Hospital Unit, has been commissioned captain in the Medical Officers Reserve Corps.—Dr. C. Frank Jones, one of the health wardens of Baltimore, has been named by Commissioner of Health John D. Blake as acting head of the division of communicable diseases with the rank and pay of an assistant commissioner. Dr. Jones takes the place of Dr. John F. Hogan, who temporarily becomes first assistant to Dr. Blake.—Dr. Henry C. Houck has been appointed a substitute health warden for Baltimore.

MICHIGAN

Sanatorium Proceedings.—The Detroit Board of Health, July 23, voted to erect a municipal tuberculosis sanatorium with 605 beds, at an approximate cost of \$975,000.—At a conference, held in Powers, July 19, the county supervisors discussed the question of a joint tuberculosis sanatorium for Delta, Dickinson and Menominee counties.

Personal.—Dr. Hugo A. Freund, recently appointed health commissioner of Detroit, was elected president of the board of health, July 23, succeeding Lieut.-Col. Angus McLean, called to the front to be director of the Harper Base Hospital Unit No. 17, and Dr. Francis Duffield, a newly appointed health commissioner, was appointed vice president, to take the place of Major J. Walter Vaughan, who has also been called to the colors.—Dr. Forrest R. Ostrander, Detroit, has been appointed full-time health officer of Lansing, and will take up his duties, August 15, when the resignation of Dr. Lynch becomes effective.—Dr. Charles B. G. de Nancrede, professor of surgery in the University of Michigan, has resigned.

NEW YORK

State Food Bill Framed.—A bill after the best features of the national and the Whitman food control measures has been framed by Elon R. Brown and introduced into the legislature. The governor does not favor giving the proposed State Food Commission of three members power to commandeer food products except those held in storage by food speculators. No attempt will be made to seize the crops of producers.

State Society Meeting.—The medical men of Albany have named the committee on arrangements for the meeting of the Medical Society of the State of New York, to be held in Albany, May 21 to 24, 1918. Dr. Arthur J. Bedell has been appointed chairman of the committee, and will be assisted by Drs. Frederick C. Conway, Thomas W. Jenkins, Howard E. Lomax, Andrew MacFarlane, Leo H. Neuman, James F. Rooney and James N. Vander Veer.—Dr. James F. Rooney, Albany, has been appointed chairman of the committee to revise the workman's compensation law.

Civil Service Positions.—The Civil Service Commission of New York State announces the following positions in the state department of health: diagnostician and epidemiologist, salary \$3,500, open to men and women, and limited to physicians; medical expert on tuberculosis, salary \$3,200, open to men and women, and limited to physicians; assistant to the deputy commissioner, salary \$3,200, open to men and women, and limited to physicians; and bacteriologist, salary \$2,000, open to men and women, minimum age, 25 years, preferred ages 30 to 40 years, a degree in medicine or an equivalent education in a college maintaining a standard satisfactory to the commission. Applications must be received before August 29.

Mobilization of County Tuberculosis Hospitals.—With a view to assisting in carrying out all the provisions of the recently enacted law requiring the construction of tuberculosis hospitals in counties of 35,000 population or more, Dr. Hermann M. Biggs, state commissioner of health, has appointed two committees to take charge of the tuberculosis situation in this state. The first committee, headed by John A. Smith, will have general supervision of the sites, plans, construction and equipment of tuberculosis hospitals, and will carry on the antituberculosis campaign in the state. The second committee will act as an advisory board. On the first committee are John O. R. Eichel, E. S. McSweeney and Matthias Nicholl, Jr., deputy commissioner of health, as a member, ex-officio, as well as engineering and construction experts. The advisory committee consists of Drs. Albert H. Garvin, Raybrock; John S. Billings, New York; Charles Stover, Amsterdam; Horace J. Howk, Wilton, N. Y., and Lawrason Brown, Saranac Lake.

New York City

Mabon's Estate.—The estate of the late Dr. William Mabon, superintendent of the Manhattan State Hospital, who died, February 9, has been appraised at \$39,335, which, by the terms of his will, is to be distributed in equal shares between his wife and his two daughters.

Auxiliary Medical Corps for Police Surgeons.—A police surgeon auxiliary medical corps has been organized in Greater New York with a membership of 300. It is under the command of Dr. Edward T. Higgins, chief surgeon of the police department. Dr. Walter A. Sherwood, Brooklyn, is chief of

the local corps from Brooklyn, and Dr. William T. Scovil, Richmond Hill, chief of the local corps from Queens.

Examination for Chief Medical Examiner.—The Municipal Civil Service Commission announces an examination for the position of chief medical examiner of New York. The position pays \$7,500 a year, and is to take the place of the coroners who, in accordance with legislation passed some time ago, will go out of office, Jan. 1, 1918. Physicians more than 30 years of age and having had ten years' experience in a pathologic laboratory have until August 14 to file applications.

Personal.—John F. Harris has become chairman of the New York County Chapter of the American Red Cross, and will serve without pay, as did his predecessor, Harvey D. Gibson.—Dr. Linsly R. Williams, formerly Deputy Commissioner of Health of New York State, has gone to Washington to take an assignment in the office of the Surgeon-General.—Dr. Mortimer M. Raynor, psychiatrist of the department of correction, has been commissioned captain, M. C., U. S. R., and assigned to duty with a staff of psychiatrists.

PENNSYLVANIA

Carlisle Physicians Raise Fees.—High cost of drugs and supplies and increased personal expenses have determined the physicians of Carlisle to raise fees 25 per cent. Six members of the local medical organization are officers in the Medical Reserve Corps.

Governor Approves Appropriations.—State appropriations for a total of \$81,223,836.84 for the next two years were approved by Governor Brumbaugh in his final action on appropriation bills, July 27. The \$75,000 appropriation for the Medico-Chirurgical Hospital in Philadelphia was disallowed entirely, as the institution has been taken over by the American Red Cross.

State Medical Board Condemns Draft of Medical Students.—August 2 the State Board of Medical Education and Licensure passed resolutions demanding that the federal authorities recall the ruling that medical students and young men about to enter medical colleges be included in the draft. The board contends that such ruling will cut off the future supply of doctors. It is especially emphatic in its denunciation of the view that field service will qualify medical students for the practice of their profession.

National Guard Appointments.—The following appointments in the medical corps have recently been announced: Major John J. Moore, Pottsville, assigned to the First Engineers; Capt. Clifford H. Arnold, Chester, to the Sixth Infantry; Lieuts. Charles I. Trullinger, Harrisburg, Eighth Infantry; Charles L. Reed and Carl J. Cubbison, Wilkesburg, to Field Hospital No. 4, and Lieuts. Thomas H. Snowwhite, Walter J. Lace and Charles C. Moore to Ambulance Company No. 4.—Major Gregg A. Dillinger has been assigned to duty with the headquarters division.

Philadelphia

National Guard Appointments.—Dr. Arthur J. Logie has been commissioned lieutenant and assigned to duty with Field Hospital No. 3.—Major Fred O. Waage has been placed on the retired list.

Women Physicians Wish to Aid.—A petition containing the signatures of 100 women doctors has been sent to President Wilson, protesting against their exclusion from the war medical forces that are being sent to France.

Ambulances for Jefferson Unit.—August 4, Base Hospital No. 38, organized by the Jefferson Medical College, was presented with four flags by the East Germantown Improvement Association, an ambulance by the Logan Improvement Association, and an ambulance by the Rapid Transit Company.

Personal.—Dr. Harriet L. Hartley has been appointed chief of the division of child hygiene, department of health, succeeding Dr. Henry H. Doan, deceased.—Dr. Gustave A. Van Lennop has been selected by the trustees of the Hahnemann Hospital as director of the new base hospital.—Dr. H. P. Leopold has been chosen as the head of the surgical section and Dr. William Rendell Williams as the head of the medical section.

Warns Army Camp of Smallpox.—Urging that unreported cases of smallpox be searched for at Wrightstown and stamped out in order to prevent an epidemic when mobilization for the new army begins there, Dr. A. A. Cairns, chief medical inspector of the board of health of this city, has written Dr. Jacob C. Price, commissioner of health in New Jersey. A negro who was employed at Wrightstown until

July 5 was discovered to have smallpox July 26, and had been ill since July 17.

TENNESSEE

Hospital Opening Delayed.—The opening of the Riverside Hospital, Knoxville, which was to have taken place, July 1, was delayed two months on account of the difficulty of obtaining supplies and equipment.

Personal.—Dr. William M. McCabe, superintendent and surgeon of the Nashville City Hospital since 1890, has resigned, and expects to go to France with the Vanderbilt Hospital Unit. He has been succeeded by Dr. William F. Fessey.—Dr. George F. Aycock, Nashville, superintendent of the Davidson County Tuberculosis Sanatorium, has been ordered to report to the Army Medical School, Washington, D. C.—Dr. Edward E. Reisman has been elected chief of the staff of the Baroness Erlanger Hospital, Chattanooga, succeeding Dr. Jose M. Selden, resigned.—Dr. Benjamin L. Simmons, Granville, has been appointed a member of the state board of medical examiners, to succeed himself.

New Officers.—At the twenty-sixth annual meeting of the West Tennessee Medical and Surgical Association, held in Martin, May 24-25, Jackson was selected as the next place of meeting. The following officers were elected: president, Dr. William F. Clary, Memphis; vice presidents, Drs. Tazwell B. Wingo, Martin, and Christopher H. Johnston, Lexington, and secretary-treasurer, Dr. Isaac A. McSwain, Paris (reelected).—The East Tennessee Medical Association, at its annual meeting held in Dayton, elected the following officers: president, Dr. J. Morgan Clack, Rockwood; vice presidents, Drs. William P. McDonald, Spring City, and Edward T. West, Johnson City, and secretary-treasurer, Dr. William N. Lynn, Knoxville. The semiannual autumn meeting of the association will be held in Johnson City, and the annual meeting in Athens.

Report on Memphis Hospital.—A committee of the Memphis and Shelby County Medical Society, consisting of Drs. William Britt Burns, John C. Ayers, Alfred B. DeLoach and Newman Taylor, which was appointed to examine into conditions at the Emergency Hospital, requested by the budget committee of the county court, has recommended that Shelby County build a pellagra hospital on the grounds of the Home for the Aged and Infirm; that the present pellagra hospital be remodeled and used for an isolation hospital; that a duly qualified physician be secured as superintendent of the emergency hospital, and that a committee be appointed to cooperate with the county commissioners and county court in dealing with the pellagra and smallpox situations. The committee also condemned the sanitary and other arrangements at the present emergency hospital.

UTAH

Scarlet Fever.—Mayor Barnes of Kaysville, July 10, issued an order forbidding all public assemblies until further notice, on account of an epidemic of scarlet fever.

Pledge of Utah County Medical Society.—Members of the Utah County Medical Society have pledged to pay into the society's treasury an amount sufficient to give each of its members in the federal medical services \$100 each month, for a period of three years, provided the member serves that long, and in case of death, while on duty, to pay his estate \$100 a month for one year.

Personal.—Dr. Reinhold Kanzler has been appointed city physician of Ogden.—Dr. Walter E. Whalen has resigned to enter the Army Medical Corps.—Lieut. Williard Christopherson, M. C., Utah N. G., Salt Lake City, has been promoted to major, medical corps.—Dr. John S. Gordon, Ogden, who sustained a fracture of the hip recently in an automobile accident in Los Angeles, is making progress toward recovery.—Dr. Murray R. Stewart, Salt Lake City, has been appointed a member of the staff of Salt Lake County Hospital.

VIRGINIA

Tuberculosis Stations Opened.—Twelve stations have been opened in Richmond by the Richmond Anti-Tuberculosis Association for the free examination for tuberculosis. Two physicians and two nurses are on duty at each station.

Southwestern Physicians Elect.—The annual meeting of the Southwestern Virginia Medical Society was held in Pulaski, June 27-28, and the following officers were elected: president, Dr. Wilson R. Cushing, Dublin; vice presidents, Drs. Zeb V. Sherrill, Marion, and John W. Preston, Roanoke, and secretary-treasurer, Dr. Alfred B. Greiner, Rural Retreat.

Personal.—Dr. Charles R. Anderson, Gore, has been appointed a member of the state board of health for a year from August 1.—Dr. John J. Lloyd, superintendent of the State Tuberculosis Sanatorium, Catawba, has accepted the superintendency of the Iola Sanatorium, Rochester, N. Y.—The recommendation of Dr. Claude D. J. MacDonald, Norfolk, as medical assistant to the department of health has been approved.

Lack of Physicians.—The number of physicians of the state who have connected themselves with the Medical Reserve Corps of the Army and Navy has more than offset the recent graduates from medical schools, and has left at least thirty-seven cities in Virginia without sufficient physicians to care for the sick. For this reason, the state board of health invites communication from physicians who wish to take up practice or to change their present locations.

CANADA

Tuberculosis in Army.—More than 1,000 tuberculous soldiers have already been returned to Canada.

Coming Meetings.—The sixth annual congress of the Canadian Public Health Association will be held in Ottawa on September 27 and 28. The meeting of the Canadian Association for the Prevention of Tuberculosis will be also held in Ottawa on September 26.

Hospital News.—Mount Hamilton Hospital, Hamilton, Ont., was opened a short time ago by the Governor-General. Only one unit—the medical building—has been opened, but it is the intention to eventually have a hospital of ten units. The site of the institution is a beautiful one on Hamilton mountain. Dr. Langrill is the medical superintendent and worked very faithfully for the results already achieved.

Free Diagnosis of Syphilis.—Dr. John W. S. McCullough, Toronto, of the Ontario Board of Health announces that facilities have been provided in the laboratories of the province at Toronto, Kingston and London for the free diagnosis of venereal diseases. Outfits for taking specimens are supplied to physicians from either of these centers. Provision has also been made for the taking of specimens for the diagnosis of typhoid, diphtheria and tuberculosis; also sterilized bottles will be supplied for samples of water.

Baby Welfare.—Of every thousand babies born in Canada, one hundred and two die within twelve months. Recently, under the direction of Major John W. S. McCullough of the Ontario Board of Health, a week was devoted in Hamilton to acquiring information relative to the care and feeding of infants, the health of the mother and the attention she received at the time of the infant's birth, the financial position of the parents, and other causes bearing on the possible causes of infant mortality. The information will be tabulated in connection with the baby welfare movement in Ontario.

GENERAL

Mortality from Tuberculosis.—According to a bulletin of the Department of Commerce, the Bureau of the Census is planning the publication of a monograph on the mortality from tuberculosis covering the calendar year 1918. The cooperation of all physicians is asked to the extent of carefully recording or supervising the statements of occupations on the death certificates. Circular letters have been sent out inviting this cooperation. The value of the monograph will depend to a large extent on the accuracy of the information in regard to the occupation of decedents.

FOREIGN

Neurologic Quarterly Founded in Switzerland.—The new *Schweizer Archiv für Neurologie und Psychiatrie* is to be published irregularly, four times a year. Prof. C. von Monakow is the chief of the editorial staff and with him are associate Profs. P. Dubois, R. Weber, B. Manzoni and H. W. Maier. It is to be the organ of the organized neurologists and alienists of Switzerland, and is to be published by Füssli of Zurich.

The Ruffer Wards in the Greek Hospitals.—The death of Sir Armand Ruffer was mentioned recently in these columns (*THE JOURNAL*, June 2, p. 1642). The son of a French banker at Lyons, he won a high position in England and later in Egypt as the president of the public health and quarantine service there. It was while returning from organizing the public health service at Saloniki that the ship was torpedoed by a Teuton submarine. The minister of war of

Greece has now ordered that one ward in every hospital in the country shall be called the Ruffer ward. During his many years in Egypt, Ruffer spent much time in studying the pathology of the old dynasties, thus reconstructing the medical history of the Pharaohs by a kind of necropsy thousands of years postmortem.

Memorial Tablet for Oswaldo Cruz.—A large party of medical men and others who were delegates from the medical faculty of the University of Buenos Aires and other medical organizations of Argentina sailed to Rio de Janeiro recently to visit the profession at Rio. The party bore with them a large bronze tablet to be placed in the Bacteriologic Institute founded and directed by Oswaldo Cruz. An illustration of the graceful tablet is shown in the *Prensa Medica Argentina*, representing Argentine medical science, humanity and hygiene decorating with laurel the memorial inscription to the great hygienist who cleared Rio de Janeiro of yellow fever. A number of medical students accompanied the party. The physicians were welcomed by the authorities as guests of the nation during their stay. They also presented the Museum of Natural History with plaster casts of the five skulls on which F. Ameghino has based his anthropologic theory of the fossil American man.

Deaths in the Profession Abroad.—R. G. Menocal, professor of surgery at the University of Havana and secretary of the public health service.—A. von Frisch, professor of surgery and chief of the urologic clinic of the University of Vienna, author of numerous works on the pathology of the prostate and other urologic subjects, aged 68.—R. Alvarez, chief of the clinical service connected with the chair of psychiatry at Buenos Aires, aged about 27.—A. Gabryszewski, professor of surgery at the University of Lemberg.—P. Hirtz, of Colmar, at an advanced age.—G. Clarac, a young member of the editorial staff of the *Archives des maladies du cœur*.—C. M. Ullman of Göteborg, member of the Swedish Medical Association since 1866, aged 84.—L. Orlandini, an army surgeon and professor of the Colegio Nacional at Buenos Aires. From the latest casualty lists: In England: Capt. W. A. Sneath, Capt. H. E. Rose, Capt. A. G. Peter, Lieut. B. Cohen, Lieut. J. E. Foreman, Lieut. J. G. Bradley-Smith, E. Rayner, E. Cox, W. G. Barras. In Italy: Lieut. P. Puviani, Lieut. G. Alliaud, Capt. E. Fergola, G. Bollatti.

Death of Kocher.—The cable brings word of the death of the Swiss surgeon, Theodor Kocher, professor of surgery at the University of Berne, Switzerland, aged 76. He was the pioneer in operative treatment of goiter, and this has perhaps carried his fame the farthest, but he has published well over a hundred works on various branches of surgery, reporting important contributions to the science. Among them were his works on the surgery of the male sexual organs, excision of rectal cancer by resection of the coccyx, and operations on the digestive tract, on hernia, spastic contracture, and surgery of the brain and spinal cord. He attracted attention as early as 1866 by his research on the arrest of hemorrhage, and reduction of dislocation of the shoulder, and was called to the chair of surgery at Berne when only 31, where he has since remained. In 1874 he published an argument in favor of thyroidectomy, and by 1911 he had performed 4,629 operations on goiter with no infectious complications in the last thousand, and the list has grown steadily since. His description of cachexia strumipriva dates from 1883, and his research on cretinism and hyperthyroidism may be said to have been the starting point for our present knowledge of the glands with an internal secretion. Kocher was awarded the Nobel prize in medicine in 1909, and in 1912 he presented the university with an endowment fund of \$40,000 for promotion of research in the medical sciences. He stipulated that the interest should be allowed to accumulate until the fund totaled \$100,000, which he figured would be about the time the university was celebrating its centennial in 1934. At one time he was president of the German Surgical Association, and of the international committee of the International Surgical Congresses. The list of his works in the Surgeon-General's Catalogue of 1903 fills over two columns, and he has published much since. The blood platelet extract which he worked out with Fonio as an effectual means to arrest hemorrhage he is said to have presented freely to the warring governments at the beginning of the war, donating large quantities besides the information as to the technic for its preparation. Some of his works have been translated into different languages, and two Festschriften have been published in his honor, one on the twenty-fifth and one on the fortieth anniversary of his entrance into the university faculty.

LONDON LETTER

LONDON, July 18, 1917.

The War

A CRISIS IN MILLING

When the government passed a law compelling an extraction of 78 per cent. of flour from the wheat berry, it laid a somewhat severe burden on the great roller millers, who had been wont to regard a 72 per cent. extraction as the secret of good milling, and had left 28 per cent. of the berry to go to live stock and poultry feeding. The great mills, however, adapted themselves to the new conditions, and supplied a loaf quite as palatable as its predecessor. But under the stress of circumstances the government introduced two changes which between them have resulted in the most formidable crisis known to modern milling. The first was to raise the percentage of extraction from 78 to 81, and the second to order the incorporation of a material percentage of cereals other than wheat. It is the latter requirement which has principally led to a breakdown at the mills. The incorporation of cereals other than wheat in the loaf made the production of a homogeneous flour very difficult, but skilled operatives could have faced the situation with some degree of hopefulness if "the other cereal" had been specified. Rice, maize, maize semolina, barley, rye and oats all admit of special treatment as incorporations with wheat. Millers relied on finding a public for this or that addition. Then there came the prohibition of the sale of bread with any specified addition. The miller now gets first one addition, then another, and the local mill's supply is governed by the arrivals of cereals other than wheat at the nearest ports. Complaints have been loudest from places where the addition is believed to have been maize. The result of the new high extraction, combined with the confused and varying additions, was found by the end of June to be such chaos and so much dispute that the Millers' Association agreed by a unanimous vote to make a stand. Having to break with the government, the association decided on a bold policy and to demand a 76 per cent. wheat extract. Thus the whole forward policy marked by the successful 78 per cent. load is imperiled. Should the master millers repudiate the task of making flour under the present requirements, the government officials, already in nominal charge of the mills, may hire experts in the place of the masters. Luckily the crisis has occurred at a time when the national consumption of bread is at an ebb.

Increase of 104 Per Cent. in Food Prices Over Figures
Before the War

Official statistics show that on an average there has been an increase in food prices of 104 per cent. compared with July, 1914, the month before the war began. The increase varies from 65 per cent. in the case of fresh butter to 191 per cent. in the case of certain parts of frozen mutton. The average price of bread—23 cents for the 4 pound loaf—is double that in July, 1914, and flour shows a proportionately greater advance, amounting to 109 per cent. The price of granulated sugar had risen over the war period from an average of about 4 cents to nearly 12 cents per pound, but increased duty accounts for about 2.5 cents of the rise. The average price of cheese is slightly more than double than in July, 1914; that of eggs, slightly less than double. The price of tea is 74 per cent. higher, but about half of the advance is due to increased taxation. Butter and margarin show increases approximating to 65 and 74 per cent., respectively, over prewar prices. Milk prices had risen 60 per cent., or 4 cents per quart. In arriving at the general percentage increase, the several articles are weighted in accordance with the proportionate expenditure on them in prewar family budgets, no allowance being made for the economies resulting from changes in dietary which have been effected since the beginning of the war, especially in those families in which the total income has not been increased by advances in rates of wages, greater regularity of employment, increased output, or the working of overtime. As an illustration of possible economies in this direction, if eggs are omitted from the dietary, margarin substituted for butter, and the consumption of sugar and fish reduced to one half of that prevailing before the war, the general percentage increase since July, 1914, instead of being 104, would be 72. During last month alone the general level of retail prices of the principal articles of food rose about 1 per cent. The prices of British beef increased about 5 per cent., and those of other meat from 3 to 4 per cent. Bacon and fish showed some decline in price as compared with a month ago.

Marriages

ASST. SURG. ROBERT HOWARD McMEANS, U. S. N., Pensacola, Fla., to Miss Julia Rock of San Antonio, Tex., at New Orleans, July 19.

ASST. SURG. LYLE DEE McMILLAN, U. S. N. R., Detroit, to Miss Birdie Leona Knowles of Vincennes, Ind., at Cleveland, July 22.

TOM RAY KNOWLES, M.D., to Miss Adele Berta Hexter, both of Colorado Springs, Colo., at Gunnison, Colo., July 23.

LIEUT. ADDLEY H. GLADDEN, JR., M. O. R. C., U. S. Army, Monroe, La., to Miss Le Reine Hill of New Orleans, July 25.

HOWARD LESTER FARQUHAR, M.D., Pittsburgh, to Miss May Frances Geiser of Smithburg, Md., recently.

FLOYD BURKE GILLESPIE, M.D., Brooklyn, to Miss Amanda Poulson of Omaha, in Brooklyn, July 20.

WILLIAM EMERSON PREBLE, M.D., Boston, to Mrs. Helen Smiley Phelps of Dixburg, Miss., July 6.

BENJAMIN HARRISON GILLESPIE, M.D., to Miss Edna Pearl Clawson, both of Akron, Ohio, April 30.

CHARLES CLIFFORD PINKERTON, M.D., to Miss Maude McPherson, both of Akron, July 24.

MILTON EDWARD ROSE, M.D., Chicago, to Miss Dorothy J. Shade of Decatur, Ill., July 21.

PHILIP R. WAUGHOP, M.D., to Mrs. Anna Fletcher Olmstead, both of Seattle, July 10.

GIBBS BISCOE, M.D., Penndleton, Ark., to Miss Evan Goree of Pine Bluff, Ark., July 25.

JOHN FLEMING DICKS, M.D., to Miss Ethel Reily, both of New Orleans, July 25.

ALBERT N. BAGGS, M.D., to Mrs. Ida V. Fagan, both of Philadelphia, July 26.

MAX PETER GETHNER, M.D., to Miss Lillian Livshis, both of Chicago, recently.

Deaths

Albert Wellington Smith, M.D., Milford, N. H.; Dartmouth Medical School, Hanover, N. H., 1886; aged 64; formerly a Fellow of the American Medical Association; a member of the New Hampshire Medical Society, for forty years a practitioner of Milford; for ten years town moderator; for twenty years a member of the school board, and from 1881 to 1890, representative in the state legislature; died at his home, July 21, from carcinoma of the bladder.

Edward George Rave, M.D., Hicksville, N. Y.; New York University, New York City, 1877; aged 73; formerly coroner and health officer of Oyster Bay, N. Y.; a member of the Medical Society of the State of New York; formerly vice president of the College of Pharmacy of Brooklyn; for thirty-five years chief surgeon of the Long Island Railroad; died at his home, near Hicksville, L. I., July 24.

Henry Edward Waite, M.D., New York City; Eclectic Medical College of the City of New York, 1885; aged 71; a Fellow of the American Medical Association; who had devoted his life to the manufacture of electrical medical apparatus, and was the president of the Waite and Bartlett Manufacturing Company; died at his summer home, in Bethel Park, N. Y., July 26, from heart disease.

Louis C. B. Graveline, M.D., Nassau, N. Y.; Albany, N. Y., Medical College, 1862; aged 80; a veteran of the Civil War; for twenty years local surgeon of the Boston and Albany Railroad at Albany; police surgeon for two years, and for five years physician of Columbia County; one of the founders of the Albany Zouave Cadets; died at his home, July 22, from cerebral hemorrhage.

Livius Lankford, M.D., Norfolk, Va.; New York University, New York City, 1868; aged 61; a Fellow of the American Medical Association; president of the board of health, Norfolk, for several years; a member of the Virginia Examining Board, from 1886 to 1890; July 18, while drilling with the home guard of his ward, died suddenly from myocarditis.

William Anderson, M.D., Trenton, N. J.; College of Physicians and Surgeons, Chicago, 1888; aged 59; president of the Anderson Rain-Proof Coat Company, Trenton, and the New Jersey Pulp Plaster Company; was accidentally drowned in the Delaware and Rariton Canal, Trenton, July 7.

Isaac Stover Long, M.D., Freehold, N. J.; University of Pennsylvania, Philadelphia, 1866; aged 76; a Fellow of the American Medical Association; for more than thirty years treasurer of the Monmouth County (N. J.) Medical Society; died at his home, May 11, from senile debility.

James Dwight, M.D., Boston; Harvard Medical School, 1879; aged 65; a member of the Massachusetts Medical Society; for nineteen years president of the United States National Lawn Tennis Association; died at his summer home at Mattapoisett, Cape Cod, July 14.

Theron Dyke Jenkins, M.D., Winthrop, N. Y.; University of Vermont, Burlington, 1913; aged 26; a member of the Medical Society of the State of New York; was instantly killed by a man while making a professional call in Stockholm, N. Y., June 21.

Sarah A. French Battey, M.D., New York City; Woman's Medical College of the New York Infirmary for Women and Children, 1887; aged 56; formerly a member of the New York Academy of Medicine, died at her home, July 26.

Harry Wallace Haskell, M.D., Brooklyn; New York University, New York City, 1891; aged 52; formerly a member of the Medical Society of the State of New York; died at the home of his sister in Brooklyn, July 28.

George Benton Reynolds, M.D., Scranton, Pa.; University of Pennsylvania, Philadelphia, 1891; aged 47; formerly a Fellow of the American Medical Association; died at his home, July 26, from brain abscess.

Albert Claude Bowerman, M.D., Strathmore, Calif.; University of Toronto, Ont., 1876; aged 67; formerly a Fellow of the American Medical Association; died at his home, May 28, from cerebral hemorrhage.

Lewis Marion Perry, M.D., Broadwell, Ill.; University of Louisville, Ky., 1868; aged 80; formerly a Fellow of the American Medical Association; died at his home, July 17, from neuritis.

Thomas Dyson Walker, M.D., St. John, N. B.; University of Edinburgh, Scotland, 1891; aged 50; died in the Massachusetts General Hospital, Boston, July 22, from chronic nephritis.

James Allen Nichols, M.D., New York City; Long Island College Hospital, Brooklyn, 1883; aged 58; a member of the Medical Society of the State of New York; died at his home, July 28.

Robie Blake, M.D., Cornish, Me.; Eclectic Medical College of Maine, Lewiston, 1884; aged 79; inventor of the solid black carbon transmitter for telephones; died at his home, July 27.

S. Walter Scott, M.D., Troy, N. Y.; University of Vermont, Burlington, 1867; aged 71; for twenty-seven years a practitioner of Troy; died at his home, July 22, from heart disease.

Charles Yoke, M.D., Bridgeport, Ind.; Medical College of Indiana, Indianapolis, 1879; aged 60; a member of the Marion County Council; died at his home, July 20, from pneumonia.

George W. Hughes, M.D., Armstrong, Ill.; Illinois Medical College, Chicago, 1900; aged 44; a Fellow of the American Medical Association; died at his home, June 9.

Paul Emory Gervais, M.D., Arctic, R. I.; Victoria University, Coburg, Ont., 1887; aged 54; also a druggist; died at his home, June 10, from tumor of the glottis.

Harvey H. Converse, M.D., Eastford, Conn.; American Eclectic Medical College, Cincinnati, 1878; aged 70; died at his home, July 16, from heart disease.

George Pyburn, M.D., Sacramento, Calif.; Cleveland University of Medicine and Surgery, Cleveland, Ohio, 1859; aged 86; died at his home, July 20.

William E. Cox, Carters Creek, Tenn. (license, Tennessee, 1889); aged 63; died at his former home in Theta, Tenn., July 8.

Burdette Ramsey, M.D., Paint Lick, Ky.; Medical College of Ohio, Cincinnati, 1857; aged 92; died at his home, July 13.

Franklin B. Lauderbaugh, M.D., James Creek, Pa.; University of Maryland, Baltimore, 1883; died at his home, June 26.

James A. Bradford, M.D., Macedonia, Ill.; University of Louisville, Ky., 1910; aged 33; died at his home, June 28.

George Edward Wilson, M.D., New York City; New York University, New York City, 1887; died about July 23.

John Charles McEnery, M.D., Chicago; Rush Medical College, 1897; aged 48; died at his home, about July 9.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

TRIMETHOL

Report of the Council on Pharmacy and Chemistry

Trimethol is the trade name for a substance said to be trimethyl-methoxy-phenol of the formula $C_6H(CH_3)_3(OCH_3)$. OH—1:2:4:5:6, originated by J. T. Ainslie Walker. It is sold as a nontoxic germicide, having a Rideal-Walker phenol-coefficient of 40, even in the intestinal canal. It is described as insoluble in water and not to be decomposed in the alimentary tract, and to be excreted unchanged in the feces.

Trimethol itself is not obtainable. Pharmaceutical preparations—Trimethol Syrup, Trimethol Capsules and Trimethol Tablets, said to contain Trimethol—are prepared by The Walker-Leeming Laboratories and sold by Thos. Leeming and Co., New York.

The Trimethol preparations are advertised for use in all conditions dependent on intestinal putrefaction. The advertising claims made are very extensive and some of them give to "Trimethol" the scope of a panacea. For example:

"Physicians are constantly reporting cases where Trimethol has been especially efficient, and describing conditions (until recently, not associated with intestinal infection) which have been distinctly benefited by its use. This would seem to bear out the contentions of Charcot and Metchnikoff that 90% of all human ailments have their origin in intestinal infection.

"The careful practitioner, when in doubt, will bear this in mind, now that we have a really efficient and non-toxic intestinal germicide—not a mere antiseptic."

The Walker-Leeming Laboratories have not formally requested the Council to consider the Trimethol preparations, though in a personal letter to a member of the Council, J. T. Ainslie Walker invited an investigation of his compound.

For the investigation of Trimethol and its preparations the Council secured the aid of a bacteriologist who has given much attention to the study of the intestinal flora. The Walker-Leeming Laboratories and J. T. Ainslie Walker were both asked to submit details of experimental studies and also to furnish a supply of the pure "Trimethol." But the only data sent that had any definiteness set forth the bacterial counts made of plate cultures of stools of one patient before and after the administration of Trimethol Capsules.

REFUSE TO FURNISH TRIMETHOL

The request for the pure substance was refused on the grounds that the substance was not used in the undiluted form. The failure to furnish the chemical substance claimed as the essential constituent of the Trimethol preparations is to be deprecated if indeed it has not greater significance. At least it made it impossible for the Council's expert to express his results in terms of absolute Trimethol of established composition. The data obtained apply only to the market preparations claimed to contain Trimethol. So far as the investigation and report go, "Trimethol" is a hypothetical substance.

Clinical or animal tests of the asserted intestinal antiseptics have hitherto given equivocal results because it is impossible, on the one hand, to predict the course of any intestinal infection, or, on the other hand, to determine what effect, if any, was produced by administration of the medication. It therefore seemed unwise to undertake this line of investigation until the more direct laboratory bacteriologic methods had been exhausted. Consequently the investigator checked, in the first place, the phenol-coefficient of one of the Trimethol preparations and then also determined its "penetrability" coefficient. Although by both methods Trimethol was found to be a germicide, the results did not indicate any remarkable potency or other properties, suggesting that the drug possessed special therapeutic value. From the results obtained it appeared inadvisable to proceed further with the work until more definite evidence of the nature and of the

value of the substance should be at hand. The report of the bacteriologic investigation follows:

THE BACTERIOLOGIST'S REPORT

"I have made no attempt to study the effects of internal administration of Trimethol on the intestinal flora. The methods available at the present time of enumerating the numbers of *viable* bacteria in the feces are probably not accurate within one hundred per cent. and the precision of such determinations is equally variable. The physiologic factors involved are so complex that they would appear to make a really valuable assay a question of many months' careful study. If it were possible to administer known amounts of Trimethol as such, the problem might be worth while; inasmuch as the available reactive substance is not at present quantitatively assayable, this phase of the investigation barely seems practicable.

"Trimethol Syrup," as such, appears to be about ten per cent. as efficient in its germicidal value as carbolic acid. If the assay, $\frac{3}{4}$ m. Trimethol per drm. (as the label indicates), is correct, the substance would appear to possess germicidal merit provided enough could be administered, if it is not influenced by passage through the stomach.

"A package containing four four-ounce bottles labeled 'Trimethol, A Non-Toxic Germicide SYRUP Representing $\frac{3}{4}$ m. Trimethol per drm., Alcohol $1\frac{1}{2}$ per cent.' was received at the laboratory December 15, 1916. Later a smaller package containing, according to label, 100 Trimethol tablets, each 5 gr., representing $1\frac{1}{4}$ m. Trimethol was received. The tablets were apparently chocolate coated.

"Two separate series of tests¹ were made upon the syrup. (a) PHENOL COEFFICIENT, using the method outlined in *Bulletin No. 82*, Hygienic Laboratory, Method of Standardizing Disinfectants With and Without Organic Matter. (b) A PENETRABILITY COEFFICIENT by the method of Kendall and Edwards, *Journal of Infectious Diseases*, 8, 250.

"The PENETRABILITY COEFFICIENT resulted as follows: A 5 per cent. solution of phenol killed *Bacillus coli*, suspended uniformly throughout a cylinder of 1.2 per cent. agar in the interval between 60 and 90 minutes. A one per cent. solution of phenol killed the same organisms under the same conditions in the interval between two and one-half and three hours. An undiluted solution of Trimethol Syrup killed the organism in the interval between two and one half and three hours. A ten per cent. solution (nine volumes of distilled water to one volume of Trimethol Syrup) failed to kill the organisms in four hours. It would appear that undiluted Trimethol Syrup has the same combined penetrability and germicidal value as a one per cent. phenol solution.

"The PHENOL COEFFICIENT: A ten per cent. solution of Trimethol Syrup in distilled water (nine volumes of distilled water to one volume Trimethol Syrup) possesses the same germicidal power as a one per cent. solution of carbolic acid. This coefficient takes no cognizance of the *actual amount of Trimethol as such*—it merely indicates the relative germicidal power of the Trimethol Syrup as sold."

The preceding report shows that Trimethol Syrup has a phenol coefficient of $1/10$, and assuming Trimethol Syrup contains the amount of Trimethol declared, the substance Trimethol would have a phenol coefficient of $8\frac{1}{3}$ instead of 40, as is claimed. According to Kendall and Edwards' method, the penetrability-germicidal value of the syrup is equal to a 1 per cent. solution of phenol.

WALKER'S REPLY TO CRITICISM

The report of the bacteriologist was submitted to The Walker-Leeming Laboratories for comment. The following reply was received from J. T. Ainslie Waker:

(May 22, 1917) "In reply to your letter of the 15th inst., which has just been placed before me on my return to town, I have to inform you that the potent constituent of Trimethol Tablets and Trimethol Syrup is not fully available as a bactericide until it comes in contact with the pancreatic fluid.

"As you will see from the enclosed extracts from clinical reports, the therapeutic value of Trimethol has been well established.

"As regards penetrability, no claim has ever been made for Trimethol in this connection; and, as I pointed out in my original paper (*American Medicine*, September, 1914), when referring to the independent tests made by Dr. Frederick Sondern, 'No attempt was made to determine the bacterial content of the solid particles, as in the opinion of the writer sterilization of the interior of these particles is not only absolutely impossible, but wholly unnecessary. The fact of the fluid contents of

1. The details of the tests are omitted from this report but will appear in the Annual Council Reports.

the canal being sterile may be taken to indicate that the exterior of all solid particles is in a like condition, and therefore harmless. It is the organisms in the fluid portions only that produce the deadly effects through the chemical substances they secrete; those in the interior of the solid portions (i.e., as evacuated) may be disregarded, as they are not available for good or evil.

"I must confess to no little surprise on learning that your investigator is still using the Hygienic Laboratory method of determining phenol coefficients. I would respectfully suggest that you call his attention to the critical comparison of the Hygienic Laboratory and R.-W. Tests, which he will find in the enclosed reprint from the *New York Medical Journal* of March 11, 1916.—'Instead of being an improvement upon the standard R.-W. Test, the so-called Hygienic Laboratory Method is so defective as to be wholly unreliable, and incapable of furnishing results of any scientific or practical value whatever.'"

As to the statement that the potent constituent of Trimethol Tablets and Trimethol Syrup is not fully available as a bactericide until it comes in contact with the pancreatic fluid, attention is called to a leaflet, which accompanies each bottle of Trimethol Syrup, that reads:

"Trimethol is insoluble in water, but when properly emulsified has a Rideal-Walker co-efficient of 40; that is to say, it is 40 times more efficient as a germicide than phenol (pure carbolic acid)."

The Trimethol Syrup which was used in the investigation, when mixed with water produced an almost perfectly transparent solution, which justifies the assumption that the proper physical conditions were observed and that this objection is not well founded.

As regards the relation of pancreatic fluid to bactericidal availability of Trimethol, there is little to say, other than that the published statements in the advertising accompanying the packages make no mention of this point. It would be interesting to know what, if any, relation the pancreatic fluid has to this substance in view of the statement that it "has a Rideal-Walker co-efficient of 40."

The Trimethol "literature" does not throw light on the question, What is the germicidal value of Trimethol Syrup as compared with phenol? The only available method of determining the germicidal value of a liquid disinfectant is to make a direct comparison of the substance in question with phenol under similar conditions. Given parallel conditions, not obviously prejudicial to the substance tested in contrast to the standard solution, the results are comparable, and furnish a basis for estimating the relative germicidal power of the two substances. In the investigation, Trimethol Syrup and phenol were thus compared.

As regards the contention that the bacteria within fecal masses are harmless, this may be granted. But it must also be admitted that these intestinal masses are constantly being reformed so that buried micro-organisms do not remain in the interior. For this reason, the determination of the penetrability coefficient of a germicide is pertinent.

Regarding the respective merits of the old Rideal-Walker and the newer U. S. Hygienic Laboratory method of determining the phenol coefficient, the Rideal-Walker method was found to possess certain drawbacks, and in an attempt to overcome these the "Lancet Method" was evolved; this method in turn was improved in the U. S. Hygienic Laboratory and led to the United States Public Health Service Hygienic Laboratory method for the determination of the phenol coefficient of disinfectants (published in *Hygienic Laboratory Bulletin* 82). In 1913 this method was formally adopted by the Council for the valuation of disinfectants or germicides of the phenol type, and the method is now in general use for this purpose in the United States.¹ In this connection Hiss and Zinsser may be quoted (Ed. 2, page 80): "The most precise method of standardizing disinfectants is that now in use in the United States Public Health Service." Stitt, director of the United States Naval Medical Schools, in his *Practical Bacteriology, Blood Work and Parasitology* (Ed. 4, page 473) says: "In the United States disinfectants are rated according to the Hygienic Laboratory Phenol Coefficient."

1. Those who are interested in the relative merits of the Rideal-Walker, the *Lancet* and the Hygienic Laboratory methods for the valuation of disinfectants should read the following: Method of Standardizing Disinfectants with and without Organic Matter, *THE JOURNAL A. M. A.*, Aug. 24, 1912, p. 667. Standardization of Disinfectants, Report of the Council on Pharmacy and Chemistry, *THE JOURNAL A. M. A.*, April 26, 1913, p. 1316; Standardizing Disinfectants, *THE JOURNAL A. M. A.*, Sept. 30, 1916, p. 883.

The Council adopted the recommendation of the Committee on Pharmacology to the effect that the claims made for Trimethol are unsupported by acceptable evidence. Accordingly, Trimethol and the pharmaceutical preparations said to contain it—Trimethol Syrup, Trimethol Capsules, and Trimethol Tablets—were held ineligible for New and Nonofficial Remedies.

Correspondence

PRIORITY FOR SIMPLIFIED METHOD FOR DETERMINING THE ISO-AGGLUTININ GROUP

To the Editor:—It is of interest to note that the simplified method for determining the iso-agglutinin group, by W. L. Moss (*THE JOURNAL*, June 23, 1917, p. 1905) is substantially the same as that used by me, and described in the *Journal of Laboratory and Clinical Medicine*, October, 1916. Two points given by me, however, should be emphasized: The serums of Groups II and III should be especially strong in agglutinins to prevent error. Moreover, the use of Group IV serum is of value, as noted by me, for a control in case the agglutinins of the other groups happen to have weakened.

NORMAN E. WILLIAMSON, M.D., Stockton, Calif.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

GUIDE TO FRENCH

To the Editor:—I want a small elementary guide to French, one that would give those of us who may go to France a sufficient knowledge of French to get along. Please do not use my name if you publish this.

M. R. C.

ANSWER.—The following books have been especially prepared for this purpose:

Wilkins, Coleman and Preston: First Lessons in Spoken French for Doctors and Nurses, Chicago, University of Chicago Press, 54 cents, postpaid.

Wilkins, Coleman and Huse: First Lessons in Spoken French for Men in Military Service, Chicago, the University of Chicago Press, 54 cents, postpaid.

Gallichan, Walter M.: The Soldiers' English and French Conversation Book, Philadelphia, J. B. Lippincott Company, 30 cents.

Plumon, Eugène: Vade-Mecum, New York, Brentano's, 75 cents.

The books by Wilkins, Coleman and Preston and by Plumon contain portions especially adapted for medical officers. The Vade-Mecum contains much special information in the way of tables, measures, abbreviations, etc.

PICA—EATING DIRT

To the Editor:—I have a boy 2 years old who is in perfect physical condition in all respects, but who persists in eating dirt or sand or anything with earth in it. Will you tell me what is lacking in his system which causes this phenomenon, and what I can give him to relieve the situation?

C. O. Y.

ANSWER.—The habit of dirt eating, called pica, occurs as a neurosis in children between the first and second years, and sometimes in older persons, as a form of perverted appetite. In most of these cases earth, cinders, etc., may be consumed with avidity, whereas ordinary food is refused. Such patients become thin, sallow and unhealthy looking, and suffer from colic and diarrhea. The condition is usually curable by prevention, by producing free evacuation, and by supplying plenty of wholesome food. In case the habit is associated with mental deficiency, the treatment is directed toward that condition. The condition is psychologic, not physiologic, in character, and must be treated from a psychologic point of view.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

HAWAII: Honolulu, Sept. 10-13. Chairman, Dr. R. W. Benz, 1141 Alakea St., Honolulu.
MASSACHUSETTS: Boston, Sept. 11-13. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.

REPORT OF SECOND EXAMINATION OF THE NATIONAL BOARD OF MEDICAL EXAMINERS

The second examination of the National Board of Medical Examiners was held in Washington, D. C., June 13-21, 1917. Of the twenty-seven who applied, twenty-five were found to have the essential preliminary and medical qualifications, and thirteen of these appeared for the examination (see table, bottom of page), the others having been ordered on active duty. The subjects of the examination and the relative value of each were: anatomy, 100; physiology, 75; chemistry, 75; pathology, 50; bacteriology, 50; materia medica, pharmacology and therapeutics, 75; medicine, 200; surgery, 200; obstetrics and gynecology, 100; hygiene and sanitation, 50, and medical jurisprudence, 25. A percentage of 75 was required to pass. Falling below 65 in more than two subjects, or below 50 in more than one subject, constituted a failure. The following colleges were represented:

PASSED		
Name and College	Year of Graduation	
Adrian Stevenson Taylor, University of Virginia and Harvard Medical School	1905 and 1916	
George B. Packard, Harvard Medical School.....	1914	
Roscoe Clayton Webb, Johns Hopkins.....	1914	
Walter Philip Kreiehbaum, Northwestern University.....	1914	
Arthur Beek Hamilton, University of Pennsylvania.....	1915	
Douglas Power Murphy, University of Pennsylvania.....	1916	
Clarence Stiles McKee, University of Pennsylvania.....	1915	
James Lancelot Wilson, Columbia University, College of Physicians and Surgeons.....	1916	
Harvey Welton Snyder, Atlanta Medical College.....	1916	
College	FAILED	Year of Graduation
University of Michigan.....		1910
Northwestern University		1905
McGill University		1916

RESULT OF EXAMINATIONS FOR MEDICAL DEPARTMENT OF THE NAVY

The following are the combined figures of two examinations held in April and May of this year of members of the Naval Reserve Force for commissions in the Medical Corps, U. S. Navy. Four hundred and eighty-six were examined, and of these 369 found qualified professionally, that is, 76 per cent. The first ten honor men were graduates of the following institutions, in the order indicated:

1. Pennsylvania..... 1917	6. Northwestern..... 1917
2. Northwestern..... 1915	7. Western Reserve..... 1916
3. Harvard..... 1917	8. Northwestern..... 1917
4. Rush..... 1917	9. Georgetown..... 1917
5. Washington..... 1917	10. Harvard..... 1917

Thus of the first ten, Northwestern led with three, Harvard had two, and Pennsylvania, Rush, Washington University, Western Reserve and Georgetown, one each.

Of the first twenty-five, Harvard led with four, North-western and Rush had three each, Pennsylvania and Illinois had two each, and Washington University, Western Reserve, Georgetown, Minnesota, Tulane, California, Cornell, Pitts-burgh, Atlanta, Vermont and Tennessee, one each.

Medical College	Number Examined	Number Passed	Percentage Passing	Average of Pass-ing Marks	Stand-ing by Pass-ing Marks
University of Minn., Med. School...	16	16	100	80.64	18
Med. School of Harvard Univ.	14	14	100	83.20	4
George Wash. Univ., Med. School...	11	11	100	80.10	22
Johns Hopkins Univ., Med. Dept. ...	8	8	100	80.82	14
Tulane Univ., School of Med.	8	8	100	80.50	20
Univ. of Pitts., School of Med.	5	5	100	79.26	32
Columbia Univ., Col. of P. & S.	3	3	100	81.06	11
Univ. of Virginia, Dept. of Med. ...	3	3	100	79.86	25
Cornell Univ., Med. College.....	2	2	100	83.80	3
Yale Univ., School of Medicine.....	2	2	100	78.40	39
Syracuse Univ., Col. of Medicine....	2	2	100	75.00	54
Boston Univ., School of Medicine...	1	1	100	75.00	57
Bowdoin Medical School.....	1	1	100	81.50	6
Univ. of Buffalo, Dept. of Med. ...	1	1	100	81.00	12
McGill Univ., Faculty of Med.	1	1	100	80.00	23
Univ. of N. Carolina, Sch. of Med. ...	1	1	100	75.00	58
Univ. of North Dakota.....	1	1	100	81.00	13
Temple Univ., Dept. of Med.	1	1	100	76.80	52
Western Reserve Univ., Sch. of Med. ...	1	1	100	88.90	1
Univ. of Penn., School of Med.	16	16*	100	80.67	17
Rush Med. College (Univ. of Chi.) ...	15	15*	100	82.55	5
Univ. of California Med. School....	11	10*	91	81.29	10
Univ. and Bellevue Hosp. Med. Col. ...	9	8	89	79.70	28
Washington Univ. Med. School.....	8	7	88	81.70	8
Northwestern Univ., Sch. of Med. ...	8	7	88	84.20	2
Atlanta Medical College.....	8	7	88	80.60	19
Univ. of Michigan, Med. School....	8	7	88	78.14	42
Long Island College Hospital.....	8	7**	88	79.50	30
Univ. of Illinois, Col. of Med.	14	12†	86	79.70	28
Univ. of Colorado, School of Med. ...	7	6	86	78.48	37
Jefferson Med. College of Phila. ...	25	21	84	79.47	31
Univ. of Alabama, School of Med. ...	6	5	83	77.80	46
St. Louis Univ., School of Med.	11	9	82	80.81	16
Leland Stanford Jr. Univ. Sch. M. ...	16	13	81	78.64	36
Univ. of Texas, Dept. of Med.	5	4	80	81.37	9
Georgetown Univ., School of Med. ...	5	4*	80	80.82	15
Univ. of Maryland, School of Med. ...	15	12†	80	77.95	44
Univ. of Kansas, School of Med. ...	9	7	78	76.87	51
Hahnemann Med. Col. & Hosp. ...	4	3	75	81.86	7
State Univ. of Iowa, Col. of Med. ...	4	3*	75	79.06	33
Univ. of Tennessee, Col. of Med. ...	11	8	73	79.80	26
Indiana Univ., School of Med.	11	8	73	77.52	49
Univ. of Oregon, Dept. of Med.	7	5*†	71	78.34	40
Medical College of Virginia.....	26	18†††	69	78.70	35
Marquette Univ., School of Med. ...	9	6*†	67	78.15	41
Univ. of Vermont, Col. of Med. ...	8	5	63	79.80	27
Medico-Chirurgical Col. of Phila. ...	8	5	63	76.78	53
Vanderbilt Univ., Med. Dept.	17	10	59	79.60	29
Ohio State Univ., College of Med. ...	10	5	50	78.42	28
Univ. of Georgia, Med. Dept.	2	1	50	78.10	43
Univ. of Neb., College of Med.	2	1	50	75.80	55
Chicago College of Med. & Surg. ...	2	1	50	75.10	56
Tufts College, Medical School.....	18	9††	50	77.40	50
Medical Col. of State of S. Carolina	13	6†	46	77.85	45
Fordham Univ., School of Med.	7	3	43	78.76	34
Univ. of Louisville, Med. Dept.	18	7*†	39	77.58	48
Detroit Col. of Med. & Surg.	12	4*	33	77.65	47
John A. Creighton Med. Col.	8	2	25	80.35	21
Univ. of Arkansas, Med. Dept.	1	0†	...	.....	61
Albany Medical College.....	1	0†	...	.....	60
Birmingham Medical College.....	1	0	...	.....	59

* Each star represents one candidate who failed on first examination, but passed on second.
† Each dagger represents one candidate who failed on both examinations.

AVERAGES OBTAINED IN THE EXAMINATION OF THE NATIONAL BOARD OF MEDICAL EXAMINERS

Subjects	Candidates by Number												General Aver. by Subjects
	1	2	3	4	5	6	7	8	9	10	12	13	
Anatomy.....	82	82	54	98	42	79	78	60	82	82	81	86	76.3
Chemistry.....	66	77	70	87	67	80	76	85	67	81	79	81	76.1
Pharmacology, materia medica and therapeutics.....	90.5	90	77	94	69.2	90	88	84	90	90	90	90	87
Obstetrics.....	80	95	84	93	60	77	70	75	80	75	85	85	79.7
Hygiene.....	77.5	80	70	85	66	79	76	70	66	67	81	76	74.4
Medicine.....	88	83.5	78	96	67.5	86	81	76	83.5	84.5	91	87.5	83.5
Surgery.....	76	85.5	47	82	59	81	73	68.5	69	88.5	87	77.5	76.2
Pathology.....	78	84	57	90	60	80	77	74	71	73	90	88	76.2
Bacteriology.....	80	80	69	92	74.5	70	79	56	69	82	80	79	75.9
Physiology.....	86	87	70	95	72	75	83	75	80	88	90	77	78.9
Medial jurisprudence.....	80.3	82	85	90	58	80	58	75	78	92	88	73	80.6
General average of candidates.....	80	83	69	91	63	79	76	72	75	82	85	81	

Book Notices

OPERATIVE SURGERY OF THE NOSE, THROAT, AND EAR, FOR LARYNGOLOGISTS, RHINOLOGISTS, OTOLOGISTS, AND SURGEONS. By Hanau W. Loeb, A.M., M.D., Professor of Ear, Nose and Throat Diseases in St. Louis University; in Collaboration with Joseph C. Beck, M.D., George W. Crile, M.D., William H. Haskin, M.D., Robert Levy, M.D., Harris P. Mosher, M.D., George L. Richards, M.D., George F. Shambaugh, M.D., and George B. Wood, M.D. In Two Volumes, Volume 2. Cloth. Price, \$7. Pp. 427, with 476 illustrations. St. Louis: C. V. Mosby Company, 1917.

The first volume of this work appeared several months ago, and now with this volume, the complete work furnishes a valuable contribution to the literature of this special field of surgery. In any treatise on operative surgery, illustrations, if well reproduced, are invaluable concomitants to the text. The author of this work cannot be too highly complimented on the character of the unusually large number of good illustrations. They assist the reader very materially in understanding the various steps of the operations described. The first 158 pages are devoted to the surgery of the nasal passages. A short chapter on the pharynx follows, given up mostly to the different operations on the tonsils. Then comes an instructive chapter on endolaryngeal operations with the aid of the laryngoscope, and finally the operations on the external ear and the surgery of the mastoid process. The book goes into the subject-matter direct, omitting much that might be included on pathology, etiology, etc., but which is really unnecessary in a work strictly on operative surgery.

CATARACT, SENILE, TRAUMATIC AND CONGENITAL. By W. A. Fisher, M.D., Professor of Ophthalmology, Chicago Eye, Ear, Nose and Throat College. Cloth. Price, \$1.50. Pp. 119, with illustrations. Chicago: Chicago Eye, Ear, Nose and Throat College, 1917.

Had the title of this work been "Extracts from the Literature of the Smith-Indian Extraction of Senile Cataract," it would have conveyed a much truer idea of its contents. The whole subject of traumatic and congenital cataracts, their causation and treatment, is dismissed in ten pages; about five pages are devoted to other methods of removing senile cataract, while the remainder of the book, say, one hundred pages, consists mostly of previously published articles and chapters on the removal of cataract in its unruptured capsule, chiefly by Vail, Wright, Greene, Colonel Smith and the author. Long extracts from popular textbooks—de Schweinitz, Fuchs, Weeks, Swanzy—also take up a good deal of space. There are many rather poor electrotypes illustrating the book, some of which, especially of the author's modifications of the instruments or methods of others, are considered of such prime importance that they are repeated. For instance, identical cuts showing the "Smith-Fisher instrument" and the "author's lid hooks" are pictured on three separate occasions. The extraction of senile cataract in the unruptured capsule in properly selected cases, and in the hands of a trained operator and a trained assistant presents certain advantages over many forms of removal, but that it should be employed universally or to the exclusion of all other extraction methods (see page 99) is not yet established.

ANATOMY AND HISTOLOGY OF THE MOUTH AND TEETH. By I. Norman Broomell, D.D.S., Professor of Dental Anatomy and Clinical Dentistry, Philadelphia Dental College, and Philipp Fischelis, M.D., Professor of Histology, Medico-Chirurgical College of Philadelphia. Fifth Edition. Cloth. Price, \$3 net. Pp. 467, with 368 illustrations. Philadelphia: P. Blakiston's Son & Co., 1917.

This is practically a reprint of the previous edition, and is a combination of what might be better published as three separate books. It is subject to the criticism which may usually be applied to such efforts. It includes descriptive anatomy of the mouth and adjacent parts, the anatomy of the teeth and their supporting tissues, and the histology of these structures. In general, the book lacks the finer detail and thoroughness which a work on anatomy or histology should have. For example, in describing the cementum which forms the outer layer of the tooth root, it states that this tissue is similar to bone, but neglects to mention the very important difference that it has no circulation of blood, which is the thing of probably greatest importance for the

dentist to know in considering the chronic infections involving this tissue. The statement is repeated in this edition that the enamel of the incisor teeth is formed from three points of beginning instead of four. The book states that the gingival portion of the gum tissue is of denser structure than those portions more distant from the teeth, but does not mention the differences in detail, such as the many long projecting legs of connective tissue which carry blood vessels far into the dense epithelium and provide for its rapid regeneration. Throughout, the book fails to have the vision of practical application which would make its use as a text more interesting to the student. There are many excellent illustrations. Among these the "in series" pictures of the roots of teeth in process of development give the best idea of any yet published of their form during growth.

Medicolegal

Representing to Judge that a Person Is Insane and Needs Hospital Treatment

(*Reycraft vs. McDonald (Mich.)*, 160 N. W. R. 836)

The Supreme Court of Michigan affirms a judgment for the defendant, who was sued for slander because he made to the probate judge a statement to the effect that the plaintiff was insane and needed hospital treatment. The court says that the statement was made in the office of the judge of probate when only the defendant and the judge were present. It was clear from the record that it was for the purpose of instituting proceedings by which the plaintiff's alleged insanity should be judicially determined. On the information received by him at the time from the defendant, the judge prepared a proper petition for an order directing the admission of the plaintiff to an asylum or institution for the care of the insane, and the petition was signed and verified by the defendant. Notice of such petition, and of the time and place of the hearing thereon, was duly served on the plaintiff, who, with his attorney, thereupon appeared at the probate office for the purpose of the investigation. In the meantime it had been discovered by the judge that the defendant had no authority under the statute to make the petition, and he so announced to the plaintiff's attorney. The attorney replied that they would waive the question of jurisdiction and proceed with the merits of the matter; but it being the opinion of a physician, who had been consulted, that the plaintiff was not insane, the proceedings were dismissed. On behalf of the defendant it was claimed that the statement made to the probate judge regarding the plaintiff's insanity was absolutely privileged, because made in the course of judicial proceedings; but the plaintiff insisted that it was not made in the course of judicial proceedings, inasmuch as the defendant was not authorized to institute such proceedings, and his petition gave the court no jurisdiction over the person of the plaintiff. The supreme court agrees with the defendant's contention. It thinks his communication to the probate judge in this case was a matter of absolute privilege. It was made for the purpose of instituting legal proceedings, and to a court having jurisdiction of the subject-matter. Whether the defendant was authorized to make the petition, and whether it empowered the court to act in the particular case, were themselves questions for judicial determination.

Employment of Physician by Claim Agent or Subordinate Employee of Railroad

(*Scullin et al. vs. Routh (Ark.)*, 191 S. W. R. 218)

The Supreme Court of Arkansas affirms a judgment for \$210 in favor of plaintiff Routh against the defendants, as receivers of a railroad company, for medical services rendered to a man who sustained a double compound fracture of the leg in a wreck on the railroad. The court says that the general claim agent of the company telephoned to the plaintiff to go and take charge of the man and take him to his home. The plaintiff did so, and charged for the service \$10. Septic infection set in, and it became necessary for some

one to continue to treat the man. The plaintiff made twenty-eight more visits to him, and charged therefor \$7.50 a visit, which he said was a reasonable price, the place at which the patient was being about 9 miles away. The plaintiff stated that the general claim agent and his assistant both knew that he was continuing to treat the man, and directed him to do so. The claim agent admitted that he called the plaintiff to take charge of the man after he had been injured in the wreck, and also admitted that he knew that the plaintiff had continued to treat him and that it was necessary for some physician to treat him, but he said he had no authority to employ a physician except in cases of emergency. The railroad company introduced its rules in regard to the employment of physicians, which stated that the company would not recognize any responsibility for medical and surgical attention, etc., except such as contracted for by its general manager or superintendent. When persons or employees were injured, the nearest company surgeon should be called. If the case was urgent, and the company surgeon could not be immediately procured, the conductor, agent or officer in charge, if unable to procure instructions from the proper authority, was authorized to call the nearest surgeon available to administer first aid and care to the patient until the company surgeon could take charge of the case. This court has adopted the rule that subordinate employees of a railroad company, who under ordinary circumstances have no authority to bind the railroad company by contracts for medical attendance on its servants or passengers, have an implied authority to make such contracts in its behalf in cases in which there is an urgent necessity for the immediate employment of a physician or surgeon to attend to servants or passengers who have been injured by conditions or occurrences incident to the operation of a railroad. The urgency and necessity of the employment of the plaintiff by the claim agent who was in charge at the scene of the accident was submitted to the jury under proper instructions, but counsel for the defendants contended that under the rule announced in the decisions of this court as above, the liability of the railroad arises with the emergency and with it expires. They contended that the emergency ceased before the plaintiff rendered all the services for which he obtained judgment, and that on this account the verdict was without evidence to support it. But the court does not think that the doctrine of implied authority in such cases had any application to the facts of this case; for under the rules the claim agent had express authority to employ a physician within certain limitations. There was sufficient evidence to warrant the jury in finding that when the wreck occurred the general claim agent took charge and was unable to secure a surgeon of the company, and that he called in the plaintiff to take charge of the case. It was true that on cross-examination the plaintiff admitted that the company had a local physician near where the injured man resided, but it was not shown that this physician or any other physician of the company was in a position to take charge of the man. This was a matter peculiarly within the knowledge of the company. Its officers knew at what time one of its surgeons could take charge of the case, and the burden of proof was on the defendants to establish that fact. They did not do so, and there was nothing in the record tending to show that a surgeon of the company could have taken charge of the case at any time while the services were rendered by the plaintiff. The verdict for the plaintiff was sustained by the evidence.

Society Proceedings

COMING MEETINGS

- Am. Assn. Obstetricians and Gynecologists, Newark, N. J., Sept. 17-19.
American Electro-Therapeutic Association, Atlantic City, Sept. 11-13.
American Roentgen Ray Society, Pittsburgh, Sept. 19-22.
Colorado State Medical Society, Colorado Springs, Sept. 25-27.
Indiana State Medical Association, Evansville, Sept. 26-28.
Michigan State Medical Society, Battle Creek, Sept. 4-6.
Missouri Valley Medical Society, Lincoln, Neb., Sept. 20-21.
Pennsylvania State Medical Society, Pittsburgh, Sept. 24-27.
Utah State Medical Association, Salt Lake City, Sept. 12-13.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Roentgenology, New York

July, IV, No. 7

- 1 Roentgen Diagnosis of Pathologic Gallbladder. A. W. George and R. D. Leonard, Boston.—p. 321.
- 2 Development of Roentgenology. H. C. Snook, Chicago.—p. 337.
- 3 Localization of Foreign Bodies. W. A. Wilkins, Montreal, Canada.—p. 343.
- 4 Sutton Method of Foreign Body Localization. E. H. Skinner, Kansas City, Mo.—p. 350.
- 5 Dangers in Roentgen Laboratory. J. S. Shearer, Ithaca.—p. 357.

Archives of Pediatrics, New York

June, XXXIV, No. 6

- 6 Early Recognition of Poliomyelitis. R. S. Haynes, New York.—p. 401.
- 7 Cerebrospinal Fluid in Acute Anterior Poliomyelitis with Special Reference to Diagnosis. J. A. Kolmer, Philadelphia.—p. 413.

Boston Medical and Surgical Journal

July 26, CLXXVII, No. 4

- 8 Some Medical Practice among New England Indians and Early Settlers. C. M. Cobb, Lynn.—p. 97.
- 9 Biologic Analysis in Study of True Epilepsy. F. L. Dunham, Baltimore.—p. 105.
- 10 Surgical Treatment of Laryngeal Cancer. J. E. Mackenty, New York.—p. 110.
- 11 *Mastiche and Potassium Permanganate Tests Applied to Cerebrospinal Fluid of Insane. L. G. Lowrey, Boston.—p. 115.
- 12 Case of Fracture of Cuboid Bone. W. P. Coues, Boston.—p. 117.
- 13 Case of Henoch's Purpura. E. D. Gardner, New Bedford.—p. 118.

11. Mastiche and Potassium Permanganate Tests Applied to Fluid of Insane.—From data presented by Lowrey dealing with the mastiche test on thirty-six fluids, and the permanganate test on twenty fluids from insane persons, the conclusion is drawn that neither of these tests is of sufficient value to become a part of the routine examination of spinal fluids from the insane.

Colorado Medicine, Denver

July, XIV, No. 7

- 14 Tumors of Breast. P. Hillkowitz, Denver.—p. 180.
- 15 Pulpless Teeth. I. C. Brownlie, Denver.—p. 183.
- 16 Dysmenorrhea. L. J. Weldon, Denver.—p. 189.
- 17 Transillumination of Larynx and Upper Trachea. F. R. Spencer, Boulder.—p. 193.
- 18 Diseases of Eye Resulting from Lesions of Mouth and Throat. J. A. Patterson, Colorado Springs.—p. 197.

Florida Medical Association Journal, Jacksonville

July, IV, No. 1

- 19 Presence of Tubercle Bacilli in Specimens of Feces Examined for Animal Parasites. H. H. Fox, Tallahassee.—p. 1.
- 20 Responsibility of General Practitioner to Mental Defective. G. B. Coon, Tampa.—p. 3.
- 21 Venereal Disease Problem. E. G. Birge, Jacksonville.—p. 10.
- 22 Value of Fresh Cow's Milk in Infant Feeding Compared with Artificial and Pasteurized Milk. J. G. DuPuis, Lemon City.—p. 14.
- 23 Abdominal Pregnancy. G. R. Holden, Jacksonville.—p. 16.
- 24 Neglect of Massage Reason Osteopaths and Chiropractors Exist. F. J. Walter, Daytona.—p. 19.

Georgia Medical Association Journal, Augusta

July, VII, No. 3

- 25 Classification of Mental Disorders Adopted by Georgia State Sanitarium. E. M. Green, Milledgeville.—p. 41.
- 26 *Endothelioma of Kidney; Report of Three Cases. J. Funke, Atlanta.—p. 47.
- 27 Treatment of Nausea of Pregnancy. S. T. Barnett, Atlanta.—p. 51.
- 28 Patent Medicine and Quacks. J. O. Elrod, Forsyth.—p. 54.

26. Endothelioma of Kidney.—Funke's first patient was a male, aged 43 years. Two years before the fatal issue he began to experience discomfort in the region of the kidney; he underwent repeated examination, but no definite conclusion could be reached as to the nature of the trouble. About one and one-half years before his death there appeared in the urine a few red blood cells, and about one month later the left kidney appeared to be slightly enlarged. Succeeding

examination revealed an increase in the size of the left kidney and constant presence of blood in the urine. About one month before death, the urine contained spherical cells, ranging from 20 to 30 microns in diameter, the protoplasm of which contained highly refractile bodies not unlike fat globules. The nucleus could not be seen. The necropsy showed a mass occupying the position of the left kidney measuring 13 by 42 by 12 cm., and weighing 900 gm. The lower half of the right kidney contained a circumscribed, well defined nodular mass measuring 2.5 cm. Histologically, the diagnosis was endothelioma of the left kidney, with metastasis to the opposite kidney and peribronchial lymph nodes. The second patient was a girl, 2 years of age. There was no history of a preexisting disease which was in any way related to the present condition. About six months previous the parents noticed that something inconvenienced the child, and that the disease seemed to be on the left side. In a very short time the patient complained of great discomfort, there was a bulging in the region of the left kidney. Urine showed nothing abnormal. A diagnosis of sarcoma was made. The mass was removed at operation and was found to be a part of the kidney. It proved to be an endothelioma of the kidney. The third patient was a man, 54 years of age. His trouble began about one and one-half years before death, and consisted of discomfort in the region of the left kidney. For more than six months before the operation the urine contained blood, never large in quantity. Enlargement of the kidney could not be determined. The left kidney was removed. The patient died four days later. The histology of this growth was like that of the other two cases.

Illinois Medical Journal, Chicago

July, XXXII, No. 1

- 29 Injuries of Head, with Special Reference to Intracranial Complications. T. A. Davis, Chicago.—p. 1.
- 30 Lower Abdominal Incision. H. T. Byford, Chicago.—p. 10.
- 31 Diabetes: Initial Fast and Tolerance Testing. E. J. Brown, Decatur.—p. 12.
- 32 Splenectomy for Hemolytic Icterus. C. A. Elliott, Chicago.—p. 18.
- 33 Tonsil as Portal of Entry in Tuberculosis of Cervical Glands. W. B. Metcalf, Chicago.—p. 19.
- 34 State Hospital—Its Purposes, Limitations and Handicaps. W. M. Hotchkiss, Jamestown, N. D.—p. 23.
- 35 Incipient Psychoses. G. H. Moody, San Antonio, Texas.—p. 27.
- 36 Care of Newborn. T. Warloe, Chicago.—p. 28.

Indiana State Medical Association Journal, Fort Wayne

July, X, No. 7

- 37 Factors which Contribute to Safety and Success in Surgical Procedures. J. C. Fleming, Elkhart.—p. 269.
- 38 Evolution of the Beasley Splint for Femur. G. F. Beasley, Lafayette.—p. 276.
- 39 Working Knowledge of Ophthalmology and Otolaryngology for General Physician. G. W. Spohn, Elkhart.—p. 286.

Iowa State Medical Society Journal, Des Moines

July, VII, No. 7

- 40 Wrist Injuries Frequently Overlooked. H. L. Beye, Iowa City.—p. 239.
- 41 Fractional Gastric Analysis. M. Mallory and L. K. Meredith, Des Moines.—p. 242.
- 42 Blood Chemical Analyses in Reference to Diagnosis and Treatment. R. B. H. Gradwohl, St. Louis.—p. 244.
- 43 Vasomotor Epilepsy or Vasoconstrictor Anaphylaxis. J. J. Rowan, Jr., Dubuque.—p. 248.
- 44 Duty of Medical Man in Present Crisis. J. C. Bloodgood, Baltimore.—p. 254.
- 45 Radium Therapy. D. P. Johnson, Muscatine.—p. 255.

Journal of Medical Research, Boston

July, XXXVI, No. 3

- 46 *Studies on Circulation of Kidney in Relation to Architecture and Function of Organ in Health and Disease. L. Gross, Montreal, Canada.—p. 327.
- 47 *New Pathogenic Sporotrichum. Found in Case of Acute Arthritis of Knee Following Injury (Sporotrichum Councilmani). S. B. Wolbach, W. R. Sisson and F. C. Meier, Boston.—p. 337.
- 48 Part Played by Protein-Free Digestion Products and by Meat Infusion in Diphtheria Toxin Production. H. C. Robinson and L. F. Rettger, New Haven, Conn.—p. 357.
- 49 *Physiologic Significance of Anatomic Changes Produced in Nerve Cells by Toxin of B. Diphtheriae. R. R. Simmons, St. Louis.—p. 377.
- 50 *Spleen as Bacterial Filter. Y. Ozaki, New Haven, Conn.—p. 413.

- 51 *Treatment of Patients with Bronchial Asthma with Subcutaneous Injections of Proteins to which They are Sensitive. I. C. Walker, Boston.—p. 423.
- 52 Study of Micro-Organisms of Dental Caries. P. R. Howe and R. E. Hatch.—p. 481.
- 53 *Studies in Calcification by Use of Vital Dyes. C. C. Macklin, Baltimore.—p. 493.
- 54 Studies on Paratyphoid-Enteritidis Group. Differentiation of Members of Paratyphoid Enteritidis Group from B. Typhosus. C. Krumwiede, Jr., and L. A. Kohn, New York.—p. 509.
- 55 Selective Medium for Isolation of B. Pestis from Contaminated Plague Lesions and Observations on Growth of B. Pestis on Autoclaved Nutrient Agar. J. G. Drennan and O. Teague, Rosebank, N. Y.—p. 519.

46. **Circulation of Kidney.**—By means of barium sulphate injections and roentgenograms, Gross studied the architecture of the blood vessels of the kidney. The results obtained indicate that this method of demonstrating the circulation is applicable to most organs, and that it furnishes a more reliable, rapid, complete and truthful picture than can be obtained by other methods so far in use. So far as the kidney is concerned, the older conceptions which are still found in anatomic and histologic textbooks were shown to be wrong. The roentgenograms will show that there are no divisions of the renal artery which could possibly correspond to the so-called arcuate arteries, and that, instead, the renal arterial architecture resolves itself into a simple tree-like dichotomous arrangement of the branches of the principal afferent artery. These, it is true, run between the pyramids and cortical substance; also they break up rather acutely into their branches, undoubtedly by this means transmitting directly the high aortic pressure. A remarkable point is the very abrupt and complete breaking up of the large arteries, as they approach the cortex, into numerous very small straight branches which permeate the latter. This abrupt breaking up of comparatively large arteries into very small ones (endarteries) undoubtedly gives rise again to a relatively tremendously high pressure in the latter. In view of the totally different conception which these reconstructions give of the architecture of the renal blood vasculature, a different terminology is suggested. The first large branches of the renal artery coursing between the pyramidal and cortical substance, Gross would call interlobar arteries—the very numerous small endarteries which run perpendicularly throughout the cortex, intralobular arteries—and the small branches which come off at right angles to the latter and run to the glomeruli, glomerular arteries.

47. **Pathogenic Sporotrichum Found in Acute Arthritis.**—From a case of traumatic arthritis (nail puncture) of the knee, the authors isolated a new sporotrichum for which the name *Sporotrichum councilmani* is proposed. The important distinguishing features of *Sporotrichum councilmani* are: (1) its pleomorphic growth, characterized by a free aerial growth of hyphae; (2) the abundant spore formation, large size of the spores and absence of lateral spore clusters and (3) the occurrence in lesions as septate branching filaments.

49. **Anatomic Changes Produced in Nerve Cells.**—The changes produced by diphtheria toxin, Simmons says, are essentially, if not solely, those of pure functional depression. The degree of depression produced by lethal doses of the toxin depends on the time afforded for the action of the toxin after inoculation. Temporary cessation of function may result from profound depression, or, if the process goes on to necrosis, the damage is permanent. Clinical evidence is not lacking to prove that in some cases the damage done is irreparable and the paralysis permanent, while in other cases it is temporary and the cells ultimately return to normal or nearly normal function.

50. **Spleen as Bacterial Filter.**—Ozaki found that the accumulation of bacteria in the spleen, such as occurs in experimental bacteremia, is principally dependent on the vital activity of the cells, and the mechanical filtration of bacteria by the spleen is not an important factor in their detention.

51. **Treatment of Bronchial Asthma.**—This paper is based on the study and treatment of forty patients with bronchial asthma, all of whom were sensitive to some type of protein derived from bacteria, food, or animal hair. Bronchial asthmatics who are sensitive to proteins found in horse

dandruff and in cat hair were relieved of attacks during a series of subcutaneous injections with these proteins. Some cases have remained free from asthma as long as five and six months while treatment was continued. Bronchial asthmatics who are sensitive to the proteins in *S. pyogenes-aureus* and *albus* were relieved of attacks during treatment with vaccines of these organisms, and in the case of the former relief continues for four to six months after the vaccines are discontinued, but with the *albus* vaccines relief continues for a shorter time after they are discontinued. A second course of vaccines relieves a relapse of asthma quicker than did the first course. Bronchial asthmatics who are sensitive to the food proteins were relieved of attacks, and they remain free from asthma while such proteins are omitted from their diet. Patients with bronchial asthma associate attacks with cold air, dampness, changeable weather, winds, menstruation, indigestion, nervousness, irritability, colds and bronchitis. After-treatment with proper proteins these patients become tolerant to such conditions, so that they can be exposed to them without asthma and they become free from nervousness, irritability and indigestion without the use of drugs and hygienic measures. There seems to be two types of colds and bronchitis, one type is anaphylactic, and relief or freedom from this type follows proper treatment with proteins, the other type seems to be caused by bacteria and frequently vaccine relieves and prevents these.

53. Studies in Calcification.—The results of Macklin's investigations showed that nonosseous calcareous deposits, such as calcific granules in the permanently ligated kidney and in the lens in cataract, are distinctly and specifically stained by feeding madder. When the dyestuff was fed during only a part of the period when the concretion was forming the stain is found only in parts of the concretion, and these stained areas probably represent the masses which were deposited during the time that the dyestuff was being fed. In these respects, and in the fact that the intensity of staining differs in different areas in direct proportion to the extent of the deposition, during the period of madder feeding, of calcium salts, the phenomenon is analogous to that which obtains in developing bone of the madder fed animal. Thus the conception of a closely similar or identical physico-chemical process in the formation of developing bone and of pathologic calcific deposits is strengthened. Not only is calcified cartilage formed in the development of "cartilage bone," vitally stained by madder feeding, but the portions of any cartilage which contain salts of calcium are vitally stained with the dyes of madder if feeding is prolonged. This staining was found in rats fed continuously for three months or longer.

Journal of Urology, Baltimore

June, I, No. 3

- 56 *Ratio Between Urea Content of Urine and of Blood After Administration of Large Quantities of Urea. T. Addis, San Francisco.—p. 263.
- 57 *Operative Treatment of Urethrorrectal Fistula. Presentation of Method of Radical Cure. H. H. Young and H. B. Stone, Baltimore.—p. 289.
- 58 Use of Tests of Renal Function in Cases of Nephritis. H. A. Christian, Boston.—p. 319.

56. Ratio between Urea in Urine and Blood.—The ratio between the urea content of the urine and of the blood expresses the number of times by which the urea excreted in the urine during a certain period of time exceeds the amount of urea present in 100 c.c. of the blood supplied to the kidney during this time. It is the relation between the amount of work accomplished by the kidney, and the most important measure of the amount of work the kidney is called on to perform. Differences in the concentration of urea in the urine are not the cause of this variability in the ratio over short periods of time. Evidence is given against the supposition that this variability arises from such alterations in the amounts of urea or of oxygen brought to the kidney as would be produced by differences in the rate of flow of blood through the kidney. The magnitude of the ratio increases with increase in the blood urea concentration. In other words, the kidney responds to a call for more work by an increase in output which is greater than the increase

in demand. A direct relationship exists between the magnitude of the ratio and the size of the kidneys. The removal of one kidney leads to a depression of the ratio. In kidneys whose effective size has been reduced by necrosis or degeneration of varying extent, there is a relation between the degree of depression in the ratio and the amount of tissue which has been rendered functionless.

57. Operative Treatment of Urethrorrectal Fistula.—The operation described by Young and Stone is performed as follows: First, suprapubic drainage of the bladder is established, with the patient in dorsal posture. The patient is then shifted to the exaggerated lithotomy position. A racquet-shaped incision, beginning in the midline of the perineum about 3 cm. anterior to the anal margin, is carried backward to this margin, and then encircles it at the mucocutaneous juncture. Through the circular part of this incision the mucosa of the rectum is dissected free all around until a cylinder of the membrane is stripped from its attachments well above the point at which the rectal orifice of the fistula opens, the fistulous tract, of course, being divided transversely in this process. This ascending dissection of the bowel is carried upward until sufficient mucous membrane is loosened to permit the pulling of the segment containing the fistulous orifice well out of the anus, the orifice and a small margin of normal mucosa above it, and all that below it, lying outside the skin level and later being excised. Next, the structures of the perineal body are divided through the straight incision in the midline—the handle of the racquet—so as to expose thoroughly the urethral orifice of the fistula.

The edges of the urethral fistulous opening are freshened, and brought together with catgut sutures over a sound previously passed through the urethra. These sutures do not penetrate the surface of the urethral mucous membrane. The levatores, fascia, and smaller muscles are then brought together by interrupted catgut sutures across the midline of the perineum in several layers, reconstructing the perineal body much as is done in gynecologic operations for relaxed vaginal outlet. Finally, the sphincter ani is restored by uniting its ends with a mattress suture of catgut, and the midline incision is closed with interrupted sutures. The last stage in the operation consists in the excision of the protruding cuff of rectal mucosa in which the fistulous opening lies, and the union of the lower end of the rectal tube to the anal skin margin by interrupted silk sutures after four submucous-subcutaneous sutures of catgut have been placed at quadrant points to help anchor the bowel in place.

Kentucky Medical Journal, Bowling Green

July, XIV, No. 7

- 59 Recruiting for the Military Service. F. T. Woodbury.—p. 307.
- 60 Unusual Injuries Treated under Adverse Circumstances. O. B. Demaree, Mt. Sterling.—p. 317.
- 61 Railway Surgeon and His Work. L. M. Scott, Jellico, Tenn.—p. 319.
- 62 Neuroses Following Railroad Injuries. H. B. Scott, Louisville.—p. 322.
- 63 Gunshot Wounds. W. Bach, Jackson.—p. 323.
- 64 Sprains and Their Treatment. C. Austin, Bagdad.—p. 325.
- 65 Fractured Skull. J. W. Parker, Corbin.—p. 326.
- 66 Illustrating Some Possibilities of Antiseptic Surgery. D. G. Simmons, Adairville.—p. 327.
- 67 Railway Surgeon as an Expert Witness. A. R. Burnam, Jr., Richmond.—p. 328.
- 68 Blood Pressure. W. A. Jenkins, Louisville.—p. 330.
- 69 Laboratory as Aid in Diagnosis of Mastoiditis and Its Complications. W. B. Doherty, Louisville.—p. 334.
- 70 Therapeutics of Organic Heart Diseases. E. A. Cram, Butler.—p. 340.
- 71 Burns and Their Treatment. A. H. Barkley, Lexington.—p. 341.
- 72 Diabetes Mellitus. J. J. Molloy, Covington.—p. 344.
- 73 Pericarditis. W. Byrne, Sr., Russellville.—p. 346.
- 74 Efficacy of Drugs. W. J. Gerding, Newport.—p. 348.

Laryngoscope, St. Louis

July, XXVII, No. 7

- 75 Technic of Suspension in Bronchoscopy and Esophagoscopy. R. C. Lynch, New Orleans.—p. 533.
- 76 Primary Carcinoma of Middle Ear; Report of Case. H. Newhart, Minneapolis.—p. 543.
- 77 New Instrument and Technic for Enucleation of Tonsil. J. Braun, New York.—p. 556.
- 78 Headache; Its Otorhinologic Aspects. W. T. Patton, New Orleans.—p. 564.

- 79 Lateral Sinus Thrombosis with Spontaneous Rupture of Sinus. A. C. Lewis, Memphis, Tenn.—p. 569.
80 Adhesions of Soft Palate to Posterior Pharyngeal Wall; Successful Silver Plate Method of Treatment. F. Hazlehurst, Baltimore.—p. 574.
81 Interesting Cut Throat Case. W. W. Carter, New York.—p. 578.
82 Case of Staphylococemia. W. W. Carter, New York.—p. 579.

Medical Record, New York*July 21, XCII, No. 3*

- 83 Histopathology of Human and Experimental Poliomyelitis. G. B. Hassin, Chicago.—p. 89.
84 Effects of Civilization on Morbidity and Mortality of Tuberculosis. S. A. Knopf, New York.—p. 94.
85 Nonspecific Protein Treatment of Inoperable Cancer. S. P. Beebe and H. S. Williams, New York.—p. 98.
86 Alcoholism in Relation to Epileptoid States and Epilepsy. A. Gordon, Philadelphia.—p. 100.
87 Medicolegal Aspects of Radium Therapy. J. B. Bissell, New York.—p. 102.
88 Gas Bacillus Infection in Chronic Mastoiditis with Cholesteatoma; Operation, Recovery. W. W. Carter, New York.—p. 104.

July 28, No. 4

- 89 Poliomyelitis. A. H. Doty, New York.—p. 135.
90 Civilization and Children's Diseases. R. G. Freeman, New York.—p. 136.
91 Civilization and Diseases of Adult Life. E. O. Otis, Boston.—p. 138.
92 Civilization and Diseases of Middle Life. H. Brooks, New York.—p. 140.
93 Early Diagnosis of Tuberculosis. M. E. Lapham, Highlands, N. C.—p. 143.
94 Relative Value of Massage, Exercises, and Baths in Treatment of Affections of Heart. D. Graham, Boston.—p. 148.
95 Instruments of Precision for Percy Treatment of Uterine and Other Cancer. Electropneumatic Heater. Distensible Hydrothermotaxic Heater. A. E. Gallant, L. H. Moss, New York; L. Bliss, Washington, D. C., and E. N. Lightfoot, New York.—p. 151.
96 Trench Fever. B. Sherwood-Dunn, Paris.—p. 155.

Medicine and Surgery, St. Louis*July, I, No. 5*

- 97 Looking Backward. W. G. Morgan, Washington.—p. 449.
98 Treatment of Chronic Protozoic Enterocolitis as Encountered in Northern United States. F. Smithies, Chicago.—p. 460.
99 Differential Diagnosis of Atrophic Hepatic Cirrhosis and Gastric Cancer, without Palpable Tumor. A. E. Austin, Boston.—p. 468.
100 Three Cases of Colon Infection. J. Sailer, Philadelphia.—p. 473.
101 Roentgen Rays in Diagnosis of Intestinal Stasis. G. E. Pfahler, Philadelphia.—p. 478.
102 Syphilis of Stomach; Report of Cases. A. L. Levin, New Orleans.—p. 498.
103 Silent Common-Dust Stone. D. N. Eisendrath, Chicago.—p. 507.
104 Chronic Hemolytic Icterus; Report of Two Cases Treated by Splenectomy. J. W. Larimore, St. Louis.—p. 513.
105 Stomach Disturbance without Stomach Disease; Report of Cases. M. L. Harris, Chicago.—p. 524.
106 Relation of Bacteriuria and Pyuria to Intestinal Disturbances in Children. F. C. Neff, Kansas City.—p. 536.
107 Pyloric Obstruction in Infancy. E. H. Schorer, Kansas City.—p. 541.

Missouri State Medical Association Journal, St. Louis*July, XIV, No. 7*

- 108 True Physician a Moral Force. J. F. Welch, Salisbury.—p. 273.
109 Intra-Ocular Tuberculosis and Associated Inflammatory Lesions of Upper Respiratory Tract. F. O. Schwartz and M. M. Meyers, St. Louis.—p. 276.
110 Complement Fixation Test for Tuberculosis and Wassermann Test in Pulmonary Tuberculosis. G. Ives, and J. J. Singer, St. Louis.—p. 284.
111 Prevention of Venereal Diseases. H. E. Kleinschmidt, St. Louis.—p. 288.
112 Drug Intoxication. H. C. Park, Knobnoster.—p. 292.

Modern Hospital, St. Louis*July, IX, No. 1*

- 113 Henry W. Putnam Memorial Hospital, Bennington, Vt. H. L. Walker and S. S. Goldwater, New York.—p. 1.
114 Institutional Care of Aged. I. L. Nascher, New York.—p. 4.
115 Economy in Cutting of Surgical Dressings. C. C. McGrath, Detroit.—p. 8.
116 Institutional Life of Moron. R. P. C. Wilson, Marshall.—p. 9.
117 Institutional Care of Epileptics. W. T. Shanahan, Sonyea, N. Y.—p. 10.
118 State Care for Feeble-minded. J. M. Murdoch, Polk, Pa.—p. 12.
119 Sonoma State Home for Feeble-minded and Epileptics. W. J. G. Dawson, Eldridge, Cal.—p. 14.
120 Flavoring Extracts, Their Character and Composition. J. P. Street, New Haven, Conn.—p. 15.
121 Standardization of Hospitals—University or Teaching Hospital. J. A. Hornsby and others, Chicago.—p. 18.

New Jersey Medical Society Journal, Orange*July, XIV, No. 7*

- 122 Social Insurance. P. Marvel, Atlantic City.—p. 257.
123 Surgical Treatment of Joints. G. H. Sexsmith, Bayonne.—p. 262.
124 Uterine Curet in Treatment of Septic Abortions and Puerperal Infections. J. M. Fisher, Philadelphia.—p. 265.
125 Historical Evidence of Origin of Syphilis. J. H. Rosenkrans, Hoboken.—p. 268.
126 Treatment of Complicated Gonorrhea in Male with Special Reference to Local Action of Drugs. N. Ramos, Newark.—p. 271.
127 Ideals of Medicine. W. P. Eagleton, Newark.—p. 273.
128 Idealism in Medicine. H. C. Bleyle, Newark.—p. 274.
129 Review of Fifty Years' Practice of Medicine. G. R. Kent, Newark.—p. 277.

New York Medical Journal*July 21, CVI, No. 3*

- 130 Medical Service in British Army. T. H. Goodwin.—p. 101.
131 Psychopathology of Prostitution. M. J. Karpas, New York.—p. 103.
132 Value of Sputum Cultures in Diagnosis of Pulmonary Tuberculosis. J. A. Roddy and D. R. Brewer, Philadelphia.—p. 108.
133 Human Anthrax; Report of Case. J. B. Bissell, New York.—p. 110.
134 Clinical Significance of Fecal Analysis. L. W. Kohn, Philadelphia.—p. 111.
135 Intravenous Use of Calcium Solutions as Aid in Treatment of Tuberculosis. T. J. Beasley, Indianapolis.—p. 116.
136 Acute Appendicitis. A. Nicoll, New York.—p. 117.
137 Treatment of Locomotor Ataxia by Maloney Method. H. F. Wolf, New York.—p. 121.

July 28, No. 4

- 138 Control of Uterine Hemorrhage. A. B. Davis, New York.—p. 149.
139 Race Betterment Based on Principles of Physical and Mental Prophylaxis. A. Gordon, Philadelphia.—p. 153.
140 Simple Aspirating Device. A. L. Benedict, Buffalo.—p. 156.
141 Cause and Management of Puerperal Eclampsia. R. S. Hill, Montgomery, Ala.—p. 157.
142 Acroparesthesia. H. Climenko and R. Bogan, New York.—p. 159.
143 Clinical Significance of Gastro-Intestinal Toxemias. E. E. Smith, New York.—p. 161.
144 Operative Treatment of Gunshot Fractures. J. R. Eastman, Indianapolis and R. B. Bettman, Chicago.—p. 164.
145 Bradford Frame in Treatment of Buttock and Hip Injuries of War. K. Speed, Chicago.—p. 168.
146 Creosote Carbonate and Quinin in Pneumonia. C. M. Nice, Birmingham, Ala.—p. 170.

Northwest Medicine, Seattle*July, XVI, No. 7*

- 147 Important Medical Matters of Today. J. M. Semple, Spokane.—p. 191.
148 War Experiences in England and France. R. D. Forbes, Seattle.—p. 194. To be concluded.
149 Case of Unusual Idiosyncrasy to Quinin. R. W. Stearns, Medford, Ore.—p. 197.
150 Linitis Plastica. (Leather Bottle Stomach.) E. O. Houda, Tacoma.—p. 197.
151 Rectal Dam and Irrigator. S. D. Calonge, Salt Lake City.—p. 198.

Ophthalmic Record, Chicago*July, XXVI, No. 7*

- 152 Diagnosis of Couched Cataract. R. H. Elliot, London, England.—p. 329.
153 Case of Pneumococcus Conjunctivitis of Great Chronicity and Subsequent Death from Pneumonia. C. A. Clapp, Baltimore.—p. 336.
154 Rare Intra-Ocular Tumor. H. R. Wright, Columbus.—p. 339.

Pennsylvania Medical Journal, Athens*July, XX, No. 10*

- 155 Removal of Foreign Bodies by Direct Bronchoscopy and Esophagoscopy. C. C. Eves, Philadelphia.—p. 687.
156 Mine Injuries to Eye as Related to Compensation Law. G. D. Murray, Scranton.—p. 695.
157 Disappointments Following Tonsillar Operations. B. C. Gilc, Philadelphia.—p. 705.
158 Trachoma—Diagnostic Point and Method of Treatment. V. E. VanKirk, Pittsburgh.—p. 708.
159 What is Diagnosis? F. N. Emmert, Chambersburg.—p. 709.
160 *Diabetic Gangrene. J. H. Jopson and E. H. Goodman, Philadelphia.—p. 710.
161 *Present-Day Treatment of Tuberculous Abscesses and Sinuses. C. W. Delaney, Altoona.—p. 717.
162 Idiosyncrasies in Ectopic Pregnancy. W. A. Nason, Roaring Spring.—p. 719.
163 *Some Phases of Chronic Colitis. E. Zugsmith, Pittsburgh.—p. 721.
164 *Value of Roentgen Rays in Diagnosis of Pulmonary Tuberculosis. W. F. Manges, Philadelphia.—p. 725.

160. Abstracted in THE JOURNAL, Nov. 4, 1916, p. 1394.

161, 163 and 164. Abstracted in THE JOURNAL, Nov. 11, 1916, pp. 1471 and 1472.

Tennessee State Medical Association Journal, Nashville

July, X, No. 3

- 165 *Traumatic Hysteria. W. G. Somerville, Memphis.—p. 91.
166 Acidosis. J. B. McElroy, Memphis.—p. 94.
167 Case of Congenital Deformity of Leg, Toes and Fingers. A. G. Nichol and R. H. Perry, Nashville.—p. 99.
168 Interpretation of Bladder Disturbance in Female. V. D. Holloway, Knoxville.—p. 101.
169 Development of Medical Education and Its Effect on Profession. J. L. Miller, Nashville.—p. 104.
170 Transvesical Prostatectomy. G. R. Livermore, Memphis.—p. 109.
171 Pus in Peritoneal Cavity. A. B. Cooke, Los Angeles.—p. 114.

165. Abstracted in THE JOURNAL, April 28, 1917, p. 1286.

Texas State Journal of Medicine, Fort Worth

July, XIII, No. 3

- 172 Early Diagnosis of Exophthalmic Goiter. J. A. Witherspoon, Nashville, Tenn.—p. 109.
173 Simplicity and Rationalism vs. Complexity and Radicalism in Treatment of Purulent Dacryocystitis. W. R. Thompson, Fort Worth.—p. 111.
174 *Diagnosis of Functional Disease of Liver. H. L. McNeil, Galveston.—p. 114.
175 Pyorrhea Vital Factor in Insurance Examinations. J. L. Davis, Waco.—p. 118.
176 Collection of Vital Statistics in Smaller Cities. L. Kaffie, Corpus Christi.—p. 139.

174. **Diagnosis of Functional Disease of Liver.**—In a series of ninety-eight patients suffering from the greatest variety of diseases, including some twenty cases of disease of the liver, McNeil found seven patients with an increased amount of blood ammonia (considering as an increase any amount over 3 mg. per 100 c.c. of blood). One of these was a patient with eclampsia, whose liver at necropsy showed extensive degeneration. Another was a patient with syphilis of the liver in a fairly advanced stage; four cases were patients with long continued chronic passive congestion of the liver from chronic cardioneuropathy, and one case was a chronic alcoholic suffering from the periodic and persistent vomiting referred to previously. In four of these cases acidosis was present, but in the three others including the last case no acidosis whatever was present. Twenty-four other cases of acidosis, many of the severest type, studied with this point in view, showed a uniform absence of appreciable increases of ammonia in the blood. Also five other cases of atrophic cirrhosis of the liver failed to show any increase in ammonia above 5 mg. per 100 c.c. of blood. As a result of these investigations, it would seem that acidosis, per se, does not cause any excessive increase of ammonia in the blood (over 3 mg. per 100 c.c.), but that such an increase is indicative of disturbance of the functional capacity of the liver.

Washington Medical Annals

July, XVI, No. 4

- 177 Achylia Gastrica; Diagnosis. J. R. Verbrycke, Jr., Washington, D. C.—p. 242.
178 Symptoms of Achylia Gastrica. W. E. Clark, Washington, D. C.—p. 244.
179 Anencephalic Fetus. H. C. Macatee, Washington, D. C.—p. 248.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

April-June, XIV, Nos. 160-162

- 1 Lipodystrophia Progressiva. F. P. Weber.—p. 81.
2 Ureteral Calculi in Childhood. C. G. Cumston.—p. 94.
3 Case of Multiple Urinary Calculi. F. C. Pybus.—p. 97.
4 Presence of Meningococci in Purpuric Elements of Meningococcal Infection. A. Netter and M. Salanier.—p. 101.
5 Case of Hyperacute Purpura without Cerebrospinal Meningitis; Recognition of Its Meningococcal Nature During Life by Microscopic Examination. A. Netter, M. Salanier and Wolf-rom.—p. 104.
6 Some Points in Lateral Curvature of Spine. J. S. K. Smith.—p. 107.
7 Case of Acute Delirium with Lobar Pneumonia in Child. H. T. Ashby.—p. 111.

British Journal of Surgery, Bristol

April, IV, No. 16

- 8 General Pathology of Acute Bacillary Gangrene Arising in Gunshot Injuries of Muscle. E. F. Bashford.—p. 562.
9 Two Cases of Bullet Extraction from Lung. R. L. Rea.—p. 597.
10 Fifty Cases of Injury of Peripheral Nerves. J. R. White.—p. 607.
11 Treatment of Infected Suppurating War Wounds with Bismuth-Iodoform-Paraffin Paste. R. Morison.—p. 659.
12 Study of Twelve Hundred Cases of Gunshot Wounds of Abdomen. C. Wallace.—p. 679.
13 Gunshot Wounds of Abdomen, Study of Sixty-Three Cases. B. Hughes.—p. 744.
14 Cases of Gunshot Wounds of Abdomen. S. Barling.—p. 772.

British Medical Journal, London

June 30, I, No. 2948

- 15 Technic of Nerve Suture. S. A. Smith.—p. 861.
16 Chloramins as Nasal Antiseptic. E. K. Dunham and H. D. Dakin.—p. 865.
17 Case of Fibroid Disease of Bursae. M. Morris.—p. 867.
18 *Bronchoscopy in Treatment of Asthma. W. S. Syme.—p. 868.
19 *New Culture Medium for Gonococcus. D. Thomson.—p. 869.
20 *Value of Brilliant Green as Antiseptic. C. H. S. Webb.—p. 870.
21 Flies and Bacillary Enteritis. W. Nicoll.—p. 870.
22 Adaptation and Disease. J. G. Adami.—p. 872.

July 7, II, No. 2949

- 23 Treatment of Gunshot Injuries of Mandible. J. F. Colyer.—p. 1.
24 Department of Oral Surgery of Harvard Surgical Unit. V. H. Katsanlian.—p. 3.
25 Oral Surgery. A. C. Valadier and H. L. Whale.—p. 5.
26 Flavine, Sodium Desoxycholate, and Quinin as Mouth Wash. F. M. Wells.—p. 6.
27 Acriflavine Paste as Dressing for Infected Wounds. C. J. Bond.—p. 6.
28 Acute Osteomyelitis of Frontal Bone; Operation; Recovery. H. Tilley.—p. 7.
29 Association of Herpes Zoster with Arsenic. H. Carlill.—p. 9.
30 Adaptation and Disease. J. G. Adami.—p. 9.

July 14, No. 2950

- 31 Medical and Surgical Notes from Mesopotamia. G. G. Turner.—p. 33.
32 Acute Febrile Polyneuritis. G. Holmes.—p. 37.
33 Mental Hygiene and Shell Shock During and After War. F. W. Mott.—p. 39.
34 Treatment of Cranial Injuries in War. J. Anderson.—p. 42.
35 *Early Treatment of Gunshot Injuries of Spinal Cord. H. M. W. Gray.—p. 44.

18. **Bronchoscopy in Treatment of Asthma.**—Syme has treated eight patients with asthma by the direct application of silver nitrate solution to the lining of the bronchi with the aid of the bronchoscope. The ages of the patients ranged from 10 to 53. The bronchoscope is introduced, and a mixture of cocaine and epinephrin is applied to the mucous membrane in advance of the tube so far as the openings of the secondary bronchi. The entrance to the secondary bronchi and the main bronchi are then swabbed with a 10 per cent. solution of silver nitrate. Syme has been specially careful to apply the solution to the regions of the bifurcations, because it seemed that the mucous membrane at these places was hyperemic, and, at any rate, the air current impinges most strongly at these points, and the reflex is most active there. The idea underlying the treatment is that in asthma one factor in the causation is an exaggeration of a normal reflex. When an irritative substance, such as an irritating gas, touches the lining of the bronchi and larger branches, the smaller bronchi and bronchioles are by reflex action contracted for protective purposes. In attempting to weaken this reflex in asthma by applications to the peripheral pole, it is not implied that the hypersensitiveness is at that part. Probably it is, as has been previously observed, central in the main. Silver nitrate solution suggested itself because it is commonly used in irritative conditions of the higher parts of the respiratory apparatus, and because it leaves a coating of silver chlorid or albuminate, and so its action is prolonged. A fairly acute reaction follows the application, and the breathing is somewhat labored for a day or two, during which the patient is kept in bed.

19. **New Culture Medium for Gonococcus.**—The medium used by Thomson is made up as follows: 1. Prepare nutrient agar (2.5 per cent.) in the ordinary way with bouillon and Witte's peptone (1 per cent.), and render it +6 acid. 2. Add all the salts natural to the human blood (as in Ringer's solution), namely, sodium chlorid, 9 gm.; calcium chlorid, 0.25 gm., and potassium chlorid, 0.42 gm. per liter. 3. Add

glucose 2.5 per cent. 4. The nutrient agar, with salts and glucose, is then tubed, about 4 c.c. being added to each test tube. 5. The sterile tubed agar is melted in boiling water, and after allowing it to cool to about 50 C., add 1 c.c. of human plasma to each tube and mix thoroughly by rolling the tube between the palms. Allow the medium to solidify in a sloping position. For plating, the contents of three tubes may be added to a Petri dish.

20. **Brilliant Green as Antiseptic.**—Webb dissolves the brilliant green in normal saline solution in the strength of 1 in 1,000. At this strength it can be used as a lotion, and gauze soaked in it can be applied to the wound as a dressing. It is nonirritating to the tissues. Webb has applied it to the peritoneum, the meninges, the synovial membranes, and practically all other varieties of tissue without harmful effects. The less vascular tissues are stained green by its use—for instance, the cuticle of the skin, the edges of fascia or aponeurosis, and sometimes bones. But where it has been in contact with the more vascular muscle or subcutaneous tissue, no staining occurs. Dead and necrosed portions of muscle are stained green, and this fact is sometimes of use in distinguishing such necrotic tissue. After being in contact with the tissue, the dye gradually becomes transformed into a leukoderivative, and the hitherto green-dyed gauze in contact with the wound becomes white to the depth of several layers. Granulation tissue rapidly forms in the wound. The most striking results are seen in the cut surfaces of muscle. Webb has also used the green in conjunction with "salt" tablets. It has given better results than the use of one or other alone. It can also be used after the method of Carrel— $\frac{1}{2}$ ounce to 1 ounce of a 1 in 1,000 solution being syringed down a tube or series of tubes leading into the depths of the wound. It is not so irritant to the skin edges as the hypochlorite solution.

35. **Treatment of Gunshot Injuries of Spinal Cord.**—Three types of cases which arrive at a casualty clearing station showing paraplegia are considered by Gray—one in which the symptoms are due to local concussion, another in which the cord is organically severed, and a third in which paraplegia has developed since the injury. The paralyzing effects of local concussion are often very marked. This may be caused even by the flight of a missile close to but outside the spinal canal. In such cases the paralysis usually begins to clear up within a few days. If no sign of return of function occurs within nine or ten days, the question of operation for removal of blood clot or possible depressed bone, occurs, but must be decided at the base. If, on the other hand, a rifle bullet causing a through and through wound of the trunk traverses the spinal canal, the cord is usually hopelessly pulped. It is obvious that cases of complete sudden paraplegia should not be kept in the casualty clearing station if they are otherwise fit to travel. If, however, the paralysis has developed since the man was wounded, it is probably due to pressure from blood clot (when it is not likely to be absolute), or to displacement of fragments of bone during movement. In both these cases early operation may be indicated, but in the latter only if the Roentgen rays show a minor degree of displacement. If displacement is great, the cord is probably pulped.

If conduction, either motor or sensory, is present in the affected part of the cord when the patient is admitted to the casualty clearing station, it is usually found that fragments of bone are pressing on the cord, or that the missile causing the injury is in close relationship to it, and will probably have carried in sepsis. There may or may not be partial division of the cord. A missile with momentum sufficient to carry it far past the cord usually produces complete early paraplegia, even though it may not cause complete section. If, then, Roentgen rays reveal fracture or the presence of a foreign body partly or wholly in the spinal canal, operation should be performed at once, with the quadruple purpose of relieving pressure, cleansing the wound, restoring normal circulation as soon as possible, and thus of combating sepsis. In some cases pain is so excessive and uncontrollable by other means, that, whatever the amount of paralysis, operation is imperative in order to relieve the pain.

Edinburgh Medical Journal

July, XIX, No. 1

- 36 Technic of Splenectomy. C. J. Smith.—p. 8.
- 37 Acute Otitis Media with Paralysis of Sixth Nerve (Gradenigo Symptom-Complex). D. Guthrie.—p. 15.
- 38 Clinical Symptoms and Treatment of Hypertrophy of Thyroid Gland. C. G. Cumston.—p. 20.
- 39 *Case of Myxosarcoma of Soft Palate. D. M. Greig.—p. 24.

39. **Myxosarcoma of Soft Palate.**—A boy, 13 years of age, was referred to Greig on account of a growth on the palate of between three and four years' duration. He had no illness previous to nearly four years ago, when it was noticed that he was speaking somewhat thickly, and on examination a small growth was observed depending from the soft palate. This was removed by a surgeon under local anesthesia. The growth recurred, however, shortly afterward, and a year after the first operation it was more thoroughly removed by another surgeon, and the base of the tumor frequently cauterized thereafter. Some twenty applications of the actual cautery were made and from time to time sloughs separated but the treatment lapsed and again the growth gained ground. The entire soft palate, the uvula, and the posterior half of the hard palate were hidden by a flattened, papillomatous-looking growth split up into many lobules and obviously attached by a broad base. There was no induration, the general surface of the tumor was smooth, no individual lobule projecting. The right tonsil seemed fuller than natural. There was no nasal obstruction, and no enlarged glands to be felt about the neck. An incision was made through the whole thickness of the soft palate at its junction with the hard palate, and was prolonged laterally backward to include the anterior pillars of the fauces, and the right tonsil was at the same time enucleated. The boy remained free of any trouble for nine months, when Greig found a small recurrence on the right side on the mucous membrane in front of the site of the enucleated right tonsil. This small recurrence was freely excised, and he has had no trouble since.

Journal of Laryngology, Rhinology and Otology, London

June, XXXII, No. 6

- 40 War Injuries and Neuroses of Otologic Interest. H. J. Marriage.—p. 177.
- 41 Cranial Osteomyelitis Following Intranasal Operation for Chronic Frontal Sinusitis. N. MacLay.—p. 186.
- 42 Acute Middle Ear Suppuration, Mastoid Empyema, Sinus Thrombosis, Purulent Leptomenigitis, Cerebellar Abscess, Operations, Death. W. S. Syme.—p. 190.

Journal of Tropical Medicine and Hygiene, London

July 2, XX, No. 13

- 43 Case of Urinary Amebiasis with Cystitis. E. J. Wright.—p. 145.
- 44 Espundia (Naso-Oral Leishmaniasis) in Anglo-Egyptian Sudan. B. J. Susu.—p. 146.

Lancet, London

July 7, II, No. 4897

- 45 Concussion Injuries of Visual Apparatus in Warfare, of Central Origin. S. A. K. Wilson.—p. 1.
- 46 *Skin Grafting: Plea for Its More Extensive Application. S. R. Douglas, L. Colebrook and A. Fleming.—p. 5.
- 47 *Treatment of Wounds of Knee Joint. T. S. Novis.—p. 12.
- 48 *New Physical Sign in Pneumothorax and in Pleural Effusion. O. K. Williamson.—p. 13.
- 49 Susceptibility to Cerebrospinal Fever in Relation to Age. A. Compton.—p. 14.

July 14, No. 4898

- 50 Adaptation and Disease. J. G. Adami.—p. 35.
- 51 *Purulent Bronchitis. J. A. B. Hammond, W. Rolland and T. H. G. Shore.—p. 41.
- 52 *Marching Fractures; Report of Six Cases. A. H. Pirie.—p. 47.
- 53 Universal Extension Splint for Gunshot Fractures of Upper Limb. R. Williams.—p. 48.
- 54 Treatment of Recent Gunshot Wounds with Bismuth-Iodoform-Paraffin Paste. L. Colledge and H. Drummond.—p. 49.
- 55 *Hemoglobin Value of Blood in Surgical Shock. F. A. Bainbridge and H. B. Bullen.—p. 51.
- 56 Device for Insuring Spontaneous Separation of Blood Clot from Walls of Containing Vessel. A. D. Gardner.—p. 51.
- 57 Sebaceous Horn. O. Vevers.—p. 53.

46. **Skin Grafting.**—The authors have revived the use of Steele's grafts and introduced certain new features into both the grafting operation and the after-treatment, which aim at making the transplantation of skin a simple, reliable pro-

cedure. With respect to the grafting operation, the chief new, or at least unusual, features are: (1) the use of local anesthesia induced by nerve blocking; (2) the suture of each of the raw surfaces left after removal of the grafts. With regard to after-treatment the authors have been influenced by the recognition of the important part played by the tryptic action of pus; in consequence the after-treatment advocated has aimed especially at preventing the accumulation of pus, while avoiding at the same time any movement of the grafts. The means employed to achieve this were the use of a material to hold the grafts in position and allow the escape of any discharge from the wound; at the same time it permits the surface to be efficiently cleansed at frequent intervals. This material consists of an oiled fabric suitably perforated; it is strong, durable, and can be boiled; it is sufficiently supple to follow the irregularities of the wound, adheres lightly to the surrounding normal skin, but hardly at all to the granulations or the grafts. When a layer of this material is placed between the grafted surface and the outer dressings, it has proved perfectly feasible and safe to change the latter every day following the operation, provided these dressings have kept moist. Except in the case of the few wounds which have practically no discharge, such a daily change of dressing is not only advisable but indispensable for successful grafting. Locke's solution, as representing most nearly the blood fluids, is used for cleansing the wound both at the time of operation and also at the daily dressings.

47. Treatment of Wounds of Knee Joint.—Novis emphasizes the necessity for free drainage of the posterior pouches. He says that if this is done at a reasonably early stage the large majority of cases will recover with a useful limb and many with a fair range of movement. Complete ankylosis will by no means necessarily follow. A free incision is made into the subcrureus bursa and into the lateral pouch on either side of the patella and drainage tubes of moderate size inserted into the joint. The patient is then turned on his face, an incision made on either side between the hamstring and the gastrocnemius, and the ligament of Winslow freely incised longitudinally over either condyle of the femur. In making the external incision care must be taken to avoid the external popliteal nerve which should be drawn inward with the gastrocnemius. In cases in which suppuration is prolonged, difficulty may be experienced in keeping open the posterior incisions, but in these cases good drainage can be obtained by making a communication between the posterior pouches in front of the ligament of Winslow and behind the crucial ligament and passing a small tube through from one posterior incision to the other. The limb should be fixed on a splint in a slightly flexed position. Irrigation with salt solution, weak iodine, or other mild antiseptic should be carried out in the early stages, and if there is much inflammation hot fomentations are beneficial. The drainage tubes should be removed as early as possible, and gentle passive movements commenced as soon as active mischief has ceased. Great care must be taken to prevent the tibia from falling back on the femur while the wounds are healing and the ligaments still soft.

48. New Physical Sign in Pneumothorax and in Pleural Effusion.—Williamson's observation consists in the fact of the existence in these cases of a markedly diminished blood pressure in the leg as compared with that in the arm on the same side, a difference usually of a least 10 mm., and in many cases of over 20 mm.

51. Purulent Bronchitis.—An epidemic of a variety of purulent bronchitis was analyzed by Hammond and his associates. For the following reasons they consider the cause of the disease to be the influenza bacilli: (a) the almost constant occurrence of this organism in the sputum; (b) its presence in the pus of the affected bronchioles; (c) in some typical cases it occurs apart from the presence of any other organism; (d) the outbreak of the disease in epidemic form at the time of year when influenza epidemics are most common and while one was in progress; (e) the marked signs of toxic poisoning found during life and postmortem. There are well marked clinical features which distinguish these

cases from ordinary cases of bronchitis. The most prominent are the characteristic sputum, the extreme tachycardia, the cyanosis, the course of the temperature (notably the ante-mortem fall), and the extremely high mortality. Treatment has so far been unsatisfactory. The most encouraging results have been obtained by the use of a steam tent. Vaccines have not yet had a trial, but the authors believe that it is unlikely, in view of the blocked condition of the bronchioles, that they would be of great benefit.

The morbid anatomy consists of three groups of changes. (a) The lung condition; marked purulent bronchitis, the smaller bronchi being filled with thick pus, from which air is notably absent. In some cases secondary bronchopneumonia and edema, pleurisy and emphysema are common; (b) evidence of toxemia; especially seen in kidneys, spleen, liver, lymphatic glands and heart muscle; (c) signs of right side heart failure and passive congestion. Some patients die of the toxemia and others of the cardiac failure. The histologic changes are those of an acute purulent bronchitis affecting the smaller bronchi with or without some surrounding catarrhal pneumonia. Degenerative changes are seen in other organs, notably in the kidneys, where the appearances of a toxic nephritis may be found.

52. Marching Fractures.—By a "marching fracture" is meant fracture of a second, third, or fourth metatarsal bone, or combination of these, in the right or left foot, caused by marching, and with no history of an accident. This fracture comes under the class of fracture caused by muscular action combined with indirect violence, and is caused by severe prolonged marching. The patient's feet become very sore, especially when standing up after resting. This indicates that the arch of the foot is giving way. The breaking of a metatarsal bone then takes place while marching. The patient does not know when the fracture takes place, as his feet are already so sore from the acute flat-foot. After the fracture takes place he struggles on for a time, but has finally to fall out. The exact cause of a marching fracture seems to be the following: In the normal foot the arch of the foot is so constructed that the bulk of the weight of the body is transmitted through the stout first metatarsal. The next strongest bone is the fifth metatarsal, which takes the next largest share in bearing the weight of the body.

When the arch falls down the weight of the body is distributed more equally to all the metatarsals, but the central ones being in more direct line with the astragalus get more than their share of the weight, and the second metatarsal, being in direct line with the head of the astragalus, gets the greatest proportion of the weight of the body. It receives more weight than it is constructed for, and under prolonged strain of long marching, when the soldier is carrying his full equipment, it gives way. When a person stands on his toes on one foot, the greatest breaking strain is near the head of the metatarsal bones, and this is the position in which the fracture occurs most frequently. It probably occurs when the man rises on to the toes of one foot to make a forward step with the other foot.

55. Hemoglobin Value of Blood in Surgical Shock.—The authors point out that surgical shock in man is frequently associated with considerable hemorrhage; and the normal reaction of the body to hemorrhage is the rapid absorption of fluid from the tissues into the blood. By this means the volume of the blood is more or less completely restored to its former level, although the blood becomes more dilute and its percentage hemoglobin value is lowered. It seems probable that in a patient suffering from both shock and hemorrhage the percentage hemoglobin value of the blood represents the outcome of two opposing processes, namely, shock, which tends to concentrate the blood, and hemorrhage which leads to dilution of the blood. Determination of the percentage hemoglobin value in such a case ought to show which of these processes is predominant; a low hemoglobin value may be regarded as indicating that the patient is spontaneously increasing the volume of his blood at the expense of his tissue fluids, whereas if the hemoglobin value is approximately normal the physiologic reaction to loss of blood is being counteracted by the tendency of shock to concentrate

the blood. The authors had the opportunity of determining the hemoglobin value of the blood in several cases of shock. They found that in shock accompanied by hemorrhage, a normal or approximately normal hemoglobin value indicates that the patient is unable to make up for the loss of blood by absorbing fluid from his tissues. In these circumstances the volume of his blood becomes inadequate for the carrying on of the circulation, and the intravenous injection of saline solution (preferably a hypertonic solution) is desirable at the earliest possible moment.

Practitioner, London

July, XCIX, No. 1

- 58 Real Neurasthenia. L. Williams.—p. 2.
- 59 Use of Roentgen Rays in Hyperactivity of Ductless Glands, with Special Reference to Exophthalmic Goiter, and Certain Forms of Ovarian Dysmenorrhea. F. Hernaman-Johnson.—p. 10.
- 60 Shock (Anaphylaxis). Disturbance of Normal Hydrogen Ion Concentration. J. E. R. McDonagh.—p. 19.
- 61 Moral Imbecility. A. F. Tredgold.—p. 43.
- 62 Some Indications for Nephrectomy. G. Taylor.—p. 57.
- 63 Pel-Ebstein Recurrent Pyrexial Type of Hodgkin's Disease (Lymphogranulomatosis Maligna). F. P. Weber.—p. 62.
- 64 Wassermann's Reaction. L. Cobbett.—p. 72.
- 65 Use and Value of Sulphur in Vaginitis. F. P. Gill.—p. 85.
- 66 Case of Malingering or True Neurosis; Case of Malingering or Hysteria. R. O. Townsend.—p. 88.
- 67 Abundant Presence of Bacillus Aerogenes-Capsulatus in Urine Unattended by Symptoms of Bacillary Infection, an Associated Occurrence of Renal Traumatism by Projectile. S. H. Bennett.—p. 92.

Archives des Maladies du Cœur, etc., Paris

May, X, No. 5, pp. 209-256

- 68 *The Oculocardiac Reflex. C. Laubry and P. Harvier.—p. 209.
- 69 *Action of Digitalis on High Blood Pressure. D. Danielopolu (Bucharest).—p. 228.

68. **The Oculocardiac Reflex.**—Laubry and Harvier discuss certain peculiarities of this reflex and the variability of the response in some persons. Compression of the eyeball excites the pneumogastric nerve; hence its effects are multiple and complex. They have been studying these effects on 150 persons, including a number of healthy subjects. The findings are tabulated and charted. They show that opposite responses may be obtained with a hasty and with a prolonged compression. They show also an inexplicable variety sometimes not only in different persons, but in the same person. On the whole, they warn of the necessity for being reserved in the clinical application of the findings. They may confirm the suspicion of unstable nervous conditions, especially in the pneumogastric system, but otherwise much reliance cannot be placed on them.

69. **Digitalis with High Blood Pressure.**—Danielopolu gives the details of thirty-six patients with high blood pressure from chronic aortitis, or arteriosclerosis with symptoms of interstitial nephritis. There was no dilatation of the right heart in any of the subjects and no other treatment was being given except the digitalis. The results confirm that small doses of digitalis may reduce the tension materially while the diuresis increases and the general condition improves. He ascribes the hypertension to accumulation in the blood of vasoconstricting substances (products of the suprarenals, and carbon dioxid), with resulting peripheral vasoconstriction, especially in the glomeruli. Hydremia is a further factor. Digitalis relieves the vasoconstriction, and the glomeruli relax which reduces the peripheral resistance directly and, indirectly, by increasing the diuresis and reducing the hydremia. Better functioning of the liver and lungs aids in the elimination of the vasoconstricting waste substances in the blood, and the vicious circle is broken up. Increased diuresis does not always occur even when the pressure shows a satisfactory reduction. The digitalis relaxes vasoconstriction at other points in the vascular system as well as in the kidneys.

Gottlieb and Magnus have demonstrated vasodilation in the extremities and in the brain under the influence of digitalis. Fraenkel and Magnus found also that stimulation of the pneumogastric reduces arterial tension, and digitalis is known to have a vagotonic influence. The doses of digitalis in the experiences here related varied from 30 to 90 drops of a French preparation taken in the course of two or three suc-

cessive days the first week, and from 20 to 30 drops the following weeks or months. After having obtained the maximum of the desired effect, that is, the greatest possible drop in the tension, the effect is maintained with the smallest doses capable of keeping the blood pressure down and the subjective symptoms ameliorated. In some cases the blood pressure drops in a few days, in others not until after several weeks of treatment. In two of the cases reported the effects persisted after suspension of the drug. He never witnessed any phenomena indicating intolerance, even in patients who for more than two years had taken quite large doses of digitalis two or three days each week. When improvement has been realized, the drug can be dropped for a few weeks or months, ready to resume it as conditions demand.

Bulletin de l'Académie de Médecine, Paris

June 19, LXXVII, No. 25, pp. 777-796

- 70 A Gouty Tendency Leads to Sterility in Families. (De l'arthritisme, comme cause de l'infécondité.) E. Maurcl.—p. 788.
- 71 The Pulmonary Prejudice against Ether. Mériel.—p. 794.

Paris Médical

June 23, VII, No. 25, pp. 517-532

- 72 *Evolution and Prognosis of Acute Nephritis in the Troops. E. Sorel.—p. 518.
- 73 *To Improve the Prognosis of Operations on the Stomach. V. Pauchet.—p. 520.
- 74 Anatomic Localization of Projectiles in the Tissues. A. Rabourdin and Samson.—p. 526.
- 75 Recurring Febrile Headache, with or without Meningeal Reaction. Gougerot.—p. 529.

72. **Acute Nephritis in the Troops.**—Sorel gives a typical example of each of the three main types of acute nephritis among the soldiers on active service. The nephritis assumes a different course when there are preexisting organic taints, arteriosclerosis, insufficiency of the liver, or alcoholism. Even when there is no special organic taint, the acute nephritis may recur after excessive fatigue or slight indigestion. The recurrence may be as severe as at first, or may appear in an attenuated form. In the third group of cases, the acute or subacute nephritis leaves permanent albuminuria, an evidence of weakness on the part of the kidney, or recovery may be complete. Of his eighteen cases, two were in men with already impaired health, and chronic nephritis is imminent. Four were in men of the second group, and seventeen in the third. Only five of the total eighteen are free from pathologic sequels.

73. **Surgery of the Stomach.**—Pauchet gives eleven illustrations showing the preferable technic for various operations on the stomach and remarks that the prognosis depends to an exceptional degree on the technical skill of the surgeon, the preparation and the aftercare. Patients with stomach trouble are more debilitated than others, as the derangement of the stomach has interfered with nutrition. Hence they require a week of preparation, with daily lavage of the stomach.

Presse Médicale, Paris

June 14, XXV, No. 33, pp. 337-344

- 76 *Glycosuria of Renal Origin. H. Roger.—p. 337.
- 77 Oiled Silk Chiffon in Treatment of Burns. P. Alglave.—p. 339.
- 78 Treatment of Partially Denuded Scalp. J. Labouré.—p. 344.

June 18, No. 34, pp. 345-360

- 79 *Treatment of Wounded Legs. L. Chevrier.—p. 345.
- 80 *Inflammatory Process in the Base of the Thorax. (Les costo-diaphragmatites discrètes dans l'armée et le syndrome de l'extrême base thoracique.) G. Mouriquand.—p. 348.
- 81 *The Sensory Achilles Tendon Sign with Sciatic Disease. G. R. d'Allonnes.—p. 351.

76. **Renal Glycosuria.**—Roger relates experiences which suggest that the kidney first stores up and then eliminates sugar. This is particularly evident when there is glycosuria in animals under the influence of epinephrin. In one such test, an hour afterward there was 2 per thousand sugar in the blood and 7.5 in the urine. After two hours, in the blood 1.3 and in the urine 40 per thousand. By the third hour, 0.3 per thousand in the blood and 1.75 in the urine. He describes a clinical case which, he says, is the fourteenth on record: showing pronounced glycosuria and symptoms of kidney derangement, edema of the face and polyuria, but the sugar

content of the blood seemed to be normal. Simple exaggeration of the permeability of the kidneys cannot be held responsible alone for the notable glycosuria observed, but at the same time the kidney element undoubtedly facilitates the glycosuria. He says that in the thirteen cases of renal glycosuria the sugar content of the urine varied from 1.2 to 24.8 per cent., while that of the whole blood ranged from 0.5 to 0.88, only one case showing 1.2. The range was thus within physiologic limits. Those patients with renal glycosuria that have been traced have shown nothing specially pathologic during the years since. Study of renal glycosuria has demonstrated that the liver does not have so much to do with the glycosuria of pregnant women as formerly supposed. It seems to be the result merely of exaggeration of the permeability of the kidney. In conclusion, Roger remarks that as calcium chlorid is said to reduce the permeability of the kidneys, it might be well to give it when the glycosuria is connected with some functional disturbance of the kidney.

79. Management of Wounded Leg.—Chevrier insists that the wounded must be kept from assuming a vertical position until the wounds of the leg are entirely healed. Healing is delayed when the person stands erect, even without bearing weight on the limb. He tells the men that the vertical position does as much harm to the tissues regenerating in the wound as if they were pounded with one's fist. If the men are too impatient to get up, he has their clothes taken away. From the very first day efforts are made to correct the attitude of the leg, as the men lie in bed, and to keep the muscles and joints in good functional condition, while preventing vicious attitudes in healing.

80. Inflammation of the Diaphragm.—Mouriquand mentions that in the last six months he has had 150 cases of what he calls discreet costodiaphragmatitis, and he here describes with illustrations the differential diagnosis and the treatment. The general tendency is toward spontaneous healing, although very slow; it can be followed by roentgenoscopy. In every case, rational breathing exercises and local heliotherapy are useful adjuvants.

81. Achilles Tendon Sign of Sciatic Disease.—D'Allonnes calls attention to the pain when the Achilles tendon is pinched if the sciatic nerve happens to be diseased. Adjacent tissues may be tender also, but the hyperalgesia of the Achilles tendon is more pronounced and more constant. He has found this sensory Achilles sign very useful in distinguishing between true and false sciatica. It is also interesting from the theoretic standpoint.

Progrès Médical, Paris

June 16, XXXII, No. 24, pp. 199-206

82 *Amnesia After War Wounds. R. Oppenheim.—p. 199. Conclusion.

83 Dystrophy of Muscles after War Wounds. H. Claude, A. Vigouroux and J. Lhermitte.—p. 204.

84 Consumptives in Fiction. Coudeyras.—p. 205.

June 23, No. 25, pp. 207-216

85 Epinephrin Test of Liver Functioning. M. Loeper and G. Verpy.—p. 207.

86 Acute Myelitis and Paratyphoid B. G. Etienne.—p. 209.

87 Trench Foot. P. Voivenel and P. Martin.—p. 212.

82. The Amnesia after War Wounds.—The first part of Oppenheim's article was summarized in these columns, page 321. He here describes cases of what he calls present amnesia or amnesia of fixation, and inability to concentrate the attention, as sequels of war wounds or shell shock. In study of such cases he has found that the Binet tests were beyond their reach. The only test that proved instructive was to have the man strike out a certain letter in a twenty line item, all the "r's," for instance, or separate into piles on a table 100 colored beads given him in a box, sorting them by colors. The traumatic amnesia seems to be always accompanied by a certain amount of mental depression. His experience has further shown that the war has not created any new morbid entities in this line; all the cases encountered fit into familiar frames, but never before have they been observed except singly. The dominant notes are the physical and psychic asthenia, the readiness to fatigue, the inability to keep up any sustained work, especially brain work, irrita-

bility and emotional instability. No connection between the site of the trephining and the gravity of the psychic disturbances could be discovered. The clinical picture, however, was strikingly like that of the amnesia of intoxications and auto-intoxications. The concussion and the emotional shock may have upset the balance of the glands with an internal secretion and thus started up an actual intoxication. Treatment must include general tonics and treatment for the nervous system, physiotherapy, psychotherapy, and daily measures to train the attention such as are used for backward children, with daily exercises to reeducate the brain and prepare for resumption of social life. All this requires psychologic and pedagogic training in the physician in charge of these cases. But men mutilated in the brain require the appropriate measures as well as those whose bodies have been mutilated.

Correspondenz-Blatt für Schweizer Aerzte, Basel

June 30, XLVII, No. 26, pp. 817-848

88 *Dermographism in Diagnosis. L. Schwartz.—p. 817.

88. Dermographism in Diagnosis.—Schwartz describes comprehensive study of the vasomotor response to circumscribed pressure on the skin. His subjects were a battalion of Swiss troops and patients in the surgical and internal wards of the Basel public hospital. He used a little spring instrument which showed the amount of pressure being applied, and gives an illustration of this arethrometer. For peripheral dermatographia he applies a pressure of 50 or 500 gm. The history, technic and findings with dermatographism are reviewed, and the variations after a hot drink and after exercise are emphasized. The close dependence on external and internal conditions was somewhat of a surprise. This factor may prove misleading. The dermatographic response may prove of great assistance in study of the effects on the vasomotors of the skin of the distribution of blood, the effect of local application of heat, of intoxications, of electricity, and of emotional factors. He classes both the "red line" and the "white line" as forms of peripheral dermatographia. Müller in 1913 called attention to a third form, dermatographia dolorosa or irritative reflex erythema. When the test causes a little pain, the redness is not restricted to the line or spot, but extends quite a distance beyond it. The livelier the pain, the greater the extension of the redness. This response is evidently of reflex origin. This assumption is confirmed by the opposite behavior sometimes of the simple peripheral and the painful dermatographia.

Gazzetta degli Ospedali e delle Cliniche, Milan

May 17, XXXVIII, No. 39, pp. 593-600

89 *Tabetic Pruritus. C. Vignolo-Lutati.—p. 594.

89. Tabetic Pruritus.—Lutati refers to the pruritus which may develop as the precursor of tabes, the first symptom to appear. He discusses the literature on the subject, and describes a typical case in a man of 52 who had contracted syphilis at 24 and had taken little if any treatment. Symptoms of tabes had developed at 41, and during the last year he had had attacks of pruritus. They were evidently tabetic equivalents, as they occurred during the intervals between the gastric crises and fulminating pains. The pruritus affected only the regions of the skin which were over the sites of the tabetic crises of pain.

Policlinico, Rome

June 24, XXIV, No. 26, pp. 813-840

90 *Hypertrophy of the Lingual Tonsil. G. Turtur.—p. 813.

91 Rupture of the Aorta. E. Soprano.—p. 816.

92 Diagnosis of Pneumonia. E. Guangioli.—p. 820.

Medical Section, No. 6, pp. 229-268

93 *Familial Neuropathology. (Della sindrome atassica ereditaria e sue varietà.) R. Massalongo.—p. 229.

94 *Emotional Psychoneuroses in Soldiers at the Front. G. Pighini.—p. 243.

90. The Lingual Tonsil.—Turtur mentions that it has been suggested recently that the lingual tonsil may belong to the system of glands with an internal secretion. Be this as it may, its chronic catarrhal hypertrophy may entail consider-

able disturbance in both children and adults. There may be the sensation of a foreign body in the throat, difficulty in swallowing, retching, and various local and remote reflex trouble, asthma, or neuralgia, but a dry insistent rebellious cough is usually the most annoying and often a misleading symptom. In the case of an otherwise healthy woman of 30 with a healthy child, this inexplicable spasmodic cough was accepted as a symptom of apical tuberculosis until Turtur was consulted and found the lingual tonsil congested and enlarged. Under local treatment the cough subsided. This treatment is merely to paint with cocain the base of the tongue now and then. Only occasionally now the cough returns at night, accompanied with a sensation of spasm of the larynx. A sister of this patient presents symptoms of pluriglandular insufficiency, and the patient herself, after curetting of the uterus had profuse periodical uterine hemorrhages, suggesting disturbance in ovarian functioning. In another case the lingual tonsil became enlarged soon after the cystic ovary had been removed. The enlargement of the lingual tonsil was so considerable that cancer was suspected and the tonsil was removed, but no trace of malignant disease could be discovered in it. Notwithstanding the extreme enlargement there was never any cough in this case. The patient was a woman of 50, whose business required public speaking.

93. **Inherited Ataxia.**—Massalongo describes the case of a boy of 14 with extreme ataxia apparently intermediate between the Friedreich and the Marie types. The other children and the parents were apparently healthy, but the mother had inherited syphilis and still gave a positive Wassermann reaction. The boy also responded with a positive reaction to the Wassermann test in both blood and cerebrospinal fluid. There had evidently been some anomaly in the development of the microscopic structure of some portion of the cerebrospinal axis, condemning it sooner or later to exhaustion and degeneration, hastened by toxi-infectious or other causes of injury. Marie's disease and Friedreich's disease and their transitional forms are all to be regarded as effects from the compromised cerebellar system, its centers and its afferent and efferent tracts. They form a group of heredofamilial, cerebellar ataxia affections. Treatment as for syphilis generally comes too late.

94. **Emotional Psychoneuroses.**—Pighini presents evidence that a pure acute emotional psychoneurosis is accompanied in its initial phase with a state of autonomous miopragia and contemporaneous dysfunction of the sympathetic system. The latter in many cases is connected with abnormal functioning of the thyroid. This is manifested in some cases by symptoms suggesting exophthalmic goiter, in others by other symptoms of thyrosympathetic pathology. Symptoms of hysteria may be superposed, but they rarely develop as early as the independently functioning narrowing of the caliber of the blood vessels—the autonomous miopragia.

Riforma Medica, Naples

June 9, XXXIII, No. 23, pp. 609-628

- 95 Vaccine Therapy of Typhoid. M. Chiadini.—p. 609.
- 96 Temporary Protheses after Amputations. R. Falcone.—p. 616.
- 97 *Behavior of the Thyroid in Asphyxia. R. Pellegrini.—p. 617.

97. **The Thyroid during Asphyxia.**—Pellegrini has recently described the results of his study of the thyroid during asphyxia from the fumes of bromin. He here describes similar research with asphyxia of mechanical origin. The work was done on rabbits and dogs, and the changes in the thyroid in each group seemed to be characteristic of the type of asphyxia.

Tumori, Rome

January-March, V, No. 1, pp. 1-128

- 98 *Alien Tumor Grafts in Developing Embryo. G. Acconci.—p. 1.
- 99 *Proteolytic Ferments for Alien Proteins. A. Albanese.—p. 12.
- 100 The Pathologic Anatomy and Clinical Results of Resection of the Stomach. G. Fichera.—p. 40. To be continued.

98. **Transplantability of Foreign Tumor Tissue to Embryos.**—Acconci has been conducting research along the lines of Murphy's work with implanted tumor tissue in chicken embryo. He transplanted tissue from a rat adeno-

carcinoma and sarcoma, injecting a fine emulsion into the embryo still in the uterus. Rabbits and guinea-pigs were the animals used, and the gravid uterus was drawn out and flushed first with a 1 per cent. solution of novocain to inhibit reaction to the tumor emulsion. The latter was injected through the uterine wall directly into the ovular sac or embryo in the placental region. The uterus expelled its contents before term in nearly every instance, and the results were negative for this or other reasons in all but one case, so he has only one success to report. This was in a rabbit fetus and the tumor thus induced reproduced faithfully the structure of the mother tumor, a sarcoma in a white mouse.

99. **Proteolytic Ferments for Foreign Proteins.**—Albanese tabulates the data of forty-seven series of experiments which apparently have demonstrated that, beyond question, every animal species has preformed in the blood serum certain proteolytic ferments which have a destructive action on the proteins of foreign species of animals. He found them most actively destructive, in guinea-pig serum, for the proteins of rats and dogs, while they were less active for rabbit protein. They were also evident in mouse and rabbit serum against rat protein, but none could be demonstrated in rat serum destructive for mouse and rabbit protein. These proteolytic ferments therefore are polyvalent, capable of disintegrating proteins of various origins.

Brazil-Medico, Rio de Janeiro

May 5, XXXI, No. 18, pp. 149-156

- 101 Helminths in Brazil. (Contribuição para o conhecimento da fauna helminthologica Sul-Fluminense.) L. Travassos.—p. 149.
 - 102 *Hair Disease in Brazil. (Piedra.) A. Moses.—p. 150.
 - 103 *Loss of Entire Nose from Leishmaniosis. O. Torres.—p. 151.
- May 12, No. 19, pp. 157-166

- 104 General Paralysis of the Insane; Nine Cases. O. Clark.—p. 157.

102. **Piedra.**—Moses has been studying hairs from over fifty cases of the disease of the hairs called piedra, and compares his findings with those reported by de Almeida last year during an epidemic of 500 cases. He obtained cultures from the gritty nodosities on the hairs in forty cases, and in all but two the *Trichophyton acuminatum escurio* developed; in seven cases it was associated with the vermiform colonies described by J. Renoy. He adds that piedra is common in Japan, and the "chignon disease" of the sixties was probably the same thing.

103. **Destructive Leishmaniosis.**—The illustrations of Torres' case show an elderly woman with absolutely nothing left of the nose or its bony framework. The destructive process was arrested by systematic treatment with tartar emetic, after failure of all other measures. The patient was 56 years of age, and of the highest social position in her town. She refuses a plastic operation and wears a false nose held in place with spectacles.

Prensa Medica Argentina, Buenos Aires

June 20, IV, No. 2, pp. 13-24

- 105 Total Colectomy for Chronic Ectasia. G. B. Arana.—p. 13.
- 106 Physiologic Action of Theraphosae Spider Venom. B. A. Hous-
say.—p. 18.
- 107 Acute Abdominal Affections. R. E. Pasman.—p. 19. Conclusion.
- 108 *Toxicity of Emetin. J. Guglielmetti.—p. 20.
- 109 Memoirs. E. R. Coni. Continuation.—p. 21.

108. **Toxicity of Emetin.**—Guglielmetti experimented with emetin from various sources, testing them on eight different species of animals and on pigeons. He tabulates the fatal dose for each by the subcutaneous, intramuscular, intravenous and intraspinal routes and by the stomach. His research confirmed the special toxic action of emetin on the myocardium and central nervous system, and that this is enormously greater by the intravenous than by other modes of administration. The fatal phenomena may develop without prodromal symptoms. Another fact to which he calls attention is that the animal apparently surviving a single dose may succumb suddenly several days later. The emetin was reformed exclusively in the stomach, intestines and liver and their contents, whatever the mode of entry of the drug. It disappeared from the blood in three hours after intravenous injection. Consequently, it is not necessary to take

the grave risk of intravenous administration as the drug reaches the digestive tract by other routes as well. Baermann and Heinemann reported in 1913 that 0.4 gm. of emetin intravenously seems to be the maximal dose, and they recommend 0.25 gm. as the current dose. But some of the patients given this amount died about the fifteenth day, conditions thus closely resembling those in the experimental research related here. The final conclusions are that the subcutaneous is the proper route for injection of emetin hydrochlorid. He has given up to 0.15 gm. in this way daily for a week without inconvenience.

Revista Clinica, Medellin, Colombia

I, No. 1, pp. 1-42

110 *Epidural Injections in Treatment of Polyneuritis. B. Mejia.—p. 2.

111 *General Anesthesia by Rectal Injection of Ether. J. B. Montoya.—p. 23.

No. 2, pp. 43-101

112 *Nocturnal Incontinence of Urine. B. Mejia.—p. 43.

113 Sodium Cacodylate in Treatment of Syphilis. A. Soto.—p. 46.

114 *Intestinal Parasites in Colombia. E. Henao and G. T. Villa.—p. 57.

115 Pernicious Malaria. A. Mesa.—p. 71.

116 Creosote in Amebic Dysentery. M. M. Calle.—p. 73.

117 Gangrenous Appendicitis. A. Castro.—p. 81.

118 Medical Impressions of America. J. B. Montoya.—p. 89.

110. **Epidural Injections in Treatment of Polyneuritis.**—In Mejia's first case the polyneuritis developed late in convalescence from severe typhoid. The polyneuritis persisted for two months unmodified by the usual measures, but yielded to epidural injection of a 0.7 per cent. sodium chlorid solution, repeated six times in the course of twelve days. Relief was apparent from the first injection, but there was considerable atrophy of muscles. The second patient was likewise a robust young man. The polyneuritis developed twenty days after acute gonorrhea. The first two epidural injections, commenced the twenty-fifth day of the polyneuritis, did not seem to have any effect, but the cure was complete after the fifth.

111. **Ether by the Rectum.**—Montoya reports twelve patients anesthetized with a mixture of oil and ether. The technic is simple and efficient, but the irritation of the rectum is a serious drawback. Three of his twelve patients died with bloody diarrhea, undoubtedly the work of the ether, as the operations were on the jaw, uterus or leg. The amounts of ether used were from 100 to 150 gm. with 2 ounces of oil to 4.5 ounces of ether. He did not rinse out the rectum afterward and leave pure oil in it, as Gwathmey recommends, but mentions that in four cases reported from Bogota, Gwathmey's directions were strictly followed, but dysenteriform diarrhea followed also in two cases.

112. **Epidural Injections for Incontinence of Urine.**—Mejia relates two instances of what may be called essential enuresis, occurring in children with a nervous taint. He comments on the remarkable change for the better in every way in the children when their enuresis was conquered and they felt they were like other children instead of being pariahs. They were boys of 13 and 10. One had also an irritable bladder which seemed also to be restored to normal by this reflex therapy as he calls it. He injected 10 c.c. of physiologic saline, a total of five or six injections, although the desired result seemed to have been obtained with the first three.

114. **Associated Helminths in Colombia.**—Henao and Villa report that in the course of examination of railroad employees and townsmen, a total of 200 persons, helminths were found in large numbers: ankylostoma in 88 and 48 per cent.; trichocephalus in 60 and 76 per cent.; amebas in 23 and 21 per cent., and the strongylus in 16 and 9 per cent. In 23 cases the ankylostoma and the trichocephalus were associated; in 7 the ameba and the trichocephalus and other associations were common. They say that in treatment of the trichocephalus the milky juice of the fig-tree (*leche de higueron*), seems to be the only treatment that proves effectual. This helminth seems to be responsible for the majority of the cases of chronic dysenteriform colitis among children in this district. They protest against the assumption that it is better to let the ascaris go untreated than to expose to the danger of

santonin poisoning. It is not uncommon at Medellin for children to pass 200 or 300 ascarides. In conclusion, they remark that the total lack of medical statistics there renders it impossible to get reliable data of any epidemic, as, for example, of the typhoid epidemic of 1913. But it is their impression that intestinal hemorrhage and perforation were exceptionally frequent, and they query whether helminths may not have been responsible for this. The ascaris was found in 67 and 66 per cent. of their two groups of 100 persons each.

Semana Medica, Buenos Aires

May 3, XXII, No. 18, pp. 511-538

119 *Ptosis of the Mamma. J. C. L. Massini.—p. 511.

120 Angioma of the Pharynx. R. Becco.—p. 513.

121 The Therapeutics of the Army Physician. J. A. Lopez.—p. 515.

122 *Treatment of the Pain with Laryngitis in the Tuberculous. A. Cetrangolo.—p. 517.

123 Lymphoeytosis in Syphilis. C. P. Mayer and A. C. Gourdy.—p. 520. Continuation.

119. **Ptosis of the Mamma.**—The woman of 35 had nursed her four children, but with her last two children the right breast had suppurated during lactation. The sustaining ligaments of the mammary gland had been partially destroyed by a series of abscesses and the gland and breast sagged down to below the umbilicus.

122. **Treatment of Pain with Laryngitis in the Tuberculous.**—Cetrangolo describes the various devices in vogue for insufflating an anesthetic powder for the throat. He prefers the Leduc tube, bending up the long end in a curve. But for durable effect he blocks the superior laryngeal nerve with alcohol, as he describes in detail. This has always proved successful in his experience. In case of need, the inferior laryngeal can be blocked also.

Siglo Medico, Madrid

June 16, LXIV, No. 3314, pp. 425-444

124 Inefficacy of Radiotherapy in Treatment of Simple Enlarged Glands. J. and S. Ratera.—p. 426.

125 Peptic Ulcer of the Jejunum. L. Urrutia.—p. 427. Continuation.

126 Diathermy in Gynecology. Poblacion.—p. 436. Continuation.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

May 19, I, No. 20, pp. 1623-1702

127 *Research on Striated Muscle Tonus and Its Innervation. II. (Spiertonus en onthenseningstijfheid.) G. van Rijnberk.—p. 1623.

128 *Rheumatismal Aortic Valvular Disease and Myocarditis. W. Kouwenaar.—p. 1635.

129 Experimental Research on the Blood Pressure in the Vessels of the Nose. C. E. Benjamins.—p. 1647.

130 *Polyserositis with Sarcoma in the Abdomen of Young Woman. P. H. Kramer.—p. 1654.

127. **Innervation of Muscle Tonus.**—Van Rijnberk's experiments were made on cats and they are described with illustrations. The data recorded seem to suggest that all the tonic phenomena of striped, voluntary muscles entail an increase in the creatin content, and thus all must depend on one and the same chemical process. This can be elicited and maintained in different cases by the mediation of different nerves, some by the autonomic nerves, in others by the nerves of voluntary control of the muscles.

128. **Rheumatismal Myocarditis.**—A double plate shows the findings in two cases of rheumatismal myocarditis with aneurysm of the valves, causing aortic insufficiency. There were also numerous subcutaneous movable nodules scattered over the body, and similar lumps of lymphoid tissue were found in lungs, spleen and kidney as well as in the heart. Kouwenaar relates instances of similar lumps of lymphoid tissue found in various organs, including the brain, joint capsule, pia and bone. The patients were boys of 6 and 10, and the fatal acute verrucous endocarditis followed three or four months after the febrile rheumatism in the first case. The interval was over a year in the second.

130. **Polyserositis with Sarcoma.**—In Kramer's case the woman of 21 during the last two and a half years of her life had been tapped 198 times and a total of 1,040 liters of effusion had been withdrawn from the pleura, tapped 68 times, and the abdomen, 130 times. The sarcoma in the peritoneum was found inoperable when the physician first saw the case.

Hospitalstidende, Copenhagen

June 13, LX, No. 24, pp. 573-596

- 131 Myocarditis. L. S. Fridericia and P. Møller.—p. 573. To be continued.
- 132 Diverticula in Stomach and Duodenum. K. Secher.—p. 582.

Norsk Magazin for Lægevidenskaben, Christiania

June, LXXVIII, No. 6, pp. 641-768

- 133 Work as a Therapeutic Factor. (Om arbejdsterapien. Psykanalytiske strøtanker.) J. Strømme.—p. 641.
- 134 Rupture of Intestine from Contusion; Two Cases. C. Johannessen.—p. 664.
- 135 Traumatic Rupture of the Gallbladder. G. Gjestland.—p. 674.
- 136 *Colloids. E. Poulsson.—p. 686.
- 137 *An Ichthyosis Family. V. Magnus.—p. 703.
- 138 *Anaphylactic Shock after Injection of Diphtheria Antitoxin; Two Cases. T. Schønfelder.—p. 705.
- 139 Congenital Heart Defect. (Transpositio aortae et art. pulmonalis.) E. Platou.—p. 712.
- 140 *Optochin Amblyopia. I. Schiøtz.—p. 717.

136. **Colloids.**—Poulsson relates how the mystery of the colloids has been solved in recent years. Instead of being separate chemical bodies, they have been found to be merely suspensions in which the size of the particles ranges merely from one-thousandth to one-millionth of a millimeter. When the particles are smaller than this, we have the true solutions, as when sugar is dissolved, and when the particles are larger than this we have ordinary suspensions. The particles ranging from one-thousandth to one-millionth are too small to be seen directly in the microscope, but they may show up readily, even to the naked eye, as they catch the light, as dust motes show in a sunbeam entering a darkened room. Theoretically, any substance if divided into particles of this size will form a colloid in suspension in water or gas. Tobacco smoke, he says, is a colloid in gas form. Our atmosphere is a colloid of gas, water and dust particles. One of the most interesting features of colloids is that the solid particles of this size in them are always in lively motion, the Brownian molecular movement, when suspended in enough water. This molecular movement can be seen even in the small enclosed cavities in minerals opened up ages and ages after their first formation. The cause of the movement is not known, but chilling arrests it. Quite recent research is connecting the Brownian movement with the kinetic gas theory.

The enormous surface of the hosts of minute particles in a colloid, considered together, explains the process of adsorption, and possibly also the action of ferments and enzymes, which are colloids. Inorganic bodies can have a similar ferment action. The resemblance between them extends even to the fact that both can be paralyzed by certain poisons, prussic acid, for instance, and both can overcome the intoxication and resume their ferment action.

Living protoplasm is a colloid. Most colloidal solutions can solidify as a whole, and the jelly or gel holds its shape. This permits such living beings as the medusa, which consists of 95 per cent. water; certain water plants consist of 98 per cent. water, and parts of the human body contain 70 per cent. water. The different content of finely divided solids causes the blood to be a fluid while the muscle, which contains fully as much water, is a solid mass, and likewise the kidneys which actually show a higher percentage of water than the blood. The gel property of colloids is responsible for the setting of cement. Tungsten transformed into a colloid form permits the brittle metal to be drawn out into delicate wires for our electric lamps. Great efforts are being made now to prepare peat for fuel; as this is a colloid, the water cannot be squeezed out. The whole jelly mass escapes when pressure is applied, so that to date there is no process known except the tedious drying in the air. Among recent achievements in colloid chemistry is the transformation of the ill-smelling and easily decomposing whale oil into a hard white substance free from smell and absolutely durable. If this discovery had been made in time, he remarks, Germany might have prepared against the fat famine she has been experiencing. Salts and acids modify colloidal solutions. If the colloid is sufficiently dilute, under the influence of the salt it falls out of the water. This, Poulsson says, explains the delta of a river reaching tidewater. If the colloid is too concentrated for this, its avidity for water is increased. This

is Fischer's explanation for edema, and it seems to explain the facts observed better than any other theory. The water is sucked up by the colloids and thus retained in the body.

The colloids which do not form gels are precipitated by electricity. He says that clouds are typical specimens of these suspension colloids, and their coagulation product, rain, is induced by electricity. The coagulation occurs with special haste and violence when there is much electricity in the air, as during the first drops of a thunder shower. In medicine, the two types of colloids are combined to make the product more stable, as in the making of collargol, for instance, albumin is utilized as a "protecting colloid."

137. **Familial Ichthyosis.**—In the family described, the ichthyosis was transmitted through the two sound daughters to their three sons, and through a sound daughter in the third generation to her three sons. None of the daughters of the four generations showed the affection, and the children of the sons were always free from it.

138. **Anaphylactic Phenomena after Injection of Diphtheria Antitoxin.**—Schønfelder reports what he thinks are the first cases of anaphylactic disturbance that have been published in Norway. In both there were restlessness, prostration and other symptoms of collapse, with urticaria in the milder case. This girl of 17 had been given 4,000 units by intramuscular injection four years after a similar injection. The other child, a boy under 3, was given 4,000 units by intramuscular injection five weeks after a prophylactic injection of 500 units. The collapse and other symptoms were quite alarming in this case, requiring subcutaneous injection of camphor, but there was no pronounced dyspnea, and no eruption followed. The threatening symptoms subsided by the end of the third hour.

140. **Optochin Amblyopia.**—The history of the therapeutic use of optochin and its drawbacks is reviewed in detail by Schiøtz, who also reports a case of transient blindness in a sailor of 48 after optochin given for pneumonia. Vision is considerably reduced even now, but not enough to incapacitate him for his work. He is color-blind and the visual field is much restricted and the papilla grayish. There is also considerable hemeralopia. This seems to be the first case of optochin blindness reported in Norway.

Ugeskrift for Læger, Copenhagen

June 7, LXXIX, No. 23, pp. 899-940

- 141 *Comparative Research on Leukemia in Man and Fowls. V. Ellermann.—p. 899.
- 142 Treatment of Scabies. (Erfaringer over Fnatbehandling med Ungv. hepatis sulfuris.) M. B. Pedersen.—p. 909.

June 14, No. 24, pp. 941-996

- 143 *Focal Reaction after Injection of Tuberculin in Lupus. A. L. Fønss.—p. 941.

141. **Leukemia in Man and Fowls.**—Ellermann gives the clinical and necropsy findings in a case of myeloid leukemia in a man of 30 and compares them with the corresponding necropsy findings in a hen with leukemia, commenting on the remarkable parallelism between them, including the tumor formation. It seems evident that infection is able to induce hyperplasia of tissue of a more or less malignant nature. It is possible, he adds, that from the etiologic standpoint we must distinguish between typical leukemia and the atypical (leukosarcomatosis). Experimental research on hen leukemia seems to offer the solution to the question whether a new etiologic factor is superposed when leukosarcomatosis develops from a typical leukemia, and tumors form. It seems plausible to assume that some still unknown factor is responsible for the tumor production, but he has several times witnessed leukosarcomatosis develop in the course of typical leukemia, and is inclined to believe in their identity.

143. **Focal Reaction to Tuberculin in Lupus.**—Fønss expatiates on the diagnostic importance of a focal reaction to a test injection of tuberculin, as this locates the process. He has been studying it since 1912 in lupus patients—104 in all. He tabulates the data from 76 cases. They show that 5 mg. is the proper dose to induce a focal reaction. If this does not induce a focal response, increasing the dose will rarely accomplish it. In seven of the seventy-six there was no reaction, and in eleven it was dubious.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXIX, No. 7

CHICAGO, ILLINOIS

AUGUST 18, 1917

THE RELATIONS OF GYNECOLOGY TO GENERAL SURGERY, PAST AND PRESENT *

HOWARD W. LONGYEAR, M.D.

DETROIT

The following more or less desultory and somewhat reminiscent remarks, on which I ask your kind indulgence, are given not for any exact historical value which they may contain, but more as a sort of reminder, lest we forget.

As I began the study of medicine while the development of the science of gynecology as a specialty was in its infancy, and that of abdominal surgery practically in the stage of incubation, and as I have had the opportunity of over forty years of observation, as a physician, to note the many brilliant achievements not only of the fathers of our specialty, but also of many of their successors, and to observe as well, during this time, the relative and comparative running capacity (to use a sporting term) between the gynecologist and the general surgeon, it would seem well in this day of Prussianistic surgery that I should consider a few of the alphas of success, and perhaps to attempt a little in the line of prognostication regarding the trend of surgical thought and practice toward the omega of relationship between the gynecologist and the surgeon.

My early professional training was conducted in the surgical atmosphere surrounding such men as J. Marion Sims, Thomas Addis Emmett, T. Gaillard Thomas, Willard Parker, T. M. Markoe, James R. Wood, Lewis A. Sayre, and others of lesser note in this country, and Schroeder, Martin and Langenbeck of Berlin, Billroth of Vienna, and Tait of England. Having come into personal contact, as a pupil, with some of these early masters, I can realize, after this lapse of time, how profoundly their influence has tended to shape the destinies of the present.

In any discussion of this or kindred subjects, we must not forget to consider certain of Nature's laws—those silent, ever active, immutable forces. These well known and generally accepted principles which automatically govern the development of the various species in the animal kingdom, which we are taught to term evolution, survival of the fittest, struggle for existence, etc., proceed with their accustomed steam-roller efficiency in other affairs of the genus *Homo* beside that which pertains to the development of the species.

The twentieth century is ushering in a period of kaleidoscopic changes, of Aladdin-like transforma-

tions in everything pertaining to the activities of man. Science, the arts, business, society, finance, methods of warfare—all are feeling the jolts of the erratic and rapid pace of this great evolutionary present-day thrust. We are living in a new world in which habits and customs, venerated by centuries of usage, are dropped without ceremony and without apparent effort or regret, and the new is blithely taken on, all in the name of progress. The horse bids fair, soon, to become extinct as a domestic animal, perhaps to revert to the wild state of his ancestors, and be captured and exhibited by future generations of man, as a curiosity, along with the gnu, zebra and giraffe.

The air has been conquered and space annihilated on land, in and on the water and in the air; previously impregnable fortresses and strongholds are now quickly wiped out by the touch of science. The once preposterous, imaginary creations of Jules Verne, considered only as romantic and interesting fiction, are now materialized, and the resultant steel monsters threaten the destruction of a world's commerce. Government of the most autocratic form, founded on centuries of despotic power, now vanishes in a night, to be swiftly and peacefully succeeded by liberal democracy.

In finance the numbers soar higher and higher until the common consideration of the most fabulous sums ceases to awe the beholder. Efficiency is now the watchword of education. In mechanics, handwork is replaced by the machine-made. Everything is manufactured in great numbers, with duplicate interchangeable parts. Similar kinds of manufacturing business are combined under one head, resulting in more economic production and better goods. This results in small business remaining small or going to the wall. The same spirit of big business is permeating the medical profession, as witness the elimination of the family doctor and the advent of the "group medicine" idea. Especially is this change true of the practice of surgery. A German physician, on visiting one of our greatest surgical centers, characterized it as *eine grosse chirurgische Fabrik*. Truly a surgical factory—a factory in which the product is turned out in immense quantity and also of good quality.

PLACE OF THE GYNECOLOGIST IN SURGERY

Is it not time that we ask what place, if any, the gynecologist has, or will have, in the near future, in the field of surgery, and will these various surgical manufacturing industries that are endeavoring to emulate the *Fabrik* spoken of by the German physician have a place for the woman's doctor, or will the general surgeon be the whole "factory"? The general surgeon is, octopus-like, progressively absorbing more and more of the surgical specialties: As soon as one is perfected, he takes it over, and this policy of adap-

* Chairman's address, read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

tation will no doubt continue. The tonsils and adenoids, the pleural cavity, the perineum and cervix, the uterus and adnexa are now his. The abdomen and pelvis were presented to him by the gynecologic pioneers, and were quickly absorbed as soon as their operative technic was perfected. While in his abdominal work he may now be said to have "arrived," his gynecologic efforts frequently exhibit a hesitant and unfamiliar technic.

What did the general surgeon of the time of Sims, Emmett, Thomas and Tait know, or even care, about gynecology? Gynecology was carefully avoided by the surgeons of that day, and its practice outside of the recognized medical centers was usually relegated to the family physician, whose greatest pride was often manifested by the ability to introduce a bivalve speculum, and whose therapeutics began and ended in the use of tincture of iodine and the glycerin tampon.

This certainly was the gynecologic status in a general hospital of which I was house physician and superintendent for three and a half years of my early professional life, and from my knowledge of other hospitals of that time, I think the picture is not overdrawn.

From this work, which the surgeon of that day scorned, the gynecologist built up and perfected the system of surgery of the female genitalia, and from that upward, progressively, the surgery of the pelvic and abdominal cavities, which forms not only the basis but the whole superstructure of that work today.

The gynecologist was the pioneer in all of this great surgical specialty evolution. The general surgeon was his follower. Whether he shall now become, in turn, the master and the gynecologist the follower (or possibly only an onlooker) will no doubt be relentlessly determined by the before-mentioned natural laws.

The hospital previously referred to (Harper Hospital of Detroit) now grinds out an average of over thirty surgical operations a day. Comparative statistics from its records are interesting as illustrating the point just made. During the year 1897 (a year taken at random, twenty years ago) 709 operations, of which 360 were abdominal sections, were performed by gynecologists and general surgeons. Of the abdominal sections, 304 were made by gynecologists and 56 by general surgeons—about 84 per cent. for the gynecologists and 16 per cent. for the general surgeons. The same statistics for the year ending Dec. 31, 1916, are given in the accompanying tabulation.

OPERATIONS AT HARPER HOSPITAL IN 1916		
	No.	Per Cent.
Surgical operations made by general surgeons and gynecologists	4,412	....
Abdominal sections	2,652	....
Made by gynecologists	384	14.5
Made by general surgeons	2,268	85.5

It will thus be seen that in the abdominal work the tables have been completely turned during the last twenty years. It will also be noted, if this exhibit is a fair average of the general surgeon's work everywhere, that he is now doing more abdominal work than all of his other work combined, so that if the average of abdominal work over general surgery continues to increase for the next twenty years as it has for the last two decades, it requires little mathematical calculation to figure the general surgeon out of everything but his abdominal work. Another of Nature's laws to be vindicated, perhaps!

If the gynecologist is thus shown to be no longer the predominating factor in abdominal surgery, what will be his position in the evolutionary processes twenty years hence? Will he pick up the bones cast aside by the general surgeon, in his lust for the peritoneum, and go on his way rejoicing, himself in turn becoming a general surgeon or will he be driven into the vast and prolific field of obstetrics—untouched, as yet, by the tentacles of the octopus?

For this popularizing of the operation of abdominal section with its present-day success, attending the work of many surgeons, the general adoption of two essentials in technic is responsible, in my opinion. I refer to asepsis, and treatment of the pedicle by the absorbable ligature. From the period of Lister's first teaching that it was something pathogenic that entered the peritoneal cavity through the wound during the operation, and not trauma of the peritoneum, which caused postoperative peritonitis, up to the finished evolution of the present method of absolute cleanliness and asepticism, the road has not been smooth and unobstructed, as we all know. Those of us who have operated in a room foggy with phenol spray, and used strong antiseptics to kill the germs on the instruments, hands and dressings, those who used enormously strong silk ligatures, which in some cases were left long, with the wound open, so that the knot could be withdrawn when the stump of the pedicle sloughed, those who used horrible clamps to get away from the ligature, and saw patients die, or struggle through a weary convalescence, can best appreciate the standard methods of today—the methods which make it possible for the general surgeon to do this work as commonly as the more ordinary operations of the past. It seems but a short and natural step from Ephraim McDowell's buckskin ligature, used in the first ovariectomy, to the catgut of today, but it took a long time, much experimentation and the cost of many lives to learn this one simple detail of technic.

THE DEVELOPMENT OF ABDOMINAL SURGERY

In the foundation of the development of the operation of abdominal section, humanity and the medical profession are greatly indebted to a gynecologist. Lawson Tait, though much maligned and criticized by the surgeons of his day, not only threw brilliant light on the pathology of the pelvic organs, but also contributed a technic that is not only practical today, but has made possible other surgical procedures within the peritoneal cavity. I believe his success was largely owing to boldness in attacking adhesions, especially those occurring in connection with pyosalpinx, the pathology of which he was the first to elucidate clearly. To illustrate the uncertain attitude of surgeons in respect to pelvic adhesions: At about the year 1890, finding my pelvic work hampered by a fear of these adhesions, I asked a well-known gynecologist how he treated them. He said if he could not break them up by the force exerted, by spreading apart the index and middle fingers, he let them alone. Shortly after this time I visited Mr. Tait in Birmingham, and while assisting at a difficult salpingectomy I asked him the same question. His answer was quite different and well worth the cost of the European trip. He said: "A man without a good forearm better not undertake it."

In my opinion Tait did much to popularize the split-flap method of perineorrhaphy, which has now, justly, almost completely supplanted that of superfi-

cial denudation. Tait, like most pioneers, was wont to go straight to the root of things. He paid little attention to what he considered unessential details—especially in the matter of cosmetic effects—passing them over with apparent unconcern, and aiming only at the solution of the fundamental surgical problems. His perineorrhaphy technic was unique and startling. He would proceed to the bedside of the patient who was already anesthetized and across the bed in the lithotomy position; then, sitting sidewise on a low ottoman by the bedside, a bunch of silkworm-gut sutures placed conveniently in his mouth (!) Sims angular scissors in one hand and a fully curved handled needle in the other, he operated practically without assistance, in from five to seven minutes' time. No painstaking dissection was made. From three to five deep incisions (according to second or third degree of rupture) with the sharp pointed scissors sufficed to lay open the tissues in the direction of the ruptured and retracted muscles and fascia; then with the other hand the large needle was passed, and the suture taken from the mouth and threaded with the hand holding the scissors. The sutures were placed so as to include all the tissues but the skin margins, which were left without further suturing.

While the technic described would offer much to criticize (although the method allowed good drainage in the event of very probable sepsis) the simplicity and effectiveness of the operation were evident at a glance. By it the ruptured and retracted tissues were reached and reunited, which made the demonstration a graphic revelation in surgical mechanics that left no doubt in the mind of the observer of the value of its fundamental principle.

Sims' operation for vesicovaginal fistula was an epoch-making procedure, as it probably had more influence than any other in placing the specialty of gynecology on a firm foundation. The technic as taught by Sims was at once accepted in this country and in Europe.

Not so readily, however, was Emmett's operation of trachelorrhaphy accepted abroad. While the pathology of the lacerated cervix uteri as taught by Emmett was quickly adopted, as was the operation in this country, it was amazing how long a time it took the surgeons of Europe to accept this valuable contribution to pathology and surgery.

I did a trachelorrhaphy, according to Emmett's method, in 1878, and yet, while pursuing my studies abroad during the years of 1879-1880, I found Martin of Berlin doing the Schroeder cervical amputation for lacerated cervix, and in London I saw a large ward full of women, all being treated for the same trouble, termed ulceration and degeneration of the cervix, by the application of potassium hydroxid.

The general surgeons of the time of Sims, Emmett and Thomas, many of whose names are now looked on as beacon lights of the profession, knew nothing, comparatively, of gynecologic surgery. Engrossed in their own absorbing and developmental work, they looked at first with amused curiosity at the achievements of the gynecologist.

The general surgeons of that day rarely undertook intra-abdominal work, and when they did it was usually in cases of far advanced ovarian cystomas. While otherwise skilful operators, they often presented sorry spectacles of surgical impotence in operations involving the abdominal cavity. They exemplified

unpreparedness, and while more dramatic, were less seriously accurate than their brothers of today.

Those of us who had the good fortune to be under the tutelage of some of those really great men can appreciate the truth of this observation. Think of the clinic of the late James R. Wood being used to demonstrate an abdominal section! He was familiarly and affectionately known as "Jimmy" Wood, and his clinic was termed "the matinee." His methods were the epitome of those of the great surgeons of that day. Rapidity and accuracy we admit were there, but above all was the spirit of dash and theatrical display that seemed to form a necessary part of the equipment of the great surgeon.

The gynecologist took himself more seriously, as his manifest destiny demanded, as he was the instrument being prepared for the accomplishment of the great surgical victories over the pathology of the pelvis and abdomen. Such a destiny could be achieved only by the serious-minded and prayerful. Also the plastic work of the vagina and cervix, the repairing of vesical and rectal fistulas, shortening of the round ligament, and other work approaching in delicacy the surgery of the eye offered no opportunity for theatricals.

From the pathology of the perineum, vagina and uterus it would seem but a step, to be quickly taken, to that of the fallopian tubes and ovaries; but owing to the dangers attending the invasion of the peritoneal cavity, this advance was not possible in any practical way until the principle of asepticism became known. Tait then boldly entered this new field with its immense possibilities, this previously unexplored region, whose gonococcus-infected tubes and ovaries were destroying the health, happiness and lives of untold numbers of women.

The younger generation in the profession, who have grown up in the atmosphere of modern pathology, can with difficulty realize the value of the boon to woman-kind that followed the discovery of the etiology of the pus tube.

Old textbooks on gynecology, written from thirty-five to forty years ago, treat voluminously of pelvic cellulitis, but not at all of pyosalpinx. The treatment was practically by the use of the hot vaginal douche. It is well occasionally to take a retrospective view that we may better appreciate the advantages of the present.

Ectopic pregnancy, also, was not well understood until after the advent of aseptic surgery. Pelvic hematocele was discussed at length in the same textbooks, and extra-uterine pregnancy was passed over with little more than mention of its rarity. Tait's brilliant work elucidated this subject. As early as 1876 he advised operation in such cases.

The modern aggressive surgery of the vermiform appendix began soon after the latter date, and here is also seen the influence of Tait and his followers, many of the latter, like the late lamented Joseph Price, carrying on the work with great energy in this country.

While Willard Parker of New York advocated and practiced the drainage of appendical abscesses as early as 1867, and reported a number of successful cases, and while many others were working along the same lines, especially in this country, it is again largely to Tait's wonderful pathologic insight, surgical skill and incisive boldness that we must credit much of the present successful operation of appen-

dectomy. It was in 1881 that he uttered the startling dictum of abdominal section for all cases of peritonitis from whatever cause occurring.

This seemed radical, a far cry from the heroic opium treatment of Alonzo Clark and his followers, which was in full swing as late as 1875; but the light was just commencing to be turned on the pathology of this time-obscurd *terra incognita*—the peritoneal cavity—and the commanding personality of a Tait was necessary to push home the new truths in a clear and forceful manner.

As regards extra-uterine pregnancy, Strahan,¹ writing in 1889, said that Lawson Tait had had more experience of such cases than any man living and more than any man who ever lived. Tait had then reported seventy-six cases, and had published a brochure² which embraces practically the views which are held on the subject at the present time. Following the lead of these pioneers in gynecology and abdominal surgery, we find the names of many surgeons of brilliant attainments whose wonderful skill in diagnosis and technic are marvels of scientific acumen. But the old pathfinders are gone, it is hoped to their much merited reward. Many of their immediate followers who pushed the work initiated by these early discoveries to a successful fruition have also passed to the other side, but their work has resulted in such a standardization of the original fundamental principles pertaining to pelvic and abdominal pathology and surgical technic that these once seemingly impossible and unapproachable problems are now open to successful solution, by the skilful and conscientious surgeon. And right here lies the danger to the public. Skilful surgeons may not all be conscientious; conscientious surgeons may not all be skilful.

DEVELOPMENT OF THE SPECIALIST

The present day free dissemination of knowledge by innumerable, lavishly illustrated textbooks results in the ruination of many good embryo internists in fashioning mediocre surgeons. The lure of the knife is an *ignis fatuus* to many would-be surgeons. It all looks too easy and simple, on paper. Self-styled surgeons have been made too quickly in this country, and when time and experience have turned out a few good ones from this number, it has been at a stupendous cost of health and life to the public.

Much good surgical timber is spoiled by the spreading out of endeavor over too wide a territory, when concentration over a much smaller area would mean success. Preeminence has rarely been achieved by the former process, and it will ever be thus until those evolutionary processes of Nature produce the superman. With the younger generation of surgeons it would seem as though some of them believed the era of the superman had arrived. The pendulum is certainly swinging in the direction of all varieties of surgery for the general surgeon, and this will no doubt go on until the spreading out process will become so thin a surgical veneer as to determine the reverse swing of the pendulum.

Will the specialist, then, come into his own by a sort of process of vicious circle action, engendered by the rapacity of the octopus, or is this simply an evolutionary process of Nature, who, in her wisdom, is working out a higher and more dignified and more

impregnable position for the specialist? We may be sure that, at this period of medical history, with its continuously higher educational requirements, the law of the survival of the fittest will determine the destiny of all concerned in this contest.

The influence of the American College of Surgeons will soon be felt in this direction in its efforts at the standardization of surgery and surgeons. This field could be possibly still farther broadened, and the beneficent usefulness of the College enhanced, by extending such standardization to the surgical specialties. It would seem that the power of arbitration so exercised would fill a long felt want in the elimination of those with little or no qualifications for the work in which they propose to specialize. The demand for the best surgery is soon to be made by both the physician and the people, as they are awakening to the fact that the performance of a great multiplicity of operations of all kinds by a surgeon does not necessarily constitute him a skilful operator or a person of sound judgment.

To make the specialist of the future, many of the short cuts now taken so easily toward the goal will be closed, and only that road—the one containing all the “jumps”—which leads to the greatest proficiency will be left open. The future surgical specialist will not be a person of narrow medical education, professing or knowing nothing outside of his chosen field. He will be a doctor of broad medical and surgical knowledge, of which his chosen specialty will be as the keystone of an arch, placed last, holding all and held by all.

The prospective specialist, after receiving his medical degree, should be required to take a hospital course in internal medicine, in which he must become proficient, and especially so in differential diagnosis. This will be his most valuable preparation for future like work, although it is now usually looked on as drudgery, to be avoided if possible, by the candidate for the hoped-for surgical distinction. It is here he will learn those points of diagnosis which will save him from making many operative blunders; such, for instance, as taking out appendixes because of pain caused by a spastic cecum, stone or “gravel” in the right ureter, or by pneumonia—mistakes made too frequently at the present day. He will then be prepared to take the hospital course in surgery, which should be general surgery, in the broadest sense of the term, as in my opinion it will be only the operator who has been well grounded in all of the principles and practices of general surgery who should be allowed to attempt a surgical specialty of any kind. The latter should be looked on as a sort of postgraduate professional accomplishment, to be attained by merit, as a soldier wins his spurs. After the course in general surgery he will be prepared to begin the serious study of his chosen specialty. This should be under the direction of, and while acting as the assistant to, a surgeon practicing such specialty. Such a term, consisting largely of practical assistance in operations, should extend over at least one year.

A specialist commencing his life work after such preparation would command respect, and the lives of the public would not be endangered, as at present, by the ignorant and venal self-seeker.

SUMMARY

I believe that the gynecologist and abdominal surgeon, as a specialist, has seen and passed the zenith

1. Strahan: Diagnosis and Treatment of Extra-Uterine Pregnancy.

2. Tait: Scheme of Ectopic Gestation in Tubo-Ovarian Tract, Lancet, London, Sept. 1, 1888.

of his activity, under present conditions; that the future promises a still greater position than that enjoyed in the past, but that it must be attained by means of a broader education and through the medium of general surgery of the highest order and broadest understanding. I believe that the general surgeon of today is doing the major part of the abdominal and pelvic work because he is a better general surgeon than the gynecologist. It is this broad understanding of surgical problems in general that begets confidence, and confidence begets patients, and patients beget patients!

The surgical millenium has not yet arrived, but when it does the lion and the lamb will be seen lying down together, side by side, and not the one in the relation of nutritive pabulum to the digestive processes of the other.

700 Shurly Building.

REPORT OF STUDIES CONCERNING ACUTE LOBAR PNEUMONIA *

RUFUS COLE, M.D.

NEW YORK

Four years ago, before this section, I discussed the question of the treatment of pneumonia by means of specific serum, and gave the results of the treatment of a few cases by this method. (During the period which has elapsed since then, the study of this form of treatment has been continued, further experience has been obtained and certain new facts elicited, and today I desire to report the progress that has been made and to discuss certain practical questions relating to this form of therapy.) At that time the type of pneumococci causing the infection had been determined in only seventy-nine cases. We have now determined the type of infecting organism in over 500 cases in the Hospital of the Rockefeller Institute alone, and the method of determination of type is now being done as a routine procedure in a large number of hospitals and by several state and city boards of health.

Judging from our own experience, about one third of the cases of pneumonia are due to infection with Type I pneumococci, one third to Type II pneumococci, 10 to 15 per cent. to Type III pneumococci, and the remainder are due to infection with pneumococci belonging in the IV group. In small series of cases the relative numbers of cases due to the different types will, of course, vary, and they may vary somewhat in different cities and in different years. Our own figures from year to year, however, have been fairly consistent, and the results obtained by others have not varied widely from those stated. The observations which have now been made concerning mortality indicate that the cases due to Type I and Type II are of average severity, the mortality being from 25 to 30 per cent.; those due to Type III are severe, one half or more of the patients dying, while the cases due to organisms of Group IV are milder and the mortality is usually not more than 10 to 15 per cent.

These observations in regard to severity of the cases due to the different types of infection have proved of great value in prognosis. When the knowledge thus

gained is combined with the knowledge obtained by blood culture, and by testing the urine for precipitable substance, we have a great deal of information regarding the probable outcome in the individual case. In the cases due to the more serious types of infection, a high grade of blood infection as shown by the number of colonies per cubic centimeter in the blood plates is of very bad omen. A heavy precipitin reaction in the urine also indicates a probable bad outcome, as Dochez and Avery have shown. These signs may already be present when the patient's condition is relatively good as indicated by ordinary clinical observations and tests. These facts have been of considerable importance in the past and will undoubtedly be of still greater value in the future in judging of the efficacy of therapeutic procedures.

At the time my previous paper on serum therapy was read, only a small number of cases due to Type II infection had been treated with serum, and no evidence could be presented which was of much importance in indicating its value. Further studies have not shown that this serum as now prepared and applied is of great value in the treatment of these cases. In the cases so far treated, no constant technic has been applied, as we have been earnestly searching for modifications of the method which would increase the value of the serum. Judging from the results in the individual cases so far treated, however, no definite marked modification in the course of the disease or in the mortality in this class of cases has been obtained. Nor has it been possible so far to modify the method of immunization in horses so as to obtain a more active serum.

As regards the serum treatment of cases due to Type I infection, however, further observations have confirmed the results obtained in the previous small series of cases, and the evidence now seems quite convincing that immune serum, rightly employed, in this form of infection is of distinct value, and by its use the mortality in patients infected with this type of pneumococci may be materially reduced. Up to the present 105 cases of this type have been treated with serum in the Hospital of the Rockefeller Institute alone, and of these, ninety-seven patients have recovered and eight have died. Of the eight fatal cases, three were treated only a few hours before death, late in the disease; one patient died on the sixteenth day of pulmonary embolism; one died on the fifty-fourth day, with a general streptococcus infection, following empyema; one at necropsy was found to have tuberculosis involving both lungs, with only a small area of pneumonia involving a part of one lobe. This leaves but two cases in which treatment may be said to have been at all adequately carried out, or in which any form of specific treatment could be expected to be of any value and these were treated late in the disease. One of these two patients died on the sixth day, after treatment on the fifth and sixth days, and one lived until the twelve day, treatment having been undertaken only on the seventh day. This patient had an extremely severe infection at the time of admission, blood cultures showing 300 colonies per cubic centimeter. In spite of this severe septicemia, the blood culture became negative, but the involvement was extensive, and in spite of treatment with massive doses of serum, he died on the twelfth day. Of thirty-five patients treated during the past winter only two have died.

* From the Hospital of the Rockefeller Institute for Medical Research.

* Read before the Section on Practice of Medicine at the Sixty-Fifth Annual Session of the American Medical Association, New York, June, 1917.

The results of serum treatment in this series of cases have therefore been extremely good, and in many of the cases the clinical changes following the administration of the serum have been so definite and striking that it seems there can be little doubt of the effectiveness of serum treatment in this type of infection. Similar results have also been obtained in other hospitals where the treatment could be carried out with full attention to details. Craig and Nichols have also tested the method in a series of cases among the troops on the Texas border and among the Type I cases so treated the mortality was but 5 per cent.

These results, and the fact that certain public health laboratories and also certain commercial houses are now preparing the serum, so that there will soon be a considerable supply available, makes it evident that during the coming winter this form of therapy will be extensively employed in civil practice, and I hope in the Army as well. The latter is of much importance. During our Civil War twice as many deaths resulted from disease as from the injuries of battle. One half of all the deaths from disease were due to typhoid, dysentery and pneumonia. One of these diseases, typhoid, has now been practically eliminated, and it is not likely that dysentery will cause great damage in the present war. On the other hand, in the camps in which raw recruits are collected, especially in the winter, pneumonia is bound to be very prevalent. It is to be hoped that by systematic and thorough treatment of the Type I cases with serum, the mortality from this disease also may be materially reduced.

For these reasons I propose to discuss briefly certain practical points connected with this form of treatment.

Questions which are immediately raised are whether it is justifiable to treat all cases of pneumonia with serum, whether its use should be confined to cases known to be due to Type I infection, or whether it is justifiable to use a polyvalent serum in all cases of pneumonia. The objection to the use of Type I serum in all cases of pneumonia is that in at least two thirds of the cases we know that it will do no good whatever. The immunologic reactions of this infectious agent are absolutely specific. If we had no means of determining the type of infection in the individual case, we might discuss whether we were justified in subjecting two thirds of all pneumonia patients to the possibility of severe serum reactions without any possible benefit to themselves, in order to obtain good results in the other one third. Fortunately, we now have means for determining the type of infection in the individual case, and the fact that the method is somewhat complicated, though not extremely so, in my opinion does not justify the indiscriminate use of serum. It is impossible to say at present to what extent the serum reactions in the cases of other types might interfere with the chances of recovery, if at all; nevertheless they are unpleasant when they occur, and may cause some anxiety to the physician, especially if he be uncertain whether in the case being treated the serum can be of any value or not. There seems to be no reason, therefore, to change the opinion which we have previously held, that determination of the type of infecting agent should be an essential prelude to this form of therapy.

The same statements apply to the use of so-called polyvalent serums. The only other type of pneumococcus infection in which, with our present knowledge, antipneumococcus serum can be of value is infection due to Type II pneumococci. The best

serum we have been able to produce against this type of infection is of considerable lower potency than the Type I serum. We have tested all the other serums manufactured in this country and know that none of them have a higher titer than ours. Our results with treatment with this type of serum are still inconclusive. We, therefore, believe that at present the use of a polyvalent Type I and Type II serum is unjustified. The indiscriminate use of serums in cases in which the type of infection is undetermined will only lead to inefficient and improper use of the serum in the cases due to Type I infection, in which, if the treatment is carried out intensively and with confidence, beneficial results may be expected.

It has been suggested that to avoid the delay incident to the determination of type, a single dose of Type I serum should be given in every case. During the time elapsing before the administration of the second dose, the type of infecting agent may be determined, and if it be not Type I, no further serum need be given. Whether by this method the disadvantages incidental to serum reactions will outweigh the advantages of earlier administration of serum, we have at present no means of knowing. The decision in the individual case will have to depend on such circumstances as the day of the disease on which the patient is first seen, the severity of the infection, etc.

In all forms of serum therapy the earlier the serum is administered the greater the effectiveness. Experience has shown this to be of much importance in treatment with diphtheria antitoxic serum, and the time of administration is undoubtedly still more important with antibacterial serums, such as antipneumococcus serum. Pneumonia is the easiest of the acute infectious diseases to diagnose; the onset is usually violent, and except in the case of the extremely poor, a physician usually sees the patient early in the disease. With general recognition of the importance of early diagnosis of the disease and determination of the type of infection, in most cases knowledge of the nature of the infectious agent can be obtained within twenty-four, or at the most forty-eight hours after onset, and serum administration can be commenced at once. If this form of serum therapy is going to prove of great practical value, it is important for all laboratories to be prepared to furnish prompt and accurate diagnoses of type. This is coming to be recognized, and a number of public health laboratories are now prepared to carry out the required tests. In outlying country districts the matter is more difficult, but in any place that examinations of throat cultures for diphtheria bacilli can be made, the tests for determination of type of pneumococci can be performed.

After it has been determined that the case is one of pneumonia due to Type I pneumococci, the administration of serum should at once be made. It is not fair to the treatment or to the patient to wait to see whether the case is going to be a severe one or not. All experienced physicians know that nothing is more difficult than prognosis in pneumonia. With the laboratory aids we have mentioned, it is not infrequently possible to say, even in the absence of severe symptoms, that a case will progress badly, but it is next to impossible to say with any authority, early in the disease, that a patient will recover. All patients with Type I infection should, therefore, be treated with serum, and treated as soon as the diagnosis is made.

In administering serum, however, it is important to know that the serum is of proper strength and potency.

Last winter in testing antipneumococcus serums prepared by commercial houses I found that certain of them had little potency against pneumococci of Type I; some of them had absolutely no protective power against any type of pneumococcus with which I am acquainted. It has been somewhat difficult to determine a standard of potency for this form of serum, though not nearly so difficult as for antimeningitis or antidyentery serum, for instance. The Hygienic Laboratory of the United States Public Health Service has now taken up the matter and within a short time it is expected that a standard will be fixed. An effective serum will be one which is equal in potency to the standard serum, 0.2 c.c. of which protects a 20 gram mouse against 0.1 c.c. of a culture, of which 0.000001 c.c. alone will kill. As soon as this standard is established, those administering this form of serum should employ only such serums as are guaranteed by the manufacturer to conform to the required tests.

This serum should be given intravenously, preferably diluted once with freshly prepared sterile salt solution, though this dilution is not absolutely necessary, provided the serum be injected slowly enough. The dosage is at present empirical. For reasons into which I cannot enter here, however, we believe that the dose for an adult should be at least 75 to 100 c.c., and if necessary this should be repeated every six or eight hours until a favorable result is obtained. In most cases two or three doses are sufficient. The average amount employed in our cases during the past winter, if we except the one fatal case which was treated over a period of five days, has been 250 c.c. Usually within an hour or two following the injection, there occurs a slight elevation of temperature succeeded by a marked fall. Frequently, however, the temperature does not remain low, but after a period of from eight to twenty-four hours it again begins to rise. We feel that it is extremely important to watch the patient after the administration of serum, taking the temperature every two hours, and whenever this rise occurs the administration of serum should be repeated at once. If no change occurs following the first dose, the reinjection should always be made within six to eight hours. Experimental evidence as well as clinical observations indicate that we should persevere, even if no reaction is obtained after several doses.

The object to be striven for in the administration of the serum is to produce in the patient's blood a concentration of antibodies such as that which occurs during natural recovery from the disease, for we believe that it is largely on this factor that recovery depends. If to obtain this result required merely the addition of a definite amount of the serum to the patient's blood, just as we might make a dilution of the serum in normal blood in the test-tube, there would be little difficulty, for the serum is of high potency and it is probably only necessary to produce a slight concentration of immune bodies in the patient's blood in order to obtain favorable results. However, experiments have shown that not only do the bacteria circulating in the blood fix antibodies and so render them ineffective, but in the infected patients the blood contains soluble antigenic substances which fix antibodies just as do the bacteria themselves. In the severely infected patients these soluble substances may be present in large amounts and it is only after these substances are all saturated that an effective concentration of immune bodies in the blood can be obtained. This fact explains why, in the severely infected or

late cases, it is necessary to inject so much more serum than it is when the patients are seen early or are less severely infected.

In administering large amounts of foreign serum, as it is necessary to do in this form of therapy, the patients may exhibit certain symptoms which are due entirely to the parenteral injection of the foreign protein, and have no relation at all to the content of the serum in specific antibodies. The physician should be familiar with these reactions, in order that they may be avoided so far as possible and that appropriate treatment may be given, and finally that he may not be unduly alarmed and avoid employing a measure which is of such distinct advantage to the patient. These so-called serum reactions are of several kinds. First, in patients who have previously received horse serum, or even occasionally in cases in which no history of the previous administration of horse serum can be obtained, there may occur, almost immediately following the injection, suffusion of the face, restlessness, increased heart rate, difficulty in breathing, urticaria, and rarely collapse. These symptoms may occur, however, after the administration of small doses of serum such as are employed in the treatment of diphtheria, as well as following large doses of serum such as are required in pneumonia. The reaction is undoubtedly analogous to, and probably in principle identical with, the so-called anaphylactic shock seen in animals following a second injection of foreign protein. That it is not of frequent occurrence and is rarely of serious import all those who have had much experience in giving diphtheria antitoxin will bear witness. Moreover, it can be guarded against and probably avoided in all cases. In the first place, we now have means of determining before administration of serum or protein whether or not a patient is sensitive. This is done by injecting into the patient's skin, not subcutaneously, a small amount of the foreign substance. If the patient is sensitive, within an hour there will occur a characteristic local edema and erythema, which is entirely lacking at the site of injection in patients who are not sensitive. It is, therefore, important that this test should be made before giving horse serum, and this applies to all forms of serum therapy. Second, it has been shown by Besredka and others that even susceptible and highly sensitized animals may be completely desensitized so that they may receive huge doses of the serum to which they are sensitive, if the injection be made gradually, beginning with an extremely minute dose, and following this with doses of gradually increasing size. It has been shown that even administering the serum with extreme slowness may be sufficient to prevent anaphylactic shock in animals. It has been our plan, therefore, to inject subcutaneously into every patient suffering from pneumonia, on admission to the hospital, a small dose, 0.5 to 1 c.c., of horse serum. This is done, even when the skin reaction has not shown that he is sensitive. By this measure, if slight grades of sensitization be present, several hours will have elapsed by the time the determination of type is made, and in the meantime the patient will have been desensitized. Then in administering the serum, it is injected slowly at first. A good rule is to allow at least fifteen minutes for the administration of the first 15 c.c. If no reaction has occurred, the remainder may be injected more rapidly, and subsequent doses may be injected without this delay. If the skin test has shown the patient to be sensitive, additional measures to desensitize the patient should be taken in the

way of repeated injections, beginning with small doses and gradually increasing them. By these means Alexander, at the Peter Bent Brigham Hospital, has been able to treat safely and successfully pneumonia patients who have been known to be highly sensitive to horse serum. It should be noted that care should be taken in the serum treatment of patients suffering from asthma, hay-fever or other forms of protein sensitiveness, for it is known that such patients are especially liable to be sensitive to horse serum as well. If the physician has knowledge of all these facts, and takes adequate precautions, severe anaphylactic shock should not occur. In any case, it should be remembered that severe shock occurs extremely rarely. Its danger should not be overemphasized, and above all, serum treatment in cases in which it is known to be effective should not be omitted because of this possible danger.

The second form of serum reaction is more difficult to guard against. This possibly has nothing to do with anaphylaxis or previous sensitization, and may occur with repeated injections. The symptoms, however, are like those seen in anaphylactic shock, consisting of restlessness, tachycardia, suffusion of the face, sweating and occasionally vomiting. They may appear during the administration of serum, or may be delayed for an hour or longer. High elevation of temperature, with abrupt fall, may be a part of this nonspecific serum intoxication. This reaction is identical with that sometimes seen after salvarsan injections, which reactions are thought to be due to improperly distilled water. It is the same kind of reaction which is seen after large injections of vaccines, which reactions have been claimed by some to have therapeutic effects. However, we do not believe that the beneficial effects of such reactions have been demonstrated. So far as the present form of therapy is concerned, we believe that the occasional occurrence of such reactions is a distinct drawback to the method, and we believe that such reactions should be prevented so far as possible. At present they cannot be entirely avoided; an occasional patient will show such a reaction, just as they do with salvarsan. However, we can undoubtedly lessen the frequency of their occurrence and their severity. Certain lots of serum are more prone to produce such reactions. Those lots of serum should not be employed. Then the injections should be given slowly and the serum should be heated to body temperature before injection. If the patient shows signs of distress during the treatment, the injection should be stopped, to be continued an hour or two later. If such reactions occur, the injection of 0.5 c.c. of epinephrin solution, or 0.01 grain of atropin will usually give relief. While these reactions, when they occur, may appear alarming, so far as we have been able to see they have in no way affected the course of the disease or interfered with the efficiency of the serum.

Finally, following serum treatment, patients may show a complex of symptoms which has been described as serum sickness. These symptoms consist of elevation of temperature, skin rashes, glandular enlargement, edema of the skin, and joint pains. Mild symptoms, especially the skin rashes, may occur within a day or two after the serum injections (so-called accelerated reactions). The entire group of symptoms most frequently occurs, however, seven to fourteen days following the administration of the serum. The attack may be repeated one or more times, or may be very irregular in its course. Mild symptoms occur in

about half the treated cases, severe attacks only rarely. While this so-called serum disease is at times distressing, it is, so far as I know, never serious, and is always recovered from, leaving no sequelae. The urticaria is the most distressing symptom. This may be relieved temporarily by the injection of small doses of epinephrin, and the discomfort may be lessened by phenol washes. It should always be remembered that during the entire period of convalescence the physician should always be watchful for complications. It is a very unsafe rule to ascribe all unusual symptoms during this period to serum sickness. Serum sickness may cause high elevation of temperature, to 103 F. or over, for instance, but care must always be taken to avoid overlooking other complications which may be responsible.

I have laid stress on these various symptoms following the administration of serum, because every physician carrying out this form of treatment should be familiar with them, and because the statement has been made that the danger of anaphylaxis is so great and the discomfort of the serum reactions so marked that serum therapy in pneumonia should not be employed. This point of view I believe to be entirely wrong. If in such a serious disease as pneumonia we have a measure which may save life, we have no right to neglect it because of the possibility of anaphylaxis, which can be avoided, or of serum reactions, which are at the most only distressing. The dangers associated with the administration of serum are probably no greater and probably much less than the danger associated with the administration of an anesthetic. We have now administered large doses of serum in 150 or more cases without seeing any unfavorable results.

We now have evidence that the treatment of cases of pneumonia due to Type I pneumococci with immune serum is of value in lessening the mortality from this disease. To produce the desired results it is extremely important that the disease be diagnosed early, that the type of infection be promptly determined, and that there occur no delay in administering the serum. The serum should be a specific one, of known high titer. It should be administered intravenously in large amounts. Finally, care should be taken to avoid anaphylactic shock, and the physician should be familiar with the different kinds of serum reactions, and, while he should try in every way to avoid them, he should in no case neglect the administration of serum because such reactions may occasionally occur.

ABSTRACT OF DISCUSSION

DR. LAWRENCE LITCHFIELD, Pittsburgh: During 1916 there were reported in Pittsburgh 1,394 cases of lobar pneumonia, while 1,296 deaths were certified to lobar pneumonia. The physicians of western Pennsylvania are learning the importance of differentiating their pneumonias according to the method of the Rockefeller Institute. We believe it is just as necessary to differentiate one type from another as it is to differentiate pneumonia from typhoid fever. It has been repeatedly shown that one type of pneumonia confers no immunity as regards other types. A patient convalescing from Group IV pneumonia, for example, may contract a Group I infection from a patient in a neighboring bed. Therefore, it is essential not only to differentiate the types of pneumonia, but to isolate them strictly from each other, as well as from other hospital patients.

Through the courtesy of Drs. Ernest W. Willetts, Oskar Klotz, S. L. Haythorn, C. C. Hartman, and A. B. Walgren, I

am able to report here practically all the cases differentiated in western Pennsylvania up to the present time. The results are shown in the table.

Types	134 Cases			
	Number	Per Cent.	Deaths	Mortality Per Cent.
I	55	41	26	47
II	39	29	16	41
III	7	5	4	57
IV	33	25	16	48

Another striking evidence of the virulence of pneumonia in our district is the fact that out of these 134 cases there have been fourteen cases of pneumococcic meningitis diagnosed by lumbar puncture, of Type I, twelve cases; of Type II and Group IV, one case each. Some of these meningitis patients were treated by the repeated injection of the undiluted Rockefeller serum into the lumbar canal, the amount injected being the same as the amount of cerebrospinal fluid withdrawn. Fluid withdrawn after these treatments showed clumping and disintegration of the pneumococci from the effect of the serum. The symptoms and progress of the meningitis were modified in a noteworthy manner, but as yet we have had no recoveries.

Of the Type I cases of lobar pneumonia, twelve patients were treated with the Rockefeller serum, with five deaths. All were late cases and the patients were desperately ill; and in spite of the high mortality, a study of the cases has made me very enthusiastic as regards this treatment. In two cases we had somewhat alarming symptoms immediately following the injection of the serum—dyspnea, tachycardia, and cyanosis—but both patients recovered after the free use of digitalis, epinephrin and atropin, intravenously.

Sixteen cases of pneumonia, Types I and II, in which urine was tested for specific precipitins without concentration gave results as follows:

Negative	Positive	
	Type I	Type II
9	4	3

Six cases of Group IV tested against antipneumococcic serum Types I, II and III were all negative.

One case, Type I, marked precipitate before boiling, negative after.

One case, marked precipitate I and II at dilutions of 1 to 10, 1 to 20 and 1 to 40, and with Type II only at 1 to 80.

DR. DAVID BOVAIRD, New York [Dr. Bovaird gave on a chart results obtained at the Presbyterian Hospital]: There is a most remarkable variability in the mortality of the different groups of this disease in different years, a variability for which we have at present no explanation. In Group IV, in 1914, the mortality was 5 per cent.; in 1916 it was 25 per cent., and so on. It is also clear that in Group I the mortality is more nearly constant at about 25 per cent. It is, therefore, important to be careful in comparing mortality statistics. Thirty-three cases belong to Group I; we have treated twenty-seven patients with serum, and of these five died, a mortality of 18.5 per cent. In the entire chart there are 211 cases with a mortality of 30 per cent. in the whole group. Two of the five serum-treated patients died of empyema subsequent to their lobar pneumonia and did not, in a fair sense, die of pneumonia itself. A third died of systemic staphylococcus infection, the origin of which we cannot accurately determine; but it was a sequel of the pneumonia and not a part of the pneumonia itself. That case should be excluded in estimating the mortality of the group. In short, but two of the five deaths are justly to be regarded as serum failures, a mortality of 7.5 per cent.

Apart from the question of mortality, it is perfectly clear that there are some definite and immediate effects of the injection of the serum. In the first place, the reduction of the temperature comes within twenty-four to forty-eight hours. Coincident with the drop of temperature there is a marked improvement in the patient. In many cases that change is analogous to that which accompanies the real crisis of the disease. The duration of the disease seems to be shortened. The total duration of the cases in the serum-treated patients is less than that of the others. In patients with positive blood cultures, the bacteria disappear from

the blood. In some patients the early reactions seem to be attended with danger. We have had no fatality which we could attribute to them. The late serum reaction is very uncomfortable to the patient and is to be reckoned with in treatment. The possibilities of these reactions demand that the serum be used only in the cases in which it is indicated. In the serum we have a remedy that is not miraculous, but which will produce definite therapeutic effects, and which has already reduced the mortality of the disease to some extent at least; all of which leads us to believe that the men who have brought forth this remedy should pursue these same lines and be able to yield us still more substantial results.

DR. S. J. MELTZER, New York: I wish to cite here an encouraging result which we obtained with the serum treatment of experimental pneumonia in dogs, produced by the method of intrabronchial insufflation. Dr. Wollstein is now in possession of a very virulent pneumococcus culture of Type I, by means of which we succeeded in producing typical pneumonia with a fatal termination. Only about a week ago we insufflated two dogs of the same size with similar doses of the culture. The nontreated animal died in less than forty-eight hours under severe clinical symptoms; the necropsy showed the presence of a severe pneumonic lesion. The other dog received four serum injections administered by Dr. Chickering. That animal is still alive and apparently well. Of course no definite conclusion can be drawn from a single experiment, but the contrast was so striking that the result may be designated as encouraging.

DR. H. A. CHRISTIAN, Boston: We treated with serum during the last winter at the Brigham Hospital fourteen patients with Group I pneumonia, and of the fourteen, two died; one died on the sixth day of convalescence from pulmonary embolism resulting from thrombosis of a vein in the leg; the other patient died in the course of the pneumonia. The patient was an alcoholic in delirium. The other patients all got well. Reaction was prompt and striking. We have treated three or four patients who were sensitive and had asthma during treatment. These were desensitized, and notwithstanding the asthma, all of them were treated with serum with success. It is a difficult thing to do, and those who have not seen a patient desensitized will have no idea of the seriousness of the condition. That is why care should be used in introducing the serum, giving it slowly and having the patient under careful observation during its administration. In one of these cases the skin test with horse serum on the skin of the forearm was negative. The other cases reacted and we were guided accordingly to great caution. In the one case the skin test showed the patient not sensitive to this test and yet the patient had asthma. That is a good reason for the slow introduction of the serum in all cases.

DR. RUFUS COLE, New York: To establish by statistical evidence the value of any therapeutic agent in lowering mortality requires much time and the accumulation of a very large number of cases. We all remember the difficulties which were encountered in deciding from statistical evidence the value of diphtheria antitoxin. We all recognize that judgment from statistical evidence is especially difficult in pneumonia. The evidence of other kinds, however, has been so striking and the mortality statistics, so far as obtained, so good that we cannot but feel hopeful that the treatment of this type of infection by immune serum is of distinct value. However good other kinds of evidence are, the final test must be as to whether patients with pneumonia are cured or not. The results of the experiment on the dog mentioned by Dr. Meltzer are striking, but of course the evidence from one experiment should not weigh heavily in our judgment. Such experiments on dogs will undoubtedly be of interest and value, because conditions in the dog more nearly resemble those seen in lobar pneumonia in man than do those which are present following infection in smaller animals. In neither case, however, are the conditions identical with acute lobar pneumonia in man, and the final test of value must come from the observation of patients.

As to variations in the relative number of cases due to the different types of organism occurring in different places and

at different times, this is to be expected. It will only be after a very large number of cases are observed that we can state with any degree of accuracy the percentage of cases due to the different types of organism. Our results from year to year, however, have been fairly consistent and the results obtained in other general hospitals have agreed fairly closely with ours.

The number of cases of meningitis observed by Dr. Litchfield is extraordinary. I shall be interested to learn whether in any of these cases serum had been administered before the onset of the meningitis. The experiments of Dr. Wadsworth and those of Dr. Bull show that animals partially immunized or inefficiently treated tend to develop local focal, rather than general, infections, and suggest that in the very serious cases which are not efficiently treated, such focal complications as empyema or meningitis may occur. This does not mean that empyema or other focal lesions occur more frequently in serum treated patients, but that patients who would otherwise die may be saved, to suffer from a focal lesion. To determine this, however, will require many more observations than we have made up to the present. In collecting statistics regarding the outcome of treated and untreated patients, I think we should always include all the patients dying, even though they die from complications not necessarily due to pneumococcus infections, and this I have done. After all, such complications would not occur and the patients would not die had they not suffered from pneumonia.

DILATED DUODENUM

WITH ESPECIAL REFERENCE TO CHRONIC DUODENAL OBSTRUCTION IN VISCEROPTOSIS *

DOUGLAS VANDERHOOF, A.M., M.D.

Professor of Medicine, Medical College of Virginia

RICHMOND

The terminal portion of the duodenum passes behind the root of the mesentery and lies on the vertebral column and aorta. In the human being, because of his erect posture, this transverse part of the duodenum is more or less compressed by the mesentery and its contained superior mesenteric artery. In 1899, Albrecht¹ pointed out that this segment of the duodenum has, under normal conditions, not a round contour but a distinctly flattened circumference. Codman,² a few years ago, also emphasized this fact and presented casts of a number of duodenums showing definite evidence of compression.

This normal constriction of the duodenum may readily be increased by slight anatomic variations, or by certain pathologic conditions, up to the point of complete occlusion of the intestines. Albrecht not only demonstrated this normal constriction of the duodenum in the cadaver but showed that if a finger be introduced into the duodenum and at the same time gentle traction downward be made on the mesentery, the constriction becomes more distinct and very evident to the examining finger. It is obvious that when this pressure of the mesentery reaches a degree great enough to give more resistance to the muscular efforts of the duodenum than the closed pylorus, the condition becomes of pathologic significance. Albrecht, and afterward Connor,³ showed on the cadaver that traction on the mesentery in the direction of the axis of the pelvis may produce obstruction in the duodenum which will be impervious to water under considerable pressure.

In many cases of visceroptosis conditions arise within the abdomen that are an exact counterpart of the experimentally induced constriction of Albrecht. With the small intestine lying altogether or chiefly in the pelvis, traction is made on the mesentery in just the direction needed to cause a more or less complete occlusion of the duodenum.

Certain contributing factors play a part in producing mesenteric ileus. The mesentery must not be too long, otherwise the small intestine is supported by the pelvic floor and no drag ensues. Then again, the duodenum is rendered much more liable to serious compression if there is any unusual prominence (lordosis) of the lumbar vertebrae (Schnitzler⁴). This increased lordosis was very evident in Case 1 of our series. A dilated cecum displaced in the pelvis was noted in five cases of chronic dilatation of the duodenum reported by Bloodgood.⁵ "The distended cecum in the pelvis, the short mesentery of the ileum near the cecum, the demonstrable pull on the mesentery, the dilated duodenum appeared to be the essential pathologic features." Jordan,⁶ who gives an excellent roentgenographic description of duodenal dilatation, looks on the mesenteric drag and subsequent duodenojejunal kinking as one of the complications of ileac stasis. "The last coils of the ileum are normally placed above the pelvis; if there be any marked delay in the passage of the ileal contents into the cecum, these last coils of the ileum become overloaded and fall into the pelvis. In falling they drag on the mesentery," etc.⁷

Our experience with chronic dilatation of the duodenum due to mesenteric obstruction embraces six cases. In the first patient the condition was recognized only at necropsy; in two instances the duodenal dilatation was demonstrated at operation, and the diagnosis in three cases was confirmed by Roentgen-ray examination. From the study of these patients we are certain that we have overlooked other instances of chronic mesenteric ileus and that, in general, the clinical manifestations of duodenojejunal kinking are frequently misinterpreted.

REPORT OF CASES

CASE 1.—*Clinical Summary: Jaundice at onset of illness five years ago, followed by aching pain in upper right abdomen; became nervous, hypersensitive and overreligious; frequent nausea and vomiting past four months; obstinate constipation; progressive loss of weight and strength; lordosis and visceroptosis; no abdominal distention; acidosis; death; necropsy; dilated duodenum.*

Miss M. (5216), aged 20 years. Date: Oct. 17, 1914. Complaint: Vomiting, weakness and pain in upper right abdomen.

History.—Patient had occasional attacks of tonsillitis, no other acute infections; her general health was good. In 1909

4. Schnitzler: Wien. klin. Rundschau, 1895, **9**, 579, 593.

5. Bloodgood, J. C.: Dilatation of the Duodenum in Relation to Surgery of the Stomach and Colon, *THE JOURNAL A. M. A.*, July 13, 1912, p. 117.

6. Jordan: Brit. Med. Jour., 1912, **1**, 1225.

7. Jordan's article is well illustrated with roentgenograms and tracings in the case of a woman with a hugely dilated duodenum. He also describes a vivid fluoroscopic picture, namely: "The duodenum was half as long again and more than double the width of a normal duodenum. For seven or eight minutes the duodenum was observed undergoing vigorous writhing contractions in a vain endeavor to force its contents into the jejunum through the kink at the duodenojejunal junction. After seven or eight minutes a very powerful contraction of the duodenum forced a large mass of bismuth emulsion through suddenly into the jejunum, and the bismuth forthwith began to course rapidly through the coils of the small intestine. . . . Fifteen hours after the bismuth meal the stomach and duodenum no longer contained any bismuth; the greater part of it was found to be in the lower coils of the ileum in the pelvis. The cecum also occupied the pelvis. . . . Twenty-seven hours after the bismuth meal there was still some bismuth at the lower end of the ileum, and the most advanced portion had reached the sigmoid. Thus the sojourn of the bismuth in the small intestine was more than three times the normal."

* Read before the Section on Practice of Medicine at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Albrecht: Virchows Arch. f. path. Anat., **156**, 285.

2. Codman: Boston Med. and Surg. Jour., 1908, **158**, 503.

3. Connor: Am. Jour. Med. Sc., 1907, **133**, 345.

the patient had jaundice for two weeks with nausea but no pain. She had a recurrence one month later with the same symptoms and duration. Made a complete recovery but a few months later developed a pain in the upper right abdomen. This continued but was never acute or severe, described as an aching. Became very nervous and overreligious. In 1912 the patient discovered a lump in the right side of the abdomen (floating kidney?) and saw a surgeon who advised against operation. Her nervousness and abdominal discomfort increased. No history of any acute attacks of abdominal pain.

In June, 1914, patient began to suffer with frequent nausea and vomiting. The vomitus was always sour and contained a great deal of bile. (Relation of pain and vomiting to meals not stated.) No hematemesis. Bowels have been obstinately constipated. Progressive emaciation and weakness. No diarrhea or stomatitis.

Examination.—Physical examination was negative, except as follows: Cheeks were flushed; tongue red and bald; abdomen retracted; lordosis to such an extent that lumbar spine does not rest on the bed; both kidneys easily palpable; moderate diffuse abdominal tenderness; abdominal walls soft.

Neurologic examination negative except as follows: Patient appeared apathetic and depressed; knee jerks were not obtained.

Roentgen-ray plates of chest were negative for active tuberculosis. (The patient was too ill to undertake roentgenographic examination of gastro-intestinal tract).

Blood: White blood corpuscles 6,900. Hemoglobin 70 per cent. Polymorphonuclears 55 per cent. Small mononuclears 35 per cent. Large mononuclears and transitionals 8 per cent. Eosinophils 2 per cent. Negative for malaria. Morphologically negative.

Urine (catheterized): amber, acid, 1.020, albumin distinct trace, sugar 0, indican slightly increased, acetone present, diacetic acid present. Microscopically negative.

Gastric Analysis: Ewald test breakfast, removed in forty-five minutes, 200 c.c. expressed. Gross appearance: greenish fluid, finely divided bread particles, no visible blood, no excess of mucus, no evidence of stasis. Free hydrochloric acid 13, total acidity 24.

Course.—During the first week in hospital, temperature ranged from 98.2 to 99.4 F., pulse 70 to 100; remaining six days temperature 98.2 to 101 F., pulse 116 to 134. Almost constant nausea, frequent hiccups, occasional vomiting. Repeated stomach washings brought back greenish-brown fluid. On one occasion gastric lavage returned some castor oil given twenty hours previously. Solution of dextrose and bicarbonate of soda by bowel retained. Obstinate constipation, but stools were secured daily by enema and purgatives. Mind was perfectly clear. No abdominal distention. Marked prostration.

Oct. 30, 1914. Patient died at 8:15 p. m. In the past forty-eight hours has not vomited but has regurgitated small amounts of slightly colored fluid on three or four occasions. Yesterday she took and retained a little nourishment by mouth, and last night retained 8 ounces of magnesium citrate. Bowels moved twice today. Kidneys have been acting quite freely until today, when secretion became scanty. Urine has continued to show large amounts of acetone and diacetic acid. The abdomen has been uniformly retracted until today, when rather marked distention appeared. The past three days the patient complained of being unable to see or hear well. The cheeks have remained flushed and there has been no jaundice. Several days ago the mouth became red and inflamed and today she has had difficulty in swallowing.

The following opinions as to the nature of patient's illness were entertained by

(1) Family physician: Chronic cholecystitis.

(2) Consulting neurologist: "If you can exclude gall-bladder disease, I think her emaciation and vomiting can be accounted for by hysteria."

(3) Consulting surgeon: No obstruction, no surgical lesion; some underlying toxemia, possibly pellagra.

(4) Medical attendant: Visceroptosis, persistent vomiting of undetermined origin, starvation, acidosis.

Necropsy (Dr. B. C. Willis).—This was performed two and one-half hours after death and was limited to the abdominal cavity. The peritoneum was everywhere smooth and glistening. The liver, gallbladder and ducts were normal. The pelvis, urinary bladder, appendix, kidneys and suprarenal glands were normal. The transverse colon and most of the small intestines were in the pelvis. The former was deeply injected and somewhat distended with gas. The small intestine was collapsed. The lower portion of the ileum contained some fluid. There were few small subserous hemorrhages on the walls of the jejunum. Passing upward, the lumen of the small intestine became smaller and smaller as the duodenum was approached. The duodenum just behind the mesentery of the small intestine was sharply kinked. The cephalad portion of the duodenum was greatly dilated (diameter 3 to 4 inches) and filled with gas but its walls were not injected. The stomach was moderately dilated and contained about a pint of dark fluid. The pylorus was patent.

Conclusion: "The dilatation of the duodenum in this case may be explained by two marked anatomic changes: First, the extreme lordosis; and second, the marked visceroptosis which caused the mesentery to partially occlude the last portion of the duodenum as it crossed the vertebral column."

CASE 2.—Clinical Summary: Abdominal pain of five years' duration with suggestive ulcer syndrome; visceroptosis; pulmonary tuberculosis; operation showed chronic mesenteric ileus with dilated duodenum.

Mrs. R. (6156), aged 37 years. Date: Nov. 1, 1915. Complaint: Abdominal pain.

History.—The past history has no special bearing on the present complaint. Average weight, 115 pounds. Present weight, 97½ pounds.

The patient had vague digestive disturbance some years ago with vomiting and abdominal pain with subsequent recovery. Had four attacks of acute abdominal pain, the first one seven years ago, last one two years ago. Dates the onset of her present illness five years ago when she began to suffer with pain similar to toothache in the epigastrium. It occurs every day and is more pronounced for a week or ten days preceding the menstrual periods. The pain bears a definite relation to meals, occurring three to four hours after eating and is always relieved by eating. It is especially troublesome about bedtime. The pain is located high in the epigastrium and radiates up into the chest and through to the back. There is some flatulence but no vomiting. Patient has frequent dull headache, sleeps very poorly and is nervous.

Examination.—Patient is an undernourished, sallow woman. Has signs of pulmonary tuberculosis in both upper lobes, more marked on the right. The abdomen shows signs of counterirritation in epigastrium. A general rigidity makes palpation unsatisfactory. Has rather marked tenderness in the epigastrium and beneath the right costal border where a typical gallbladder block is elicited. Blood, urine and gastric analysis are normal. The gastric contents contained much bile, no stasis. Clinical diagnosis lay between peptic ulcer and chronic cholecystitis.

Operation (Dr. A. M. Willis).—The gallbladder and stomach were negative. Appendix was slightly thickened. The duodenum was greatly dilated down to a point where it passed behind the mesentery. General enteroptosis. Appendix was removed and an attempt made to free the obstruction about the duodenum by widening the slit in the mesentery.

Seven months later patient had developed well-marked laryngeal tuberculosis but her abdominal symptoms were improved.

CASE 3.—Clinical Summary: Recurring spells of indigestion for fifteen years with regurgitation of food; suggestive gall-bladder syndrome; pulmonary tuberculosis; no definite visceroptosis; Roentgen-ray examination showed dilated duodenum with stasis.

Mr. W. (6284), aged 43 years. Date: Jan. 4, 1916. Complaint: Stomach trouble.

History.—Patient had typhoid twenty-five years ago. Used whisky freely until two years ago. There is no history of venereal disease. Average weight, 150 pounds. Present weight, 124 pounds.

The present illness began fifteen years ago with recurring spells of indigestion, now becoming more frequent. He has become extremely nervous and apprehensive. There is no actual vomiting but the chief complaint is regurgitation of food twenty to thirty minutes after eating. There is no difficulty in swallowing. A good deal of sour stomach and flatulence. There is a history of two short attacks of severe cramp colic in the past year requiring morphin. In general, his indigestion is not characterized by pain. He says he spits up his food because it induces fulness in the stomach with pressure about the heart which makes him very nervous. Bowels are always constipated. Has no jaundice.

Examination.—Patient is sallow and poorly nourished. The chest shows signs of fairly extensive tuberculosis in the right upper and middle lobe with some involvement at the left apex. The abdomen is entirely negative except for rather pronounced general rigidity. There is no localized tenderness. There are no masses and no free fluid. The blood and urine are negative. Gastric analysis by the fractional method showed moderate hyperacidity.

Roentgenograms of the chest confirmed the physical findings. Fluoroscopic examination and plates of the abdomen after an opaque meal showed moderate pylorospasm and considerable six hour residue. The duodenal cap was very large and dilated with considerable lagging of the meal in the second and third portions of the duodenum. No constant deformity to indicate ulcer in either stomach or duodenum. (It is barely possible that the duodenal constriction was caused by a tuberculous peritonitis.)

No operation. Patient left the hospital unimproved.

CASE 4.—Clinical Summary: Neurotic girl complaining of vomiting, abdominal pain and distention; previous appendectomy with no amelioration of symptoms; Roentgen-ray examination showed gastropnoia and marked dilatation of the duodenum. No ileal stasis.

Miss P. (7386), aged 15 years. Date: Jan. 25, 1917. Complaint: Pain in the right side of the abdomen, vomiting and nervousness.

History.—The past history has no direct bearing on her present condition except to note that she had never been well or strong. Average weight, 113 pounds. Present weight, 106 pounds.

The present illness began about three years ago when the patient complained of abdominal distention with nausea, vomiting and pain throughout the right side. She was operated on two years ago for an attack of supposed acute appendicitis but her family physician states that the appendix showed very little evidence of being diseased. This was followed by no improvement. Her pain, distention and vomiting occur in attacks lasting one to three weeks. She has almost constant nausea coming on as soon as she eats. Occasionally she has sour stomach and belching. The bowels are regular.

The patient has had some headache and considerable vertigo. She has always been very nervous and at times laughs and cries in an uncontrollable way. She has had a good many fainting attacks.

Examination.—This revealed enlarged tonsils and several decayed teeth. The abdomen was very difficult to examine as the skin appeared to be everywhere hyperesthetic and the patient could not be made to relax. The physical condition was otherwise negative.

The blood and urine were negative. The Wassermann test was negative. Gastric analysis by fractional method showed moderate subacidity.

Neurologic examination was negative, with no evidence of true epilepsy.

Roentgen-ray examination of gastro-intestinal tract showed some gastropnoia with slight dilatation of the stomach and very marked dilatation of the duodenum. No ileal stasis; colon peristalsis was good.

Medical treatment was outlined and patient returned to her home in a distant part of the state.

CASE 5.—Clinical Summary: Vomiting and abdominal pain for five years; previous cholecystostomy without relief; visceroptosis; operation; chronic mesenteric ileus with dilated duodenum.

Mrs. M. (7435), aged 41 years. Date: Feb. 17, 1917. Complaint: Vomiting, and pain in the right side of the abdomen.

History.—The past history is unimportant. Average weight, 93 to 94 pounds. Present weight, 85 pounds.

The present illness began five years ago with soreness in the right side of the abdomen just below the costal border, headache, nausea and vomiting. On operation in another city four years ago the gallbladder was drained; no stones were found. No relief was obtained and two months later she was much worse. The same symptoms have continued.

Vomiting generally occurs two to four hours after eating. The vomitus is very sour and almost always contains much bile. No relief is obtained by food or soda. There are flatulence and distention. There have been no attacks of acute abdominal pain. The bowels are slightly constipated. The stools are occasionally light colored.

Examination.—This proved negative except for evidence of visceroptosis and considerable emaciation, and moderate diffuse abdominal tenderness, possibly more marked in the upper right quadrant. Gastric analysis was normal. Blood and urine were negative. The Wassermann test was negative.

Operation (Dr. A. M. Willis).—Operation disclosed adhesions about the gallbladder and a greatly dilated duodenum to a point where it went behind the mesentery; the adhesions were freed and the gallbladder removed. An attempt was made to relieve the duodenal obstruction by widening the slit in the mesentery. The patient was advised to follow the operation with a prolonged rest cure in order to increase her weight. She made an uneventful convalescence from her operation and left the hospital much improved.

CASE 6.—Clinical Summary: Nausea and vomiting for four years; habitus enteroptoticus; previous appendectomy; Roentgen-ray examination revealed pronounced visceroptosis with dilatation of the duodenum and stomach.

Miss R. (7600), aged 20 years. Date: April 4, 1917. Complaint: Nausea and vomiting.

History.—Unimportant. Average weight, 85 pounds. Present weight, 82 lbs. About 4 years ago the patient began to suffer with nausea, headache, backache and weakness. She was treated for "chlorosis" for two years. She was operated on in September, 1916, for acute appendicitis. Her appetite is poor. She has nausea and vomiting nearly every day. This generally occurs immediately after eating and the vomitus consists of food and bile. She has heartburn occasionally and gnawing but no abdominal pain except at the time of her attack of appendicitis. Her bowels are regular. She has frequent headache, but no fever.

Complete physical examination was negative. The blood and urine were normal. The Wassermann test was negative. Gastric analysis by the fractional method showed a normal secretion.

Roentgen-ray examination of the chest showed that it was extremely elongated in comparison with its horizontal diameter. Heart was small and vertical. There was no evidence of tuberculosis.

Roentgen-ray examination of gastro-intestinal tract showed dilatation and ptosis of stomach, the greater curvature reaching into the pelvis. There was no evidence of ulcer; no pylorospasm, but distinct six hour residue; marked dilatation of duodenum; whole colon was very low. Also ptosis of liver and spleen.

This patient was placed on medical treatment in the hospital and her vomiting ceased promptly. After three weeks she returned to her home in the country to continue her treatment.

COMMENT

As to the incidence of duodenal obstruction from all causes, Anders,⁸ writing in 1912, was able to collect 262 cases. In over one half of this number the stenosis was the result of duodenal ulcer. In twenty-nine cases, or 11 per cent., the constriction was attributed to compression by the root of the mesentery. In examining Anders' statistical table it is seen that

8. Anders: Am. Jour. Med. Sc., 1912, 144, 360.

twenty-seven of these twenty-nine cases were reported by one author as having been found in 120 necropsies of patients dying with acute dilatation of the stomach.⁹

The earliest references to chronic dilatation of the duodenum appear to have been made by Glénard¹⁰ (1889) and Kundrat¹¹ (1891), both of whom stated that a persistent, incomplete obstruction of the duodenum by the root of the mesentery was not uncommon and led to a gradual dilatation of the duodenum and stomach. Albrecht¹ (1899) mentioned two cases which he thought might have been instances of this condition, and Robinson¹² of Chicago (1900) asserted that in the course of several hundred postmortem examinations he had met with fifteen or twenty examples of gastroduodenal dilatation due to such incomplete obstruction.

Connor,³ writing in 1907, states that nothing is known of the clinical manifestations of such chronic obstruction, but calls attention to the instances of duodenal dilatation reported during the preceding two years by three American surgeons (Finney,¹³ Mayo,¹⁴ and Ochsner¹⁵) and suggested that these cases were probably due to mesenteric obstruction.

Finney, in his brief report, simply called attention to certain cases seen in the preceding five years which he believed had not been mentioned in the literature, that is, dilatation of the duodenum with a patent condition of the pylorus. All of his cases were associated with visceroptosis and nothing that was done seemed to relieve the symptoms (chronic indigestion with nausea and vomiting). Only one of his cases was diagnosed before necropsy. Gastro-enterostomy was done in several instances but was found wanting, and gastric lavage gave only partial success. He referred in his report to the possible benefit to be derived from postural treatment. He concluded that the condition is a definite clinical entity. In the discussion of his report the operations of jejunostomy and duodenojejunostomy were suggested.

Ochsner's two papers, profusely illustrated from careful dissections, called attention to the hypertrophy of the walls of the duodenum which was evidently secondary to the chronic obstruction that he failed to observe or interpret. Mayo simply referred to the instances of dilated duodenum reported by Finney and Ochsner and stated that he, too, had observed such a condition.

Bloodgood,⁵ writing in 1912, says that he recognized his first case of chronic dilatation of the duodenum in 1906 during the course of an exploratory operation. The obstruction was not relieved and the patient came to necropsy twenty-seven days after operation. He describes a second similar fatal case in the service of a colleague in which a pyloroplasty was performed without relieving the symptoms (vomiting of duodenal contents). In both of these patients there was great dilatation of the duodenum associated with visceroptosis. He then reports five subsequent cases in which he recognized at operation the relation of the duodenal dilatation to ptosis of the colon, and was able to relieve four of these patients completely by resection of the right half of the colon and ileocolostomy. Bloodgood

also refers to the report of Stavely,¹⁶ of Washington, who performed a duodenojejunostomy in 1910 for chronic gastromesenteric ileus followed by complete cessation of symptoms.

Bircher,¹⁷ like Finney, looks on duodenojejunal ileus as a clinical entity. He reports three patients with recurrent attacks of vomiting, and duodenal stasis on Roentgen-ray examination. Operation in each of these cases showed dilated duodenum with stomach of normal size, ileum and jejunum practically empty, and a more or less rigid cord causing constriction at the mesenteric slit.

Since 1912 only a few isolated reports have appeared dealing with chronic dilatation of the duodenum. Barber¹⁸ refers to the coincidence of dilatation of the duodenum and ileac stasis as recognized by Roentgen-ray studies on gastro-intestinal cases, and reports his experimental studies on dogs. He found that incomplete obstruction of the extreme caudad ileum gave rise to dilatation of the cephalad duodenum but he questions whether this result is mechanical or a neuromuscular reflex.

Melchior,¹⁹ in discussing arteriomesenteric occlusion of the duodenum, emphasizes the fact that the organs in the abdominal cavity either float or rest on the organs below, and these on the floor of the pelvis and the abdominal wall. He takes exception with those authors who maintain that the viscera are suspended by their ligaments or mesentery, although there is nothing in his argument to disprove the result of traction on the mesentery in visceroptosis.

Dilatation of the duodenum in childhood, except in cases of congenital atresia, is apparently rare. Two instances, however, are reported by Frank.²⁰ One of these was demonstrated at operation in a girl 11 months old in whom there was marked dilatation of the stomach and the duodenum to the point where it was crossed by the root of the mesentery. Beyond the root of the mesentery the intestine was collapsed. Complete recovery ensued and the child, at 18 months of age, was well and strong and had no digestive disturbances. In a second child, 2 years old, suffering from recurring attacks of vomiting, Frank diagnosed chronic dilatation of the duodenum on Roentgen-ray examination and advised operation, which the parents refused. From the symptoms and Roentgen-ray findings he felt certain that the occlusion of the duodenum was due to mesenteric constriction.

The symptoms of chronic dilatation of the duodenum are those of an infrapapillary constriction, that is, an obstruction below the entrance of the common bile duct and the pancreatic duct into this portion of the bowel. They may be conveniently grouped as follows:

1. Persistent, or recurring, vomiting. In most instances the vomitus contains bile, often in considerable quantity.

2. Pain in the upper part of the abdomen, generally referred to the right hypochondrium. As a rule, this is described as an aching or dragging pain, but it may be severe so as to suggest biliary colic, or, in other instances, it simulates the pain of peptic ulcer with irregular food-relief.

9. Laffer: *Ann. Surg.*, Philadelphia, 1908, **48**.
10. Glénard: *De l'Enteroptose*, Presse méd., Belgc, 1889.
11. Kundrat: *Ueber eine seltene Form der inneren Incarceration*; *Wien. med. Wchnschr.*, 1891, **41**, 351.
12. Robinson: *Am. Pract. and News*, 1900, **20**, 124.
13. Finney: *Johns Hopkins Hosp. Bull.*, 1906, **17**, 37.
14. Mayo, W. J.: *Chronic Ulcer of the Stomach and First Portion of the Duodenum*, *THE JOURNAL A. M. A.*, Oct. 21, 1905, p. 1211.
15. Ochsner: *Ann. Surg.*, 1906, **43**, 80.

16. Stavely: *Surg., Gynec. and Obst.*, 1910, **11**, 288.
17. Bircher: *Zentralbl. f. Chir.*, 1912, **39**, 843.
18. Barber: *Ann. Surg.*, 1915, **62**, 433.
19. Melchior: *Berl. klin. Wchnschr.*, 1914, **51**, No. 38; abstr., *THE JOURNAL A. M. A.*, Oct. 31, 1914, p. 1611.
20. Frank: *Zeitschr. f. Kinderh.*, 1913, **9**, 99.

3. "Habitus enteroptoticus," often associated with exaggerated lordosis.

4. Obstinate constipation is the rule, although this may not be a feature of the case. Occasionally the stools are colorless and relatively free from bile.

5. Vague toxic symptoms are common. Headache is frequently a prominent symptom. These patients appear to be peculiarly sensitive and of an unstable nervous temperament. In marked cases starvation with acidosis develops and leads to a fatal termination.

The chief clinical interest in chronic dilatation of the duodenum lies in the fact that the symptoms are almost invariably misinterpreted. In one group of cases with lesser grades of obstruction no obvious cause is noted for the condition, and it is therefore thought to be functional. As I look back on a large number of thin, neurotic, enteroptotic women whom I relieved of "hysterical vomiting" by means of rest cures with psychotherapy, forced feeding, massage, etc., I now feel convinced that my complacency in the successful outcome in many instances was due to the increase of weight which such patients obtained, thereby relieving the visceroptosis and the chief factor in chronic mesenteric ileus. The longer one practices medicine with an open mind and an inquisitive instinct, the more one questions the diagnosis of hysteria. Furthermore, a clinician has only to see the necropsy on one patient with an unrecognized chronic mesenteric obstruction, such as the first case in the series reported above, to appreciate what a real condition it is and how it is possible for the lesser forms of obstruction to pass undiagnosed except under the title of neurosis. At once there comes to my mind the sensations of a well-known neurologist who, in demonstrating several patients with disseminated sclerosis that had been previously treated for hysteria, finally exploded with the remark, "Gentlemen, there is a special compartment in hell for the doctor who treats disseminated sclerosis as hysteria."

In a second group of cases the clinical picture is very suggestive of cholecystitis. In the absence of proper Roentgen-ray studies this is the usual pre-operative opinion in patients with a rather pronounced obstruction. The attacks of abdominal pain may recur over a period of months with finally insistent demands for surgical relief. In addition to the cases reported in this paper, I have had six patients with chronic dilatation of the duodenum due to adhesions and abnormal peritoneal folds, five of whom came to operation with the diagnosis of chronic cholecystitis. In the sixth patient peptic ulcer was thought to be present.

In a third group of cases with persistent incomplete obstruction, vomiting is almost continuous and leads to the death of the patient. In such cases the abundant and constant entrance of bile into the stomach is almost pathognomonic. In addition, the stomach, even when it has been completely emptied the evening before, may be found the next morning to contain large quantities of bile-stained fluid. While one expects and frequently finds more or less abdominal distention in these cases, yet the abdomen may be peculiarly retracted and soft all through the illness, as in Case 1 of my series.

The diagnosis, except in those cases discovered at operation or necropsy, can be reached only by having the condition in mind as a clinical entity, and then confirming it by a competent Roentgen-ray examination.

The treatment of chronic dilatation of the duodenum may be either medical or surgical, depending on the degree of obstruction. In the simpler cases a well conducted rest-cure, with increase of weight and the deposit of fat in the various supporting tissues of the abdominal cavity, brings about an entire cure of the condition. In more obstinate cases postural treatment has been successful. By placing the patient in the knee-chest position, the weight of the stomach and intestines pulls the viscera toward the anterior abdominal wall, thus tending to release the compression on the duodenum. The knee-chest position may be maintained for fifteen minutes every two hours, the patient lying on his face and abdomen in the intervals. If the vomiting stops for a few hours, the pleasanter left side position may be ordered, with the hips elevated. This treatment may be supplemented by frequent washing out of the stomach with the tube.

In the severer cases, where starvation and acidosis threaten, medical measures are entirely inadequate. From a review of the scattered case reports in the literature one finds that several widely different surgical procedures have been adopted with subsequent cure of the patient. Some operators have succeeded in widening the duodenal slit in the mesentery. In other cases duodenojejunostomy has been effectual. Again, resection of the right half of the colon with ileocolostomy has been done with complete relief to the distressing symptoms. With few exceptions, the operation of gastro-enterostomy has signally failed in gastromesenteric ileus. More careful study of this form of chronic intestinal obstruction will probably result in the adoption of a uniform method of procedure applicable to these cases.

CONCLUSION

We have in chronic dilatation of the duodenum a clinical entity, with a definite symptomatology and characteristic Roentgen-ray findings, due to compression of the terminal portion of the duodenum by the root of the mesentery. It is a feature of many cases of visceroptosis and is a remediable disease subject to proper mechanical treatment.

603 East Grace Street.

ABSTRACT OF DISCUSSION

DR. LEWIS A. CONNER, New York: Dr. VanderHoof has rendered us a real service in bringing to our attention so clearly this clinical picture which, for most of us, certainly is not one which is apt to come into mind. Duodenal obstruction and duodenal dilatation we have been more familiar with as an acute condition in association with acute dilatation of the stomach. The chronic type is perhaps really the more important and frequent type, and is one to which attention certainly should be drawn. The mechanical factors involved are still, it seems to me, very obscure. There can be no doubt that the obstruction by the root of the mesentery and by the superior mesenteric artery is a real one; but when one attempts to explain what the conditions are that bring about such an obstruction, there are many difficulties. Certain things are obviously necessary; if the mesentery is to pinch the duodenum, it must be tight and there must be traction in a certain direction. Those conditions are fulfilled by the small intestine being in the true pelvis and being empty; it cannot be in the true pelvis unless it is empty. Dr. Bloodgood and others have emphasized the drag of a mobile caput coli as an important factor. Apparently the mesentery must be neither too short nor too long in order to constrict the duodenum. An increased lordosis of the lumbar spine or downward displacement of the terminal portion of the duodenum certainly predisposes to constriction. Undoubt-

edly some of the cases which have been classed as functional recurrent vomiting are instances of constriction of this terminal portion of the duodenum. The difficulty is to say just which of them are, because we know that they are not all of that type. It seems to me important to emphasize the fact that the obstruction and not the dilatation is the important thing. We will have to rely chiefly on the Roentgen-ray findings for diagnosis. There are, however, a few things to bear in mind: the difficulty of diagnosis is greater because of the fact that cases of persistent vomiting from whatever cause are apt to be of duodenal type. Any persistent vomiting soon becomes intestinal in character; the vomitus contains bile and pancreatic juice and is alkaline and has most of the characteristics of duodenal obstruction, so the type of vomiting cannot be relied on as evidence of actual obstruction. One other matter is important to bear in mind: When there is high intestinal obstruction, great diminution or suppression of the urine is one of the common and reliable symptoms, and it seems to me that the behavior of the urine may help us to make the diagnosis and give us a clue to the progress of the condition and the necessity for surgical interference.

DR. GEORGE R. SATTERLEE, New York: There is one important point to bring out. We have all seen duodenal obstruction or duodenal dilatation due to obstruction around the ileocecal region, as Dr. Bloodgood has pointed out. I have been struck by the number of patients who have a duodenal dilatation as shown by the Roentgen ray, and who have merely an enteroptosis; also by the fact that this is connected with atonic dilatation of the cecum; these two things often go together. In visceroptosis there is a drag on the mesentery, and we have a great many reflex reactions through the sympathetic nerve system. Now the symptom of dilated duodenum is often pain, and I should like to cite a case in which the pain was in the liver region and the patient was operated on for relief of pain, and there was found a long, ptosed gall-bladder and enteroptosis. Later, the patient was operated on for appendicitis and was finally relieved by the proper treatment for enteroptosis, namely, posture. If we cannot decide that it is an operative case, we can place this patient in proper posture by elevation of the foot of the bed, abdominal support and proper treatment of the constipation, etc., which may give relief to the pain, and is worth trying. It seems to me a great many of these enteroptotics are treated for neuroses.

DR. F. B. TURCK, New York: The presentation of these eleven cases is very important, because it opens up the clinical view of scientific facts which have been recently investigated in this country. Dr. Senn of Chicago brought out, in 1888, some experimental facts on intestinal obstruction, and proved that mechanical obstruction alone cannot produce symptoms. Senn also showed that not until the venous circulation is interrupted do pathologic conditions arise. The work of Dr. Whipple and Dr. Hartwell has shown that complete obstruction is necessary before any symptoms can be produced. The fact that there is, in duodenal disturbance, a dilatation of the cecum with atony shows that it is not merely a mechanical question. It points to some more general functional derangement. We found through our experimental work that colloid material (undigested albumin, such as white of egg or bacteria in suspension) can penetrate unchanged into the walls of the intestines and can pass along the submucous tissue cephalad. Reaching the upper intestinal tract they are split up by the action of the powerful enzymes in the wall, and toxic effects are produced. We produced symptoms of degeneration and fatigue in the muscle cells, and the two conditions are identical in man and animals. We are dealing with biologic problems in these cases of atonic dilatation, and we must treat them along biologic lines, and not look on them as being simple problems in mechanics alone. We are dealing with physiologic laws, which we must meet with physiologic methods of treatment.

DR. W. L. BIERRING, Des Moines, Ia.: I should like to add an observation to this discussion. In a case of tabes with attacks of epigastric pain and vomiting, the roentgeno-

logic examination revealed a stenosis of the duodenum, which justified reference to the surgical service for operative relief. When the viscera were exposed the stenosis was recognized as spastic in nature, similar constriction occurring in the stomach, and the site varied with succeeding peristaltic waves. The attacks of pain and digestive distress in this instance were incident to visceral crises, and illustrate that the condition referred to in the paper may be simulated in organic nervous diseases.

DR. FRANKLIN W. WHITE, Boston: Since this condition of chronic duodenal obstruction has been so clearly described, it is well to remember its extreme rarity even when the digestive organs drop down very low. This may give a sharp duodenal angle, but the angle rarely causes obstruction. The duodenal angle may be compared with the splenic flexure, which is usually sharp but not obstructive. We must consider function and not anatomy. I am sure the time is now at hand when the diagnosis of duodenal obstruction will be made, not at operation or necropsy, but by the Roentgen ray. No other method shows so well the place and degree of obstruction in the digestive canal.

I should like to ask how much residue was left in the duodenum and how much delay in emptying the stomach was found in these cases.

The symptoms will prove a poor guide in diagnosis. Many of these patients have congenital asthenia and ptosis, the symptoms of which blend with and cover those of dilated duodenum. The Roentgen ray will help us most in diagnosis. The treatment is largely that of marked ptosis.

DR. DOUGLAS VANDERHOOF, Richmond, Va.: Dr. Conner is well qualified to discuss this subject. In his monograph published ten years ago he went thoroughly into the causes of acute dilatation of the stomach and duodenum. The thing that caught my eye at that time was Dr. Conner's statement that practically nothing was known of the symptomatology of chronic obstruction in the duodenum. As a matter of fact, references in the literature show only sporadic case reports. Dr. White is quite correct, I am sure, in emphasizing the physiology as well as the anatomy of such forms of obstruction. In answer to his question as to how much residue may be left in the stomach in these cases and how much delay may occur in the duodenum, I should like to read a brief description of the Roentgen-ray picture in these cases. (See reference to Jordan's article, which had not been read when the paper was presented.) Barber's experiments showed that partial constriction of the caudad end of the ileum produced dilatation of the cephalad end of the duodenum. He questions whether the result is mechanical or due to a neuromuscular reflex. To my mind the effect is mechanical, associated with the mesenteric drag and subsequent duodenojejunal kinking.

Fermi's Modification of Pasteur Treatment of Rabies.—

C. Fermi is professor of hygiene and chief of the Pasteur Institute of the University of Sassari, Italy. He has recently published the full details of what he calls the "new Italian method of antirabies treatment," although it has been in use since 1909. The vaccine is a 5 per cent. emulsion of the most virulent fixed virus, made from the brain (rabbit or dog), rendered avirulent with 1 per cent. phenol (carbolic acid). He uses mixed with this vaccine an antirabies serum derived from the horse, prepared with this vaccine for the antigen (two daily injections of 10 c.c. of the vaccine) for a month; pause of two weeks; then continued another month; pause of twenty days; withdrawal of from 3 to 6 liters of blood. The antirabies serum thus obtained is mixed with three times its volume of the vaccine, and after the mixture has stood on ice for twenty-four hours, 3 c.c. are injected subcutaneously in the morning and 3 c.c. in the evening. This is repeated for five or ten days, and then, for an additional twenty or fifteen days, the vaccine alone is injected. A set of vials for home treatment comprises ten or twenty vials of the serovaccine mixture, and forty or twenty of the vaccine alone. The 164 page pamphlet describing the technic and the comparative tests and experience with it was issued as a supplement to the *Annali d'Igiene*, 26 (Via Sistina, 14, Rome).

THE FAMILIAL TENDENCY TO FAT INCAPACITY IN INFANCY AND CHILDHOOD*

THOMAS S. SOUTHWORTH, M.D.

NEW YORK

The occurrence in a certain number of babies of an inability to digest the usual dietetic amounts of the fat of cow's milk is now generally accepted. Many of us, however, recall the day when not only was this element of cow's milk given to babies in amounts which for some proved excessive, but when the cause of the bad results from such feeding was sought among the other elements of the milk.

When later the real factor was recognized, the reduction of the excessive fat and the use of mixtures made from whole milk, though often remedial, did not serve in all cases to eliminate the difficulty, and the next logical step was to employ milk, more or less skimmed, in feeding infants whose digestive capacity had been seriously disturbed.

It is possible that the pendulum swung for a time too far in this direction, owing to a failure to recognize still other factors which entered into the feeding problem. Nevertheless, it must be admitted that a certain residuum of babies may still be found who do not tolerate well the fat of cow's milk, and it is one of my purposes to carry this a step farther and point out that it is not always a temporary incapacity, which may be overcome by careful feeding, but is in some instances an inherent characteristic which must be recognized if the best results for the individual are to be attained in later infancy and childhood.

Our knowledge of this matter has been of slow growth, certain obvious analogies in somewhat later life having been apparently overlooked. Long before the days of modern infant feeding, it was currently accepted that certain adults could not take cow's milk in any quantity without suffering as they asserted, from constipation and "biliousness." Even before the recognition of fat constipation in infancy and childhood, it was known that some of these adults could take skimmed milk or fat-free buttermilk without producing these symptoms.

Of late years, pediatricians, in increasing numbers, have found that older children suffering from nutritional disturbances of rather vague origin but more definite symptomatology were not only not benefited when they were given more of a supposedly digestible milk, but were greatly improved when the quantity of their milk was reduced, when it was skimmed, or, in some cases, when it was withdrawn entirely from the dietary. In some instances, this has apparently been done because of a suspected analogy to the fat incapacity of infancy, but more commonly on the ground that the milk did not agree with them.

Some who have so treated older children must have been aware, from the histories in their hands or from careful inquiry, that these children had suffered at some time in their infancy from fat injuries or incapacity; but so far as I know, no deductions have been drawn in our literature from this significant relation.

Let me state the proposition this way: If not a few older children are found who do better with little

or no milk and whose histories reveal that they suffered in infancy from disturbances evidently due to the fat of cow's milk, is it not a justifiable deduction that a certain number of infants who have shown a fat incapacity cannot wisely be given much whole cow's milk as they grow into childhood?

I myself have long since recognized that it was a mistake to aim at getting all such infants back to a full-fat milk, but that more general success was to be attained by continuing to feed partially skimmed milk, and to limit its amount in order that the sum total of fat, even in such skimmed milk, should not exceed their capacity.

The latter precaution is not irrational, for we have some precedents. We recall that although this country passed through a period of high fat feeding for infants, we did not originate the term *Fettnahrschädigung*. This came from German sources, and the Germans habitually use dilutions of whole milk in infant feeding and not our superfatted mixtures. There the only explanation of the fat injury lay in the fact that even diluted whole milk, if given in the strong mixtures commonly employed abroad, could carry with it sufficient fat to overtax the infant's capacity. This overtaxing may have occurred more frequently because disturbances of digestion are complex in their origin, the more evident fat indigestion being aggravated by similar if less evident difficulty arising from overfeeding with the other elements of the milk.

A similar overstepping of the capacity for fat can be reached in susceptible patients who are taking partially skimmed milk, a typical example of which I observed last summer. Although 5 ounces of cream were removed from the quart bottle before the milk mixture was made, loose irritating stools were caused when the daily quantity of partially skimmed milk was pushed beyond a certain point. Exactly the same effect had been produced previously by increasing the fat content of the milk employed without increasing the number of ounces used in the mixture. This underweight baby of 14 pounds gained 4 pounds from August to November, only to show the old symptoms on the gradual but injudicious addition of 2 more ounces of the partially skimmed milk. The parents have now been warned against attempting to give their baby other than skimmed milk throughout its childhood, and that if they do give it whole milk, obscure symptoms of nutritional disturbance may appear, the cause of which may not be recognized.

If the plan of adhering to skimmed milk were followed in more cases of limited fat capacity, the progress of such children would be more normal, and the skimmed milk, which is in itself a valuable food, could be retained in the dietary. Also, it would less frequently be necessary to eliminate milk altogether from the dietary of older children because of long standing subacute digestive disorders.

Associated with such disorders, we often find a characteristic lack of appetite and a small range of diet, many ordinary wholesome articles of food being refused whimsically, probably because the children have been cloyed with their milk fat. Often also they have been allowed butter very freely, owing to a desire to improve their nutrition. This hydrocarbon satiety and disturbance is doubtless comparable to the carbohydrate satiety found in children who have been allowed an excess of sucrose.

This same disturbing element may at times be recognized in children not especially predisposed to such

* Read before the Section on Diseases of Children at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

disturbance who habitually drink excessive quantities of milk daily, or a considerable amount of high-fat milk from fancy blooded herds of Jersey, Alderney or Guernsey cows. In such cases, a reduction of the milk taken or the removal of a part of the cream may be all that is essential to bring about improvement.

Thus far I have not spoken of any familial tendency to fat incapacity. The recognition of this tendency followed naturally from the observation in the same families of more than one infant showing limited fat tolerance, although the methods of feeding employed varied with the intervals elapsing between their births. It was inevitable, in caring for successive children born into the same families, that the digestive difficulties and peculiarities of the earlier children should be recalled when undertaking the feeding of a new scion of the house. This is a concrete example of the value of that type of experience which may be lost with the passing of the old-time family physician.

When, however, an infant, born before the days of the recognition of limited fat tolerance, had been difficult to feed, and a second infant, born about the time of our realization of the import of such limitation, had been rescued from similar difficulties by the application of the new knowledge, what could be more natural than that, with the advent of a third baby, similar tendencies, when manifested, should be met at the outset by appropriate measures, and much better results obtained?

The foregoing sketchily outlines an earlier experience in one family. A more recent one is as follows: Two children had previously been born in a family; each had thriven remarkably well at birth, but each in turn, on being weaned at 9 or 10 months of age, had done very poorly on cow's milk, remaining approximately stationary for months until limited to a pint of skimmed milk daily, with increase of other foods to provide for their caloric needs. With the birth of a third child, there was the same successful maternal nursing, but when the time for weaning came, instructions were given that the baby should receive only skimmed milk, supplemented by other food. This was clearly understood by the parents not to be a temporary but a permanent order.

The results were most satisfactory. Progress on the bottle was uninterrupted, and the child has done well, in marked contrast to the two older children. While always unsafe to generalize on a limited number of instances, the last case certainly has every appearance of substantiating the familial theory on which the feeding was planned.

The title "familial tendency" has been employed to focus attention on successive instances of fat intolerance in the same family, as well as to suggest caution in the giving of normal amounts of fat to infants subsequently born into such families. Final acceptance of the theory must, of course, await corroboration from the experience of others.

807 Madison Avenue.

ABSTRACT OF DISCUSSION

DR. LOUIS C. AGER, Brooklyn: I do not think any of us can doubt for a moment the occurrence of such cases as Dr. Southworth has mentioned. We know it from previous generations in which there is inability to digest fat. What I want to point out is the danger of having this idea promulgated without a warning. While it is true that there is a small proportion of children unable to digest any fat, we

have a very much larger class in which fat intolerance has been produced by high fat feeding, which we have not become rid of in New York, at any rate. Those children can be brought back to a normal fat digestion if the problem is worked out with sufficient patience, but when a parent has learned that a child has been disturbed by fat feeding, it makes her fear it. I know of three instances in which it was very difficult to persuade a mother gradually to go back to normal fat feeding, and in one instance, when another child came into the family, the mother could hardly be persuaded to use a normal fat formula. The average child will digest a normal amount of fat without difficulty.

DR. FRANK C. NEFF, Kansas City, Mo.: Dr. Southworth has made a valuable observation in this matter of familial tendency to fat intolerance, although I think we must be very careful about determining whether it is a familial tendency, or due to unwise feeding. The physician should have attended several children in the same family in order to determine whether it is a familial tendency, rather than a condition due to fat injury. Again, I think we make a mistake in determining that fat intolerance is due to one element rather than to the food itself. There is a cow's milk incapacity in certain families, because we undoubtedly find parents as well as children who have never been able to take milk without untoward results. Therefore, in order to be able to say that it is a fat incapacity, the character of the stools should be studied. Then, the fact that the baby has never thriven, even on breast milk, is important. My experience has been that where the child has not gained properly, even on breast milk, the reason has been an inability to digest the fat contained in the breast milk, which undoubtedly is higher than in the ordinary milk mixture, and therefore trouble would show up if fat incapacity were the real trouble.

DR. FRITZ TALBOT, Boston: In considering fat incapacity in the infant we must all bear in mind that it is a hard thing to say that fat is the sole and primary cause of the indigestion, and I think the term "fat indigestion" is very loosely used. Many times what seems to be fat indigestion is due to too much sugar. The diagnosis of fat incapacity should be made only when other causes have been ruled out. Experience has shown that in many instances the fat in cow's milk cannot be digested, while the fat in butter, cod liver oil, or olive oil is digested in a normal manner. Mistakes of diagnosis can be eliminated in many instances by careful microscopic examination of the stools. If there is not fat in the stools, or only a very small or microscopic amount, then one can be pretty sure one is not dealing with fat as a basis for the trouble.

DR. BERT R. HOOBLER, Detroit: It seems to me we are treading on dangerous ground in attempting to attribute this to familial tendency. It is much more apt to be the method of living that has been prevalent in the family. Perhaps the cook has been in the habit of serving certain types of food largely, and using large quantities of cream or butter in the food. I recall some instances in which I have been exceedingly interested in finding several children suffering from what has been called fat incapacity or indigestion. These families went out in the spring to a country home where there was a fine herd of Jersey cows, and it was not long before I was beginning to make visits to the home. At first we tried to eliminate these troubles by prohibiting milk, and giving the children skim milk, but still the trouble persisted, and not until I got into the kitchen and inquired how the cook prepared the food, was it possible to get at the real difficulty. I think oftentimes this is the real difficulty, rather than an inherited tendency.

DR. DAVID E. ENGLISH, Summit, N. J.: Dr. Southworth did not say anything about the breed of cow. Is it not true that the Guernsey and Jersey cows produce milk with a fat globule that is too large and too tough for the infant to digest easily? Does it not make a difference in those babies who seem to have an idiosyncrasy to milk fats if they are given milk from a cow of a different breed?

In the milk commission, of which I am secretary, we have found that a mixture of 45 per cent. Holstein, 45 per cent. Devon (or red cow) and only 10 per cent. Jersey makes a

more even percentage of fat, our average for the year being 4.18. I should like to ask if the breed of cow was taken into consideration in this study of fat incapacity.

DR. THOMAS S. SOUTHWORTH, New York: First, I might answer Dr. English's question. I spoke of the fact that such fat disturbances could readily arise from taking considerable quantities of the milk of Jersey, Guernsey or Alderney cows, as well as from taking excessive amounts of milk of lower fat content. It is somewhat difficult always to separate in this type of cases a fat injury from a natural fat incapacity. The fact is, where the infant has a limited fat capacity, a food injury may be produced by normal amounts of fat.

In answer to Dr. Ager and his caution, which is a proper one, I would say that this paper is directed to the profession and not to the laity.

I believe Dr. Neff is right, although I have not said in my paper that a tendency to fat indigestion may be found in some parents as well. Very fat breast milk unquestionably, as has been said, often starts trouble. Where there has been difficulty in digesting a high fat in breast milk, one often finds trouble with normal amounts of fat in cow's milk, and these children are notoriously difficult to shift over to artificial feeding. This is very commonly done on the supposition that the mother's milk is bad or poor, when really it is a high fat milk.

In answer to Dr. Hoobler, I would say that in many cases of children having fat disturbances, when one has not seen them in infancy, if one goes carefully into the history one can trace the cause in many instances to trouble with fat feeding in infancy. The fancy herds of cows possessed by well-to-do families are certainly great factors in fat disturbances. I remember one family in which child after child had trouble, and investigation brought out that they were having very rich milk sent in from the country. The superintendent of the farms, desiring to make a particularly good showing, was shipping milk in bottles from the tops of the cans, which gave too large a percentage of fat for these children.

CHOLECYSTOSTOMY VERSUS CHOLECYSTECTOMY *

MILES F. PORTER, M.D.

Fellow of the American College of Surgeons

FORT WAYNE, IND.

What is the function of the gallbladder, and of how much importance is it to the human economy? This is the paramount question that presents itself in a discussion of the relative merits of cholecystectomy and cholecystostomy. Man does not need bile in the intestine except when digestion is going on. During the period that the bile remains in the gallbladder it undergoes important changes, as is shown by comparison of the bile obtained from the gallbladder and that obtained from the bile ducts. During its stay in the gallbladder the bile has added to it mucin or nuclear albumin, and what is of much greater importance during its stay in the gallbladder, the bile has added to it sodium glycocholate and taurocholate. According to the tables of Yeo and Herroun and Hoppe-Seyler,¹ this gain of the combined salts amounts to 3.69 parts in 100 parts of bile. The secretion of pancreatic juice parallels the discharge of bile from a fistula. The bile activates the pancreatic juice. Williams and Martin² have shown that the amylolytic power of pancreatic extracts is doubled by the addition of bile salts. The

fat-splitting action of pancreatic juice is trebled by the addition of bile.

The neck of the gallbladder is on a higher level than the lowest point of the gallbladder; therefore, the weight of the bile is away from rather than toward the outlet. The muscular coat of the gallbladder is strong and the fibers are disposed both longitudinally and transversely. The mucous secretion of the gallbladder is abundant. There is a well developed sphincter of the common duct. The gallbladder is present practically always in man and in those animals whose digestion may be said to be intermittent rather than remittent and continuous. Animals that have no gallbladder have relatively large bile ducts. Experience has shown that removal or obliteration of the gallbladder in man leads to dilatation of the bile ducts, while experiments on the lower animals show the same results.

The results of the experiments of Judd and Mann of the Mayo Clinic,³ which were published since this paper was written, confirm these observations. These observers concluded that the dilatation following removal of the gallbladder is due chiefly to the sphincter of the common duct. They also found that the dilatation was less marked in goats after cholecystectomy than in dogs after the same operation. The inevitable conclusion from these experiments seems to be that for a time (about sixty days) after removal of the gallbladder there is increase in the pressure in the ducts; that by this time the ducts are fully dilated, the sphincter loses its power, and with a constant flow of bile into the intestine the bile pressure falls.

The effect on the pancreas of increased pressure of the bile within the ducts has been amply demonstrated. Flexner⁴ reports from his experiments that the entrance of bile modified by a diminution of its salts or by an increase of colloid material into the pancreatic duct is likely to set up chronic pancreatitis, while fresh unaltered bile sets up acute changes. Hohlweg,⁵ in making gastric analyses from thirty-nine patients following extirpation of the gallbladder, found that only 10 per cent. had normal hydrochloric acid. The remainder, 74.3 per cent., had either subnormal values or actual deficit of hydrochloric acid. Among forty-three patients with closure of the cystic duct or atrophy of the gallbladder, 84 per cent. exhibited a hydrochloric acid deficit. Deaver⁶ says: "It is our firm belief that the gallbladder has important functions to perform, of which the chief are to equalize the pressure of bile in the ducts and to secrete mucus which shall dilute the bile." With all the foregoing facts in mind we cannot accept Moynihan's⁷ dictum that the gallbladder is devoid of any strikingly useful purpose. On the contrary, the conclusion seems inevitable that in man the gallbladder has a very important function to perform. In a word, it may be said that the gallbladder in man is an important organ but not a vital one.

In what proportion of cases is the gallbladder the principle or sole cause of the trouble in so-called gallbladder disease? If this question were definitely answered, one could see his way much more clearly to a decision as between cholecystectomy and cholecys-

3. Judd and Mann: Surg., Gynec. and Obst., 1917, **24**, 437.

4. Flexner, in Kemp: Diseases of the Stomach, Intestines and Pancreas, Ed. 2, 1912, p. 939.

5. Hohlweg, H.: Am. Jour. Med. Sc., 1913, **146**, 292.

6. Deaver and Ashhurst: Surgery of the Upper Abdomen, 1913, **2**, 115.

7. Moynihan: Abdominal Operations, Ed. 3, Philadelphia, W. B. Saunders & Company, 1914, **2**, 289.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Yeo and Herroun, and Hoppe-Seyler, in Starling: Human Physiology, 1912, p. 801, ff.

2. Williams and Martin: Gray's Anatomy, Spitzka, 1910.

tostomy. Women who have borne children are peculiarly prone to gallstone disease. This is because in pregnancy there is an increase of cholesterol in the blood. This cholesterinemia has been found to continue for some time after the birth of the child.⁸ Aoyama⁹ has shown by experiments that the administration of cholesterin or oleic acid by mouth causes a deposit in the gallbladder of granules like cholesterin. Rothschild¹⁰ and others have shown that the cholesterol content of the blood depends on the type of food that the organism consumes, and Gerster¹¹ has recently reported three cases in his own practice which strongly confirms Rothschild's opinion. Henes'¹² studies concerning the cholesterol content of the blood confirm the findings of Rothschild and Gerster. Out of 320 gallbladders removed at Rovsing's¹³ clinic 54 per cent. were found as a result of systematic bacteriologic study to be sterile. In cases in which a single large stone is found, the percentage of sterility was 52.7, whereas in the cases with small mulberry-shaped stones the percentage of sterility was 77. Rovsing quotes Boysen as saying that he invariably found that the gallbladder was sound when the gallstones were of the small primary bile-pigment calcium type.

Deaver¹⁴ reports that of seventy-nine patients in the German Hospital with chronic pancreatitis, 91 per cent. showed evidence of infection in the bile passages, while Mayo found that 86 per cent. of 359 cases of pancreatitis were accompanied by gallstone disease.

The experience of Rothschild and Gerster, referred to above, together with that of Rhodes,¹⁵ lends color to the view that in a large percentage of cases presenting symptoms which ordinarily lead to gallbladder surgery, as well as in a large percentage of those not cured by cholecystostomy, the cause of the symptoms lies not in the gallbladder at all but in the bile itself. A careful weighing of the evidence produced seems to force one to the conclusion that disease of the gallbladder itself is relatively rarely the cause of the symptoms for which the so-called gallbladder patient consults the surgeon.

Let us now look at the clinical experience of the various surgeons regarding the relative merits of cholecystostomy and cholecystectomy. In a study made by C. H. Mayo,¹⁶ of 242 cases of cholecystostomy he found that 53 per cent. of the patients were cured, 38 per cent. improved and 9 per cent. not improved. In 219 cases of cholecystectomy the percentage of cures was 71, while 22 per cent. were improved and 7 per cent. not improved. This study shows 18 per cent. of cures in favor of cholecystectomy, while the percentage of improvement is higher in the cholecystostomies by 16. The percentage of those not improved was 2 higher in cholecystostomy than in cholecystectomy.

Clark¹⁷ says that of late years he has resorted to cholecystectomy in a greater proportion of cases because his experience has shown that, if the gallbladder wall is much diseased and the symptoms have been marked and prolonged, this operation gives better results than cholecystostomy.

W. J. Mayo¹⁸ is of the opinion that cholecystostomy may be an efficient procedure in gallstone disease when the gallbladder is normal and the ducts are free, but that in cholecystitis the method is not satisfactory. He is of the opinion that cholecystectomy is indicated in 80 per cent. of the cases of gallstone disease.

Lane¹⁹ says that his experience of the past year is that cholecystectomy is the operation of election for cholelithiasis. Ochsner,²⁰ on the other hand, says that cholecystostomy is the operation of choice for removal of stones from the gallbladder. Swope²¹ reports 96.8 per cent. of cures following cholecystectomy and only 74.8 per cent. of cures following cholecystostomy. In the discussion of Swope's paper, Erdmann of New York said that unquestionably cholecystectomy limits morbidity and increases efficiency, and largely for this reason he announced that for the past year he had been doing cholecystectomy practically in every instance. In discussing the same paper, Keefe of Providence pointed out the fact that morbidity followed after cholecystectomy as well as cholecystostomy, and said that he believed those men who were taking out all gallbladders were doing a great deal of harm.

Deaver¹⁴ says that they believe cholecystectomy should scarcely ever be preferred in simple cases of cholelithiasis, but says that it is indicated in cases, which he notes in detail, wherein the gallbladder is grossly diseased. This author²² refers to a patient of Dr. Rysen's who at that time was carrying a T tube in the common duct and had been for over two years subsequent to a cholecystectomy, because on two occasions she had experienced recurrence of symptoms after removal of the tube. C. H. Mayo¹⁶ says that the persistence of gastric symptoms after cholecystostomy is evidence that the gallbladder should have been removed.

Hubbard and Kimpton,²³ in a study based on 226 operations, conclude that the failure to obtain a permanent cure in the majority of cases of gallstones is due to the fact that stones have been overlooked and left behind. Certainly this mishap is quite as apt to occur in cholecystectomy as in cholecystostomy. Buchanan,²⁴ in a paper based on a series of 300 operations on the gallbladder, notes the difference that obtains between operators of large experience in different clinics, and concludes that "cholecystostomy is not a satisfactory operation, as it gives but 81.7 per cent. of ultimate cures; that cholecystectomy would not be satisfactory if employed in all cases by operators of ordinary skill; that there is a field for both operations and that surgeon will have most success who will not only consider the condition of the patient but estimate justly his own capability."

From the foregoing it will be seen that there are those, Lane and Erdmann, for instance, who believe that cholecystectomy is the operation of election for cholelithiasis, and on the other hand those like Ochsner and Deaver who believe that cholecystostomy is the operation of choice for the relief of stones in the gallbladder, and still others of equal experience and skill who seem to occupy a middle ground.

8. Henes, Edwin, Jr.: Surg., Gynec. and Obst., July, 1916, p. 93.

9. Aoyama: Am. Jour. Med. Sc., 1915, p. 764.

10. Rothschild, M. A., and Rosenthal, N.: Am. Jour. Med. Sc., 1916, p. 394.

11. Gerster: Progr. Med., June, 1916, p. 164.

12. Henes: Surg., Gynec. and Obst., July, 1916, p. 91.

13. Murphy: Practical Medicine Series, 1916, 2, 481.

14. Deaver: Surgery of the Upper Abdomen, 1913, 2, 323.

15. Rhodes: Surg., Gynec. and Obst., October, 1916, p. 399.

16. Mayo, C. H.: Collected Papers of Mayo Clinic, 1915, 7, 262.

17. Clark, John G.: Am. Jour. Med. Sc., 1914, 148, 265.

18. Mayo, W. J.: Am. Jour. Med. Sc., 1914, 147, 469.

19. Lane, John W.: A Plea for Cholecystectomy, THE JOURNAL A. M. A., Nov. 20, 1915, p. 1794.

20. Ochsner: New Manual of Surgery, Ed. 4, 1915, p. 517.

21. Swope, L. W.: Am. Jour. Obst., November, 1915, p. 804.

22. Deaver: Ann. Surg., 1915, 62, 201.

23. Hubbard and Kimpton: Ann. Surg., 1915, 61.

24. Buchanan: Surg., Gynec. and Obst., 1915, 21, 499.

We have here a difference of 21.8 per cent. in the results of cholecystostomy as reported by C. H. Mayo and Swope, and a difference of 25.8 per cent. between their results after cholecystectomy. In 1914 Graff and Weinert²⁵ traced 124 of their cholecystectomies, and found that only 73.4 per cent. were permanently cured, whereas Schultz, in a series of 510 cholecystectomies, had been able to examine only 145 cases, and makes the surprising statement that not one had any evidence of recurrence of the former or any other untoward symptoms. Of course, no one questions the exactitude of these figures. Neither can the discrepancy be accounted for on the ground of difference in skill between the various surgeons quoted. One is forced to the conclusion, therefore, that the difference is accounted for in the different pathologic conditions that were met. The very considerable danger of overlooking stones in the common duct, as pointed out by Kehr, Eisendrath and others, should be constantly borne in mind. A stone in the common duct of a person who still retains his gallbladder is not so great a menace as a stone in the common duct of a person on whom cholecystectomy has been performed.

The important question to decide is not whether cholecystectomy is preferable to cholecystostomy or vice versa, but rather whether in a given case surgical treatment is called for at all, and if so, what particular kind of surgical procedure best fits that case.

ABSTRACT OF DISCUSSION

DR. HOWARD LILIENTHAL, New York: I agree with Dr. Porter that operation in any given case should not be performed with a preconceived idea of what one is going to do. So far as the question between the two operations is concerned, I shall say that for more than twelve years I have steadily and persistently removed every gallbladder that was diseased enough to be operated on. Had I had any cause to regret that mode of procedure I would have changed it. I am satisfied with the results of cholecystectomy in my hands and in those of my colleagues at Mt. Sinai Hospital. In Dr. Eisendrath's specimens in the scientific exhibit you will see how absolutely hopeless it is to be sure the stones have all been removed when the gallbladder has merely been opened.

A question of importance is the course to be adopted when, in the performance of another operation, gynecologic, for instance, gallstones are found. The case is not an unusual one. Suppose you are performing an operation for fibroid, perhaps because the patient has complained of gastric symptoms, and a fibroid is present which you think accounts for these symptoms. You examine, as you ought to do, the gallbladder and find stones there. It is at least just as probable that the gallstones caused the gastric symptoms as that the fibroid did. If you take the fibroid out the patient will have to be told that the gallbladder must be removed later on. In such a case I would advise cholecystectomy with the operation for the fibroid deferred.

DR. H. J. BOLDT, New York: I should like to ask Dr. Lilienthal why in such a case as he cited he would leave the fibroid operation and take out the gallbladder. I have had two such cases this week in which I took the gallbladder out with the fibroid.

DR. HOWARD LILIENTHAL, New York: I said that in a patient suffering from gastric symptoms in whom I found a shrunken, diseased gallbladder packed full of stones I would remove the gallbladder at once and leave the fibroid until later. The extirpation of such a gallbladder may be a dangerous operation, and I think it would be unsafe surgery to perform such an operation and the operation for the fibroid at the same time. My reason, in view of this, for removing the gallbladder first is that the gallbladder condition is the

more immediately threatening of the two in such an instance, not to speak of its possibly becoming the site of carcinoma later on. I take away that which causes symptoms and threatens life.

DR. J. H. CARSTEN, Detroit: In cases such as Dr. Lilienthal referred to there are usually symptoms indicating stomach trouble, and sometimes there is good reason to suspect that all the trouble is with the gallbladder. I tell the patients that if I find the gallbladder diseased, I will operate on that also. In virtually all abdominal cases I explore the stomach and gallbladder regions when I perform a section. I am always prepared to operate on the gallbladder in any kind of a gynecologic operation. So far as the gallbladder is concerned, I have operated on a few in the last twenty-odd years and I do not see why so much should be said about recurrent attacks of gallstones. I cannot operate any better than any one else. I open the gallbladder and drain it because I cannot tell whether the stones are all out. There are sometimes little ones in the wall of the bladder that I cannot detect, and that patient is going to have trouble in the future. If I put in a tube and leave the wound open for a week or ten days, any stones in the gallbladder or in the duct (coming down from the liver) will come out. Quite a few will pass in the course of a week. There is no reason then to expect any recurrence. That is the reason I drain. In the case of the single stone, after removing it I sew up the gallbladder and drop it back and close the abdomen without drainage. In such a case, as a rule, there is no septic infection and no danger of recurrence. When the gallbladder membrane is diseased I think the gallbladder should come out, but these are exceptional cases. The operator should select his cases carefully and perform the operation indicated in the individual case. While a person can live without his gallbladder, I think it is a great deal better to have it in place, doing its work. I think we ought not to be extreme in advocating one operation above another.

DR. D. C. STRONG, San Bernardino, Calif.: Twenty years ago there was a controversy between the medical men and the surgeons as to whether this was a disease for medical or for surgical treatment. We must take into consideration the history of the case, how long it has existed, and the character of the disease preceding the attack. We have been taught that gallstones follow typhoid fever. My experience is that gallbladder disease follows pneumonia. Any digestive disturbance lasting over a considerable time should be seriously suspected of being caused by the gallbladder. If we teach ourselves to look for gallbladder impaction instead of gallstones, we may so teach the medical man; until then we had better not say much to him. In the old case, cholecystectomy is the operation of choice. If we can get the case sufficiently early we may talk about drainage, perhaps. We should take into consideration also the end-results, and such focal infections as we find about the mouth. I have had three abdominal operations for gallbladder disease; in the last the gallbladder was taken out, since when I have had no more trouble.

DR. J. W. VAUGHAN, Detroit: I am in accord with Dr. Porter's paper. Formerly I performed a great many cholecystectomies, but have performed fewer since hearing Dr. Judd's paper. It has seemed to me that the resulting dilatation of the common duct with the increased flow of pancreatic juice and bile into a duodenum which very frequently is empty and does not need this increased flow at such a time might do harm. Again, there results obstruction to the action of the sphincter muscle, which Dr. Porter has shown to be a bad procedure. One is apt to get also retrograde infection and a pancreatitis as a result of the dilatation of the common duct. Every case must necessarily be treated according to the indications.

DR. MILES F. PORTER, Ft. Wayne, Ind.: I do not think there ought to be much disagreement, but I must disagree with my friend who has his gallbladder out, on his method of argument. It reminds me a good deal of the man who knew perfectly well that the story of the ark was all right and correct because he had a friend who had given him a stone from Mt. Ararat. That is exactly the sort of an argument which this paper is written to combat. A few weeks before I came here

25. Graff and Weinert, quoted by Buchanan (Note 24).

I performed a second operation on a woman who had had a cholecystectomy, and in that second operation I removed a handful of stones from her dilated common duct. We must not conclude, therefore, that cholecystectomy is always wrong. The point I want to make is that there is overwhelming proof that in man the gallbladder is an important organ; and that, therefore, unless there is a good reason for taking it out, it should be allowed to remain in. On the other hand, I think it is as conclusively proved that in many of these cases the gallbladder has already been put out of commission by pathologic processes. To allow that sort of gallbladder to remain in an abdomen is to do imperfect work.

OBSERVATIONS ON THE EXCRETION OF DYES *

RUSSELL L. CECIL, M.D.

AND

RICHARD WEIL, M.D.

NEW YORK

The excretion of dyes offers a problem which is of interest from a variety of standpoints. It has a physiologic application on account of the light which it may throw on the functions of the excretory organs, and on the mechanism utilized by the body for the removal of waste material. Pharmacologically, it offers a simple method for the investigation of relationship between chemical structure and excretory function. Finally, it affords the clinician an instrument of precision in determining excretory activity. The method was introduced many years ago in the study of kidney function, and a variety of dyes have been employed for this purpose, of which the one in most general use today is phenolsulphonephthalein. An attempt has been made to study liver function in a similar manner, but the procedure has not proved entirely successful. The present paper reports on certain observations which throw new light on various aspects of the problem.

It has been found that some of the dyes of the diazo series are tolerated in large amount when given intravenously to human beings. We have injected in one dose as much as 1 gm. of Congo red in 2 per cent. solution without apparently disturbing in any way the general bodily equilibrium. The same quantity of trypan red has been given without injurious effect. It is of interest to note that the dye when given in such amounts circulates in the blood for several days unchanged, and may be demonstrated by the discoloration of the serum.

Dyes have been injected into human beings only after a thorough test of their toxicity in animals, the guinea-pig and the rabbit having been chiefly used for this purpose. The toxicity of the various diazo dyes varies markedly, as has been pointed out by Evans. However, there does not seem to be any direct relationship between chemical composition and toxicity. The side-chain theory of Ehrlich, which postulated a special affinity on the part of the cells for certain chemical side-chains of the molecule, is not supported by the facts. Slight variations in composition, such as an alteration in the relative positions of two side-chain groups of the naphthalene nucleus, may result in a distinct change in toxicity. The addition of a

single sulphonate group to two such preexisting groups in the molecule, a change of no apparent significance (since there may be five of these groups in a nontoxic dye, such as trypan red) may result in an enormous increase in toxicity; this is true of heliotrope 2B as compared with Congo violet. But at the same time the relative positions of the side-chains in the naphthalene group have been changed. Why this change should so completely alter the reaction of the body is not clear. The physiologic basis of these effects is for the most part quite obscure. It is of importance that the same dye, such as trypan blue, may be considerably more toxic for one species, such as the guinea-pig, than for another, such as the rabbit.

The tendency of the body is to rid the blood of this foreign material. A certain amount is taken up by the cells of the tissues, and these cells then undergo a marked discoloration. Such cells belong to the phagocytic group, and have been called "scavenger cells" by Evans. After intravenous injection into human beings of the Congo red or trypan red, the skin may assume a diffuse reddish color, the intensity of which varies with the amount injected. This discoloration gradually fades away. Inflammatory tissues also have a marked tendency to take up the color. In working with experimental arthritis, Cecil has found that trypan blue lodges in large amount in the tissue of infected joints, and Weil has shown that Congo red produced marked discolorations of the necrotic areas of malignant new growths in human beings. We have found that the dye is also excreted into pleural fluids, and is present in mucopurulent exudation from the respiratory tract, as in bronchitic sputum. We have found that the dyes are excreted on the surface of external ulcerated areas, including both ulcerated new growths and benign lesions, such as chronic varicose ulcers. Congo red, for example, when given in amounts of 0.5 gm. intravenously in human beings, appears on the surface of the ulcer in about an hour, and is then continuously demonstrable for several days. The dye certainly has no injurious effect on the ulcer, and has seemed at times to exercise a beneficial influence on the healing.

The excretion of dyes by external ulcers suggested the possibility that ulcers of the gastro-intestinal tract might perhaps act in similar fashion. We have therefore studied gastric ulcers from this standpoint. Congo red, as we have already reported in a short preliminary paper, was found in the stomach contents of a number of patients with gastric ulcer. In these cases it was usually present in very large amounts, so that the filter papers through which the contents were passed showed a heavy red deposit. In a number of cases of gastric carcinoma the same observation was made. Thus the conditions seemed most favorable for the development of a differential diagnostic test for diseases of the stomach. On the other hand, there were some cases both of ulcer and of cancer which failed to give a reaction, while there were also occasional control cases in which neither ulcer nor cancer was present in which the stomach contents showed a small amount of dye.

In trying to account for the latter group, we found that Congo red is excreted in large amounts in the bile, and that the reflux of bile into the stomach may present a serious complication in the utilization of the method as a gastric test. This fact necessitated the study of dyes in relation to their excretion by the liver. Congo red is the only dye of which the excretion in

* From the Department of Experimental Medicine, Cornell University Medical College, New York.

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

human bile has been directly investigated. A patient with a postoperative biliary fistula, but without any evidence of inflammatory conditions in the biliary tract or liver, received 0.5 gm. of the Congo red intravenously. Within one-half hour the dye appeared in the bile and continued to be excreted by that route for more than twelve hours. If dyes were to be used for the diagnosis of gastric conditions, it appeared to us to be essential to utilize such dyes as were not excreted by the bile, in order that this source of error might be excluded. The method which we employed to determine whether or not dyes were excreted by the liver was to give an animal an intravenous injection, and then after two or three hours to aspirate the contents of the gallbladder. This operation can be carried out on guinea-pigs under ether. The laparotomy wound heals well, and the animals ordinarily recover and become available for a second experiment. The discoloration of the bile offers immediate evidence of the presence of the dye. At times the color of the dye in the bile is somewhat different from that of the original watery solution. Thus Bordeaux COV may have a pinkish instead of a lilac color. Ordinarily, the addition of a few drops of peroxid alters this to the usual color, thus showing that partial reduction is responsible for the change.

It was found that dyes could be divided into three classes with reference to their excretion by the liver. These classes, of course, include only such dyes as were not toxic and could therefore be injected intravenously. In the first group are the dyes which are excreted by the liver and are present in the bile. Among such dyes, in addition to Congo red, may be mentioned neutral red, safranin, methylene blue, Biebrich scarlet, benzo-azurin, and oxamin violet. The second group comprises the dyes which do not appear in the bile. Such are rosanilin, pyronin, trypan red, orange G, eosin, indigocarmine, azur, and a number of others. The third group comprises those dyes which make their appearance in the bile occasionally, but not regularly, when injected in the routine amount of 0.5 c.c. of a 1 per cent. solution; examples of this group are Bordeaux COV, Congo rubin, and azoblue.

The chemical or physical basis of these differences is entirely obscure. Congo Corinth differs from Congo red only in the substitution of an OH for an NH group, yet the former dye is not excreted by the bile, while the latter is.

A series of observations have been made on the excretion of these dyes not only by the liver of normal animals, but of such animals as have received injections of phosphorized oil. In the latter the liver undergoes marked fatty degeneration, and whether the animal dies or recovers depends on the dose. In such poisoned animals the dyes of the first group are excreted in the bile exactly as in normal animals. Those dyes belonging to the second group, which are never excreted by the normal liver, are never excreted by these diseased livers. The dyes of the third group, toward which the normal liver exhibits a certain latitude, are always excreted by the diseased organ. These observations indicate the likelihood of finding some dye, the presence of which in the bile will always indicate a diseased process in the liver; as yet, however, this object has not been accomplished.

For the diagnosis of gastric disease, we have tested some of the dyes in group two, which are never present in the bile. The dye which has been most thoroughly studied in this connection is trypan red. This

dye has certain obvious advantages. It is very soluble, is nontoxic on intravenous injection, is excreted promptly and profusely on the surface of external ulcerations, and does not appear in the bile. These characteristics seem obviously to determine its availability for the purpose. It has been employed in a series of nine cases of organic stomach disease, including ulcer of the duodenum, and ulcer or cancer of the stomach, in which the diagnosis was established with certainty, either by operation or the Roentgen ray. In not a single one of these cases has the trypan red ever been found in gastric contents. Here, then, is an absolute difference in the behavior of the dye in skin ulcers and in gastro-intestinal ulcers. It seems difficult to account for this difference on the basis of any differences in the nature of the two types of ulceration, and we are therefore inclined to the view that chemical conditions might be such as to obscure the presence of the dye, even if actually excreted in the stomach. Experiment has indicated that this possibility does, indeed, exist. Dilute hydrochloric acid somewhat decolorizes solutions of trypan red when left in contact therewith. If hydrogen peroxid is added to the mixture, decolorization is complete and much more rapid, yet hydrogen peroxid alone produces hardly any alteration. If we assume that oxidases are present in all the tissues, especially in granulating surfaces, the difference in the coloration between gastric and cutaneous ulcers might conceivably be explained on this ground.

Pyronin has been tried out in cases of gastric ulcer, but also without result.

Experimentation is now under way in the excretion of these dyes by experimental gastric ulcers in dogs, and it is hoped that this method will throw some light on the problematic conditions which we have encountered in human beings.

We desire again to draw attention to the different manner in which the liver behaves toward dyes, excreting some and not others, and to the fact that this function can be modified by disease of the organ; furthermore, to the fact that ulceration of the gastro-intestinal tract appears to act differently as regards the excretion of dyes from ulceration of the skin surface.

123 East Sixty-Second Street—970 Park Avenue.

ABSTRACT OF DISCUSSION

DR. ARTHUR D. HIRSCHFELDER, Minneapolis: This work represents a most ingenious application of a phenomenon which in itself is interesting. A few years ago Dr. M. C. Winternitz and I began a series of experiments on pneumonia in rabbits and found, just as the essayists have found, that trypan blue and trypan red went almost specifically into the diseased tissues, so that they marked off diseased areas of the lung and would also go into the fibrinous exudate of a pleuritis or a pericardial effusion. These dyes were absorbed by fibrin, but entered everywhere into diseased tissue. Similar observations were made by Camp and Bell in Minneapolis for other local infections, and we also have been in the habit of using injections of trypan blue to mark off burned areas or areas otherwise injured. I think it represents as sure a method as one could desire for the detection of necrotic areas, but the applications that Drs. Weil and Cecil have made—to use this for the excretion through ulcerated surfaces—is extremely interesting and, I hope, practical. One point, which probably has also occurred in the experience of Drs. Cecil and Weil, which struck us in working with trypan blue in general is the variability of the toxicity of the benzidin dyes based on their colloidal state. If we allow the trypan blue to stand for a short time the dispersion or suspension of the dye is apparently changed. The ordinary suspension or solu-

tion of trypan blue represents a molecular weight which is about four times the theoretic molecular weight. If allowed to stand, definite visible aggregates occur. The longer it stands the greater the toxicity. This is important in the practical application of the dyes of the benzidin group. They must be used with distilled water and very fresh solutions must be used or toxicity will result.

DR. ROBERT A. HATCHER, New York: Dr. Weil informed us that the liver of the dog poisoned with phosphorus does not behave toward certain dyes as does the liver of the normal dog; hence we investigated the capacity of such poisoned livers to remove strychnin from the circulation and destroy it. Dogs were given phosphorus and when moribund the liver was excised and perfused with a solution of strychnin. The results were practically identical with those obtained with normal livers.

DR. FRED I. LACKENBACH, San Francisco: Another interesting field of investigation is the use of these dyes as therapeutic agents. There has been some work done with fuchsin in the treatment of tuberculosis of the bladder and kidney and in gonococcus infections. Dr. Vecki published a paper about a year ago on the employment of fuchsin solution in strengths of 0.25 to 1 per cent. for irrigating the bladder and urethra. It is important to use the solutions as fresh as possible and fuchsin of high purity; it is otherwise irritating. While the literature on the subject is not large, it is interesting and should stimulate investigation.

DR. OTTO RAUBENHEIMER, Brooklyn: From a historic standpoint it is interesting that the "pigmentarii," or color makers, of old Rome have been revived in our present age. In regard to the excretion of dyes I would say that in 1910 a number of samples of urine were brought to me with a bluish cast, and many physicians were puzzled. One woman brought around a pot of urine and some physicians considered it indican; but this is not blue, and indican must be oxidized to develop the blue color. The color was due to the administration of some proprietary pill which was distributed at that time and which contained methylene blue. This urine was left standing three months and then, to my surprise, it was not putrid but was well preserved and, very strange, was colorless. On loosening the cork and shaking it the urine developed a blue color. This may be new to some of the members of the section.

DR. WILLIAM SALANT, Washington, D. C.: The study of the elimination of dyes is a very good field for the pharmacologist and the medical man. I have been interested in it for some time and have examined a number of water-soluble and fat-soluble dyes with reference to their elimination. I was impressed with the fact that elimination by the liver in animals poisoned with hydrazin was the same as in normal animals. I think, however, some dyes will be found the elimination of which in the bile is different when the liver is normal and after it has undergone pathologic changes. The fact that in inflammatory conditions staining of certain organs with some dyes has been observed, whereas the same organs when normal remain unaffected by such dyes, is, I think, promising, for it may prove of value in the diagnosis of hepatic diseases.

DR. RUSSELL L. CECIL, New York: As to the possible toxicity of these solutions, we have injected about sixty to seventy patients intravenously and in only one did we get symptoms of toxicity, and this was, I think, because we allowed the solution to get cold. It is true that our solutions must be made up fresh with distilled water, and in using the concentrated solution it is desirable to keep it warm. This patient's temperature rose to 103 F., with chills, but the symptoms passed away in a few hours. As to the therapeutic effect, we tried one case of ulcer of the leg with granulating edges the size of a dollar which had been treated by various methods a year or two, and by constantly injecting the dyes the patient's eyes got very red, but he said he would rather be red than have the ulcer, and we injected time and again. The ulcer improved under the treatment but the patient got restless and in five or six weeks we let him go home. As to the cosmetic effect, in the anemic patients we get a wonderful color which will not rub off.

AN APPARATUS FOR THE STUDY OF THE DISSOCIATION OF OXYHEMOGLOBIN *

W. G. MACCALLUM, M.D.

NEW YORK

The work of Bohr, Barcroft and others has shown the importance of electrolyte contents, reaction, etc., in connection with the power of hemoglobin to absorb oxygen when exposed to this gas at different pressures. Determinations of the amount absorbed at successive low pressures of oxygen give a characteristic curve which is modified by various changes in the medium in which the hemoglobin is dissolved or suspended, and it seemed possible that the comparison of such curves, made with blood in which the nature of changes in the plasma were known, with others made from normal blood might give a clue as to the abnormality of the plasma. There are many other directions in which such determinations might be useful.

Barcroft's instrument allows a direct comparison between the amount of oxygen absorbed by a cubic centimeter of blood at a low oxygen pressure with that absorbed at the point of saturation. It appears to give no absolute or quantitative result, so that it would be difficult to follow daily changes in the blood, except by comparison with some standard.

With the idea of securing absolute rather than relative figures, the apparatus herein described was planned. It is, as the drawing shows, simply a modification of Van Slyke's apparatus for measuring the combining power of the blood for carbon dioxide. The modification consists essentially in lengthening the stem which is narrowed above and below, and graduating this stem throughout. The narrow parts, above and below the central wide tube, contain each 2 c.c., the graduation being in twentieths of a cubic centimeter. The broader part of the tube contains 48 c.c. graduated in tenths, so that the apparatus from the upper tap to the beginning of the lower narrowed portion contains 50 c.c.

A centimeter scale is fixed close to the glass apparatus, which itself is clamped in such a way as to occupy always the same position. The mercury bulb is supported in a ring which is raised or lowered by a cord that passes over a pulley to wind on a drum which can be turned by hand by the attached wheel. Close to it is fastened another centimeter scale. Since it is difficult to read the level of the mercury in the bulb against the scale, a float is arranged with a needle which plays directly on the scale and is adjusted to indicate the figure which corresponds with that read on the other scale from the level of the mercury in the glass apparatus when the taps are open to the atmospheric pressure.

By filling the apparatus with mercury, closing the upper tap, and lowering the mercury bulb, one may read off the barometric pressure by comparing the levels of mercury read from both scales. When the interior of the tube is wet, the barometric reading is lowered on account of the water vapor. The degree of lowering is practically constant with the small amount of fluid, and the wet barometric reading is used throughout, since all measurements must be made

* From the Department of Pathology, Columbia University, College of Physicians and Surgeons.

* Read before the Section on Pathology and Physiology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

in the presence of water vapor. Doubtless, this is one point which may be criticized, but it is thought that the error is one which admits of correction throughout.

To estimate the capacity of hemoglobin to absorb oxygen, defibrinated blood is exposed in the apparatus at a definite temperature, to oxygen at varying pressures below 100 mm. of mercury. Complete saturation occurs at pressures above 100 mm. under almost any circumstances of temperature or change in plasma constitution, so that the characteristic variations are found at pressures below that point. The absorbed oxygen is then liberated by the ammonia-ferricyanid method of Haldane, and measured.

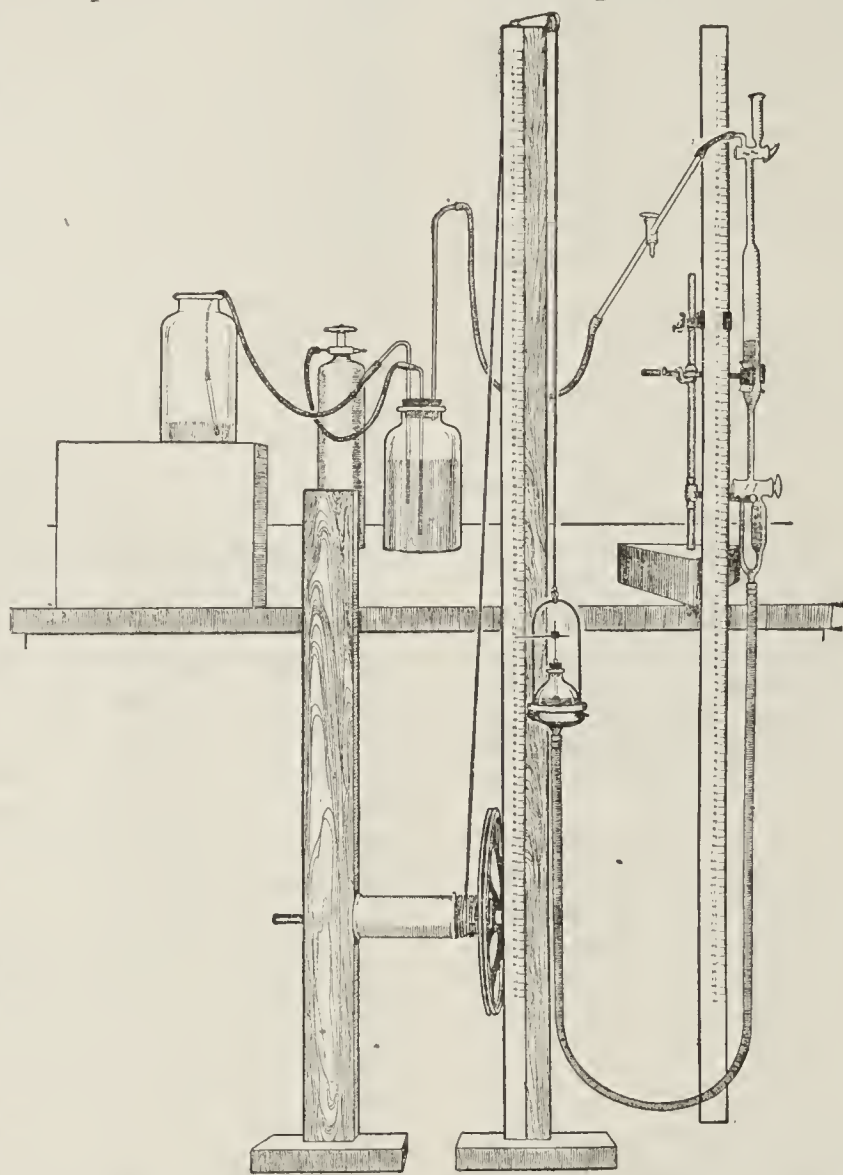
The whole procedure is carried out in the same apparatus. Two c.c. of blood are placed in the funnel at the top, the whole tube being filled with mercury, and are drawn into the tube by way of the tap. No air is allowed to enter and the mercury is lowered to the graduation at 50 c.c. There is much frothing of the blood, which becomes very dark in color, especially when the apparatus is removed from the clamp and shaken. Replaced in the clamp, the mercury is raised and the liberated gases allowed to escape through the funnel. This exhaustion is repeated until no more gas is liberated except a minute bubble of about 0.05 c.c. which is constant and represents water vapor. That this removes all free oxygen is readily shown by allowing ammonia and ferricyanid to run in with such exhausted blood, after which there is no further liberation of gas.

The exhausted blood is drawn down into the reservoir below the lower tap, and mercury allowed to run up through the other tube by turning the tap quite around until the apparatus is filled. Oxygen is now run in through the tube above the upper tap and the mercury lowered to 50 c.c. This oxygen is expelled by raising the mercury and turning the three-way tap in the tube from the oxygen apparatus, so that it escapes. When this tap is again turned, so that oxygen runs into the apparatus, only a small amount is allowed to enter, and the upper tap is closed. Then the mercury is lowered to the 50 c.c. mark, and the comparison of the two levels of mercury as read on the two scales gives the pressure at which the oxygen stands. It must be observed that here, too, the differences between the two readings are subtracted from the wet barometric reading. One may accept the pressure which comes by chance and which may be 23 or 39 mm. of mercury, or one may repeat the operation until the reading is exactly 20 or 30 mm. of mercury. It is a matter of no importance, since all readings are

equally useful in constructing the curve; but it may be of interest to compare successive readings at the same pressure of oxygen.

The mercury is now further lowered to the lowest mark on the narrow portion of the tube, so that the oxygen is now expanded to 52 c.c. and is naturally at a different pressure. But the original pressure is restored by turning the tap slowly, so as to allow the 2 c.c. of exhausted blood to float up to the top of the mercury and occupy the extra 2 c.c. of space. All taps are now closed and, since 2 c.c. of exhausted blood are exposed to 50 c.c. of oxygen at, say, 20 mm. pressure, the apparatus is removed from the clamp and shaken. This shaking is done at a constant temperature, 37 C., the apparatus being submerged in a large waterbath. After ten or fifteen minutes' vigorous shaking, it is placed once more in the clamp, and by raising the mercury the remaining oxygen is driven out through the funnel at the top. This process may be repeated, but it does not seem to be necessary to repeat it.

After all the oxygen has been expelled, 5 drops of octyl alcohol and 6 c.c. of ammonia (a dilute solution made by adding 1 c.c. of strong ammonia to 200 c.c. of distilled water), together with a little saponin to luke the blood, are drawn into the funnel. This is followed by 1 c.c. of fresh saturated solution of potassium ferricyanid. The mercury is lowered to the bottom of the tube and the whole shaken. When all the gas has been liberated, the fluid is drawn down into the reservoir and the tap turned round, so that the mercury may run up through the other tube, driving the gas up into the narrow portion at the top. The mercury in the bulb is leveled with that in this tube and the amount



Apparatus for determination of dissociation of oxyhemoglobin.

of gas read off. When this is recorded, similar estimations are made for other pressures of oxygen.

The method seems reliable and gives readings comparable with those of Barcroft and Bohr. There are many small technical difficulties which are overcome by practice, especially in the manipulation of the taps, so that blood shall not be allowed to escape or to come into contact with the air after its exposures to oxygen. It is possible to avoid this fairly well by placing a little petrolatum in the bottom of the funnel, but it must be remembered that petrolatum will dissolve and allow the passage of oxygen rather quickly. Corrections are made for temperature, pressure and water vapor.

981 Madison Avenue.

Man and Freedom of Will.—Man loves to act as he likes, and not necessarily as reason and self-interest would have him do.—Dostoevsky.

EDEBOHLS' OPERATION IN NEPHRITIS
IN CHILDREN *

JOHN LOVETT MORSE, A.M., M.D.

Professor of Pediatrics, Medical School of Harvard University; Visiting Physician, Children's Hospital, and Consulting Physician, Infants' Hospital and the Floating Hospital

BOSTON

Edebohls, in reviewing the clinical records of the patients on whom he had performed nephropexy, found that six of them had also had chronic nephritis. The complete and permanent disappearance of albumin and casts from the urine and the restoration to perfect and enduring health of three of the first five patients, led him to advise bilateral nephropexy in the sixth patient, a sufferer from chronic Bright's disease complicated with movable kidneys, mainly with the object of favorably influencing the chronic nephritis. This operation, performed Jan. 10, 1898, constituted the first operation ever undertaken on the kidneys with the deliberate purpose of curing chronic Bright's disease. The paper in which he reported this case and stated his views was published in 1899.¹

In May, 1901, Edebohls² stated that he was prepared to go a step farther and to propose surgical intervention for the purpose of attempting a cure of chronic nephritis, whether the affected kidney was movable or in place. When the kidney was movable, he advised nephropexy with denudation of the kidney, and when it was fixed, denudation of the kidney of its capsule proper, thus affording free opportunity for the formation of new vascular connections on a large scale between the blood vessels of the kidney and those of its fatty capsule.

In 1901, he published an article³ in which he reported eighteen cases of chronic Bright's disease in women between the ages of 19 and 45 years. In some cases, the disease was unilateral, in others, bilateral. In most instances, it was interstitial in type. In his early operations, he did not excise the whole capsule; in his later operations, he did. He states that excision of the renal capsule proper accurately defines the operation. Eight of nine patients, operated on a year or more before, were cured, while the outcome in the other patients was encouraging. He believed that these results proved that chronic Bright's disease is curable by operation. He stated that the first beneficial effects of the operation, which are shown by an increase in the flow of urine, do not appear before the tenth day.

He explained the good results of the operation on the basis of the conditions found at a second operation on a patient in whom nephropexy had been performed. Strong connective tissue adhesions or bands attached the kidney to its surroundings. These bands contained very large and numerous blood vessels running between the kidney and the adjacent tissues. There was a large excess of newly formed arteries over newly formed veins. In all the arteries the direction of the blood stream was toward the kidney. He concluded, therefore, that "arterial hyperemization of

the kidney is the basic factor underlying the subsequent changes which result in the cure or improvement of chronic Bright's disease after operation."

Edebohls believed that the increased and adequately maintained blood supply to the kidney established by the operation leads to gradual absorption of the interstitial or intertubular inflammatory products and exudates, thus freeing the tubules and glomeruli from external compression, constriction and distortion, and permitting the reestablishment in them of a normal circulation. The result of this improved circulation in and between the tubules and glomeruli is the regenerative production of new epithelium capable of carrying on the secretory function.

He stated that it is self-evident from the above considerations that the cure of chronic Bright's disease is initiated only by the operation, and that it is thereafter necessarily gradual and progressive. It is not a question of the simple relief of renal tension, the beneficial effects of which in acute conditions of the kidneys were described by Harrison in 1896. In these acute cases, the tight fit of the capsule proper is manifest and the kidney bulges at once through an incision or puncture made through the capsule. In chronic Bright's disease, on the contrary, the capsule proper, although it may be abnormally adherent to the kidney, never compresses the latter and may rest loosely on it. Moreover, on cutting the capsule proper, the edges of the incision do not gape.

Edebohls stated that the object of renal decapsulation is to create new and liberal supplies of arterial blood to the diseased kidneys. Both the denuded kidney and its fatty capsule are most liberally supplied with blood vessels. Both are brought together by the operation over the whole extent of the surface of the kidney. The necessary result must be the formation, on the most extensive scale, of new vascular connections between the kidney and the fatty capsule about it. The fibrous capsule proper forms an almost impenetrable barrier to the passage of blood vessels between the kidney and its fatty capsule. He also said that it must be remembered that renal decapsulation is not directly and forthwith curative of chronic Bright's disease, and that it only leads to a cure or improvement of the disease by establishing circulatory conditions essential to such cure or improvement. The attainment of permanent cure will necessarily require time.

In 1904, he admitted that the experimental evidence as to the formation of new vessels was conflicting. He asserted, however, that the results obtained were unimportant and inapplicable, because all the experimental work had been done on animals with normal kidneys or with acute nephritis, and no studies were made on animals with chronic nephritis, which condition he was describing.

He said that Dr. Larkin had made a very complete and careful examination of two kidneys of the same subject, four months after decapsulation, and was able to establish clearly the existence of an abundant vascularization of the new capsules, of direct connection between the vessels of the new capsules and the perinephritic fat, and of direct penetration of the newly formed vessels of the new capsule along connective tissue paths into the substance of the kidney.

In 1904, Edebohls⁴ summed up his results in seventy-two patients operated on before Jan. 1, 1904.

* Read before the Section on Diseases of Children at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelope.

1. Edebohls: Med. News, 1899, 74, 481.

2. Edebohls: Med. Rec., New York, 1901, 59, 690.

3. Edebohls: The Cure of Chronic Bright's Disease by Operation, Med. Rec., New York, 1901, 60, 961.

4. Edebohls: The Surgical Treatment of Bright's Disease, New York, F. L. Lisecki, 1904.

The time elapsing after operation varied from eight months to eleven years and eight months, the average being two years and ten months.

RESULTS OF OPERATIONS IN FIRST SERIES OF CASES

Three patients had disappeared from observation.

Seven had died within two weeks.

Twenty-two had died later, nine from causes not related to chronic nephritis, thirteen could be fairly ascribed to chronic nephritis. Average duration of life was thirteen months, extremes fifteen days to eight years after operation.

Forty were living; of these, three were unimproved, twenty improved and seventeen cured. The duration since the operation in the cured cases varied from sixteen months to eleven years and eight months, the average being four years.

Only one of these patients was a child; a girl of 4½ years. The diagnosis was chronic parenchymatous nephritis. She was well two and one-half years after operation.

In June, 1908, Dr. Edebohls made his final report on 102 patients operated on up to June, 1906.⁵ He died Aug. 8, 1908.

RESULTS IN SECOND SERIES OF OPERATIONS

Three patients had disappeared from observation.

Ten had died within two weeks.

Thirty-nine patients had died later, ten from causes not related to chronic nephritis, twenty-nine from chronic nephritis. Average duration of life after operation, seventeen months; extremes, fifteen days and eight years.

Fifty patients were living; of these, six were unimproved, eleven improved and thirty-three cured. Average duration after operation five years; extremes fifteen months to fourteen years and ten months.

Average length of time after operation at which urine became normal, interstitial nephritis six months; parenchymatous nephritis fourteen months.

REVIEW OF LITERATURE REGARDING EDEBOHLS' OPERATION

Edebohls' views and statements attracted a great deal of attention when they were advanced. Van Cott⁶ attacked them severely and called attention to the fact, which is unquestionably true, that the blood supply of the kidney comes from the renal artery and that these arteries are terminal arteries, the blood supply from the capsule being insignificant. He also explained that the renal tissue once destroyed does not regenerate. The following are quotations from his article:

On teleological grounds, the renal circulation cannot be restored by decapsulation and substitution of the capsula adiposa . . . No amount of restoration of renal circulation would restore the integrity of the cortex . . . Chronic nephritis, being a local expression of a general disease, will yield only to such treatment as is calculated to cure the general disease; and here there can be hope only of arresting the progress of the renal degeneration. The diseased portion of the organ will never regenerate.

His arguments as to the circulation of the kidney and to lack of regeneration of kidney tissue seem incontrovertible.

Many experiments were undertaken in all countries on animals in relation to the formation of a new capsule with a new blood supply. Most of the experiments demonstrated that a new capsule is formed very shortly, usually being complete in a few weeks, and that this capsule is thicker and denser than the normal capsule. The experiments were all done on normal

animals or on animals with an induced acute nephritis. None of them were studied over long periods of time, a few months being the limit. Most of the observers, outside of Italy, came to the conclusion that the new capsule contains less rather than more blood vessels than the old. Among these writers may be mentioned Johnson,⁷ Emerson,⁸ Hall and Herxheimer,⁹ Ehrhardt,¹⁰ Gifford¹¹ and Stern.¹² They were unable to find evidences of anastomosis between the new capsular vessels and the other vessels of the kidneys.

Asakura¹³ was inclined to favor Edebohls' contention and to believe that the circulation may be improved in chronic conditions. He advanced no evidence, however, to prove this. Zaaiger¹⁴ concluded, from his second series of experiments, that the new capsule had a higher functional worth than the normal, especially on the hilum side. The venous anastomosis was greater than the arterial. He thinks that it is possible that these results may apply to decapsulation in man.

Martini¹⁵ called attention to the fact that a considerable proportion of the circulation in the kidneys comes through the capsules and the anastomoses between the capsular vessels and the others. He believed it theoretically possible, therefore, to establish the circulation through the capsule. He believed that the new capsule was formed from the interstitial connective tissue and the blood vessels of the kidneys. Other writers agree with him. Still other students believe that the capsule is formed from the outside tissues. Martini found a new formation of vessels in the new capsule and that the new collateral blood supply was much richer than the original and the new capsule more vascular. He showed by experiments that, if decapsulation was accomplished some time previously, those dogs would survive operations on the renal vessels while other dogs that had not had their kidneys decapsulated would not recover.

Siter,¹⁶ experimenting on cats and dogs, wrapped the kidney in the omentum. He found that the kidneys increased in size, that a new capsule was formed immediately and a new collateral circulation established in ten days. This new collateral circulation was sufficient to allow the kidney to functionate properly when the renal blood vessels were tied off. The kidneys remained much enlarged. Such a formation of anastomoses between the new vessels of the capsule and the other kidney vessels is, however, according to physiologists and pathologists, impossible.

Murard¹⁷ writing in 1913, called attention to the conflicting results of previous experiments and gave a few of his own. He reviewed the work of other writers, especially in relation to experiments with injections, either through the renal arteries or into the aorta with the renal artery tied. Thelemann¹⁸ injected the renal artery and found no injection of the capsular vessels. Stern¹⁹ found a little color in a few of the extrarenal vessels, but thought that the communications were slight and unimportant. Stursburg,²⁰

7. Johnson: *Ann. Surg.*, 1903, **37**, 592.

8. Emerson: *Tr. Assn. Am. Phys.*, 1903, **18**, 192.

9. Hall and Herxheimer: *Brit. Med. Jour.*, 1904, **1**, 819.

10. Ehrhardt: *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1904, **13**, 281.

11. Gifford: *Boston Med. and Surg. Jour.*, 1904, **151**, 37.

12. Stern: *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1905, **14**, 601.

13. Asakura: *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1903, **12**, 602.

14. Zaaiger: *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1906, **15**, 421.

15. Martini: *Arch. f. klin. Chir.*, 1906, **78**, 619.

16. Siter: *Tr. Am. Assn. Gen. Urin. Surg.*, 1913, **8**, 293.

17. Murard: *Lyon Chir.*, 1913, **10**, 347.

18. Thelemann: *Deutsch. med. Wchnschr.*, 1904, **30**, 538.

19. Stern: *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1905, **14**, 601.

20. Stursburg: *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1903, **12**, 625.

5. Edebohls: *Tr. Sect. Surg. and Anat.*, A. M. A., 1908, p. 707.

6. Van Cott: *Renal Decapsulation from the Pathologist's Point of View*, *Med. News*, 1904, **84**, 970.

on the other hand, found that injections into the aorta, with the renal artery tied, penetrated deeply into the kidneys, even to the papillae. Murard concluded that, from the standpoint of efficient circulation, decapsulation is a useless operation.

PATHOLOGIC REPORTS

These are very few, being limited, as far as I found in the references which I looked up and which seemed likely to contain such reports, to those reported by Edebohls himself and three other writers. Boyd and Beattie's²¹ patient died four months after the decapsulation of one kidney. The necropsy disclosed a dense new capsule. The capsule was vascular and contained vessels which appeared to anastomose with the vessels in the superficial part of the cortex of the kidney. These writers state, however, that "it is doubtful whether the formation of these new vessels could more than compensate for the normal communication between the renal and perirenal vessels, which was ruptured by the operation of decapsulation." The new capsule formation was accompanied by prolongations of new fibrous tissue into the cortex of the kidney. The interstitial changes present before the operation were thus exaggerated.

Gatti²² performed double decapsulation in an adult patient who died twenty months later from nephritis. At necropsy the capsule was found to be thicker than normal, fibrous, compact and with few blood vessels.

Boinet²³ reports the necropsy on an adult patient who died twenty-eight and one-half months after a double decapsulation. There was a new, thick capsule which was but little vascularized. There were fibrous prolongations into the kidneys, contraction of which had tended to increase the process. No new vessels were seen passing into the kidney.

EDEBOHLS' OPERATION IN ACUTE NEPHRITIS IN CHILDHOOD

With the exception of a few who had puerperal eclampsia, Dr. Edebohls' patients all had some form of chronic nephritis. Harrison, however, had begun to operate, in one way or another, on patients with acute nephritis before Edebohls did his first operation for chronic nephritis. Harrison²⁴ reported, in 1896, three cases cured by operation; one of acute nephritis caused by scarlet fever, another following exposure to cold and damp, and one of subacute nephritis, secondary to influenza. He did not decapsulate the kidneys in these cases, however, but either incised or punctured the kidney or its capsule, or both. He believed that the good results were attributable to the relief of renal tension. In a second article,²⁵ this writer proposed incision in acute suppression of urine and in acute nephritis with tenderness on pressure over the kidneys and slow disappearance of casts and albumin. He later reported²⁶ three more cases in which he incised the kidneys for acute conditions in order to relieve tension. It is noteworthy that Harrison's object in incising the kidney was to relieve tension in acute conditions, while Edebohls proposed to promote the formation of a new circulation in the kidney by the removal of the capsule.

I do not know how generally Harrison's advice as to incising the kidneys in acute nephritis was followed,

but, from a rather superficial review of the literature, I am inclined to think that little attention was paid to his suggestions and they were soon forgotten. Edebohls' work on the decapsulation of the kidneys in chronic nephritis naturally called attention to the possibility of performing this operation in acute nephritis for the relief of tension, instead of incising the kidneys, as advised by Harrison. I have found three cases described in which decapsulation was performed in acute nephritis for the relief of tension, and do not doubt that I may have missed a few other reports.

REPORT OF CASES

CASE 1.²⁷—Boy, aged 5 years, had scarlet fever, with anuria for four days. The operation consisted of decapsulation and puncture of kidneys. The kidneys were not large and did not protrude when capsule was split. Patient began to pass urine almost at once and recovery was uneventful.

CASE 2.²⁸—Boy, aged 12 years, had scarlet fever with convulsions and followed by blindness and deafness. There was almost complete suppression of urine, which revealed presence of blood and casts.

The kidneys were very large with a capsule not adherent, so that the kidney bulged through the slit. Patient passed 24 ounces of urine in 24 hours after operation. Sight and hearing returned on third day, and he left the hospital on the eighteenth day, feeling well.

No note was made as to condition of urine.

CASE 3.²⁹—In a girl, aged 6 years, acute symptoms continued for a few days with anuria, convulsions and uremia. Urine contained much albumin but no data were recorded concerning sediment. The operation of decapsulation and incision of right kidney was made. The size of the kidney was not noted, but it bulged through wound and microscopically revealed swelling and exudation in glomeruli and fatty degeneration of epithelium of the convoluted tubules. Patient began to pass urine in a few hours and symptoms of uremia ceased. Five weeks later the patient was symptomatically well and urine contained a little albumin but no renal elements.

The kidneys of two of my own patients who had acute nephritis, suppression of urine and severe symptoms of uremia were decapsulated. The histories of these cases are as follows:

CASE 4.—Boy, aged 13 years, had an attack of tonsillitis, Feb. 10, 1917, which cleared up rapidly. He was nauseated, February 17, and February 20, the urine was scanty, smoky and contained 1.5 per cent. of albumin. The sediment contained large amounts of both normal and abnormal blood, many cells, and many hyaline, granular, epithelial and blood casts. He had a slightly elevated and irregular temperature. Under careful treatment, the urine increased from 3 ounces to 42 ounces, March 7, and the character of the urine also improved, with the amount of albumin going down to 0.1 per cent. At this time, however, although passing urine freely, the patient began to be a little edematous and the urine again became bloody. The amount of urine gradually diminished and the amount of albumin increased. In spite of cutting down the fluid intake and moving the bowels very thoroughly with salts, he began to vomit and the edema increased. March 22 he passed 10 ounces of urine and had fourteen loose stools. At 6:30 a. m., March 23, he had a convulsion. In spite of free catharsis and hot packs, the convulsions continued and there was almost complete suppression of urine, only 6 ounces being passed from that time until the kidneys were decapsulated at 9 p. m. by Dr. James S. Stone. The kidneys were distinctly enlarged, but were more edematous than congested. They bulged somewhat when the capsule was split and the lack of bleeding was very marked. Their appearance was more like that of large, white kidneys than of acute

21. Boyd and Beattie: *Edinburgh Med. Jour.*, 1905, N. S., 17, 337.

22. Gatti: *Arch. f. klin. Chir.*, 1908, 87, 658.

23. Boinet: *Arch. gén. de méd.*, 1905, 1, 660.

24. Harrison: *Lancet*, London, 1896, 1, 18.

25. Harrison: *Brit. Med. Jour.*, 1896, 2, 1126.

26. Harrison: *Brit. Med. Jour.*, 1901, 2, 1125.

27. Schmidt: *Deutsch. Ztschr. f. Chir.*, 1905, 78, 296.

28. Harding, G. F.: *Decapsulation of Both Kidneys for Acute Nephritis Following Scarlet Fever*, *THE JOURNAL A. M. A.*, July 10, 1909, p. 117.

29. Gumbel: *Deutsch. med. Wchnschr.*, 1911, 37, 594.

nephritis, and there was practically no bleeding from the organ, the denuded surface not oozing at all. There was, however, considerable edema about the kidneys and in all the tissues of the back. The patient continued in convulsions for an hour after the operation, then quieted down and died at 11:15 p. m. He did not begin to pass urine at all.

CASE 5.—Boy, aged 10 years, had an acute attack of tonsillitis, Feb. 24, 1916. A week later it was noticed that his face was swollen and that the urine was dark in color and diminished in amount. Since then the swelling had become general and he vomited practically everything taken. He was admitted to the Children's Hospital, March 17. Physical examination revealed moderate, general edema and a small amount of ascites. He passed 17 ounces of urine during the next twenty-four hours, and the urine was reddish-brown and contained a trace of albumin. The sediment contained many leukocytes, a moderate number of red corpuscles, and a considerable number of hyaline and blood casts. During the next twenty-four hours he became stupid, had headache, and passed no urine at all. The systolic blood pressure was 160 and the diastolic 104. A double decapsulation was performed, March 19, by Dr. C. S. Mixer. The kidneys were much enlarged, slightly paler than normal; bulged through the incision and the capsule was stripped off easily. The patient passed 8 ounces of urine during the night after the operation. The amount of urine steadily increased, the blood pressure gradually diminished, and beginning March 22, the patient felt well. The phenolsulphonephthalein test, made March 29, was 71 per cent. It had not been done before the operation. April 9, the systolic blood pressure was 90 and the diastolic, 60. At this time the patient was receiving 36 ounces of fluid and passing 27 ounces of urine daily, which contained a slight trace of albumin, a few casts, but no blood.

The patient was discharged from the hospital, May 3, in good physical condition. The urine then contained a faint trace of albumin and the sediment showed a few hyaline and granular casts. His urine continued to show a trace of albumin for two months, although no casts or renal elements were to be found in the sediment. No albumin was present in the urine after this time, although it was repeatedly examined. When last examined in April, 1917, more than a year after the operation, he was perfectly well and his urine was normal. The operation in this case undoubtedly saved his life and gave Nature the opportunity to heal the acute condition in the kidney.

The results of decapsulation of the kidneys in these acute cases are certainly most encouraging. It seems reasonable to believe that all of these children would have died in a few hours, if the operation had not been performed. If this is true, it is evident that the operation saved the lives of four of them, at least for the time being. Except in the case in my own practice, there are no data on record as to whether recovery was complete. In this instance, the boy, at the expiration of a year, is not only symptomatically well, but his urine is normal and has been for some time.

The explanation of the good results obtained by decapsulation of the kidneys in nephritis with suppression of the urine and symptoms of uremia is plain. Under these circumstances, the kidneys are in most instances engorged with blood and as the result, become enlarged. The capsule stretches to a certain extent, but, after a time, further distention becomes impossible and the circulation is then so much impeded that the excretion of urine is impossible. The tension of the capsule and the compression of the kidney are shown by the manner in which the capsule splits apart and the kidney bulges through the wound, when the capsule is incised. The relief of the tension afforded by the decapsulation results in a diminution of the engorgement of the kidneys, an improvement in the circulation and, in favorable cases, the restoration of the excretory function. It is possible that simple

incision of the capsule might be as effectual as decapsulation. It does not seem likely, however, because decapsulation should relieve the tension more completely than simple incision. It is possible that the manipulation of the kidney, which necessarily takes place during the operation, may be beneficial in relieving the congestion and starting up the excretion.

Decapsulation of the kidneys in acute nephritis does not remove the cause of the disease or affect in any way the essential pathologic process in the kidneys. It merely relieves the extreme congestion, which is in many cases the cause of the threatening symptoms, and, except for this, leaves the kidneys as they were before the operation. Hence, the chances of death, of complete recovery or of the development of chronic nephritis are the same as in other cases of acute nephritis in which symptoms due to extreme congestion have not developed. Decapsulation of the kidneys should be undertaken in acute nephritis, therefore, only in those cases in which there is a marked diminution in the amount of urine and symptoms of intoxication are developing. Under these conditions it is not infrequently a life saving operation. It seems only reasonable, therefore, to give every patient the chance which operative treatment affords.

EDEBOHLS' OPERATION IN CHRONIC NEPHRITIS IN CHILDHOOD

All of Edebohls' patients, with one exception, a girl, 4½ years old, were adults. In a fairly careful search through the literature, I have been able to find nineteen cases of subacute and chronic nephritis, including Edebohls' own case, in which decapsulation of the kidneys has been done.

[The abstracts of these cases are omitted because of lack of space.]

SUMMARY OF NINETEEN CASES OF SUBACUTE OR CHRONIC NEPHRITIS IN WHICH DECAPSULATION OF THE KIDNEYS WAS PERFORMED

Dead: Four patients died after 5, 6, 15 and 18 days.

Cured: Three patients seen last after 4 months, 6 months and 9 years.

Cured, but recurrence: One patient well and urine normal for 2 years; recurrence, with second operation and death in six weeks.

Not improved: Two patients living after 5 weeks and 6 months.

Improved: Two. First patient better for one year, but acute exacerbation and death in two weeks; second, improved, but died of bronchopneumonia after four months.

Symptomatically well, but urine containing albumin and casts: Seven patients, after 4½ months, 6 months, 8 months, 10 months, 1 year, 1 year, and 6 years.

I have had decapsulation of the kidneys performed in four cases of chronic nephritis of the parenchymatous type. The histories of these cases are as follows:

CASE 24.—A boy had acute nephritis at 3 years of age as the result of tonsillitis. He was treated in the Children's Hospital at this time and was discharged after five weeks symptomatically well. The urine contained no albumin, but the sediment showed a few hyaline and fine granular casts. He came to the outpatient department at intervals for various slight symptoms during the next three years. His general health was good. The urine was examined three times during this period. It did not contain albumin. The sediment was not examined. Three days before his entrance to the Children's Hospital, Aug. 7, 1915, when 6 years old, his face became puffy and he was nauseated. On admission there was marked edema of the face, moderate edema of the lower back, and slight shifting dulness in the abdomen. The urine contained

a large trace of albumin and many hyaline and granular casts. The phenolsulphonephthalein test showed an excretion of 62 per cent. in two hours. The systolic blood pressure was 110; the diastolic, 85. In spite of careful treatment, the patient became worse. The ascites and edema increased and he failed rapidly in general condition, but showed no symptoms of uremia. The urine was diminished in amount and continued to contain a large amount of albumin and many hyaline and granular casts. The phenolsulphonephthalein excretion was, however, somewhat better, being 71 per cent. Decapsulation of the kidneys was performed by Dr. Charles S. Mixer, Oct. 9, 1915. The kidneys were slightly enlarged and of about normal color, not the color of the typical white kidney. The capsules stripped off easily. During the first week after the operation, the edema and ascites increased enormously and he passed only one-half as much urine as he received of liquid. At the end of a week, he had a severe convulsion and was bled and purged. Soon after this, however, he began to improve, and by the middle of November had no edema and but little ascites. He was eating well, had good color and was much improved in every way. His urine contained the slightest possible trace of albumin and a rare hyaline cast. The phenolsulphonephthalein excretion in two hours was 64 per cent., while the systolic blood pressure was 120 and the diastolic 70.

He continued to improve, so that by the middle of December he looked and acted perfectly normal. The urine contained no albumin and no sediment. The salt and urea excretion were found to be normal. He has been symptomatically well since that time, although the urine at times contained a very slight trace of albumin and an occasional cast up to July, 1916. Since then the urine, on repeated examinations, has shown nothing abnormal. He was last seen about April 1, 1917. The systolic blood pressure in January, 1917, was 90 and the diastolic, 55.

Judging from the history and the condition of the kidneys found at operation, this boy probably had an acute exacerbation of a chronic nephritis. He would have almost certainly died in a few weeks or months without an operation. He is now well and has had a normal urine for eight months.

CASE 25.—A girl, aged 5½ years, entered the Children's Hospital, July 13, 1915. She had had tonsillitis two months before. She was admitted to the hospital because of a severe purpura of nine days' duration. She had bloody stools and joint symptoms in addition to a hemorrhagic eruption. She also had endocarditis and myocarditis. The urine began to contain blood and casts, July 26. Transfusion was done, August 3. This relieved the general purpuric condition, but the urine continued to contain from a slight trace to a trace of albumin, a moderate number of red blood corpuscles and many granular casts. The systolic blood pressure, Aug. 9, 1915, was 140; the diastolic, 90. The phenolsulphonephthalein excretion in September was only 33 per cent., and there was considerable interference with the salt and nitrogen excretion. The phenolsulphonephthalein excretion in November was 60 per cent., but there was no improvement in the excretion of salt and nitrogen. She was sent home, Dec. 8, 1915. At this time the systolic pressure was 125 and the diastolic, 78.

She returned to the hospital March 22, 1916, having shown no improvement at home. She was edematous, extremely pale, was vomiting, and the urine contained a large trace of albumin, many granular casts and a little blood. She was in unsatisfactory condition and operation on the kidneys was delayed until it was decided that her heart would bear the strain of the operation. Her systolic blood pressure at that time was 104 and the diastolic, 60. The phenolsulphonephthalein excretion was 44 per cent. The urine showed an almost complete fixation of gravity, between 1.005 and 1.008.

Decapsulation of the right kidney was performed, May 4, 1916, by Dr. Charles S. Mixer. The kidney was large and pale and the capsule was easily stripped off. The left kidney was nothing but an atrophied, soft mass, looking very little like a kidney. Nothing was done to it, as apparently most of this kidney was destroyed. She was very weak for a number of days after the operation and there was at first no important change one way or the other. Her urine about a month after

the operation contained a distinct trace of albumin, while the sediment showed many red blood corpuscles and an occasional hyaline and granular cast. From this time, her general condition steadily improved so that when seen May 6, 1917, she looked and acted perfectly well. She was well nourished, color was good and there was no edema. Her urine then showed a large trace of albumin. The sediment contained leukocytes and many hyaline and granular casts, but no blood. The phenolsulphonephthalein excretion in two hours was only 25 per cent. The urine still showed a marked fixation of gravity. The level, however, was much higher, being between 1.017 and 1.020.

This girl was changed by the operation from a helpless, bedridden invalid to a normal looking and feeling child. She would probably have lived but a short time without the operation. She is now, one year after the operation, symptomatically well. She is not, of course, cured, and will sooner or later die of her disease.

CASE 26.—A girl, aged 10 years, had had chickenpox but no other contagious disease. Her tonsils had been removed at 7 years, because of their large size, not because of tonsillitis. Her parents had noticed for a year that she tired easily and had lost color. She had occasional headaches, but otherwise seemed well. Early in March, 1915, her physician, who was visiting another member of the family, noticed that her face was puffy and asked for some of the urine. This he found to contain albumin. I saw her first, Sept. 24, 1915. During this period she had been on a careful diet and had improved in general health. She had no headaches, but was always somewhat edematous. The urine was passed freely and usually contained about 0.25 per cent. of albumin and had a specific gravity of from 1.010 to 1.012. The sediment showed leukocytes and red corpuscles with some hyaline casts and a few fatty casts. The sediment had never contained tubercle bacilli. She was a little pale but did not look or act sick. The systolic blood pressure was 108.

Dr. Edward Reynolds decapsulated the kidneys, Sept. 29, 1915. Both kidneys were large, soft and apparently fatty degenerated and the capsule was not adherent. The right kidney was split to determine if there was any local trouble in the pelvis. The left kidney was not split, but the appearance was the same. She stood the operation well and was out of bed in three weeks. The urine continued to contain from 0.125 to 0.25 per cent. of albumin, but had very little sediment, which showed an occasional cast and red blood cell. Her general condition since the operation has been better than before. She has had no headaches but at times has had some nausea but no edema. She has gained in weight and in height. The urine has continued to contain albumin, occasional casts being found; April 2, 1917, it was pale, acid, of a specific gravity of 1.010, and contained 0.125 per cent. of albumin. The sediment showed many squamous cells and a few leukocytes, some large and small round cells, an occasional red corpuscle and rarely a hyaline cast.

After a year and a half she is better than before the operation and apparently has some years of life ahead of her, whereas it seemed before the operation that she had but a few months to live.

CASE 27.—A boy, aged 9 years, had measles and whooping cough at 5 years. His tonsils and adenoids were removed when he was 7½ years old. He had had a discharge from one ear for some time and had had bad teeth for a long time. A month before he entered the Children's Hospital, his mother noticed that his scrotum was swollen. He was put on a careful diet and improved up to two days before entrance to the hospital, when he became very edematous and began to vomit. His eyesight also began to fail.

He was admitted, June 23, 1916. There was marked general edema; the teeth were bad; ascites was present. The systolic blood pressure was 106, the diastolic, 70. The urine was smoky, acid in reaction, of a specific gravity of 1.018 and contained a large trace of albumin. The sediment showed many red corpuscles and an occasional hyaline cast. Under treatment the patient passed considerable urine and the edema diminished. From that time his condition varied; at times being edematous; sometimes he passed urine rather freely.

The urine always contained a considerable amount of albumin, red corpuscles and hyaline casts; and as there was no permanent improvement, decapsulation of the kidneys was decided on.

Decapsulation of the kidneys was performed, Sept. 15, 1916, by Dr. Charles S. Mixter. The left kidney was found to be twice the normal size, soft, flabby and white. The capsule was incised and stripped back from the kidney. It loosened readily. On the right side, the muscles and fascia over the right loin were found to be bound down with old inflammatory tissue. The peritoneum was greatly thickened, and the lower pole of the kidney was adherent to the inflammatory mass. The inflammation arose probably from within the abdomen as the result of retrocecal appendicitis and had involved the kidney capsule. As it was found impossible to deliver the kidney into the wound, the capsule was incised and stripped back with the kidney in position. The right kidney was of normal size, soft, flabby and white. There was little or no improvement after the operation; the ascites increased rapidly, necessitating frequent tapping; the urine was diminished in amount; the blood pressure went up to 120 during the next month. At this time the phenolsulphonephthalein excretion was less than 10 per cent. in two hours and the urine contained a trace of albumin and hyaline and granular casts.

After leaving the hospital the patient had to be tapped frequently for a number of months, but early in May was able to return to school, having had no ascites for some time. The patient was not again examined, but judging from his mother's description, although he felt much better, yet he was not well. The urine, obtained May 20, 1917, was slightly alkaline, clear, straw-colored, and contained a large amount of albumin. There was no macroscopic sediment on standing over night. The centrifugalized sediment showed epithelial cells, many hyaline, a few fine granular and a rare waxy cast, with an occasional red cell.

In this instance, it seems fair to assume that the boy was somewhat benefited by the operation, although no good effects were seen for some time. He probably would not have been alive and going to school in May, 1917, if the operation had not been done. His condition is, however, bad and he is not likely to live many months.

COMMENT

It is very hard to understand how decapsulation of the kidneys can be of any benefit in chronic nephritis, either in childhood or in adult life. Nevertheless, it apparently does do good, at any rate in childhood, in a not inconsiderable number of cases. The good which it does cannot be due to the relief of tension and congestion, as in acute nephritis. The facts we know regarding the physiology and pathology of the kidneys, as well as the results of most experiments on animals, show that the improvement cannot be due to the establishment of a new circulation from the outside of the kidney. In lieu of a better explanation, it may be that the improvement is the result of changes in the circulation or functioning of the kidneys, initiated by the handling of the kidneys at the time of the operation.

However that may be, the results of decapsulation of the kidneys in these twenty-three cases are certainly encouraging. All of them were going from bad to worse under medical treatment. Humanly speaking, all the patients would have died in a short time. Apparently as the result of the operation, two patients have been permanently cured, one of them being well and with a normal urine after nine years and another after eight months. Another was well for two years and then died of an acute nephritis in no way connected with the previous illness. Two others were well as long as they were under observation, but the time was too short to consider them cured. Nine

others have been so much improved by the operation, or at any rate the improvement began immediately after the operation, that they have been symptomatically well for months or years instead of being chronic invalids, as they were before the operation. These patients have not, of course, been cured, and will certainly die at some time of their disease. Nevertheless, the addition of months or years of apparent health seems to amply justify the operation in these cases.

CONCLUSIONS

Edebohls' operation is of much value in properly selected cases of nephritis in childhood. It may save life and result in permanent cure in acute nephritis. No child ill with acute nephritis should be allowed to die, therefore, without giving it the advantage of the chance afforded by this operation. It may prolong life for considerable periods in a not inconsiderable number of cases of chronic nephritis, and may possibly, in rare instances, result in cure. It should, therefore, always be considered in all cases of chronic nephritis in childhood which are not responding reasonably well under medical treatment.

70 Bay State Road.

ABSTRACT OF DISCUSSION

DR. J. S. WALL, Washington, D. C.: These kidney cases resemble cardiac cases, in that the patients leave the hospital and come back in two or three months with renal decompensation. They get better, go away, and come back in a very few months with another renal decompensation. I think the proof of the pudding is always in the eating, notwithstanding what the physiologists and pathologists tell us.

It is a striking thing that the puerile kidney withstands the attack of so many affections. We see this in the way it gets rid of uric acid deposits. It does not succumb to septic nephritis, but gets pyelitis, from which the child usually recovers, but from which an adult might not. This same resistance is only possessed, perhaps, by pregnant women, who can recover from a septic pyelitis.

We have some hope in an operation of this sort, because the kidney is growing; it is developing. I think we should determine some sort of criteria by which we might judge when the Edebohl operation is to be selected and when discarded. In a case I have in mind, the child's urine was full of casts. He was most edematous. He was admitted to the hospital in June with extreme anasarca. The urine contained much albumin. The capsule was removed, the operation only taking twenty minutes. The next few days were very stormy. Since that time he has much improved, and I hope in a future report to be able to add him to Dr. Morse's twenty cases.

DR. JOHN LOVETT MORSE, Boston: I want to emphasize the difference in the indications for decapsulation in acute and chronic nephritis. In the acute cases, the operation is done to relieve congestion temporarily, and if the patient can be tided over a few hours or a day or two he has the same chance which every patient with an acute case has. In chronic nephritis, there seems to be no reason for doing the operation, except that experience has shown that a certain number are benefited, and occasionally one is cured. In most cases, I think, life is prolonged.

First Printed American Pharmacopeia.—The earliest American pharmacopeia to be printed was that prepared for use of the Continental Army by Dr. William Brown of Virginia, who succeeded Rush as physician-general of the Middle Department (1778-1780). It was issued from the military hospital at Lititz, Lancaster County, Pa., and appeared anonymously as a Latin booklet of thirty-two pages in 1778.—Lieut.-Col. C. C. McCulloch, Jr., U. S. Army: The Scientific and Administrative Achievement of the Medical Corps of the United States Army, *Scientific Monthly*.

OCCURRENCE OF TUBERCLE BACILLI
IN BREAST MILK OF TUBERCULOUS WOMEN *STANLEY L. WANG, M.D.
AND
FREDERICK COONLEY, M.D.
NEW YORK

Behring announced in 1903 that pulmonary tuberculosis could be induced from intestinal infection and that infants often become tuberculous from the milk fed to them. Since then there have been many investigations of the occurrence of tubercle bacilli in milk. The milk of tuberculous cows is of most importance in such investigations, but the milk of tuberculous women is also worthy of consideration. The demonstration of tubercle bacilli in human milk and the production of tuberculosis in animals with such milk would point out a possible means of direct transmission of the disease from mother to child. Early life is the period when individuals are most susceptible to tuberculosis, and every possible avenue of infection of children should be investigated and safeguarded if possible.

The available statistics regarding the bacteriology of human milk are much less than those of cow's milk, and the literature reveals a lack of concerted conclusions. Cow's milk has been widely investigated, and the many researches of the occurrence and incidence of tubercle bacilli as well as the abattoir and tuberculin statistics have established certain accepted results. Chief of these is that the milk of a tuberculous cow should not be used for food. However, cow's milk is a much greater source of food supply, and specimens and other necessary data are more readily obtained, which perhaps accounts for its wider research.

Holt¹ states that:

Tubercle bacilli have been demonstrated by Roger and Garnier in the milk of a woman with advanced tuberculosis, but ordinarily they are not present unless the mammary glands are the seat of the disease.

Marfan² also mentions the case of Roger and Garnier and the case of Demme, and he states that these are the only two authentic cases of children being infected by the mother's milk. He thinks it is best not to allow a tuberculous mother to nurse her child because the mother's nutrition is lowered and the child receives an insufficient amount of milk, which probably contains toxic substances even if it does not contain tubercle bacilli.

Kurashiga³ and his co-workers found tubercle bacilli in the breast milk of tuberculous women who had no mammary disease. However, they also found tubercle bacilli in the blood of tuberculous patients in all stages of the disease, and also in the blood of healthy adults in considerable numbers. These findings have not been confirmed by many other observers.

Bandelier and Roepke⁴ say:

The danger of transference of tubercle bacilli to the infant is a real one; according to observations on animals and humans the mammary glands have no special defensive power, and Cornet was able in several rare instances to find tubercle bacilli in the milk of tuberculous women who were not suffering with miliary tuberculosis. . . . The danger of infection from the mother's milk is very small compared with the much greater one of infection during the naturally intimate relationship between mother and child, provided the tuberculosis is of the open form.

Deutsch's⁵ observations on nursing and nonnursing tuberculous mothers and their infants are of importance. He used healthy mothers as a comparison, and he considered active, inactive and suspicious cases of tuberculosis; the active cases had favorable prognosis. He stated that suckling had on the tuberculous mother only rarely a good effect, usually an unfavorable and sometimes a destructive one. Almost all the infected children had been suckled by tuberculous mothers, while the children who were not suckled, even if there was a hereditary tendency, all remained healthy. Deutsch apparently inclines toward the view that the milk of a tuberculous mother contains some toxic substance, which in some way lowers the resistance of the child.

Butler⁶ investigated the opsonic content of breast milk of normal mothers, for tubercle bacilli, with negative results.

Noeggerath⁷ investigated the occurrence of tubercle bacilli in the breast milk of twenty-six tuberculous women. He injected guinea-pigs intraperitoneally and subcutaneously with breast milk, and four months later killed the guinea-pigs and examined them for tuberculosis. He produced tuberculosis in guinea-pigs with the milk from four cases, one active case, two latent and one suspect. Noeggerath does not believe that tubercle bacilli are excreted in breast milk in large enough numbers to be a frequent and wide source of danger to the child. However, he thought it best for tuberculous mothers to feed their children artificially.

At Sea View Hospital, Staten Island, N. Y., during the past year and a half, the breast milk of twenty-eight tuberculous women has been examined for tubercle bacilli. Some of these women gave birth to children in this hospital; others entered the hospital after childbirth elsewhere. The specimens of milk were obtained from these women twice each week, from 3 to 5 c.c. being gathered by breast massage, under aseptic precautions, for each examination. All specimens were examined within two hours after they were withdrawn from the breast. A plain smear was first examined for tubercle bacilli, and then the remainder of the specimen was reduced with weak antiformin solution and the resulting sediment examined for tubercle bacilli. The usual Ziehl Neelsen staining technic was used. The antiformin procedure was carried out in the following manner: The milk specimen was mixed with an equal amount of 5 to 10 per cent. antiformin solution, depending on the consistency of the milk, and placed in the incubator for one hour. It was then centrifuged for ten minutes at high speed,

* Read before the Section on Pathology and Physiology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Holt, L. Emmet: *The Diseases of Infancy and Childhood*, 1910, 139.

2. Marfan, A. B.: *Pathogenic Micro-Organisms in Milk*, *Le nourisson*, 1916, 4, 34.

3. Kurashiga, T.; Mayema, R., and Yamada, G.: *Ausscheidung des Tuberkelbazillen aus der Milch tuberculöser Frauen*, *Ztschr. f. Tuberk.*, 1912, 18, 433.

4. Bandelier and Roepke: *Clinical System of Tuberculosis*, 1913, p. 338.

5. Deutsch: *Tuberculose und Stillen*, München. med. Wehnschr., 1910, 57, 1335.

6. Butler, W. J.: *The Opsonic Content of Breast-Milk*, Tr. VI, *Internat. Cong. Tuberc.*, 2, Sec. iv, p. 390.

7. Noeggerath, C. T.: *Das Stillverbot bei Tuberculose und Tuberkulose Verdacht*, *Prakt. Ergebn. d. Geb. u. Gynec.*, 1911, 4, 1.

the supernatant liquid decanted and the sediment washed with distilled water and again centrifuged for ten minutes. The sediment was smeared on slides, fixed with the usual egg albumin fixative, stained and examined. Specimens from each of the last fifteen of our series were injected into guinea-pigs intraperitoneally, and the guinea-pigs were killed six weeks later and examined for tuberculous changes.

The twenty-eight tuberculous women had the following various types of tuberculosis: There were twelve moderately advanced, uncomplicated; one moderately advanced with an orthopedic complication; two moderately advanced complicated by tuberculous laryngitis; nine far advanced, uncomplicated, and four far advanced complicated by tuberculous laryngitis. The ages ranged from 19 to 40. Their tuberculous manifestations varied from those of the chronic indolent fibroid to the rapid fulminating miliary types. One-half (fourteen) seemed to show some improvement during their stay in the hospital, four died inside of a month after delivery, and the remaining ten showed no improvement. Most of the group were multiparas. There was no apparent mammary disease or suspicion of such in any case.

As stated before, specimens from fifteen cases were injected into guinea-pigs, intraperitoneally. All were subsequently negative, no tuberculous changes being found and no effects of any kind from the milk injections.

Altogether there were about 450 microscopic examinations of specimens taken biweekly from the whole series of twenty-eight cases. These were all negative except one, which was positive once, and one other specimen from the same case which was suspicious once. This case was a pulmonary-orthopedic patient with negative sputum, which was ascertained by repeated examinations for over eight months, and she had no symptoms of active pulmonary tuberculosis. She had tuberculous bones in both wrists which were progressing very favorably. This woman insisted on nursing her child and she nursed it regularly for about seven months. The child is now over 1½ years old, has never been sick, and seems to be a very healthy and well developed child. We regret that we did not have an opportunity to inject a specimen of her milk into a guinea-pig, for it is questionable whether or not the acid-fast bacilli found in her milk were tubercle bacilli.

The specimens were taken during all periods of mammary activity both before and after childbirth and from the one who nursed her child. In one case we obtained specimens regularly for eighty-eight days before labor, and in another case for over a year since labor. Colostrum was frequently examined and twice injected into guinea-pigs.

When we first began our microscopic examinations we were a little doubtful as to the efficiency of such examinations, for we supposed that acid-fast bacilli other than tubercle bacilli might be found. However, only one case showed acid-fast bacilli, the pulmonary-orthopedic mentioned; therefore we experienced no difficulty on that point. Our examinations were made within two hours after withdrawal from the breast, which may account for this.

We also made some observations on two guinea-pigs that were fed breast milk from two tuberculous women. The milk from these women, both of whom had normal full term deliveries in the hospital, was fed to the animals three times daily, for one month.

As much milk was obtained for each feeding as was possible, the amounts varying from 10 to 40 c.c. The pigs were a little reluctant at the beginning to take the milk, but after the first day or two they both took it very readily. A small amount of lettuce and bread was also fed to them. Our idea in this experiment was to ascertain if the animals became tuberculous, and if they did not, whether they gained weight and thrived on these feedings. If these specimens of milk contained toxic substances, as Marfan² and Deutsch⁵ seem inclined to believe, it was thought that the guinea pigs might show some effects from the daily ingestion of such relatively large amounts. Both guinea-pigs had lost weight at the end of the thirty days of feeding. A short time after we stopped the feeding of the milk, necropsy was performed on the guinea-pigs, and no evidences of tuberculosis were found in either animal.

All of our results were negative with the one exception, which may be questionable. The observations of the others herein referred to, and our experiences indicate that tubercle bacilli are infrequently found in the breast milk of tuberculous women who have no mammary disease. The possibility of infection from such milk is probably slight, but it is very likely best to inderdict nursing in every instance because the other additional factors, such as the danger of infection during the intimate relationship of the mother and the nursing child, the possibility of toxic substance in the milk and the frequent bad effects of nursing on the mother, would seem, collectively, to be sufficient reason to resort to artificial feedings. An exception might be made that a mother with a closed case of tuberculosis should be allowed to nurse her infant, although it is often difficult to distinguish between a closed and open case after pregnancy and labor. The tuberculous woman undergoes a profound strain before and during childbirth, and it frequently takes a long period of observation to ascertain if her disease has been activated.

Sea View Hospital, Staten Island, N. Y.

Clinical Notes, Suggestions, and New Instruments

PAINLESS AND BLOODLESS REMOVAL OF CHALAZION WITHOUT LID CLAMP

EDWARD J. BERNSTEIN, M.D., DETROIT

While the application of the lid clamp to the lids, for the removal of chalazion, controls hemorrhage, it is quite painful even though the conjunctiva is quite well cocaineized. As soon as the clamp is released, an annoying bleeding occurs and the curettage of the sac makes even the most stoic wince. It occurred to me that it would be a gain if I could make use of the Freer method of anesthesia and blood control used in nasal surgery. I have done this with such success that I give it to the profession:

A cotton tipped probe is dipped into the stock solution of epinephrin, and a few flakes of pure cocaine picked up; this is rubbed into the conjunctiva over the mass and a short distance beyond. In two minutes, with the same probe and solution, the area is again rubbed. In another two minutes anesthesia and blanching is complete. After making the cut into the conjunctiva, I have made use of Meierhof's tympanum curet to remove the sac. This curet differs from the ordinary type in that its edges are serrated and thus thoroughly remove the whole sac with the least damage.

MEDICAL EDUCATION IN THE UNITED STATES

ANNUAL PRESENTATION OF EDUCATIONAL DATA FOR 1917 BY THE COUNCIL ON MEDICAL EDUCATION

The tabulated statistics herewith presented are for the year ending June 30, 1917, and are based on reports received from the medical colleges or from other reliable sources. We take pleasure in acknowledging here the courtesy and cooperation of the officers of the colleges who have made the compilation of these complete statistics possible.

STATISTICS OF COLLEGES

Table 1 (pages 534-536) gives the colleges in session during 1916-17; the population of the city; the rating given to the college in the latest classification of the Council on Medical Education; the number of students, men and women, registered during the year; the number of 1917 graduates, men and women; the number of graduates holding collegiate degrees; the number of teachers for each college; the number of weeks of actual work in the college year; the total fees for each year; the executive officer of the college, and the dates of beginning and ending of the next session. The figures in heavy-faced type show the totals by states. Beginning on page 553 are given essential facts concerning all medical colleges, arranged by states.

HOME STATES OF MEDICAL STUDENTS

Table 2, on pages 538-541, shows from what states the students came who were in attendance at each medical college during the session of 1916-17. The influence of the proximity of the medical school is seen in the fact that states having medical colleges contribute more students in proportion to the population than those which have no colleges. This is shown by the dark zone of figures running diagonally down the page. A comparison of this table with the large tables based on state board examinations,¹ which show the distribution of the alumni of each college, is interesting. The college which has widely distributed alumni usually has a student body from an equally large number of states.

The state furnishing the largest number of students this year was New York, with 2,113. Illinois contributed 1,159 and Pennsylvania, 1,106. The next states, in the order of the number of students contributed, are: Ohio, 628; Massachusetts, 615; Texas, 501, and Michigan, 409. Four states had less than 20 each, these being Arizona, 11; New Mexico, 9; Wyoming, 8, and Nevada, 4. There were 105 students from Hawaii, Porto Rico and the Philippine Islands, and 317 students from foreign countries.

In Table 3, on page 542, the students enrolled in each college are shown by classes. This permits one

to see whether the attendance at each college is increasing or decreasing. The total attendance for the first year was 4,107, as compared with 3,582 freshmen last year. The second year attendance was 3,117, as compared with 3,094 last year. The enrolments for the third and fourth years, respectively, were 2,866 and 3,674, as compared with 3,559 and 3,727 last year. The freshman and sophomore class enrolments, therefore, show increases, respectively, of 525 and 23 over the enrolments of the previous year. This indicates that the college enrolments have largely been readjusted under the higher entrance requirements and, as was expected, the enrolment of medical students is again on the increase.

AGES OF GRADUATES OF 1917

Table 4 gives figures showing the ages of the graduates of 79 medical colleges, from which complete information regarding ages was obtained. These

TABLE 5.—MEDICAL COLLEGE ATTENDANCE

Year	Non-sectarian	Homoeopathic	Eclectic	Physio-Med.	Non-descript	Total
1880.....	9,776	1,220	830	...	...	11,826
1890.....	13,521	1,164	719	...	...	15,404
1900.....	22,710	1,909	522	...	...	25,171
1901.....	23,846	1,683	664	80	144	26,417
1902.....	24,878	1,617	765	91	150	27,501
1903.....	24,930	1,498	848	149	190	27,615
1904.....	23,662	1,309	1,014	123	234	28,142
1905.....	24,119	1,104	578	114	232	26,147
1906.....	23,116	1,085	644	110	249	25,204
1907.....	22,303	1,039	545	97	292	24,276
1908.....	20,936	891	479	90	206	22,602
1909.....	20,554	899	413	52	227	22,145
1910.....	20,136	867	455	49	19	21,526
1911.....	18,414	890	433	49	...	19,786
1912.....	17,277	827	308	...	...	18,412
1913.....	15,919	850	256	...	...	17,015
1914.....	15,438	794	270	...	...	16,502
1915.....	13,914	736	241	...	...	14,891
1916.....	13,121	638	263	...	...	14,022
1917.....	12,925	580	250	...	...	13,764

schools are arranged in three groups: those which required for admission (1) a high school education; (2) one year of college work and (3) two or more years of college work in 1913, at the time these graduates matriculated. The chief difference is noted in the number of students in the groups who graduated under the age of 22. There were 35 in Group 1, 1 in Group 2 and none in Group 3. In Group 1 the largest number of graduates (260) were 24 years of age, in Group 2 also the largest number (76) were 24 years of age, while in Group 3 the largest number (214) were 25 years of age. It is noteworthy that the colleges included in Group 1 enrolled a proportionately larger number who were over 35 years of age. In fact, in Group 1 there were 16 graduates over 40 years of age and 2 who were over 50 years. In Groups 2 and 3, there were, respectively, 3 and 4 graduates over 40 years of age and none over 50. A study of these fig-

1. THE JOURNAL, State Board Number, April 14, 1917, pages 1102 to 1109 inclusive.

(Continued on page 537)

TABLE I.—STATISTICS OF MEDICAL COLLEGES IN THE UNITED STATES AND CANADA

Marginal Number	NAME AND LOCATION OF COLLEGE	Population of City where College is Located (Census of 1915)	Classification by Council on Medical Education	No. of Students Registered 1916-17		Graduates 1917		Grads. with A.B., B.S. or Ph.B.	Number of Teachers	Weeks in College Year	Total Fees (Dollars)				Executive Officer		Session of 1917-18		Marginal Number
				Men	Women	Men	Women				1st year	2d year	3d year	4th year			Begins 1917	Ends 1918	
1	ALABAMA University of Alabama School of Medicine, Mobile.....	56,536	A	43	...	18	...	1	41	32	160	155	155	180	T. H. Frazer, M.D., Dean.....		Oct. 4	June 5	1
2	ARKANSAS University of Arkansas Medical Department, Little Rock.....	55,153	B	43	...	15	...	1	60	34	50	50	50	50	Morgan Smith, M.D., Dean.....		Sept. 17	May 29	2
3	CALIFORNIA College of Medical Evangelists, Loma Linda.....	125	C	47	8	9	4	43	52	36	166	161	136	136	Newton Evans, M.D., President.....		Sept. 2	May 30	3
4	College of Physicians and Surgeons, Los Angeles.....	465,367	B	123	13	44	5	...	103	36	220	217	202	227	Charles W. Bryson, M.D., Dean.....		Sept. 4	June 6	4
5	Oakland College of Medicine and Surgery, Oakland.....	190,803	B	13	3	3	1	...	44	35	185	179	150	175	Edward N. Ewer, M.D., Registrar.....		Aug. 20	May 14	5
6	College of Physicians and Surgeons of San Francisco.....	448,502	C	73	4	7	1	...	39	36	193	192	193	217	C. O. Southard, M.D., Secretary.....		Sept. 3	June 6	6
7	Hahnemann Medical College of the Pacific, San Francisco.—H.....	448,502	B	26	6	14	4	...	27	36	...	...	...	180	James W. Ward, M.D., Dean.....		Aug. 14	May 15	7
8	Leland Stanford Junior Univ. School of Medicine, San Francisco.....	448,502	A	80	20	17	6	21	97	34	160	155	150	150	William Ophuls, M.D., Dean.....		Oct. 1	June 13	8
9	University of California Medical School, San Francisco.....	448,502	A	115	14	22	4	17	139	33	195	155	160	150	Herbert C. Moffitt, M.D., Dean.....		Aug. 20	Apr. 27	9
10	COLORADO University of Colorado School of Medicine, Denver ¹	253,161	A	81	4	20	1	16	89	35	85	85	75	75	Charles N. Meader, M.D., Dean.....		Sept. 10	June 5	10
11	CONNECTICUT Yale University School of Medicine, New Haven.....	147,095	A	74	3	10	...	9	75	35	195	165	150	163	George Blumer, M.D., Dean.....		Sept. 27	June 19	11
12	DISTRICT OF COLUMBIA Georgetown University School of Medicine, Washington.....	358,679	A	276	9	66	1	15	91	34	165	150	150	150	George M. Kober, M.D., Dean.....		Sept. 26	June 12	12
13	George Washington University Medical School, Washington.....	358,679	A	108	6	40	1	...	94	33	175	175	175	175	W. C. Borden, M.D., Dean.....		Sept. 26	June 5	13
14	Howard University School of Medicine, Washington.....	358,679	A	108	3	13	...	8	39	32	140	130	130	137	Edward A. Ballock, M.D., Dean.....		Oct. 1	June 5	14
15	GEORGIA Emory University School of Medicine, Atlanta ²	184,873	A	204	...	74	...	6	122	32	172	160	155	180	W. S. Elkin, M.D., Dean.....		Sept. 24	May 28	15
16	University of Georgia Medical Department, Augusta ¹	49,848	A	149	...	63	...	5	49	34	55	50	55	60	William H. Doughty, Jr.		Sept. 12	May 29	16
17	ILLINOIS Chicago College of Medicine and Surgery, Chicago.....	2,447,045	B	1802	115	497	34	158	172	32	160	155	155	155	George E. Wyncken, M.D., Secretary.....		Sept. 25	May 28	17
18	Chicago Hospital College of Medicine, Chicago ³	2,447,045	C	53	...	7	...	...	...	...	137	135	115	145	Joseph P. Cobb, M.D., Dean.....		Sept. 24	June 6	18
19	Hahnemann Medical College and Hospital of Chicago.—H.....	2,447,045	B	67	9	25	5	3	83	34	176	162	176	192	John D. Mackellar, M.D., Dean.....		Sept. 19	June 22	19
20	Jenner Medical College, Chicago.....	2,447,045	C	113	5	13	1	...	125	36	140	135	135	175	Alfred de Roulet, M.D., Dean.....		Sept. 25	June 1	20
21	Loyola University School of Medicine, Chicago.....	2,447,045	B	220	8	79	4	5	111	33	155	150	150	175	Arthur I. Kendall, M.D., Dean.....		Sept. 25	June 8	21
22	Northwestern University Medical School, Chicago.....	2,447,045	A	247	...	42	...	26	148	33	190	195	190	206	John M. Dodson, M.D., Dean.....		Oct. 2	June 15	22
23	Rush Medical College (University of Chicago).....	2,447,045	A	523	44	113	11	115	274	34	185	180	180	195	A. C. Eycleshimer, M.D., Dean.....		Oct. 1	June 12	23
24	University of Illinois College of Medicine, Chicago.....	2,447,045	A	202	11	47	2	9	128	34	155	160	150	165			Oct. 1	June 12	24
25	INDIANA Indiana University School of Medicine, Indianapolis.....	265,578	A	169	6	37	...	29	161	35	100	100	130	130	Charles P. Emerson, M.D., Dean.....		Sept. 17	June 12	25
26	IOWA State University of Iowa College of Medicine, Iowa City ¹	10,957	A	165	4	21	...	8	51	35	95	85	85	95	Lee Wallace Dean, M.D., Dean.....		Sept. 17	June 7	26
27	State University of Iowa College of Homeo. Med., Iowa City.—H.I.	10,957	A	159	3	20	...	0	26	35	95	85	85	95	George Royal, M.D., Dean.....		Sept. 17	June 7	27
28	KANSAS University of Kansas School of Medicine, Rosedale ¹	392,663	A	110	8	19	...	15	57	35	60	60	100	100	M. T. Sudler, M.D., Associate Dean.....		Sept. 20	June 12	28
29	KENTUCKY University of Louisville Medical Department, Louisville.....	237,012	A	118	...	63	...	4	96	33	175	176	179	183	Henry Enos Tuley, M.D., Dean.....		Sept. 25	June 6	29
30	LOUISIANA Tulase University of Louisiana School of Medicine, New Orleans...	366,484	A	250	17	51	1	18	116	33	190	190	185	215	Isadore Dyer, M.D., Dean.....		Sept. 26	June 5	30
31	MAINE Bowdoin Medical School, Brunswick-Portland.....	63,014	A	54	...	10	...	4	66	33	120	120	110	110	Addison S. Thayer, M.D., Dean.....		Oct. 11	June 20	31

TABLE 1.—STATISTICS OF MEDICAL COLLEGES IN THE UNITED STATES AND CANADA—(Concluded)

Marginal Number	NAME AND LOCATION OF COLLEGE	Population of City where College is Located (Census of 1915)	Classification by Council on Medical Education	No. of Students Registered 1916-17		Graduates 1917		Grads. with A.B., B.S. or Ph.B.	Number of Teachers	Weeks in College Year	Total Fees (Dollars)				Executive Officer		Session of 1917-18		Marginal Number
				Men	Women	Men	Women				1st year	2d year	3d year	4th year			Begins 1917	Ends 1918	
76	PENNSYLVANIA																		76
77	Hahnemann Medical College and Hospital of Philadelphia.—H.	1,683,664	A	1411	68	331	20	112	86	33	185	185	185	200	Wm. A. Pearson, M.D., Dean.		Oct. 1	June 6	77
78	Jefferson Medical College of Philadelphia.	1,683,664	A	111	...	37	...	9	157	33	215	210	210	210	Ross V. Patterson, M.D., Dean.		Sept. 24	June 1	77
79	Medico-Chirurgical College of Philadelphia.	1,683,664	A	540	...	140	...	29	...	...	...	...	...	...	Frank C. Hammond, M.D., Dean.		Sept. 24	June 15	78
80	Temple University Department of Medicine, Philadelphia.	1,683,664	B	184	...	86	...	5	67	...	175	160	160	161	William Pepper, M.D., Dean.		Sept. 24	June 15	79
81	University of Pennsylvania School of Medicine, Philadelphia.	1,683,664	A	79	4	27	1	50	190	35	233	210	210	214	Martha Tracy, M.D., Acting Dean.		Sept. 28	June 5	80
82	Woman's Medical College of Pennsylvania, Philadelphia.	1,683,664	A	390	11	72	1	4	61	34	192	176	183	180	Thomas S. Arbuthnot, M.D., Dean.		Sept. 19	June 5	81
83	University of Pittsburgh School of Medicine, Pittsburgh.	571,984	A	...	43	...	...	15	103	34	265	250	250	255			Oct. 1	June 12	82
84	SOUTH CAROLINA																		83
85	Medical College of the State of South Carolina, Charleston.	60,427	A	59	...	24	...	8	59	33	150	150	145	145	Robert Wilson, Jr., M.D., Dean.		Sept. 28	June 6	83
86	SOUTH DAKOTA																		84
87	University of South Dakota College of Medicine, Vermillion*.	2,187	A	16	1	...	...	...	10	35	60	60	...	...	Christian P. Lonnmen, B.S., Dean.		Sept. 20	June 12	84
88	TENNESSEE																		85
89	Lincoln Memorial University Medical Department, Knoxville ¹⁰ .	38,300	B	546	8	236	3	31	...	...	...	...	...	...	L. Junius Desha, Ph.D., Dean.		Sept. 22	June 5	85
90	University of Tennessee College of Medicine, Memphis ⁴ .	146,113	A	117	5	56	2	3	105	34	107	102	102	127	M. V. Lynk, M.D., Dean.		Sept. 17	May 7	86
91	University of West Tennessee College of Med. and Surg., Memphis.	146,113	C	20	...	4	...	...	24	31	60	60	60	70	George W. Hubbard, M.D., President.		Sept. 25	May 9	87
92	McHerry Medical College, Nashville.	115,978	B	252	3	97	1	20	25	30	70	70	70	80	Lucius E. Burch, M.D., Dean.		Oct. 1	June 12	88
93	Vanderbilt University Medical Department, Nashville.	115,978	A	152	...	75	...	8	...	33	125	125	125	175					89
94	TEXAS																		90
95	Baylor University College of Medicine, Dallas.	118,482	A	337	18	75	3	13	54	32	120	115	115	125	Edward H. Cary, M.D., Dean.		Oct. 1	May 31	90
96	Fort Worth School of Medicine, Fort Worth.	39,328	B	44	1	11	...	...	68	33	115	125	115	119	Samuel A. Woodward, M.D., Dean.		Oct. 1	June 8	91
97	University of Texas Department of Medicine, Galveston.	41,076	A	242	13	48	2	13	41	32	78	47	30	17	William S. Carter, M.D., Dean.		Oct. 1	May 31	92
98	UTAH																		93
99	University of Utah School of Medicine, Salt Lake City* ⁴ .	113,567	A	22	...	...	...	...	23	34	100	100	...	...	Perry G. Snow, M.D., Dean.		Sept. 13	June 7	93
100	VERMONT																		94
101	University of Vermont College of Medicine, Burlington.	21,247	A	82	...	18	...	3	37	36	145	145	145	170	Henry C. Tinkham, M.D., Dean.		Sept. 26	June 26	94
102	VIRGINIA																		95
103	Medical College of Virginia, Richmond.	154,674	A	314	...	119	...	18	132	34	170	170	170	200	Stuart McGuire, M.D., Dean.		Sept. 13	June 4	95
104	University of Virginia Department of Medicine, Charlottesville.	6,765	A	206	...	96	...	12	25	36	150	140	140	140	Theodore Hough, M.D., Dean.		Sept. 13	June 12	96
105	WEST VIRGINIA																		97
106	West Virginia University School of Medicine, Morgantown*.	12,239	A	33	1	...	...	...	15	35	35	20	...	...	John N. Simpson, M.D., Dean.		Sept. 17	June 12	97
107	WISCONSIN																		98
108	University of Wisconsin Medical School, Madison* ⁴ .	30,084	A	131	8	13	...	10	32	36	70	70	...	...	Charles R. Bardeen, M.D., Dean.		Sept. 24	June 26	98
109	Marquette University School of Medicine, Milwaukee.	428,062	A	57	...	13	...	10	101	36	175	170	170	195	J. Van de Erve, M.D., Associate Dean.		Sept. 13	June 13	99
110	CANADA ¹¹																		100
111	University of Alberta Faculty of Medicine, Edmonton, Alta. [†] .	60,000	—	1597	59	311	4	36	15	30	87	87	...	...	Cecil E. Race, A.B., Registrar.		Oct. 1	May 16	100
112	Dalhousie University Faculty of Medicine, Halifax, N. S.	46,619	B	29	4	...	...	...	30	32	100	110	110	110	D. Fraser Harris, M.D., Secretary.		Sept. 25	May 30	101
113	Queen's University Faculty of Medicine, Kingston, Ont.	18,874	C	277	...	56	...	1	38	32	115	115	115	115	J. C. Connell, M.D., Dean.		Sept. 26	May 29	102
114	University of Toronto Faculty of Medicine, Toronto, Ont.	376,538	A	431	39	96	4	15	201	33	150	150	150	150	C. K. Clarke, M.D., Dean.		Sept. 25	June 1	103
115	Western University Faculty of Medicine, London, Ont.	46,300	B	71	...	14	...	2	57	32	115	115	115	140	H. A. McCallum, M.D., Dean.		Oct. 1	May 31	104
116	McGill University Faculty of Medicine, Montreal, Que.	473,712	A	335	...	63	...	10	131	31	174	181	174	204	John W. Seane, M.D., Registrar.		Oct. 3	May 24	105
117	Montreal School of Medicine and Surgery, Montreal, Que.	473,712	B	192	...	29	...	...	75	35	118	126	126	138	E. P. Lachapelle, M.D., Dean.		Oct. 3	June 29	106
118	Laval University, Faculty of Medicine, Quebec, Que.	78,190	B	87	...	7	...	6	29	34	75	75	75	75	Edwin Turcot, M.D., Dean.		Sept. 18	June 1	107
119	University of Manitoba, Manitoba Medical College, Winnipeg.	200,000	B	112	8	32	...	2	58	30	155	155	155	155	Gordon Bell, M.D., Acting Dean.		Sept. 25	May 11	108

H.—Homeopathic; E.—Eclectic.

* Gives only the first two years of the medical course.

† Gives the first three years of the five-year medical course.

1. Fees given are for residents of the state. For nonresidents amounts should be added for each year in the several states as follows: Colorado, \$25; Georgia, \$100; Iowa, \$15; Kansas, \$20 (for the first two years only); Michigan, \$20 (and \$25 extra the first year for matriculation); Tennessee, \$50; Utah, \$25, and Wisconsin, \$124.

2. Name recently changed; formerly the Atlanta Medical College.

3. Figures are accurate. Numbers of women students and graduates not obtained.

4. Figures are from a reliable source; partly verified by official reports.

5. This college is an offshoot of the Eclectic Medical University, an institution rated in Class C. It is reported as not recognized by the Missouri State Board of Health.

6. Has declared its intention to discontinue in 1918, after the one remaining class has been graduated.

7. This college merged with the National University of Arts and Sciences in 1915 but in 1916 withdrew and resumed its career as a separate college.

8. Merged in 1914 with the Medical College of Virginia but retained a nominal existence until the three remaining classes had graduated.

9. Merged in 1916 with the University of Pennsylvania and became its Graduate School of Medicine. Continued to teach part of its students, however, during the session of 1916-17.

10. Merged in 1916 with the University of Tennessee College of Medicine but retained a nominal existence until the three remaining classes had graduated.

11. In Canada the entrance requirement to all medical schools is a secondary school education. The Canadian colleges are on a par, however, with medical colleges in the United States which require one year of premedical college work, since the first of the Canadian five-year medical course is devoted largely to courses in physics, chemistry and biology. In the United States these courses are required to have been completed in one or two years of premedical college work. On a similar basis it could be said that the medical schools of the United States are giving a five-year, or a six-year medical course.

(Continued from page 533)

ures shows that, for many medical students, preliminary education has nothing to do with the advanced age of graduation. The chief reason why the average age at graduation is so high is the late time in life at which many students decide to take up the study of medicine.

NUMBER OF MEDICAL STUDENTS

The total number of medical students (see Table 5) in the United States for the year ending June 30, 1917, excluding premedical, special and postgraduate students, was 13,764, a decrease of 258 below last year. It is noteworthy, however (see Table 13, page 544), that in the high grade (Class A) medical colleges the total enrolment of students shows an increase. Of the total number of students, 12,925 (93.9 per cent.) were in attendance at the nonsectarian (regular) colleges, 580 (4.2 per cent.) at the homeopathic and 259 (1.9 per cent.) at the eclectic colleges. As indicated by the larger enrolments in the freshman and sophomore classes, the enrolment of medical students has about reached its lowest ebb under the higher entrance requirements.

NUMBER OF MEDICAL GRADUATES

The total number of graduates for the year ending June 30, 1917, was 3,379, a decrease of 139 below

TABLE 6.—MEDICAL COLLEGE GRADUATES

Year	Non-sectarian	Homeopathic	Eclectic	Physio-Med.	Non-descript	Total
1880.....	2,673	380	188	..	..	3,241
1890.....	3,853	380	221	..	..	4,454
1900.....	4,715	413	86	..	..	5,214
1901.....	4,879	387	148	18	12	5,444
1902.....	4,508	336	138	16	11	5,009
1903.....	5,088	420	149	24	17	5,698
1904.....	5,190	371	146	20	20	5,747
1905.....	5,126	276	153	22	23	5,600
1906.....	4,841	286	186	22	29	5,364
1907.....	4,591	225	121	11	32	4,980
1908.....	4,370	215	116	12	28	4,741
1909.....	4,163	209	84	15	44	4,515
1910.....	4,113	183	114	16	14	4,440
1911.....	4,006	152	110	5	..	4,273
1912.....	4,206	185	92	..	..	4,483
1913.....	3,679	209	93	..	..	3,981
1914.....	3,370	154	70	..	..	3,594
1915.....	3,286	195	55	..	..	3,536
1916.....	3,274	166	78	..	..	3,518
1917.....	3,134	180	65	..	..	3,379

1916. The number of graduates from the non-sectarian colleges was 3,134, or 140 less than last year. The number from the homeopathic colleges was 180, or 14 more than last year, and from the eclectic there were 65 graduates, or 13 less than last year.

GRADUATES HOLDING DEGREES IN ARTS

Of the 3,379 medical graduates, 1,099, or 32.5 per cent., were reported to hold also degrees in arts or science. This total includes those taking the combined courses in arts or science and medicine. Last year 26.9 per cent. held these degrees and 24.3 per cent. in 1915. In 1910 it is noteworthy that only 15.3 per cent. of the graduates showed this evidence of higher preliminary qualifications. Of the 3,134 non-sectarian school graduates, 1,078, or 34.4 per cent.,

were reported to have baccalaureate degrees; of the homeopathic graduates, 19, or 10.5 per cent., were so reported, and of the eclectic graduates, only 2, or 3.1 per cent., were reported as holding such degrees. As will be noted by referring to Table 12, of the 1,099 graduates holding baccalaureate degrees, 192—the largest number—came from the Massachusetts colleges. Last year New York furnished the largest

TABLE 7.—MEDICAL GRADUATES WITH LIBERAL ARTS DEGREES

Year	Nonsectarian			Homeopathic			Eclectic			Totals		
	Graduates	A.B., B.S.	Per Cent.	Graduates	A.B., B.S.	Per Cent.	Graduates	A.B., B.S.	Per Cent.	Graduates	A.B., B.S.	Per Cent.
1910.....	4,113	664	16.1	183	13	7.1	114	3	2.6	4,440	680	15.3
1911.....	4,006	683	17.0	152	18	11.8	110	4	3.6	4,273	705	16.5
1912.....	4,206	744	17.7	185	15	8.1	92	4	4.3	4,483	763	17.0
1913.....	3,679	732	19.9	209	20	9.6	93	1	1.1	3,981	753	18.9
1914.....	3,370	794	23.5	154	7	4.5	70	6	8.6	3,594	807	22.5
1915.....	3,286	839	25.5	195	16	8.2	55	3	5.5	3,536	858	24.3
1916.....	3,274	928	28.3	166	20	12.0	78	0	0.0	3,518	948	26.9
1917.....	3,134	1078	34.4	180	19	10.5	65	2	3.1	3,379	1099	32.5

quota, and in 1915 and previous years the Illinois colleges were in the lead. Illinois comes second this year with 158, followed by New York with 133, Pennsylvania with 112 and Maryland with 74. The percentage of graduates holding collegiate degrees is rapidly increasing and will continue to increase, since most medical schools are now requiring two years of college work for admission, which brings more students in the combined course for the B.S. and M.D. degrees.

WOMEN IN MEDICINE

During the past year there were 610 women studying medicine, or 44 more than last year and 21 less

TABLE 8.—WOMEN IN MEDICINE

Year	Total Women Students	Percentage of All Students, Both Sexes	Total Women Graduates	Percentage of Graduates, Both Sexes	Women's Colleges	Students	Percentage of All Women Students	Graduates	Percentage of All Women Graduates	Co-ed. Schools	Students	Percentage of All Women Students	Graduates	Percentage of All Women Graduates
1904	1,129	4.3	244	4.0	3	183	16.2	56	23.0	97	946	83.8	198	77.0
1905	1,073	4.1	219	4.0	3	221	20.6	54	24.5	96	852	79.4	165	75.5
1906	895	3.5	233	4.3	3	189	21.0	33	14.1	90	706	79.0	200	85.9
1907	928	3.8	211	4.2	3	210	22.6	39	18.5	86	718	77.4	172	81.5
1908	835	3.7	185	3.9	3	186	22.3	46	24.9	88	649	77.7	139	75.1
1909	921	4.2	162	3.7	3	169	18.4	33	20.3	91	752	81.6	129	79.7
1910	907	4.2	157	3.5	3	155	17.1	41	26.1	82	752	82.9	116	73.9
1911	680	3.4	159	3.7	2	134	19.7	36	22.6	74	546	80.3	123	77.4
1912	679	3.2	142	3.2	2	143	21.1	32	22.5	64	536	78.9	110	77.5
1913	640	3.8	154	3.8	2	138	21.6	33	21.4	55	502	78.6	121	78.6
1914	631	3.8	121	3.4	2	135	21.4	25	20.7	54	496	78.6	96	79.3
1915	592	4.0	130	3.7	2	116	19.6	38	29.2	53	462	80.4	92	70.8
1916	566	4.0	134	3.8	2	102	18.0	28	20.0	51	464	82.0	106	80.0
1917	610	4.5	153	4.5	2	81	13.3	29	18.9	56	529	86.7	124	81.1

than in 1914. The percentage of women to all medical students is 4.5, a larger percentage than in any previous year. This is true also in regard to women graduates. There were 153 women graduates this

(Continued on page 540)

Marginal Number	NAME OF COLLEGE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Marginal Number
		Alabama.....161	Arizona.....11	Arkansas.....91	California.....384	Colorado.....116	Connecticut.....237	Delaware.....25	Dist. of Col.....98	Florida.....64	Georgia.....244	Idaho.....34	Illinois.....1,159	Indiana.....333	Iowa.....364	Kansas.....246	Kentucky.....135	Louisiana.....165	Maine.....89	Maryland.....200	Massachusetts.....615	
1	University of Alabama School of Medicine, Mobile....	39																1				1
2	University of Arkansas Medical Dept., Little Rock....			36					1									2				2
3	College of Medical Evangelists, Loma Linda.....		3		14	3				1		1		2	1							3
4	College of Phys. and Surgs., Los Angeles*.....				29	5				1			12	2	7	3	2				3	4
5	Oakland College of Medicine and Surgery, Oakland...				6								1									5
6	College of Phys. and Surgs., San Francisco.....		1		37	2	2						12			1	2				1	6
7	Hahnemann Medical College of the Pacific.—H.				21									1	1			1			1	7
8	Leland Stanford Junior University, School of Med. ...				80	2							2		1							8
9	Univ. of California Medical School, San Francisco....				120																	9
10	Univ. of Colorado School of Med., Boulder-Denver....					72						1	2			1						10
11	Yale University School of Medicine, New Haven.....				1		55						4								4	11
12	Georgetown University School of Medicine.....						9		19										1	1	6	12
13	George Washington University Medical School.....	1			1		2		40		1		3			1				3	2	13
14	Howard University School of Medicine.....	1		1				1	16	3	1		3		1		5			9		14
15	Emory University School of Medicine.....	17			1					3	90						2					15
16	University of Georgia Medical Dept., Augusta.....										53											16
17	Chicago College of Med. and Surg., Chicago.....	3	2		2		2		1	2	9	1	188	16	12	4	7	2	4	1	4	17
18	Chicago Hospital College of Medicine, Chicago.....							1					53									18
19	Hahnemann Med. College and Hosp. of Chicago.—H. ...												26	10	6	5				1		19
20	Jenner Medical College, Chicago.....												118									20
21	Loyola University School of Medicine, Chicago.....	2			1	1	2			2	2		133	5	3	1			1		1	21
22	Northwestern University Medical School, Chicago....			1	3	2							113	7	18	8	1	1		1		22
23	Rush Medical College (University of Chicago).....	2	1	1	8	3	1			1	1	4	203	28	38	34	4	1			1	23
24	University of Illinois College of Medicine, Chicago....	2			1	1						2	119	2	25	3		1	1			24
25	Indiana University School of Medicine, Indianapolis...	1											1	170								25
26	State Univ. of Iowa College of Medicine, Iowa City...				2	1						1	3		147	1						26
27	State Univ. of Iowa Coll. of Homeo. Medicine.—H. ...														7							27
28	Univ. of Kansas School of Med., Lawrence-Rosedale...															110						28
29	University of Louisville Medical Dept., Louisville....			2						2			5	19	1	1	51					29
30	Tulane University of Louisiana School of Medicine....	32		16						11	9					1		120				30
31	Bowdoin Medical School, Brunswick-Portland.....						2								1				35		9	31
32	Johns Hopkins University Medical Dept., Baltimore...	6		1	7	5	10		2	3	11	4		10	6	1	8	1	2	74	12	32
33	Univ. of Maryland School of Med. & Coll. of P. & S. ...	1	1	1	1		8	4	3	4	2			1	1		1		2	86	10	33
34	Boston University School of Medicine.—H.												1			1			4		33	34
35	College of Physicians and Surgeons, Boston.....																				51	35
36	Medical School of Harvard University, Boston.....	2	1		8	9	12	1	3	3	6	2	8	6	4	2	1	1	14		148	36
37	Tufts College Medical School, Boston.....	1					15				1		1			1			10		274	37
38	University of Michigan Medical School.....	1			2		1		2		4	2	11	14	3	3	2				1	38
39	University of Michigan Homeo. Med. School.—H.				3			1					1	2		2				1		39
40	Detroit College of Medicine and Surgery, Detroit....				1						1			1		1						40
41	University of Minnesota Medical School.....				3							2	1	1	12					1		41
42	University of Mississippi School of Med., Oxford....				1					1								1				42
43	University of Missouri School of Med., Columbia....			1										1								43
44	Eclectic Medical University, Kansas City.—E.															11						44
45	Kansas City College of Med. and Surg.—E.†.....																					45
46	National University of Arts & Sciences, Med. Dept. ...											1	19	1		1	1					46
47	St. Louis College of Phys. and Surgs., St. Louis*....												8		2	6						47
48	St. Louis University School of Medicine.....	1		1	10	1					1		41	7	21	16	1	2		1	1	48
49	Washington University Medical School, St. Louis....			4		2							22	3	2	10						49
50	Lincoln Medical College, Lincoln.—E.														1							50
51	John A. Creighton Medical College, Omaha.....					1									17	6						51
52	University of Nebraska College of Med., Omaha.....			1	1	1									7	3	1					52
53	Dartmouth Medical School, Hanover.....				1		1						2						2		10	53
54	Albany Medical College, Albany.....						1														3	54
55	University of Buffalo Dept. of Medicine, Buffalo....				2											1					1	55
56	Columbia University College of Phys. and Surgs.		1			2	22				9	1		3	1		1				2	56
57	Cornell University Medical College, New York City....				2		7		1				1				1	1			2	57
58	Fordham University School of Med., New York City...						19														8	58
59	Long Island College Hospital, Brooklyn.....						3														1	59
60	New York Homeo. Med. Coll. and Flower Hosp.—H.* ...				1		5												1			60
61	New York Med. Coll. and Hospital for Women.—H. ...																					61
62	Univ. and Bellevue Hosp. Med. Coll., New York City...				1		15			1	1		1			1					1	62
63	Syracuse University College of Medicine, Syracuse....						1															63
64	Univ. of North Carolina Sch. of Med., Chapel Hill...									1	1										1	64
65	North Carolina Medical College, Charlotte.....									1												65
66	Leonard Medical School, Raleigh.....	2									1											66
67	Wake Forest College School of Medicine, Wake Forest...					1																67
68	University of North Dakota School of Medicine.....																					68
69	Eclectic Medical College, Cincinnati.—E.						1						5	5	1	1	8					69
70	University of Cincinnati College of Medicine.....				1				1				1	5			12					70
71	Western Reserve University School of Medicine.....					1						2	3	2	2		1					71
72	Ohio State University College of Med., Columbus....									1				1			1					72
73	Ohio State Univ. Coll. of Homeo. Med., Columbus.—H. ...													1								73
74	Univ. of Okla., Sch. of Med., Norman-Oklahoma City...	1		1						1		1						1				74
75	University of Oregon Medical School, Portland.....											1										75
76	Hahnemann Med. Coll. & Hosp. of Philadelphia.—H. ...						1	3	2		1	2	5	1	1	1	1		1	3	11	76
77	Jefferson Medical College of Philadelphia.....	3		2	6		16	7		1	1	2	5	1	1	1	1					77
78	Medico-Chirurgical College of Philadelphia.....				1		2	1	1		1			1		1			1	1	1	78
79	Temple University Dept. of Med., Philadelphia.....						2	1												1		79
80	University of Pennsylvania School of Medicine.....	1			3		5	5	1		3	1	8	4	7			1	1	6	1	80
81	Woman's Medical College of Pennsylvania.....												1								3	81
82	University of Pittsburgh School of Med., Pittsburgh...														1							82
83	Medical College of the State of South Carolina....								1	2	1											83
84	University of South Dakota College of Medicine.....																					84
85	Lincoln Memorial University Med. Dept., Knoxville...																4					85
86	University of Tennessee College of Med., Memphis...	2		4						2		1	1				2					86
87	Univ. of W. Tennessee Coll. of Med. & Surg., Memphis...	1		3															1			87
88	Meharry Medical College, Nashville.....	20		8					1	7	24		8		1	1	7	10		1		88
89	Vanderbilt University Medical Department, Nashville...	16		6	1	1				8	3		5				3	7				89
90	Baylor University College of Medicine, Dallas.....										1		1									90
91	Fort Worth School of Medicine, Fort Worth.....																		1			91
92	University of Texas Dept. of Med., Galveston.....	1	1	1							1	1		1					2	1		92
93	University of Utah School of Med., Salt Lake City...											1										93
94	University of Vermont College of Med., Burlington....						9				1								5		8	94

H.—

Marginal Number	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	Totals.....	Marginal Number				
	Michigan.....409	Minnesota.....342	Mississippi.....135	Missouri.....513	Montana .....38	Nebraska.....261	Nevada.....4	New Hampshire...48	New Jersey.....341	New Mexico.....9	New York.....2,113	North Carolina 336	North Dakota...63	Ohio.....628	Oklahoma.....116	Oregon.....85	Pennsylvania 1,106	Rhode Island....70	South Carolina 134	South Dakota...65	Tennessee.....232	Texas.....501	Utah.....94	Vermont.....53	Virginia.....294	Washington....109	West Virginia...136	Wisconsin.....328	Wyoming.....8	Philippines, etc. 105	Foreign.....317	13,764					
1			3												1					1	1										43	1					
2			1												1					2	3										43	2					
3						3			1	1	1			7	1		7			1	2					5		1	1		8	55	3				
4	5	4		4	1	10					5		1			1						3	1							1	13	136	4				
5				1							1										1					1					5	16	5				
6				2	1	1					6			1							1	1				1					13	77	6				
7																					1				1					2	3	32	7				
8				1			3				1					2						2	1			2				1	2	100	8				
9							1									2										1					1	129	9				
10		1	1			1				1				2				1				1				1				1		85	10				
11		1						1			6				1			1								2						77	11				
12	1			1					1		5				3		7							1						4		60	12				
13	1	1						1	2	2	8	2		2	1		9	1			2				8	1		3		5	11	114	13				
14				1					4		4	11			2		6		5		3				13						13	111	14				
15			3	2								11							6		4				1		1				6	149	15				
16																			2													55	16				
17	17	15		3	3	3			2		17	1		17	1	1	12	1		2	1	4	1			2	8	16	1	14	13	415	17				
18														4																		53	18				
19	6	4		1																	1				1			6				4	76	19			
20																																	118	20			
21	5	4	1	4	1	2			1		6	1		4			5	1		1	1	1	1		1		3	10		12	9	228	21				
22	7	12	1	4	1	5				1			8	8	2	2	2			6	1	2	1		1	10		15			2	247	22				
23	19	18		17	8	18					4		8	13	5	7	6		1	17	4	8	18		2	9	3	39		4	6	567	23				
24	4	13		5		1					1			3	3		1			2			2			1					8	213	24				
25		1																														175	25				
26		1																		2											3	162	26				
27																																	7	27			
28				6											1	1																	118	28			
29		1		5							1			2	1		5		3			5	5			2	7					118	29				
30		1	28	3				4				4					1				1	26				2		1			8		267	30			
31																																	54	31			
32	6	1		5	1	2			8	1	28	7	6	23	1	4	37	4	6		6	7	1		27	4	3	5			3	359	32				
33			1	1				3	10		17	31		5	2		21	4	6				2		12		29			17	11	298	33				
34			1					3				1		2	1		2		1					2							10	62	34				
35																																	53	35			
36	2	6		5		1		4	3		22	7		11	1		9	16	2		2	7	7	2	1	3		6			9	357	36				
37	1							14	1		16			2			6	28								1					3	8	383	37			
38	155	4		3	1	1			2		27			28	1	1	18	1	1	3	1	1	1	1		7	1				6	14	322	38			
39	24	2									4			3	1		1									1	1					17	48	39			
40	131	215		1	1	1					1		10	1			1			3						5						2	161	40			
41	1																																265	41			
42			51	1							1																						60	42			
43				20		2																											85	43			
44																																	31	44			
45				114																	1					1							114	45			
46				37																													64	46			
47				30							3			23	2	1	3					5	1				7						46	47			
48	9	6		71	1	3					1	1		1	2						2	2										254	48				
49		1		61																													125	49			
50											1									3						2							17	50			
51	1	3		1	11	15					1			1		1							1										108	51			
52	1					57					1									3													143	52			
53						120					6			1																			40	53			
54								10		2															1									110	54		
55											103						7																	196	55		
56	2	4	2	2				3	56	1	324	4		3	1	2	7	3	2		2	3	8	1	4	2	2	4	1		6		491	56			
57									15		117	1		2			3																	165	57		
58						4			24		240						2		1															297	58		
59									15		269	1																						295	59		
60	1								24		130						3					1		1										170	60		
61									9		29																							38	61		
62			1			1			61		328	2		2							1	1	3	1		1								429	62		
63									1		114			1			1																	124	63		
64																																			64	64	
65																																			21	65	
66											2																								8	66	
67																																			32	67	
68																																				33	68
69	1			1		2					2				1		4										1								97	69	
70	1	1		1							1						2																				

Marginal Number	NAME OF COLLEGE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Marginal Number
		Alabama.....161	Arizona.....11	Arkansas.....91	California.....384	Colorado.....116	Connecticut.....237	Delaware.....25	Dist. of Col.....98	Florida.....64	Georgia.....244	Idaho.....34	Illinois.....1,159	Indiana.....333	Iowa.....304	Kansas.....246	Kentucky.....135	Louisiana.....165	Maine.....89	Maryland.....200	Massachusetts.....615	
95	Medical College of Virginia, Richmond.....	.....	.....	.....	1	.....	3	.....	1	1	.....	.....	.....	1	.....	.....	.....	.....	.....	6	.....	95
96	University of Virginia Dept. of Med., Charlottesville..	2	.....	.....	.....	.....	2	1	2	1	4	.....	.....	.....	1	.....	2	1	.....	2	.....	96
97	West Virginia Univ. School of Med., Morgantown.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	97
98	University of Wisconsin Medical School, Madison.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	7	.....	.....	1	1	.....	.....	.....	.....	98
99	Marquette University School of Medicine, Milwaukee...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	99
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

H.—Homeopathic; E.—Eclectic * Totals exact; distribution approximate. † Figures and distribution approximate.

(Continued from page 537)

year, 19 more than last year and 32 more than in 1914. Of all the women matriculants, a smaller percentage were in attendance at the two medical colleges for women, while 529 (86.7 per cent.) were matricu-

TABLE 9.—MEDICAL COLLEGES

Year	Non-sectarian	Homeopathic	Eclectic	Physio-Med.	Non-descript	Total
1850.....	44	3	4	1	..	52
1860.....	53	6	4	2	..	65
1870.....	60	8	5	2	..	75
1880.....	76	14	8	2	..	100
1890.....	106	16	9	2	..	133
1900.....	126	22	9	2	1	160
1901.....	125	22	10	2	1	160
1902.....	126	20	9	3	2	160
1903.....	126	20	9	3	2	160
1904.....	127	19	9	3	2	160
1905.....	125	19	9	3	2	158
1906.....	130	19	8	3	2	162
1907.....	127	18	9	3	2	159
1908.....	120	18	9	2	2	151
1909.....	115	15	8	1	1	140
1910.....	109	12	8	1	1	131
1911.....	103	12	7	..	..	122
1912.....	101	11	6	..	..	118
1913.....	92	10	5	..	..	107
1914.....	87	10	5	..	..	102
1915.....	83	9	4	..	..	96
1916.....	82	10	3	..	..	95
1917.....	83	9	4	..	..	96

lated in the 56 coeducational colleges. From the two women's colleges there were 29 graduates, while 124 secured their degrees from coeducational colleges. This increase of women students in coeducation colleges is not surprising, since in recent years some of the largest and oldest medical schools, such as Columbia, Tulane and the University of Pennsylvania, have thrown open their doors to women.

Since June 30, 1916, two medical colleges were reestablished and one college (mentioned on page 544) was suspended. The present total number of medical colleges is 96—one more than last year.

LENGTH OF TERMS

During the last seventeen years there has been a decided lengthening of college terms. This has reference to the weeks of actual work exclusive of holidays. For two years no colleges have had sessions shorter than 29 weeks, and this year only one college reported a session of 30 weeks. Sessions of from 33 to 36 weeks were reported by 77, or 80.2 per cent. of all colleges.

TUITION AND OTHER FEES

Attention is called to Table 1, on page 534, to the amount charged by the various medical colleges per annum for tuition, matriculation, laboratory and graduation fees for each student. In Table 11, 95 of the 96 colleges—from one class C college the figures were not obtained—have been grouped according to the amount of fees charged and according to their classification by the Council on Medical Education in Classes A, B and C. Sixteen colleges charge fees of \$100 or less per year; fifty-three between \$100 and \$175, and twenty-six charge above \$175. Of the sixteen colleges charging \$100 or less, twelve (75 per cent.) are listed among Class A (acceptable) colleges² by the Council on Medical Education; three are Class B colleges and one is rated in Class C. Among the twelve Class A colleges having these low fees are the schools of medicine of the state universities of Colorado, Iowa, Michigan, Mississippi, Missouri, North Dakota, South Dakota, Texas and Utah. On the other hand, nine colleges listed by the Council in Class C charge fees of from \$100 to \$175 per year for each student, and two exact fees between \$175 and

TABLE 10.—COLLEGE TERMS

Year	23 to 26 weeks		27 to 28 weeks		29 to 30 weeks		31 to 32 weeks		33 to 34 weeks		35 to 36 weeks		Over 36 weeks	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1901	58	36.5	42	26.4	8	5.0	26	16.4	4	2.5	18	11.3	3	1.9
1902	44	28.4	44	28.4	11	7.1	33	21.3	3	1.9	18	11.6	2	1.3
1903	33	21.4	46	29.9	15	9.7	37	24.0	2	1.3	19	12.4	2	1.3
1904	27	16.3	44	26.5	22	13.3	37	22.3	13	7.8	20	12.0	3	1.8
1905	15	9.4	35	21.8	12	7.5	44	27.5	13	8.1	28	23.8	3	1.9
1906	14	8.7	35	21.7	26	16.1	32	19.9	24	14.9	28	17.4	2	1.3
1907	6	3.7	27	16.8	26	16.1	42	26.1	29	18.0	29	18.0	2	1.3
1908	2	1.3	21	13.8	28	18.4	51	33.6	24	15.8	22	14.5	4	2.6
1909	4	2.3	17	11.6	23	16.4	51	34.9	18	12.3	30	20.5	3	2.0
1910	2	1.5	8	6.0	19	14.3	42	31.5	30	22.6	30	22.6	2	1.5
1911	..	....	6	5.0	16	13.3	37	30.8	32	26.7	28	23.4	1	0.8
1912	1	0.9	1	0.9	11	9.5	34	29.3	37	31.8	31	26.7	1	0.9
1913	..	....	3	2.8	5	4.7	29	27.4	41	38.7	27	25.5	1	0.9
1914	..	....	2	2.0	4	4.0	25	24.8	41	40.5	28	27.7	1	1.0
1915	..	....	1	1.0	5	5.3	22	23.2	36	37.9	30	31.6	1	1.0
1916*	..	....	..	....	4	4.2	17	17.9	43	45.3	28	29.5	..	...
1917*	..	....	..	....	1	1.0	15	15.6	46	47.9	31	32.3	..	...

* Information not obtained from three Class C colleges.

\$200. As shown on page 550, diplomas from Class C colleges are reported as not recognized by thirty-two state licensing boards. No intelligent student would knowingly spend his time and money in a low-grade

2. See Classification of Medical Colleges, page 548.

	Marginal Number		21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51			
95	...	Michigan.....	409
96	...	Minnesota.....	342
97	...	Mississippi.....	135
98	1
99	1	4	2	2	2	...	1	1	1
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51					

college, the diplomas of which are not recognized by many states,³ when in the same time and for even less money he could attend one of the best-equipped colleges, the diplomas of which are recognized everywhere. Although fifty colleges listed in Class A charge fees ranging from \$150 to \$275 per year for each student, the actual expense for teaching that student in these colleges amounts to from two or three to several times these sums. In fact, accurate data secured from eighty-two medical colleges show that the average amount received each year from the individual student was \$150, while the average amount actually expended in the training of that student for a year was \$419! And among these eighty-two colleges were several which still apparently made profits

TABLE 11.—COLLEGE FEES

Total Fees	Number of Colleges			
	Class A*	Class B	Class C	Total
\$ 50 or less.....	3	2	..	5
50 to \$ 75.....	5	1	1	7
75 to 100.....	4	..	..	4
100 to 125.....	8	4	1	13
125 to 150.....	9	1	6	16
150 to 175.....	18	4	2	24
175 to 200.....	12	1	2	15
200 or above.....	10	1	..	11
Totals.....	69	14	12	95†

* Based on the latest classification of medical colleges prepared by the Council on Medical Education (see page 548).
† Information not obtained for one Class C college.

from teaching medical students or which paid all expenses, including rents, or even erected new buildings which are being paid for out of the income from students' fees!

SCHOLARSHIPS IN MEDICAL SCHOOLS

As evidence that provision is being made for worthy students, regardless of their financial status, 287 scholarships are reported this year in the following thirty-eight medical schools:

University of Alabama School of Medicine, Mobile	66
Hahnemann Medical College of the Pacific, San Francisco.....	1
University of California Medical School,* San Francisco.....	3
University of Colorado School of Medicine,* Boulder	1
Yale University School of Medicine, New Haven, Conn.....	2
Hahnemann Medical College and Hospital of Chicago*.....	6
Loyola University School of Medicine, Chicago.....	3

3. See also THE JOURNAL, April 14, 1917, page 1112, Table D, which shows in what states diplomas granted by various colleges are not recognized as an acceptable qualification for the license to practice.

Rush Medical College, Chicago.....	7
University of Illinois College of Medicine, Chicago.....	7
Indiana University School of Medicine, Indianapolis.....	12
Johns Hopkins University Medical Department, Baltimore	6
University of Maryland School of Medicine,* Baltimore.....	6
Medical School of Harvard University,* Boston.....	52
Detroit College of Medicine and Surgery.....	6
University of Minnesota Medical School,* Minneapolis.....	1
Washington University Medical School, St. Louis.....	4
Dartmouth Medical School,* Hanover, N. H.....	2
Albany Medical College, Albany, N. Y.....	4
New York Medical College and Hospital for Women, New York City	2
University and Bellevue Hospital Medical College, New York City	1
University of Buffalo Department of Medicine*.....	1
University of North Carolina School of Medicine, Chapel Hill....	1
University of Cincinnati College of Medicine*.....	12
Western Reserve University School of Medicine, Cleveland.....	1
University of Oregon Department of Medicine,* Portland.....	3
Hahnemann Medical College and Hospital of Philadelphia*.....	12
Jefferson Medical College of Philadelphia.....	1
Temple University Department of Medicine, Philadelphia.....	3
University of Pennsylvania School of Medicine,* Philadelphia.....	3
Woman's Medical College of Pennsylvania,* Philadelphia.....	15
Medical College of the State of South Carolina, Charleston.....	8
University of Tennessee College of Medicine, Memphis.....	1
Vanderbilt University Medical Department, Nashville, Tenn....	4
Baylor University College of Medicine, Dallas, Tex.....	3
University of Texas Department of Medicine,* Galveston.....	1
Medical College of Virginia, Richmond.....	15
University of Virginia Department of Medicine, Charlottesville....	2
West Virginia University School of Medicine, Morgantown.....	8

Total in 38 medical schools 287
* Have loan funds also.

LOAN FUNDS

The colleges marked by an asterisk (*) also have loan funds for deserving but needy students. Such funds are available also at the following medical schools:

Leland Stanford Jr. University School of Medicine, San Francisco, Cal.
College of Medical Evangelists, Loma Linda, Cal.
Yale University School of Medicine, New Haven, Conn.
Howard University School of Medicine, Washington, D. C.
University of Kansas, School of Medicine, Lawrence, Kan.
Tulane University of Louisiana School of Medicine, New Orleans, La.
University of Missouri School of Medicine, Columbia, Mo.
University of Nebraska College of Medicine, Omaha, Neb.
University of North Dakota, School of Medicine, University, N. D.
University of Wisconsin Medical School, Madison, Wis.

COLLEGES, STUDENTS AND GRADUATES BY STATES

Illinois formerly had the largest number of medical colleges, but for the last two years the first place is held by New York, where there are ten colleges. Illinois has eight; California and Missouri each has seven and Pennsylvania has six colleges. Of Class C colleges, however, Missouri leads with 4, and California and Illinois each has 2. For the last two years New York has had the largest number of students enrolled, this year having 2,223, followed by Illinois with 1,802 and Pennsylvania with 1,411. In

(Continued on page 544)

Name of College	Enrolled During 1916-17					Name of College	Enrolled During 1916-17				
	1st Yr.	2d Yr.	3d Yr.	4th Yr.	Total		1st Yr.	2d Yr.	3d Yr.	4th Yr.	Total
University of Alabama School of Medicine.....	8	5	7	23	43	Dartmouth Medical School, Hanover.....	20	20	.....	.....	40
Univ. of Arkansas Medical Dept., Little Rock..	5	6	17	15	43	Albany Medical College, Albany.....	33	14	21	42	110
College of Medical Evangelists, Loma Linda...	17	3	22	13	55	Univ. of Buffalo Dept. of Medicine, Buffalo...	66	41	29	60	196
College of Phys. and Surgs., Los Angeles.....	21	38	28	49	136	Columbia Univ. Coll. of Phys. and Surgs.	147	130	118	96	491
Oakland College of Med. and Surg., Oakland...	4	4	4	4	16	Cornell Univ. Medical College, New York City..	66	39	32	28	165
College of Phys. and Surgs., San Francisco....	30	11	25	11	77	Fordham University School of Medicine.....	104	79	65	49	297
Hahnemann Med. Coll. of the Pacific.—H. ....	.....	.....	14	18	32	Long Island College Hospital, Brooklyn.....	107	60	49	79	295
Leland Stanford Junior Univ. School of Med.	34	19	20	27	100	New York Homeopathic Medical College and	.....	.....	.....	.....	.....
University of California Medical School.....	48	30	24	27	129	Flower Hospital.—H.	44	22	47	57	170
University of Colorado School of Medicine....	25	29	10	21	85	New York Med. Coll. & Hosp. for Women.—H.	6	16	4	38	38
Yale University School of Med., New Haven...	32	25	9	11	77	Univ. & Bellevue Hosp. Med. Coll., N. Y. City	167	102	95	65	429
Georgetown University School of Medicine.....	17	11	17	15	60	Syracuse University College of Medicine.....	44	26	24	30	124
George Washington University Medical School.	47	15	15	37	114	University of North Carolina School of Med...	30	34	0	0	64
Howard University School of Medicine.....	34	26	32	19	111	North Carolina Medical College, Charlotte....	.....	2	1	18	21
Emory University School of Medicine, Atlanta	33	27	23	66	149	Leonard Medical School, Raleigh.....	6	2	.....	.....	8
University of Georgia Medical Department....	23	10	6	11	55	Wake Forest College School of Medicine.....	15	17	.....	.....	32
Chicago College of Medicine and Surgery.....	66	43	89	217	415	University of North Dakota School of Medicine	18	15	.....	.....	33
Chicago Hospital College of Medicine.....	10	12	11	20	53	Eclectic Medical College, Cincinnati.—E.	20	22	24	31	97
Hahnemann Medical College and Hospital.—H.	11	18	16	31	76	University of Cincinnati College of Medicine...	37	21	22	14	94
Jenner Medical College, Chicago.....	45	.....	45	28	118	Western Reserve University School of Medicine	53	37	42	33	165
Loyola University School of Medicine, Chicago	47	33	47	101	228	Ohio State University College of Medicine.....	31	17	26	68	142
Northwestern University Med. School, Chicago	63	71	67	46	247	Ohio State Univ. College of Homeo. Med.—H.	2	10	15	9	36
Rush Medical College, Chicago.....	142	142	139	144	567	University of Oklahoma School of Medicine...	27	21	13	24	85
University of Illinois College of Medicine.....	89	47	27	50	213	University of Oregon Med. School, Portland...	16	23	21	12	72
Indiana University School of Medicine.....	68	33	34	40	175	Hahnemann Med. Coll. & Hosp. of Phila.—H.	31	32	10	38	111
State Univ. of Iowa Coll. of Med., Iowa City..	59	49	33	21	162	Jefferson Medical College of Philadelphia.....	179	115	105	141	540
State Univ. of Iowa Coll. of Homeo. Med.,	.....	.....	.....	.....	.....	Medico-Chirurgical College of Philadelphia...	39	54	.....	91	184
Iowa City.—H.	2	1	3	1	7	Temple University Dept. of Med., Philadelphia.	13	17	17	36	83
University of Kansas School of Medicine.....	48	34	17	19	118	University of Pennsylvania School of Medicine	118	77	133	73	401
University of Louisville Medical Department...	21	16	12	69	118	Woman's Medical College of Pennsylvania.....	10	8	7	18	43
Tulane Univ. of Louisiana School of Medicine	94	61	58	54	267	University of Pittsburgh School of Medicine...	42	31	25	19	117
Bowdoin Medical School, Brunswick-Portland..	10	15	19	10	54	Medical Coll. of the State of South Carolina..	14	10	10	25	59
Johns Hopkins University Medical Dept.	90	90	87	92	359	University of South Dakota College of Med. ..	12	5	.....	.....	17
University of Maryland School of Medicine and	.....	.....	.....	.....	.....	Lincoln Memorial University Medical Dept. ....	.....	.....	.....	5	5
College of Physicians and Surgeons.....	79	56	61	102	298	University of Tennessee College of Medicine....	23	14	22	63	122
Boston University School of Medicine.—H.	13	10	11	28	62	Univ. of West Tennessee Coll. of Med. & Surg.	5	4	6	5	20
College of Phys. and Surgs., Boston.....	23	8	11	11	53	Meharry Medical College, Nashville.....	38	36	79	102	255
Medical School of Harvard University.....	109	87	93	68	357	Vanderbilt University Medical Dept., Nashville	29	25	21	77	152
Tufts College Medical School, Boston.....	105	121	74	83	383	Baylor University College of Medicine, Dallas..	11	10	13	11	45
Univ. of Michigan Med. School, Ann Arbor...	117	73	70	62	322	Fort Worth School of Medicine.....	19	13	6	17	55
Univ. of Michigan Homeo. Med. School.—H. ...	10	11	13	14	48	University of Texas Department of Medicine...	95	64	45	51	255
Detroit College of Medicine and Surgery.....	46	29	22	64	161	University of Utah School of Medicine.....	15	7	.....	.....	22
University of Minnesota Medical School.....	75	76	68	46	265	University of Vermont College of Medicine....	23	20	21	18	82
University of Mississippi Dept. of Medicine...	29	31	.....	.....	60	Medical College of Virginia, Richmond.....	31	28	42	105	206
University of Missouri School of Medicine.....	49	36	.....	.....	85	University of Virginia Department of Medicine	30	30	25	23	103
Eclectic Medical University, Kansas City.—E.*	4	6	10	11	31	West Virginia University School of Medicine...	20	14	0	0	34
Kansas City College of Med. and Surg.—E.†...	22	30	40	22	114	University of Wisconsin Medical School.....	79	53	.....	.....	132
National Univ. of Arts and Sciences Med. Dept.	.....	.....	26	38	64	Marquette University School of Medicine.....	27	12	7	11	57
St. Louis Coll. of Phys. & Surgs., St. Louis*	10	10	15	11	46	Totals for 1917.....	4107	3117	2866	3674	13764
St. Louis University School of Medicine.....	83	68	53	50	254	Totals for 1916.....	3582	3094	3559	3727	14022
Washington University Med. School, St. Louis	36	23	34	32	125	Totals for 1915.....	3373	3919	3675	3864	14891
Lincoln Medical College, Lincoln.—E.	4	6	3	4	17						
John A. Creighton Medical College.....	25	23	16	44	108						
University of Nebraska College of Medicine....	58	40	27	18	143						

H.—Homeopathic; E.—Eclectic.

* Totals exact; distribution approximate.

† Total and distribution approximate.

TABLE 4.—AVERAGE AGE OF GRADUATES OF 1917.
GROUP 1.—ADMISSION REQUIREMENTS —1913—A HIGH SCHOOL EDUCATION

Colleges	Number of Graduates at Various Ages																	Total Students	Total Years	Aver. Age	
	Under 21	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	Over 35				
University of Alabama.....	1	2	1	3	6	2	1	.....	2	.....	.....	.....	.....	.....	.....	.....	18	447	24.8	
University of Arkansas.....	3	1	3	1	.....	1	.....	1	1	.....	.....	.....	1	3	15	436	29.1	
College of Medical Evangelists.....	1	1	.....	.....	3	1	1	.....	1	.....	1	1	1	.....	2	13	386	29.7	
Oakland College of Med. and Surg.	1	.....	.....	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	4	122	30.5	
Coll. of Phys. & Surg., San Francisco	2	.....	.....	.....	.....	1	3	.....	.....	.....	.....	.....	1	7	203	29.0	
Hahnemann Med. Coll. of the Pacific...	1	3	3	2	2	1	1	.....	.....	1	1	1	.....	2	18	524	29.1	
George Washington University.....	7	9	4	3	6	3	1	1	1	.....	.....	.....	1	2	3	41	1,071	26.1	
Emory University School of Medicine...	1	8	9	7	10	4	3	6	6	5	1	.....	.....	2	.....	1	63	1,651	26.2	
University of Georgia.....	2	1	1	3	.....	2	1	.....	.....	.....	.....	1	.....	.....	.....	11	281	25.5	
Hahnemann, Chicago	1	2	3	3	2	2	2	1	2	2	3	1	4	2	30	885	29.5
Jenner Medical College.....	1	2	1	3	3	1	2	1	14	395	28.2
Loyola University	1	2	3	10	8	8	7	2	4	5	4	5	6	5	4	9	83	2,420	29.1	
University of Louisville.....	3	7	8	12	6	9	6	3	2	2	1	1	5	65	1,761	27.1
University of Maryland.....	1	9	17	15	12	7	5	3	2	3	3	3	2	82	2,001	25.5
Boston University	2	2	4	3	4	3	1	1	2	2	24	639	26.8
Tufts College	1	8	16	9	12	11	7	2	3	3	1	2	1	76	1,932	25.4
Detroit College of Med. and Surg.	1	3	12	13	12	8	2	5	1	1	1	1	1	1	1	63	1,605	25.5
Eclectic Medical University.....	1	.....	.....	1	.....	1	1	4	134	33.5	
Kansas City College of Med. and Surg.	1	.....	1	.....	2	.....	.....	2	.....	.....	1	2	6	15	504	33.6	
National Univ. of Arts and Sciences...	1	4	5	6	6	3	.....	1	1	1	1	2	1	.....	37	990	26.7	
Creighton Medical College.....	3	4	9	7	3	4	3	4	4	1	.....	1	.....	.....	.....	43	1,076	25.0	
Albany Medical College.....	4	10	3	8	7	7	1	.....	1	1	.....	.....	.....	.....	42	1,050	25.0	
University of Buffalo.....	1	3	5	15	11	6	3	3	4	1	.....	4	2	.....	.....	2	60	1,525	25.4	
Long Island College Hospital.....	6	12	7	9	13	11	4	1	4	1	.....	1	1	.....	.....	70	1,725	24.6	
North Carolina Medical College.....	1	1	1	3	2	1	1	2	3	.....	2	.....	.....	.....	.....	17	446	26.2	
Eclectic Medical College.....	2	2	2	5	9	2	2	.....	3	.....	1	.....	.....	1	29	771	26.6	
Ohio State University College of Med.	1	5	6	12	13	5	4	11	2	3	1	.....	2	.....	.....	65	1,673	25.7	
Ohio State University, Homeopathic.....	2	1	.....	1	2	.....	.....	1	.....	.....	.....	.....	1	8	219	27.4	
University of Oklahoma.....	1	4	3	4	1	1	.....	.....	1	1	3	.....	1	4	24	679	28.3	
Jefferson Medical College.....	1	13	18	29	28	12	13	8	7	7	.....	1	1	1	.....	140	3,553	25.4	

TABLE 4.—AVERAGE AGE OF GRADUATES OF 1917—(Concluded)
GROUP 1.—ADMISSION REQUIREMENTS—1913—A HIGH SCHOOL EDUCATION

543

Colleges	Number of Graduates at Various Ages																	Total Students	Total Years	Aver. Age
	Under 21	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	Over 35			
Medico-Chirurgical Coll. of Philadelphia		1	7	9	19	12	12	8	8	3	3	.....	1	2	.....	.....	.....	85	2,165	25.5
Temple University				1	2	4	1	1	5	1	1	.....	1	1	.....	1	.....	19	523	27.5
Medical College of South Carolina.....		1	1	1	3	7	5	1	1	.....	2	2	.....	.....	.....	.....	.....	24	620	25.8
Lincoln Memorial University.....						2	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	4	120	30.0
University of Tennessee.....			3	5	13	6	6	4	6	4	1	3	1	1	1	.....	4	58	1,570	27.1
University of West Tennessee.....						.....	.....	1	.....	.....	.....	1	1	.....	1	.....	.....	4	124	31.0
Meharry Medical College.....				4	7	7	15	15	11	12	7	8	3	1	3	.....	5	98	2,763	28.2
Vanderbilt University		6	17	11	21	7	4	3	2	1	1	1	.....	.....	.....	1	.....	75	1,798	24.0
Fort Worth School of Medicine.....		1	2	1	1	.....	1	1	1	1	2	1	.....	1	.....	.....	.....	13	346	26.6
Medical College of Virginia.....		2	4	8	20	22	8	10	9	6	3	2	.....	1	.....	.....	.....	95	2,433	25.6
Marquette University				1	2	4	1	1	.....	1	.....	.....	.....	.....	.....	.....	2	12	331	27.6
Totals, 41 colleges.....	1	35	128	204	260	249	181	141	113	73	66	48	35	29	19	24	62	1,668	43,987	26.4
Percentage	0.6	2.1	7.6	12.2	15.6	14.9	10.8	8.4	6.7	4.3	3.9	2.9	2.1	1.7	1.4	1.4	3.7			

GROUP 2.—ADMISSION REQUIREMENTS—1913—ONE YEAR OF COLLEGE WORK

Howard University	.....	.....	.....	1	2	1	3	2	1	1	.....	1	.....	.....	.....	1	13	366	28.1
University of Illinois	.....	.....	1	6	4	4	3	13	4	5	5	2	.....	.....	2	.....	49	1,322	27.0
Tulane University of Louisiana	.....	.....	3	11	12	5	4	4	5	1	3	1	.....	1	.....	2	52	1,337	25.7
Bowdoin Medical School	.....	.....	.....	1	1	1	4	1	.....	1	.....	.....	.....	.....	.....	2	10	288	28.3
St. Louis University	.....	.....	.....	3	4	11	10	7	4	1	.....	.....	.....	.....	.....	1	41	1,066	26.0
Fordham University	.....	.....	1	5	10	7	7	3	5	3	3	1	.....	1	1	2	49	1,308	26.7
University and Bellevue Hospital	.....	.....	6	16	20	5	8	1	2	2	.....	.....	.....	.....	1	1	64	1,603	25.1
University of Oregon	.....	.....	.....	1	1	1	1	5	.....	.....	2	.....	.....	.....	.....	2	12	347	28.9
Hahnemann, Philadelphia	.....	1	7	6	4	5	4	2	5	2	1	.....	.....	.....	.....	.....	37	920	24.9
Woman's Med. Coll. of Pennsylvania	.....	.....	1	1	4	1	1	1	2	.....	1	.....	.....	.....	3	1	17	482	28.3
Baylor University	.....	.....	.....	1	.....	3	.....	4	2	.....	.....	.....	.....	1	.....	.....	11	294	26.7
University of Texas	.....	.....	1	4	7	6	4	8	6	10	2	2	.....	.....	.....	.....	50	1,332	26.6
University of Vermont	.....	.....	.....	2	4	.....	4	2	.....	1	3	.....	2	.....	.....	.....	18	485	26.9
University of Virginia	.....	.....	1	2	4	8	8	3	.....	.....	1	.....	1	.....	.....	.....	23	585	25.4
Totals, 14 colleges	1	22	56	76	59	54	57	37	27	22	6	2	5	7	4	11	446	11,738	26.3
Percentages	0.2	4.9	12.6	17.0	13.2	12.1	12.8	8.3	6.1	4.9	1.3	0.5	1.1	1.6	0.9	2.5			

GROUP 3.—ADMISSION REQUIREMENTS—1913—TWO OR MORE YEARS OF COLLEGE WORK

Ieland Stanford Junior.....					3	2	5	7	3	1			1			1	23	644	28.0	
University of California.....			1	2	6	7	4	3		1			1			1	26	695	26.7	
University of Colorado.....			1	4	7	2	1	2			2	1	1				21	556	26.5	
Yale University.....				1	4	2	2		1								10	259	25.9	
Georgetown University.....			2	1	3	2		4					1				13	342	26.3	
Northwestern University.....		2	2	5	12	3	3	5	2	1	1	3					42	1,120	26.7	
Rush Medical College.....			5	18	25	21	19	6	6	4	5	5	3	1		4	122	3,292	27.0	
Indiana University.....		1		3	5	7	6	3	5	1	2	1		2		1	37	1,025	27.7	
State University of Iowa.....				1	2	7	3	3	2					1		1	20	550	27.5	
State University of Iowa, Homeopathic.....			1														1	23	23.0	
University of Kansas.....		1	1	2	5	4	1	2	1		1	2				1	19	501	26.4	
Johns Hopkins University.....				7	25	18	18	9	2	3		2	1	1	1	2	89	2,394	26.9	
Medical School of Harvard University.....			1	7	16	13	11	11	2	2		3				1	67	1,784	26.6	
University of Michigan Medical School.....			2	11	14	10	10	7	5			2				1	62	1,632	26.3	
University of Minnesota.....				1	6	3	3	2	1								16	418	26.1	
Washington University.....		2	2	9	6	5	3	2				1	1				31	788	25.4	
University of Nebraska.....			1		6	5	1	1		1	1		1				17	452	26.6	
Columbia University.....		3	14	12	18	12	8	9	5	1	4	3			1		90	2,336	25.9	
Cornell University.....			1	1	2	7	9	3	1	2			1				27	702	26.0	
Syracuse University.....			2	3	2	8	9	3			1					1	29	753	26.0	
University of Cincinnati.....				1	2	3	1	2			1	1				1	14	382	27.3	
Western Reserve University.....				2	6	4	9	3	1	3	1	2				1	32	881	27.5	
University of Pennsylvania.....				5	5	23	15	6	4	6	1	1	2	2		2	73	1,949	26.7	
University of Pittsburgh.....			1	7	4	2	2		1	1		1		1			20	522	26.1	
Totals, 24 colleges.....			12	44	104	214	163	123	84	48	22	19	24	16	8	2	18	901	24,000	26.6
Percentages.....			1.3	4.9	11.5	23.8	18.1	13.7	9.3	5.3	2.4	2.1	2.7	1.8	0.9	0.2	2.0			
Grand totals (79 colleges).....	1	36	162	304	440	522	398	321	234	148	110	73	61	50	34	30	91	3,015	79,725	26.4
Percentage of all graduates at each age	0.2	1.2	5.4	10.1	14.6	17.3	13.2	10.6	7.8	4.9	3.6	2.4	2.0	1.6	1.1	1.0	3.0			

This table shows the average ages of the graduates of the 79 medical colleges from which information in regard to age was obtained. The colleges are arranged in three groups, according to the entrance requirements in 1913, at the time these graduates matriculated. Group 1 is those which required a high school education; Group 2 those which required one year of college work, and Group 3 those which required two or more years of college work. At the bottom of each group table the totals and percentages of graduates of each age are given. The grand totals and the percentages of all graduates of the 79 colleges are given under the table for Group 3. It would be expected that the average age of graduates under Groups 2 and 3 would be one and two years higher, respectively, than that of Group 1. That such is not the case is due to the fact that more students of advanced age matriculated in the 41 medical colleges in Group 1. Note that 62 students in the colleges of this group were over 35 years of age at the time they graduated, one college having nine such graduates. In fact, of the 62, 18

were 40 years or over, the oldest being 53. The two highest averages, 33.5 and 33.6, were obtained by two colleges of Kansas City, neither of which is reported as recognized by the Missouri State Board of Health.

The lowest average age of all graduates in Group 1 was 24.0 for Vanderbilt University, Nashville; in Group 2 the lowest average age was 24.9, for Hahnemann Medical College of Philadelphia, and in Group 3, omitting a college which had only one graduate, the lowest average was 25.4, obtained by the Washington University, St. Louis. In this comparison we find the expected differences, due, undoubtedly, to differences in entrance requirements. In Group 1 the largest number of students, 260 (15.6 per cent.), were 24 years of age. In Group 2 likewise the largest number, 76 (17 per cent.), were 24 years of age; while in Group 3 the largest number, 214 (23.8 per cent.), were 25 years of age. Higher standards for admission clearly affect the minimum age at graduation, but the most important factor in high averages is the late time when many students enter on the study of medicine.

(Continued from page 541)

regard to the graduates, Illinois leads with 531, followed by New York with 485, Pennsylvania with 401, and Tennessee with 239.

Table 13 shows the students and graduates of the last five years grouped according to the rank of the colleges in the classification of the Council on Medical Education. Note that during the five years the percentage of students enrolled in Class A colleges has increased from 65.4 to 82.2 and that the total attendance of 1917 shows an increase over the total for the

TABLE 12.—MEDICAL COLLEGES, STUDENTS AND GRADUATES BY STATES

State	College		Students		Graduates		Graduates with B.S. or A.B.
	Total	Class C	Men	Women	Men	Women	
Alabama.....	1	..	43	....	18	....	1
Arkansas.....	1	..	43	....	15	....	1
California.....	7	2	477	68	116	25	43
Colorado.....	1	..	81	4	20	1	16
Connecticut.....	1	..	74	3	10	....	9
Dist. of Columbia...	3	..	276	9	66	1	15
Georgia.....	2	..	204	....	74	....	6
Illinois.....	8	2	1,802	115	497	34	158
Indiana.....	1	..	169	6	37	....	29
Iowa.....	2	..	165	4	21	....	8
Kansas.....	1	..	110	8	19	....	15
Kentucky.....	1	..	118	....	66	....	4
Louisiana.....	1	..	250	17	51	1	18
Maine.....	1	..	54	....	10	....	4
Maryland.....	2	..	615	42	165	9	74
Massachusetts.....	4	1	809	46	165	13	192
Michigan.....	3	..	511	20	130	4	56
Minnesota.....	1	..	256	9	17	....	13
Mississippi.....	1	..	60	....	....	....	....
Missouri.....	7	4	692	27	144	9	37
Nebraska.....	3	1	261	7	61	2	20
New Hampshire.....	1	..	40	....	....	....	....
New York.....	10	1	2,223	92	462	23	133
North Carolina.....	3	..	125	....	17	....	....
North Dakota.....	1	..	32	1	....	....	....
Ohio.....	5	..	510	24	144	4	46
Oklahoma.....	1	..	81	4	24	....	2
Oregon.....	1	..	69	3	11	1	4
Pennsylvania..	6	..	1,411	68	381	20	112
South Carolina.....	1	..	59	....	24	....	8
South Dakota.....	1	..	16	1	....	....	....
Tennessee.....	4	1	546	8	236	3	31
Texas.....	3	..	337	18	75	3	13
Utah.....	1	..	22	....	....	....	....
Vermont.....	1	..	82	....	18	....	3
Virginia.....	2	..	314	....	119	....	18
West Virginia.....	1	..	33	1	....	....	....
Wisconsin.....	2	..	181	8	13	....	10
Totals.....	96	2	13,151	613	3,226	153	1,069

TABLE 13.—STUDENTS AND GRADUATES ACCORDING TO CLASSIFICATION

Year	Students						Graduates					
	Colleges Rated in Class						Colleges Rated in Class					
	A	%	B	%	C	%	A	%	B	%	C	%
1913	11,122	65.4	4,158	24.4	1,735	10.2	2,539	63.8	1,050	26.4	392	9.8
1914	12,336	74.7	2,838	17.2	1,328	8.1	2,626	73.1	686	19.1	282	7.8
1915	11,314	76.0	2,668	17.9	909	6.1	2,629	74.4	688	19.4	219	6.2
1916	11,162	79.6	2,087	14.9	773	5.5	2,630	74.7	695	19.8	193	5.5
1917	11,317	82.2	1,761	12.8	686	5.0	2,577	76.3	648	19.2	154	4.5

two previous years. Note, on the other hand, that the percentage of students in Class B colleges has been reduced from 24.4 to 12.8 and in Class C colleges from 10.2 to 5.0. Of graduates, also, the percentage in Class A colleges shows an increase; in Class B colleges it is nearly at a standstill, while in Class C colleges there has been a decrease. *It is evident, therefore, that the reduction in the total numbers of students and graduates has been in the lower grade colleges, while the numbers of students and graduates in the higher grade colleges are actually increasing.*

COLLEGE NOTES

College Closed.—One medical college, the Southwest School of Medicine and Hospital of Kansas City, Mo., was closed permanently in 1916.

Colleges Reestablished.—Two medical colleges have been reestablished. The Eclectic Medical University of Kansas City, which had no classes during 1915-16, was reopened in 1916. The St. Louis College of Physicians and Surgeons was merged in 1915 with the Medical Department of the National University of Arts and Sciences, but in 1916 was reestablished as a separate institution.

Special Items Concerning Medical Education

Alabama.—The city commissioners of Mobile appropriated \$10,000 for the erection of a modern operating room at the City Hospital, for the use of the University of Alabama School of Medicine.

Arkansas.—The Arkansas General Assembly appropriated \$52,708 for the Medical Department of the University of Arkansas for the biennium ending June 30, 1919, of which \$17,258 is for maintenance and improvement. Another bill provided for the sale of certain lands, to secure a sum estimated at \$150,000 for the erection of a new state hospital in Little Rock to be used as the teaching hospital of the Medical Department of the University of Arkansas and be controlled by the trustees of the university. The new Isaac Folsom Clinic building has been completed at a cost of \$55,000.

California.—The College of Medical Evangelists received \$55,218 for the purchase of ground and the erection of a hospital in Los Angeles.

—Leland Stanford Junior University School of Medicine has adopted the quarter system, to begin Oct. 1, 1917, thus providing a continuous session, any three quarters of which will constitute a college year. The new Stanford University Hospital has been erected at a cost of approximately \$500,000.

—The University of California Medical School received sums amounting to \$43,493 to furnish and equip the new University Hospital. The institution received from Mrs. A. F. Morrison \$1,500 for the purchase of an ophthalmologic library.

Connecticut.—Yale University School of Medicine received \$100,000 from Mrs. E. H. Harriman to establish a department of orthopedics, to be shared with the University Department of Health. Pledges amounting to \$250,000 have been made for the endowment fund of the School of Medicine. The university also received \$260,000 for the equipment of the Yale Mobile Hospital Unit, and other gifts amounting to \$6,000. The Brady Memorial Laboratory, presented to Yale University as a memorial to the late Anthony N. Brady, has been completed and equipped at a cost of approximately \$175,000. It is situated on the grounds of the New Haven Hospital, and will house the departments of pathology, bacteriology, pathologic chemistry, obstetrics and gynecology, and medicine.

Georgia.—An outpatient building, costing \$75,000, has been completed on the campus of Emory University School of Medicine in Atlanta. Buildings for anatomy, physiology and chemistry, costing, respectively, \$90,000, \$98,000 and \$54,000, have been erected on the main campus of Emory University.

Illinois.—The University of Chicago, by raising \$3,461,500, has secured the fund of \$2,000,000 offered by the Rockefeller Foundation and the General Education Board for the organization of medical instruction at the university. The money will be used to establish undergraduate and graduate medical schools and a foundation for medical research. The undergraduate medical school will be directly connected with the University on the South Side. The Billings Memorial Hospital, at a cost of \$1,000,000, will also be erected on the Midway. It will contain 250 beds, will have \$3,000,000 endowment, and will be utilized for teaching and clinical study. On the West Side, Rush Medical College, the Presbyterian Hospital and the Central Free Dispensary will be combined to form the new graduate medical school. A new laboratory building costing \$300,000 will be erected on the site of the old Rush Medical College building. The heads of the departments of medicine, surgery and obstetrics and all laboratory men in both the undergraduate and graduate schools will be full-time salaried instructors.

Indiana.—The Indiana University School of Medicine is to have a new medical school building to cost about \$400,000, which will be erected adjoining the Robert W. Long Hospital, the teaching hospital of the university. It is expected the building will be ready for occupancy in the fall of 1918.

Maryland.—Johns Hopkins University Medical Department received \$350,000 from the General Education Board, of which

\$250,000 will be used for the departments of pathology, physical chemistry and several minor branches of the laboratory department, and \$100,000 for the department of pediatrics. The School of Hygiene and Public Health of the university, which will be opened in October, received \$70,000 for maintenance from the Rockefeller Foundation. A bequest of \$300,000 to the Johns Hopkins Hospital, for the erection of the Brady Urological Institute, was provided by the will of James Buchanan Brady.

—The Maryland legislature, at its last session, appropriated \$25,000 a year for two years and ordered the payment of \$30,000 to the medical school of the University of Maryland, which amount had been appropriated by a previous legislature, but never paid. The school has acquired property on West Lombard Street on which a central outdoor obstetrical clinic will be established.

Nebraska.—The University of Nebraska College of Medicine received from the state legislature an appropriation of \$350,000 for the next biennium. Part of the amount will be used in the erection of another laboratory building, an exact duplicate of the one now occupied. The University Hospital, the teaching institution of the University of Nebraska College of Medicine, which, with the equipment, cost approximately \$210,000, has been completed.

New York.—The Albany Medical College received \$10,000 from members of the board of trustees and other donors.

—Columbia University College of Physicians and Surgeons received from Mrs. Clara L. McMurtry, in memory of her son, Dr. Charles Wood McMurtry, the entire furnishings of his library, valued at \$7,000. The school also received a donation of 600 volumes, valued at \$3,000, from Dr. Frederic S. Lee, and a valuable collection of specimens and medical apparatus from Dr. Herbert N. Gorham. The institution received \$1,000 from Willard V. King, to be applied to the medical school removal and rebuilding.

—A bequest of \$500,000 for the endowment fund of Cornell University Medical College was provided by the will of Col. Hazard Payne.

—The faculty of the Long Island College Hospital has voted to make the institution coeducational. Friends of the late Dr. John A. McCorkle have added to his bequest of \$50,000 the sum of \$100,000, which is to be known as the McCorkle Memorial Fund, the income from which may be used as the board of the Long Island College Hospital may direct. The school also received \$20,000 by the will of Francis S. C. A. Ripley.

—The New York Medical College and Hospital for Women received \$3,000 from Mr. W. Dominick for the endowment of the library.

—The University of Buffalo Department of Medicine was given \$2,000 by Dr. Clara A. March, to be known as the Frank Miller March Memorial Fund and loaned to needy students.

Ohio.—The residuary estate of Mrs. Anna Hunt Heady, estimated at \$100,000, was bequeathed to the University of Cincinnati to endow a chair in the medical department, in the name of Dr. James F. Heady.

—Western Reserve University School of Medicine and two allied hospitals have been given land valued at \$350,000. The School of Medicine also received \$300,000 for the erection of new buildings on this land.

Oklahoma.—The state legislature at its last session appropriated \$200,000 for the building and equipment of a hospital at Oklahoma City, to be under the supervision of the School of Medicine of the University of Oklahoma.

Oregon.—The University of Oregon Department of Medicine received an appropriation of \$100,000 from the state legislature.

Pennsylvania.—The Hahnemann Medical College and Hospital of Philadelphia received \$40,000 by the will of Marcus N. Darr, and \$5,000 by the will of Dr. L. H. Adams, for its endowment fund. The school also received \$20,000 from an anonymous donor, to be used in the assistance of needy students, and two donations of \$1,000 each for laboratory apparatus. By the will of the late Dr. Louis L. Posey, his library, consisting of about 2,000 volumes, was given to the institution.

—The Jefferson Medical College of Philadelphia received gifts amounting, approximately, to \$70,000, for its endowment fund.

—The Woman's Medical College of Pennsylvania has secured an additional \$150,000 for its endowment fund. Of

this amount, about \$50,000 was given for scholarship endowments, the rest being unrestricted.

Tennessee.—Meharry Medical College received \$7,500 from the Carnegie Foundation for the Advancement of Teaching, and a similar amount from the General Education Board for general maintenance. It received also \$10,000 from J. W. Anderson and his wife for the erection of the new Anderson anatomic hall.

Virginia.—Citizens of Richmond subscribed \$225,000 for the erection of a hospital for colored patients, and Major James H. Dooley gave \$40,000 to build a hospital for contagious diseases. The buildings now under construction are to be a part of the Memorial Hospital, the teaching hospital of the Medical College of Virginia.

—A new wing to the University of Virginia Hospital has been opened. Besides additional beds, it contains the laboratory of clinical diagnosis, new quarters for the outpatient department and additional rooms for special medical and surgical service.

Wisconsin.—Marquette University School of Medicine has been offered one third of a million dollars by the Carnegie Foundation for the Advancement of Teaching, on condition that the university raise the other two thirds of a million within a year. The fund is to be used in the development of the School of Medicine.

Scholarships and Fellowships in Medical Schools

Harvard University Medical School, in cooperation with the Boston Dispensary, offers a fellowship to graduates in medicine who desire to pursue a course of study leading to the certificate of public health in the school for health officers, or to the degree of Doctor of Public Health in the department of preventive medicine and hygiene. Fellows are required to give half their time to the treatment and supervision of the sick in their homes, in a district of the city of Boston, and half their time to study or research at the medical school. The stipend is \$750 a year, and appointments are for one or two years.

At the University of Minnesota Medical School, fellowships in ophthalmology and otolaryngology have been established by Dr. Frank C. Todd and Dr. Frank E. Burch. They provide a stipend of \$500 the first year, \$750 the second year and \$1,000 the third year. Such fellows are to spend half their time in the private clinic of Dr. Todd or Dr. Burch, and the other half in laboratory and clinical work and in pursuit of certain courses for specialists in ophthalmology and otolaryngology at the university. For work done in these private clinics, credit will be given toward the degree granted by the university in the course in ophthalmology and otolaryngology given to accepted doctors of medicine, covering a period of three years.

In the College of Physicians and Surgeons of Columbia University, under the special George Blumenthal scholarship of \$900, distinct additions have been made to the clinical knowledge of diabetes. Three undergraduate scholarships have also been established during the last two years, and a fourth will be added during this year. The students who receive these scholarships work as special assistants in the laboratory and are used as assistants in laboratory teaching.

Funds for Research

The University of California Medical School has received gifts amounting to \$700 for scientific research in the department of biochemistry.

The Hunterian Laboratory of the Johns Hopkins University Medical Department, made possible through the munificence of the Rockefeller Foundation, has been completed. The building cost about \$115,000 and the scientific equipment many thousands more. This laboratory will be used by men engaged in research work. It is connected by tunnels with the medical school and the physiologic building. It contains the medical library, the department of art as applied to medicine, the Carnegie Embryological Institute, a department for clinical medicine and children's diseases, and the pathologic department.

Washington University Medical School has received \$1,000,000 from the General Education Board to finance research in surgery, medicine and pediatrics.

The Vanderbilt Clinic of the College of Physicians and Surgeons of Columbia University received \$10,000 from the East River Homes Foundation of New York for tuberculosis work. The college also received \$5,000 from Clarence H. Mackay to be added to the fund for surgical research, and \$2,500 from Mrs. Frederick S. Coolidge for maintenance of the Coolidge Research Fellowship in Medicine.

EDUCATION PRELIMINARY TO THE STUDY
OF MEDICINE

PRELIMINARY REPORT OF A SPECIAL COMMITTEE¹ OF THE COUNCIL
ON MEDICAL EDUCATION, THE ASSOCIATION OF AMERI-
CAN MEDICAL COLLEGES AND THE ASSOCIATION
OF AMERICAN UNIVERSITIES, APPOINTED
FEB. 5, 1917

I. High School Requirements

(a) For admission to the two-year premedical college course, students shall have completed a four-year course of at least fourteen (fifteen after Jan. 1, 1920) units in a standard accredited high school or other institution of standard secondary school grade, or have its equivalent as demonstrated by examinations conducted by the College Entrance Examination Board, or by the authorized examiner of a standard college or university which has been approved by the Council on Medical Education. Unless all the entrance units are obtained by examination, a detailed statement of attendance at the secondary school, and a transcript of the student's work should be kept on file by the college authorities. This evidence of actual attendance at the secondary schools should be obtained no matter whether the student is admitted to the freshman or to higher classes.

(b) The subjects for which credits for admission to the Premedical College Course may be granted are shown in the following schedule:

SCHEDULE OF SUBJECTS REQUIRED OR ACCEPTED FOR ENTRANCE TO THE PREMEDICAL COLLEGE COURSE			
Subjects	Units	Required	
English literature and composition.....	3-4	3	
Latin	1-4	..	
Greek	1-3	..	
French or German.....	1-4	2*	
Other foreign languages.....	2	..	
Mathematics			
Elementary algebra	1	1	
Advanced algebra	1½-1	..	
Plane geometry	1	1	
Solid geometry	½	..	
Trigonometry	½	..	
History (one unit required)			
Ancient history	1	1	
Medieval and modern history.....	1		
English history	½-1		
American history	½-1		
Civil government	½-1		
Science			
Botany	½-1	..	
Zoology	½-1	..	
Chemistry	1	..	
Physics	1	..	
Physiography	½-1	..	
Physiology	½-1	..	
Astronomy	½	..	
Geology	½-1	..	
Agriculture	1-2	..	
Bookkeeping	1	..	
Business law	½	..	
Commercial geography	½-1	..	
Domestic science	1-2	..	
Drawing, freehand and mechanical	½-2	..	
Economics and economic history	½-1	..	
Manual training	1-2	..	
Music: Appreciation or harmony.....	1-2	..	

A unit is the credit value of at least 36 weeks' work of four or five recitation periods per week, each recitation period to be of not less than 40 minutes. In other words, a unit represents a year's study in any subject in a secondary school constituting approximately a quarter of a full year's work. A satisfactory year's work in any subject cannot be accomplished under ordinary circumstances in less than 120 sixty-minute hours, or their equivalent.

Of the 15 units of high school work it is suggested that 8 units be required, as indicated in the above schedule, and that other work to the amount of at least 7 units may be made up from any of the other subjects of the above schedule.

* A reading knowledge of French or German is required and should be obtained either in the high school or in college.

II. Premedical College Course

(c) Beginning Jan. 1, 1918, the minimum requirement for admission to acceptable medical schools, in addition to the high school work specified above, will be sixty semester hours of collegiate work, extending through two years, of thirty-two weeks each, exclusive of holidays, in a college of liberal arts and sciences approved by the Council on Medical

1. The Committee consists of Dr. Kendric C. Babcock, Dean of the College of Liberal Arts and Sciences of the University of Illinois, Urbana; Professor George Gailey Chambers, Director of Admissions of the University of Pennsylvania, Philadelphia; Dr. W. F. R. Phillips, Professor of Anatomy of the Medical College of the State of South Carolina; Dr. Theodore Hough, Dean of the University of Virginia Department of Medicine, and Dr. N. P. Colwell, Secretary of the Council on Medical Education of the American Medical Association.

Education. The subjects included in the two years of college work should be in accordance with the following schedule:

SCHEDULE OF SUBJECTS OF THE TWO-YEAR PREMEDICAL COLLEGE COURSE		
Sixty Semester Hours Required		
Required Courses:		Semester Hrs.
Chemistry (a)	12	
Physics (b)	8	
Biology (c)	8	
English Composition and Literature (d).....	6	
French or German (e).....	6-12	
Courses Strongly Urged:		
Advanced Algebra, Solid Geometry and Trigonometry.....	3-6	
Additional courses in Chemistry.....	3-6	
An additional Modern Language—French or German (e)....	6-12	
Psychology	3-6	
Advanced Zoology, Embryology or Comparative Anatomy.....	3-6	
Suggested Elective Courses:		
English (additional), Economics, History, Sociology, Political Science, Logic, Mathematics, Latin, Greek, Drawing.		

SUGGESTIONS REGARDING INDIVIDUAL SUBJECTS

(a) *Chemistry*. Twelve semester hours required, of which six must consist of laboratory work. Of the twelve, at least eight semester hours must be in general inorganic chemistry, of which four semester hours must consist of laboratory work. The remaining hours may consist of work in analytic or organic chemistry. When more than two years are spent in college, courses in organic, analytic or physical chemistry may be taken to advantage. Chemistry is probably the most important science fundamental to medicine.

(b) *Physics*. Eight semester hours required, of which at least two must be laboratory work. It is urged that this course be preceded by courses in advanced algebra, solid geometry and trigonometry.

(c) *Biology*. Eight semester hours required, of which four must consist of laboratory work. This requirement may be satisfied by an eight semester hour course in either general biology or zoology, or by four semester hour courses each in zoology and botany.

(d) *English Composition and Literature*. The usual six semester hour introductory college course, or its equivalent, is required.

(e) *French or German*. A reading knowledge of one of these languages is required, and the requirement may be absolved by demonstration on examination, written or oral, of the ability to read fluently medical French or German. When the requirement is absolved by college work, the student must complete the six semester hour course following either the two semester beginner's college course, or the completion of two entrance units of high school work in the language. When the requirement is absolved by an examination, such examination shall be a standard examination covering a course of at least six semester hours. If credit for such language has been counted toward the required fifteen units of secondary school work, no credit is to be given therefor, in the total sixty semester hours of required college work. If the reading knowledge in one of these languages is obtained on the basis of high school work, the student is urged to take the other language in his college course. It is not considered advisable, however, to spend more than twelve of the required sixty semester hours on foreign language. In case a reading knowledge of one language is obtained by six semester hours of college work, another six semester hours may be well spent in taking the beginner's course in the other language; if this is followed up by systematic reading of scientific prose, a reading knowledge of the second language may be readily acquired. When a student spends more than two years in college he may well spend twelve semester hours of his college work in the second language.

STANDARDS OF THE COUNCIL ON MEDICAL
EDUCATION OF THE AMERICAN MEDICAL
ASSOCIATION

ESSENTIALS OF AN ACCEPTABLE MEDICAL
COLLEGE

(Revised to Aug. 15, 1917)

The following outline of the essentials of an acceptable medical college was issued by the Council on Medical Education of the American Medical Association for its suggestive value in the rapid development in progress in the medical colleges of the United States. It also represents the basis on which medical colleges are rated in the Council's classifications.

ADMISSION OF STUDENTS

1. A strict enforcement of the foregoing¹ standards and requirements for admission, the college itself to be held responsible for any instances in which they are not enforced.

Note.—Since the product of the medical school depends largely on the quality of the students admitted, in rating medical colleges, special emphasis is laid by the Council on the strictness and honesty by which the standards of admission and advanced standing are administered. By the admission of unfit students the school is handicapped from the very beginning and, in the opinion of the Council, deserves a low rating regardless of its equipment, its clinical facilities and its teaching force.

ENTRANCE CONDITIONS UNTIL JAN. 1, 1918

2. A student may be admitted with certain subject conditions provided he has completed at least one year [thirty semester hours, see paragraph (c)] of work in an approved college of liberal arts or science, provided *no conditions may be permitted in the prescribed eight semester hours of college chemistry*. These conditions may be either in (1) or (2), but not in both: (1) In one half (four semester hours) of the required course in physics, or, (2) in one half of the required course in biology (four semester hours), or in zoology (three semester hours). These conditions must be removed before the beginning of the work of the second medical year, and the credits for these conditions must be in addition to the required thirty semester hours.

(c) A candidate who has completed two or more years of work in an approved college of liberal arts, or science, may be admitted conditioned in all of the required work in physics, or in one half of the physics and one half of the work required in biology, to a total not to exceed eight semester hours. These conditions must be removed before the beginning of the second medical year. No condition may be permitted in the prescribed eight semester hours of college chemistry.

After Jan. 1, 1918, the minimum requirement for admission to acceptable medical schools will be two years (sixty semester hours) of work in a college of arts and sciences¹ approved by the Council on Medical Education or its actual educational equivalent as demonstrated by an examination approved by the Council. It is suggested that in addition to the courses outlined in the preceding paragraph, this two year course include a course in organic chemistry, a second year of biology and more work in the modern language unless the student already possesses a reading knowledge of it.

APPROVED COLLEGES OF ARTS AND SCIENCES

3. (a) A list of colleges of arts and sciences approved by the Council on Medical Education is being prepared and will be published from time to time. By an approved college (of arts and sciences) is meant one whose standing has been vouched for by some standardizing agency in whose methods the Council has confidence. To be approved a college must have sufficient scientific equipment and maintain laboratories in the premedical sciences. It must have ample endowment to maintain a sufficient corps of teachers. Membership in some national organization or association of colleges will be favorably regarded by the Council and, in the absence of such membership, careful investigation will be made of the causes of exclusion.

MEDICAL SCHOOL REQUIREMENTS

4. The college should require that students be in actual attendance in the college *within the first week* of each annual session and thereafter.

5. Actual attendance at classes should be insisted on except for good cause, such as for sickness, and under no circumstances should credit be given for any course where the attendance has been less than 80 per cent. of the full time.

6. (a) Full advanced standing may be granted to students only for work done in other acceptable colleges, and in granting advanced standing there should be no discrimination against the college's full-course students. (b) In *exceptional cases* students from Class B medical schools may be given advanced standing but not higher than *entrance* to the third year (junior) class, and no credit should be given in any subject except on recommendation of the head of the department teaching that subject. (c) In *exceptional cases* students from Class C colleges may be given advanced standing but not higher than *entrance* to the second year (sophomore) class, and then only after thorough examinations in all first year subjects have been passed.

1. See report of special committee on "Education Preliminary to the Study of Medicine."

SUPERVISION, EQUIPMENT, TEACHERS

7. There should be careful and intelligent supervision of the entire school by a dean or other executive officer who holds, and has sufficient authority to carry out, fair ideals of medical education as determined by modern knowledge.

8. There should be a good system of records showing conveniently and in detail the credentials, attendance, grades and accounts of the students by means of which an exact knowledge can be obtained regarding each student's work. Records should also be kept showing readily the attendance of patients at the teaching hospitals and dispensaries; the maternity cases attended by students, and the postmortem cases used in teaching.

9. The college should have a fully graded course covering four years of at least thirty-two weeks each, exclusive of time required for matriculation and holidays, and at least thirty hours per week of actual work; this course should be clearly set forth in a carefully prepared and printed schedule of lectures and classes.

(a) The college should give two years of work consisting largely of laboratory work in thoroughly equipped laboratories in anatomy, histology, embryology, physiology, chemistry (inorganic, organic and physiologic), bacteriology, pathology, pharmacology, therapeutics and clinical diagnosis. Present-day medical knowledge makes it essential that these subjects be in charge of full-time, well-trained teachers.

(b) Two years of clinical work largely in hospitals and dispensaries, with thorough courses in internal medicine (including physical diagnosis, pediatrics, nervous and mental diseases), surgery (including surgical anatomy and operative surgery on the cadaver), obstetrics, gynecology, laryngology, rhinology, ophthalmology, otology, dermatology, hygiene and medical jurisprudence.

(c) As soon as conditions warrant, a fifth undergraduate year should be required which should be spent by the student as an intern in an approved hospital.

10. The college should provide at least *six expert, thoroughly trained professors* in the laboratory branches, salaried so that they may devote their entire time to instruction and to that research without which they cannot well keep up with the rapid progress being made in their subjects.² There should also be a sufficient number of assistants in each department to look after the less important details. For colleges having *sixty students or less* in each class, there should be *at least one full-time salaried assistant each in the departments* of (a) anatomy, (b) physiology, (c) pathology and bacteriology, and (d) physiologic chemistry and pharmacology, and *one additional assistant in each of these departments should be provided for each additional thirty students enrolled*. This represents a low average of the full-time assistants already employed by the acceptable medical colleges.

11. The faculty should be thoroughly organized and should be made up of graduates of institutions recognized as medical colleges and who have had a training in all departments of medicine. Nonmedical men should be selected as teachers in medical schools only under exceptional circumstances and only when medical men of equal special capacity are not available. Faculty members should be appointed because of their ability as teachers and not because they happen to be on the attending staff of a hospital or for other like reasons.

CLINICAL FACILITIES

12. The college should own or entirely control a hospital in order that students may come into close and extended contact with patients under the supervision of the attending staff. This hospital should be in close proximity to the college and have a daily average (for senior classes of 100 students *or less*) of not less than 200 patients who can be utilized for clinical teaching, these patients to be of such character as to permit the student to see and study the common variety of surgical and medical cases as well as a fair number in each of the so-called specialties. In the use of this material it is suggested that *bedside and ward clinics* be developed for sections of from five to ten students, and that a certain number of patients in medicine, surgery and the specialties be assigned to each senior student. A

2. These professors should have a definite responsibility in the conduct of the college, and their first and chief interest should be the training of medical students. It is advised that four of these professors be placed in charge of the departments of (a) anatomy, (b) physiology, (c) pathology and bacteriology and (d) physiologic chemistry and pharmacology. The other two may be assigned one to the laboratory course in histology and embryology under the department of anatomy and the other to the department of pathology and bacteriology, possibly to the course in laboratory clinical diagnosis.

well supervised clinical clerk system should also be installed. The treatment and care of these patients should be particularly observed and recorded by the student under the strict supervision of the intern, or the attending staff of the hospital.³

13. The college should also have ample hospital facilities for children's diseases, contagious diseases and nervous and mental diseases.

14. At least six maternity cases should be provided for each senior student, who should have actual charge of these cases under the supervision of the attending physician. Careful records of each case should be handed in by the student.

15. Facilities should be provided for at least thirty necropsies (for senior classes of 100 students *or less*) during each college session which are attended and participated in by senior students.

16. The college should own or control a dispensary, or outpatient department, the attendance to be a daily average of 100 patients (visits) (for senior classes of 100 students *or less*), the patients to be carefully classified, good histories and records of the patients to be kept and the material to be well used. The attending staff should be made up of good teachers, should be well organized and be regular in attendance.

OTHER TEACHING FACILITIES AND FINANCES

17. The college should have a working medical library to include the more modern text and reference books with the *Index Medicus* and thirty or more leading medical periodicals; the library room should be properly lighted and heated, and easily accessible to students during all or the greater part of the day; it should be equipped with suitable tables and chairs, and have a librarian in charge.

18. A working medical museum having its various anatomic, embryologic, pathologic and other specimens carefully prepared, labeled and indexed so that any specimen may be easily found and employed for teaching purposes. It is suggested that so far as possible with each pathologic specimen coming from postmortems there also be kept the record of the postmortem, the clinical history of the patient on whom the necropsy was held and microscopic slides showing the minute structures of the disease shown in the gross specimen.

19. There should be sufficient dissecting material to enable each student individually to dissect at least the lateral half of the human cadaver; to provide cross-sections and other demonstration material and to allow of a thorough course for each senior in operative surgery on the cadaver.

20. For modern experimental laboratory work in physiology, pharmacology and bacteriology as well as for a reasonable amount of medical research, a supply of animals—frogs, turtles, rabbits and guinea-pigs, if not also cats and dogs—is essential. Proper provision, also, is necessary for the housing and care of such animals. In any use made of animals great care should be used to prevent needless suffering, and work by students should be carefully supervised.

21. A supply of such useful auxiliary apparatus as a stereopticon, a reflectoscope, carefully prepared charts, embryologic or other models, manikins, dummies for use in bandaging, a Roentgen ray and other apparatus now so generally used in medical teaching.

22. The college should show evidences of thorough organization and of reasonably modern methods in all departments and evidences that the equipment and facilities are *being intelligently used* in the training of medical students.

23. A clear statement of the college's requirements for admission, tuition, time of attendance on the classes, sessions, courses offered and graduation should be clearly set forth, together with complete classified lists of its matriculants and latest graduating class in regular annual catalogues or announcements.

24. Statistics show⁴ that modern medicine cannot be acceptably taught by a medical school depending solely on the income from students' fees. No medical school should expect to be retained in Class A, therefore, which does not have an annual income of at least \$25,000 in addition to the amount obtained from students' fees.

NOTE.—Correspondence from medical colleges regarding the above requirements is invited, and further suggestions or information available will be gladly furnished.

Grading of Medical Colleges

All medical colleges are rated by the Council on Medical Education on a civil service basis on a scale of 1,000 points. The data relating to each college are grouped under ten general heads in such manner that the groups have as nearly equal weight as possible, each group allowing a possible 100 points (10 per cent.) out of a possible 1,000 points (100 per cent.). The ten heads under which the data are arranged are as follows:

1. Showing of graduates before state boards and other evidences of the training received.
2. Enforcement of a satisfactory preliminary educational requirement, granting of advanced standing and the character of the records.
3. Character of curriculum, grading of course, length of session, time allowed for matriculation and supervision.
4. Medical school buildings; light, heat, ventilation, cleanliness.
5. Laboratory facilities and instruction.
6. Dispensary facilities and instruction.
7. Hospital facilities and instruction, maternity work, necropsies, specialties.
8. Faculty, number and qualifications of trained teachers, full-time instructors, and assistants, especially of the laboratory branches, organization, and extent of research work.
9. Extent to which the school is conducted for properly teaching the science of medicine rather than for the profit of the faculty directly or indirectly.
10. Possession and use made of libraries, museums, charts, stereopticons, etc.

Class A colleges are those which are acceptable; Class B, those which, under their present organization, might be made acceptable by general improvements, and Class C, those which require a complete reorganization to make them acceptable.

CLASSIFICATION OF MEDICAL COLLEGES

Revised to June 7, 1917

CLASS A—ACCEPTABLE MEDICAL COLLEGES

ALABAMA

University of Alabama School of Medicine.....Mobile

CALIFORNIA

Leland Stanford Junior Univ. School of Med..San Francisco

University of California Medical School.....San Francisco

COLORADO

University of Colorado School of Med.....Boulder-Denver

CONNECTICUT

Yale University School of Medicine.....New Haven

DISTRICT OF COLUMBIA

Georgetown University School of Medicine.....Washington

George Washington University Medical School..Washington

Howard University School of Medicine¹.....Washington

GEORGIA

Emory University School of Medicine².....Atlanta

University of Georgia Medical Department³.....Augusta

ILLINOIS

Northwestern University Medical School.....Chicago

Rush Medical College (University of Chicago).....Chicago

University of Illinois College of Medicine.....Chicago

INDIANA

Indiana Univ. School of Med.....Bloomington-Indianapolis

IOWA

State University of Iowa College of Medicine....Iowa City

State Univ. of Iowa Coll. of Homeopathic Med....Iowa City

KANSAS

University of Kansas School of Med....Lawrence-Rosedale

KENTUCKY

University of Louisville Medical Department⁴.....Louisville

LOUISIANA

Tulane Univ. of Louisiana School of Med....New Orleans

MAINE

Bowdoin Medical School.....Brunswick-Portland

MARYLAND

Johns Hopkins University Medical Department...Baltimore

University of Maryland School of Medicine and the College of Physicians and Surgeons.....Baltimore

3. Suggestions more in detail may be found in the "Report of the Committee on the Reorganization of Clinical Teaching," THE JOURNAL A. M. A., March 6, 1915. Reprint sent on application.

4. See Medical College Finances, THE JOURNAL A. M. A., April 8, 1916, p. 1115.

1. Rating raised to Class A June 6, 1910.

2. Rating raised to Class A Feb. 24, 1914; formerly the Atlanta Medical College.

3. Class A rating restored Feb. 24, 1913.

4. Rating raised to Class A June 6, 1910.

MASSACHUSETTS

Boston University School of Medicine.....Boston
Medical School of Harvard University.....Boston
Tufts College Medical School.....Boston

MICHIGAN

Detroit College of Medicine and Surgery⁵.....Detroit
University of Michigan Medical School.....Ann Arbor
University of Mich. Homeopathic Med. School....Ann Arbor

MINNESOTA

University of Minnesota Medical School.....Minneapolis

MISSISSIPPI

University of Mississippi School of Medicine*.....Oxford

MISSOURI

St. Louis University School of Medicine.....St. Louis
University of Missouri School of Medicine*.....Columbia
Washington University Medical School.....St. Louis

NEBRASKA

John A. Creighton Medical College⁶.....Omaha
University of Nebraska College of Medicine.....Omaha

NEW HAMPSHIRE

Dartmouth Medical School*.....Hanover

NEW YORK

Albany Medical College.....Albany
Columbia Univ. Coll. of Phys. and Surgs....New York City
Cornell University Medical College.....New York City
Fordham University School of Medicine⁷.....New York City
Long Island College Hospital⁸.....Brooklyn
Syracuse University College of Medicine.....Syracuse
University and Bellevue Hospital Med. Coll..New York City
University of Buffalo Department of Medicine.....Buffalo

NORTH CAROLINA

University of North Carolina School of Med.* Chapel Hill
Wake Forest College School of Medicine*....Wake Forest

NORTH DAKOTA

University of North Dakota School of Medicine*..University

OHIO

Ohio State University College of Medicine.....Columbus
University of Cincinnati College of Medicine....Cincinnati
Western Reserve University School of Medicine..Cleveland

OREGON

University of Oregon Medical School.....Portland

PENNSYLVANIA

Hahnemann Medical College and Hospital.....Philadelphia
Jefferson Medical College of Philadelphia.....Philadelphia
University of Pennsylvania School of Med....Philadelphia
University of Pittsburgh School of Medicine⁹.....Pittsburgh
Woman's Medical College of Pennsylvania.....Philadelphia

SOUTH CAROLINA

Medical College of the State of South Carolina¹⁰..Charleston

SOUTH DAKOTA

University of South Dakota College of Medicine*..Vermilion

TENNESSEE

University of Tennessee College of Medicine¹¹.....Memphis
Vanderbilt University Medical Department.....Nashville

TEXAS

Baylor University College of Medicine¹².....Dallas
University of Texas Department of Medicine....Galveston

UTAH

University of Utah School of Medicine*.....Salt Lake City

VERMONT

University of Vermont College of Medicine.....Burlington

VIRGINIA

Medical College of Virginia.....Richmond
University of Virginia Department of Med....Charlottesville

WEST VIRGINIA

West Virginia Univ. School of Medicine*¹³.....Morgantown

WISCONSIN

Marquette University School of Medicine¹⁴.....Milwaukee
University of Wisconsin Medical School*.....Madison
Total, 69.

CLASS B—COLLEGES NEEDING GENERAL
IMPROVEMENTS TO BE MADE
ACCEPTABLE

ARKANSAS

University of Arkansas Medical Department....Little Rock

CALIFORNIA

Oakland College of Medicine and Surgery¹⁵.....Oakland
University of Southern California Medical Department (Col-
lege of Physicians and Surgeons).....Los Angeles

ILLINOIS

Chicago College of Medicine and Surgery.....Chicago
Hahnemann Medical College and Hospital¹⁶.....Chicago
Loyola University School of Medicine¹⁷.....Chicago

NEW YORK

New York Homeopathic Medical College and
Flower Hospital¹⁸.....New York City

NORTH CAROLINA

Leonard Medical School*¹⁹.....Raleigh

OHIO

Eclectic Medical College.....Cincinnati
Ohio State Univ. Coll. of Homeopathic Med.²⁰.....Columbus

OKLAHOMA

Univ. of Oklahoma School of Med.²¹..Norman-Oklahoma City

PENNSYLVANIA

Temple University Department of Medicine²²....Philadelphia

TENNESSEE

Meharry Medical College²³.....Nashville

TEXAS

Fort Worth School of Medicine²⁴.....Fort Worth
Total, 14.

CLASS C—COLLEGES REQUIRING A COMPLETE
REORGANIZATION TO MAKE THEM
ACCEPTABLE

CALIFORNIA

College of Medical Evangelists....Loma Linda-Los Angeles
College of Physicians and Surgeons.....San Francisco

ILLINOIS

Chicago Hospital College of Medicine.....Chicago
Jenner Medical College²⁵.....Chicago

MASSACHUSETTS

College of Physicians and Surgeons.....Boston

MISSOURI

Eclectic Medical University²⁶.....Kansas City
National Univ. of Arts and Sciences Med. Dept.²⁷....St. Louis

NEBRASKA

Lincoln Medical College²⁸.....Lincoln

* Give only the first two years of the medical course.

13. Class A rating restored Feb. 4, 1917.

14. Rating raised to Class A Feb. 15, 1915.

15. Rating dropped to Class B June 6, 1910.

16. Rating dropped to Class B June 3, 1912.

17. Heretofore known as Bennett Medical College.

18. Rating dropped to Class B Feb. 15, 1915.

19. Rating raised to Class B June 21, 1914.

20. Rating raised to Class B Feb. 4, 1917.

21. Rating dropped to Class B June 3, 1912.

22. Rating raised to Class B June 6, 1910.

23. Rating dropped to Class B Feb. 24, 1914.

24. Rating changed to Class B May 10, 1914.

25. Rated in Class C when last inspected—1912. Has recently refused reinspection. Data otherwise obtained do not indicate that a higher rating is warranted.

26. An offshoot of this institution—the Kansas City College of Medicine and Surgery—was organized in 1915. It is reported not recognized by the Missouri State Board of Health. Since it is an offshoot of a Class C institution reported not recognized by the Missouri State Board of Health, no higher rating could be granted it pending an inspection.

27. Formerly known as the American Medical College.

28. Formerly known as the Cotner University Medical College.

* Gives only the first two years of the medical course.

5. Class A rating restored June 21, 1914.

6. Class A rating restored Feb. 4, 1917.

7. Class A rating restored Feb. 24, 1914.

8. Class A rating restored June 21, 1914.

9. Rating raised to Class A June 6, 1910.

10. Class A rating restored Feb. 6, 1916.

11. Rating raised to Class A June 21, 1914.

12. Rating raised to Class A June 12, 1916.

NEW YORK

New York Med. Coll. and Hosp. for Women²⁹. New York City

TENNESSEE

University of West Tenn. Coll. of Med. and Surg.. Memphis
Total 10.CLASSIFICATION OF CANADIAN MEDICAL
COLLEGES

CLASS A

University of Toronto Faculty of Medicine.... Toronto, Ont.
McGill University Faculty of Medicine..... Montreal, Que.

CLASS B

University of Manitoba, Manitoba Medical College³⁰ Winnipeg, Ont.
Dalhousie University Faculty of Medicine.... Halifax, N. S.
Western University Faculty of Medicine³¹ London, Ont.
Montreal School of Medicine and Surgery.... Montreal, Que.
Laval University Faculty of Medicine..... Quebec, Que.

CLASS C

Queen's University Faculty of Medicine³² Kingston, Ont.

The University of Alberta at Edmonton, besides the pre-medical year, gives only the first two years of the medical course as measured by that of the medical schools of the United States. It has not been inspected.

Colleges Not Recognized

Official statement from the following thirty-six state licensing boards indicate that as a rule the colleges rated in Class C are not recognized:

Alabama	Maine	Ohio
Arkansas (Reg.)	Maryland (Reg.)	Oklahoma
Colorado	Michigan	Pennsylvania
Connecticut (Reg.)	Minnesota	Porto Rico
Delaware	Mississippi	Rhode Island
Florida (Reg.)	Montana	South Carolina
Georgia	New Hampshire	South Dakota
Indiana	New Jersey	Texas
Iowa	New Mexico	Vermont
Kansas	New York	Virginia
Kentucky	North Carolina	West Virginia
Louisiana (Reg.)	North Dakota	Wisconsin

The licensing boards of Montana, New Hampshire, Rhode Island and Virginia report that they recognize only the medical colleges listed in Class A.

Colleges Having Higher Entrance Requirements

The fifty-three medical schools* which are now requiring, as a minimum for entrance, *two years* or more of work in a college of liberal arts in addition to a four-year high-school education, the year when the higher requirement became effective and the rating of each college, are as follows:

	In College Effect Rating
ALABAMA	
University of Alabama School of Medicine.....	1915 A
CALIFORNIA	
College of Medical Evangelists.....	1915 C
University of Southern California Medical Department (College of Physicians and Surgeons)	1916 B
Leland Stanford Junior University School of Medicine....	1909 A
University of California Medical School.....	1905 A
COLORADO	
University of Colorado School of Medicine.....	1910 A
CONNECTICUT	
Yale University School of Medicine.....	1909 A
DISTRICT OF COLUMBIA	
Georgetown University School of Medicine.....	1912 A
Howard University School of Medicine.....	1914 A
ILLINOIS	
Hahnemann Medical College and Hospital.....	1916 B
Northwestern University Medical School.....	1911 A
Rush Medical College (University of Chicago).....	1904 A
University of Illinois College of Medicine.....	1914 A
INDIANA	
Indiana University School of Medicine.....	1910 A
IOWA	
State University of Iowa College of Medicine.....	1910 A
State University of Iowa College of Homeopathic Medicine	1910 A
KANSAS	
University of Kansas School of Medicine.....	1909 A

* 29. Rating dropped to Class C June 3, 1912.

30. Rating dropped to Class B Feb. 6, 1916.

31. Rating raised to Class B Feb. 4, 1917.

32. Rating dropped to Class C Feb. 6, 1916.

* Colleges will be omitted from this list unless evidence obtained shows that, in the admission of students, they are requiring at least sixty semester hours of preliminary collegiate work in addition to a four-year high school education.

MAINE

Bowdoin Medical School..... 1916 A

MARYLAND

Johns Hopkins University Medical Department..... 1893 A

MASSACHUSETTS

Boston University School of Medicine..... 1916 A
Medical School of Harvard University..... 1900 A

MICHIGAN

University of Michigan Medical School..... 1909 A
University of Michigan Homeopathic Medical School..... 1916 A

MINNESOTA

University of Minnesota Medical School..... 1907 A

MISSOURI

University of Missouri School of Medicine..... 1910 A
Washington University Medical School..... 1912 A

NEBRASKA

University of Nebraska College of Medicine..... 1909 A

NEW HAMPSHIRE

Dartmouth Medical School 1910 A

NEW YORK

Columbia University College of Physicians and Surgeons.. 1910 A
Cornell University Medical College..... 1908 A
Syracuse University College of Medicine..... 1910 A

NORTH CAROLINA

Leonard Medical School..... 1914 B
Wake Forest College School of Medicine..... 1908 A
University of North Carolina School of Medicine..... 1917 A

NORTH DAKOTA

University of North Dakota School of Medicine..... 1907 A

OHIO

Ohio State University College of Medicine..... 1915 A
Ohio State Univ. College of Homeopathic Medicine..... 1916 C
University of Cincinnati College of Medicine..... 1913 A
Western Reserve University School of Medicine..... 1901 A

OKLAHOMA

University of Oklahoma School of Medicine..... 1917 B

OREGON

University of Oregon Department of Medicine..... 1915 A

PENNSYLVANIA

Hahnemann Medical College and Hospital..... 1917 A
Jefferson Medical College..... 1917 A
University of Pennsylvania School of Medicine..... 1910 A
University of Pittsburgh School of Medicine..... 1913 A
Woman's Medical College of Pennsylvania..... 1915 A

SOUTH CAROLINA

Medical College of the State of South Carolina..... 1916 A

SOUTH DAKOTA

University of South Dakota College of Medicine..... 1909 A

TEXAS

University of Texas Department of Medicine..... 1917 A

UTAH

University of Utah School of Medicine..... 1910 A

VIRGINIA

Medical College of Virginia..... 1915 A
University of Virginia Department of Medicine..... 1917 A

WEST VIRGINIA

West Virginia University School of Medicine..... 1917 A

WISCONSIN

Marquette University School of Medicine..... 1915 A
University of Wisconsin Medical School..... 1907 A

The thirty following medical colleges† which are now requiring, as a minimum for entrance, one year of collegiate work in addition to a four-year high school course, the years when the requirements began and the rating of the colleges are:

	In College Effect Rating
ARKANSAS	
University of Arkansas Medical Department.....	1915 B
CALIFORNIA	
Oakland College of Medicine and Surgery.....	1915 B
DISTRICT OF COLUMBIA	
George Washington University Medical School.....	1914 A
GEORGIA	
Emory University School of Medicine, Atlanta.....	1914 A
University of Georgia Medical Department.....	1914 A
ILLINOIS	
Loyola University School of Medicine.....	1915 B
Chicago College of Medicine and Surgery.....	1915 B
KENTUCKY	
University of Louisville Medical Department.....	1914 A
LOUISIANA	
Tulane University of Louisiana School of Medicine.....	1910 A

† Colleges will be omitted from this list unless evidence obtained shows that, in the admission of students, they are requiring at least thirty semester hours of preliminary collegiate work, in addition to a four-year high school education.

MARYLAND

University of Maryland School of Medicine and College of Physicians and Surgeons..... 1914 A

MASSACHUSETTS

Tufts College Medical School..... 1914 A

MICHIGAN

Detroit College of Medicine and Surgery..... 1914 A

MISSISSIPPI

University of Mississippi School of Medicine..... 1914 A

MISSOURI

St. Louis University School of Medicine..... 1910 A

NEBRASKA

John A. Creighton Medical College 1914 A

NEW YORK

Albany Medical College..... 1914 A

Fordham University School of Medicine..... 1911 A

Long Island College Hospital..... 1914 A

New York Homeopathic Medical College and Flower Hospital 1915 B

New York Medical College and Hospital for Women..... 1916 C

University and Bellevue Hospital Medical College..... 1912 A

University of Buffalo Department of Medicine..... 1914 A

OHIO

Eclectic Medical College..... 1915 B

OKLAHOMA

University of Oklahoma School of Medicine..... 1914 B

PENNSYLVANIA

Temple University Department of Medicine..... 1914 B

TENNESSEE

Vanderbilt University Medical Department..... 1914 A

University of Tennessee College of Medicine..... 1914 A

TEXAS

Baylor University College of Medicine..... 1913 A

Fort Worth School of Medicine..... 1916 B

VERMONT

University of Vermont College of Medicine..... 1912 A

The eleven following medical colleges either have not announced the higher entrance requirements or evidence has not been received to show they are in effect for all students enrolled:

	Rating
College of Physicians and Surgeons, San Francisco.....	C
Chicago Hospital College of Medicine.....	C
Jenner Medical College, Chicago.....	C
College of Physicians and Surgeons, Boston.....	C
Middlesex College of Medicine and Surgery, Cambridge, Mass.....	*
Eclectic Medical University, Kansas City.....	C
Kansas City College of Medicine and Surgery.....	*
National University of Arts and Sciences, St. Louis.....	C
St. Louis College of Physicians and Surgeons.....	C
Lincoln Medical College, Lincoln, Neb.....	C
University of West Tenn. College of Med. and Surg., Memphis....	C

* This college has not been inspected.

State University Medical Schools

Twenty-nine states now have medical schools as integral parts of the state universities or—in one instance—under state control as a separate institution. These states and other interesting data regarding the medical schools are as follows:

STATE UNIVERSITY MEDICAL SCHOOLS

Medical School of State University of	Only School in State	Length of Med. Course in Years	Years of College Work for Admission	Medical School of State University of	Only School in State	Length of Med. Course in Years	Years of College Work for Admission
Alabama.....	Yes	4	2+	North Carolina..	Yes	2	2
Arkansas.....	Yes	4	2+	North Dakota...	Yes	2	2+
California.....	Yes	5	2	Ohio*.....	Yes	4	2
Colorado.....	Yes	4	2+	Oklahoma.....	Yes	4	2+
Georgia.....	Yes	4	2	Oregon.....	Yes	4	2
Illinois.....	Yes	4	2	South Carolina..	Yes	4	2+
Indiana.....	Yes	4	2+	South Dakota...	Yes	2	2+
Iowa*.....	Yes	4	2+	Tennessee.....	Yes	4	2
Kansas.....	Yes	4	2+	Texas.....	Yes	4	2
Maryland.....	Yes	4	2+	Utah.....	Yes	2	2
Michigan*.....	Yes	4	2+	Vermont.....	Yes	5	2
Minnesota.....	Yes	5	2+	Virginia.....	Yes	4	2+
Mississippi.....	Yes	2	2	West Virginia...	Yes	2	2
Missouri.....	Yes	2	2	Wisconsin.....	Yes	2	2+
Nebraska.....	Yes	4	2				

* Have homeopathic departments.
† Similar requirements by licensing board.

In sixteen states no other medical schools exist, medical education in the state being entirely in charge of the state university.

An act of the Maryland legislature in 1914 created a Maryland State University and provided \$15,000 per year for 1915 and 1916, to be used for medical education in the state. The University of Maryland School of Medicine and the College of Physicians and Surgeons of Baltimore is the medical school of the new university.

Of the twenty-nine state medical schools, twenty-one give the complete medical course and grant degrees, while eight give only the first two years of the medical course. California, Minnesota and Vermont require a five-year course, the fifth year to be spent by the student in a hospital as an intern, or in other recognized clinical work. The universities of Iowa, Michigan and Ohio have homeopathic departments.

All of these medical schools now require or have announced the requirement of two years of college work for admission. In fifteen states, the colleges have the support of their state licensing boards, which have adopted two years of college work as the minimum requirement of preliminary education. In some of the remaining states the licensing boards do not appear to be in sympathy with the higher requirement.

State Requirements of Higher Preliminary Education

There are now thirty-seven states which have adopted requirements of preliminary education in addition to a standard four-year high school education. These states, the number of college years required and the time the higher requirements became or become effective are as follows:

State Examining Board of	Number of Years Required	Affects Students Matriculating	Affects All Graduates
<i>Requiring Two Years: 25</i>			
Alabama.....	2	1915-16	1919
Alaska.....	2	1918-19	1922
Arizona.....	2	1918-19	1922
Arkansas.....	2	1918-19	1922
Colorado.....	2	1910-11	1914
Indiana.....	2	1911-12	1915
Iowa.....	2	1911-12	1915
Kansas.....	2	1918-19	1922
Louisiana.....	2	1918-19	1922
Maryland.....	2	1918-19	1922
Michigan.....	2	1918-19	1922
Minnesota.....	2	1908-09	1912
Montana.....	2	1918-19	1922
New Hampshire.....	2	1915-16	1919
New Jersey.....	2	1917-18	1921
New Mexico.....	2	1918-19	1922
New York.....	2	1918-19	1922
North Dakota.....	2	1908-09	1912
Oklahoma.....	2	1917-18	1921
Rhode Island.....	2	1918-19	1922
South Carolina.....	2	1918-19	1922
South Dakota.....	2	1911-12	1915
Virginia.....	2	1917-18	1921
Washington.....	2	1918-19	1922
Wisconsin.....	2	1915-16	1919
<i>Requiring One Year:</i>			
Alaska*.....	1	1914-15	1918
Arizona*.....	1	1914-15	1918
Arkansas*.....	1	1915-16	1919
California.....	1	1915-16	1919
Connecticut.....	1	1910-11	1914
Illinois.....	1	1915-16	1919
Indiana*.....	1	1910-11	1914
Kansas*.....	1	1910-11	1914
Kentucky.....	1	1914-15	1918
Louisiana*.....	1	1915-16	1919
Maryland*.....	1	1914-15	1918
Michigan*.....	1	1914-15	1918
Mississippi.....	1	1915-16	1919
New Hampshire*.....	1	1914-15	1918
New Jersey*.....	1	1916-17	1920
New York*.....	1	1917-18	1921
North Carolina.....	1	1914-15	1918
Oklahoma*.....	1	1914-15	1918
Pennsylvania.....	1	1914-15	1918
Rhode Island*.....	1	1914-15	1918
South Dakota*.....	1	1908-09	1912
Tennessee.....	1	1915-16	1919
Texas.....	1	1914-15	1918
Utah.....	1	1913-14	1917
Vermont.....	1	1913-14	1917
Virginia*.....	1	1914-15	1918
Washington*.....	1	1914-15	1918
West Virginia.....	1	1917-18	1921

* The 2-year requirement became or becomes effective later.

Hospital Intern Year

Six medical colleges have adopted the requirement of a fifth year to be spent by the student as an intern in an approved hospital or in other acceptable clinical work before the M.D. degree will be granted. These colleges and the sessions when the requirement became effective are as follows:

	Session of
University of Minnesota Medical School.....	1910-11
Leland Stanford Jr. University School of Medicine.....	1914-15
Rush Medical College (University of Chicago).....	1914-15
University of California Medical School.....	1914-15
Northwestern University Medical School.....	1915-16
University of Vermont College of Medicine.....	1915-16

Six state licensing boards now require that every candidate to be eligible for license to practice medicine in those states must have served at least one year as an intern in an approved hospital. The requirement became effective in Pennsylvania in 1914, in New Jersey in 1916, and will become effective in North Dakota and Rhode Island in 1918, in Illinois in 1921 and in Michigan in 1922.

THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

The requirements for admission to and graduation from colleges holding membership in this association are 14 units of high school work and two years (60 semester hours) of college work.

THE HIGH SCHOOL REQUIREMENT

(A) Required, 7 units	Units
Mathematics (minimum 2 years, maximum 3 years), algebra and plane geometry	2
English (minimum 2 years, maximum 4 years).....	2
One foreign language (minimum 2 years, maximum 4 years)	2
History and civics	1

Total number of required units..... 7

(B) Elective, 7 units.

To be selected from the following:

	Units
English language and literature (in addition to the required work)	1 to 2
Foreign languages, additional, Latin, German, Italian, French, Spanish or Greek (not less than 1 year in any one).....	1 to 4
Advanced mathematics, advanced algebra, solid geometry and trigonometry (½ year each)....	1
Natural science, chemistry 1 year, physics 1 year, and biology, botany, physiology and zoology (½ to 1 year each)	½ to 2
Earth science, physical geography, geology and agriculture (½ year to 1 year each).....	½ to 1
Astronomy (½ year)	½
Drawing (½ to 1 year).....	½ to 1
History, ancient, medieval and modern, and English (1 year each).....	1 to 3
Economics (½ year)	½
Manual training (1 year).....	1
Bookkeeping (½ to 1 year).....	½ to 1

One unit in any subject is the equivalent of work in that subject for four or five periods per week for a year of at least thirty-six weeks, periods to be not less than forty-five minutes in length. One unit is equivalent to 2 semester credits or 2 points.

PREMEDICAL COLLEGE COURSE

(See Report of Special Committee on Education Preliminary to Study of Medicine, page 546.)

MEDICAL CURRICULUM

DIVISION 1.—ANATOMY, 720 HOURS (18 per Cent.)

	Hours.	Lect.	Rec.	Dem.	Lab.	Wk.
(a) Gross anatomy (including applied anatomy)	510		120			390
(b) Histologic and microscopic anatomy	135		30			105
(c) Embryology	75		30			45

DIVISION 2.—PHYSIOLOGY AND CHEMISTRY, 600 HOURS (15 per Cent.)

	Hours.	Lect.	Rec.	Dem.	Lab.	Wk.
(a) Inorganic chemistry	180		60			120
(b) Organic chemistry	75		30			45
(c) Physiologic chemistry	104		30			75
(d) Physiology	240		140			100

DIVISION 3.—PATHOLOGY, BACTERIOLOGY AND HYGIENE, 450 HOURS (11.25 per Cent.)

	Hours.	Lect.	Rec.	Dem.	Lab.	Wk.
(a) Bacteriology	135		30			105
(b) Hygiene and general dietetics	45		45			...
(c) Pathology	270		60			210

DIVISION 4.—PHARMACOLOGY, MATERIA MEDICA AND THERAPEUTICS, 240 HOURS (6 per Cent.)

	Hours.	Lect.	Rec.	Dem.	Lab.	Wk.
(a) Pharmacology	105		40			65
(b) Materia medica and pharmacology	80		...			...
(c) Therapeutics	55		...			...

DIVISION 5.—MEDICINE AND MEDICAL SPECIALTIES, 970 HOURS (24.25 per Cent.)

	Hours.	Lect.	Rec.	Dem.	Lab.	Wk.
(a) General medicine (including clinical microscopy)	640		...			...
(b) Pediatrics	150		...			...
(c) Nervous and mental diseases	105		...			...
(d) Jurisprudence, ethics and economics	30		...			...
(e) Dermatology and syphilis... ..	45		...			...

DIVISION 6.—SURGERY AND SURGICAL SPECIALTIES, 720 HOURS (18 per Cent.)

	Hours.	Lect.	Rec.	Dem.	Lab.	Wk.
(a) General surgery	510		...			...
(b) Orthopedic surgery	45		...			...
(c) Genito-urinary diseases.....	45		...			...
(d) Eye	60		...			...
(e) Ear, nose and throat.....	60		...			...

DIVISION 7.—OBSTETRICS AND GYNECOLOGY, 300 HOURS (7.5 per Cent.)

	Hours.	Lect.	Rec.	Dem.	Lab.	Wk.
(a) Obstetrics	195		...			...
(b) Gynecology (including some abdominal surgery)	105		...			...

Colleges may reduce the number of hours in any subject not more than 20 per cent. provided that the total number of hours in a division is not reduced. Where the teaching conditions in a college are best subserved, the subject may be, for teaching purposes, transferred from one division to another. When didactic and laboratory hours are specified in any subject, laboratory hours may be substituted for didactic hours.

(NOTE.—At the 1916 meeting the Committee on Education and Pedagogics was instructed to revise this curriculum to meet the present requirements.)

MEMBERS OF ASSOCIATION

University of Alabama School of Medicine.
Leland Stanford Junior University School of Medicine.
University of California Medical School.
University of Southern California Medical Department.
University of Colorado School of Medicine.
Yale University School of Medicine.
Georgetown University School of Medicine.
George Washington University Medical School.
Howard University School of Medicine.
Emory University School of Medicine.
University of Georgia Medical Department.
Northwestern University Medical School.
Rush Medical College.
University of Illinois College of Medicine.
Indiana University School of Medicine.
State University of Iowa School of Medicine.
University of Kansas School of Medicine.
University of Louisville Medical Department.
Tulane University of Louisiana School of Medicine.
Johns Hopkins University Medical Department.
University of Maryland School of Medicine and College of Physicians and Surgeons.
Medical School of Harvard University.
Tufts College Medical School.
Detroit College of Medicine and Surgery.
University of Michigan Medical School.
University of Minnesota Medical School.
University of Mississippi School of Medicine.
St. Louis University School of Medicine.
University of Missouri School of Medicine.
Washington University Medical School.
John A. Creighton Medical College.
University of Nebraska College of Medicine.
Columbia University College of Physicians and Surgeons.
Cornell University Medical College.
Fordham University School of Medicine.
Syracuse University College of Medicine.
University and Bellevue Hospital Medical College.
University of Buffalo Medical Department.
University of North Carolina School of Medicine.
Wake Forest College School of Medicine.
University of North Dakota School of Medicine.
University of Cincinnati College of Medicine.
Ohio State University College of Medicine.
Western Reserve University School of Medicine.
University of Oklahoma School of Medicine.
Hahnemann Medical College and Hospital of Philadelphia.
University of Pennsylvania School of Medicine.
University of Pittsburgh School of Medicine.
University of the Philippines College of Medicine and Surgery.
Medical College of the State of South Carolina.
Meharry Medical College (Affiliated Member).
University of Tennessee College of Medicine.
Vanderbilt University Department of Medicine.
Baylor University School of Medicine.
University of Texas Department of Medicine.
University of Vermont College of Medicine.
Medical College of Virginia.
West Virginia University School of Medicine.
Marquette University School of Medicine.
University of Wisconsin Medical School.

The secretary-treasurer of the Association is Dr. Fred C. Zapffe, 3431 Lexington Street, Chicago.

DESCRIPTION OF MEDICAL COLLEGES

Below are given brief descriptions of the medical colleges in the United States and Canada that are legally chartered to teach medicine, several of which do not grant degrees. The name, address, year of organization, history and date when first class graduated are given in each instance. Unless otherwise stated, a class graduated each subsequent year. Where official reports have been received from the college, information regarding faculty, entrance requirements, length of term, fees, students (excluding specials and postgraduates), graduates, name of dean and next session is given without discrimination, regardless as to whether the college is sectarian or not. In a few instances in which such reports were not received, the information published is from other reliable sources. Figures for graduates include all who graduated since July 1, 1916. Extracts of rules and the membership of the Association of American Medical Colleges are shown following the list of colleges. Figures showing population of cities and states are taken from the United States Census Bureau's estimate for 1915. Statements have been added showing the preliminary requirements held by state licensing boards where those requirements include one or two years of collegiate work. Six states, Illinois, Michigan, New Jersey, North Dakota, Pennsylvania and Rhode Island require a year's hospital internship before a license will be granted.

ALABAMA

Alabama, population 2,301,277, has one medical college, the School of Medicine of the University of Alabama, located in Mobile, a city with a population of 56,536.

In order to secure licenses to practice medicine in Alabama, students matriculating in the session of 1915-16 and thereafter must have completed *two years* of work in an approved college of liberal arts, including courses in physics, chemistry, biology and a modern language, prior to entering on the study of medicine.

Mobile

UNIVERSITY OF ALABAMA SCHOOL OF MEDICINE, St. Anthony and Lawrence Streets.—Organized in 1859 as the Medical College of Alabama. Classes were graduated in 1861 and in all subsequent years except 1862 to 1868 inclusive. It was reorganized as the Medical Department of the University of Alabama in 1897. All property was transferred to the University of Alabama in 1907, when the present title was assumed. Two years of college work are required for admission. The faculty consists of 14 professors and 27 lecturers and assistants, a total of 41. The course of study covers four years of thirty-two weeks each. The total fees for each of the four years, respectively, are \$160, \$155, \$155 and \$180. The Dean is Dr. T. H. Frazer. The total registration for 1916-1917 was 43; graduates, 18. The fifty-second session begins Oct. 4, 1917, and ends June 5, 1918.

ARKANSAS

Arkansas, population 1,713,102, has one medical college, the Medical Department of the University of Arkansas, located in Little Rock, a city of 55,158.

To secure licenses to practice medicine in Arkansas, students matriculating in the session of 1915-16 and thereafter must have completed at least one year of collegiate work including college courses in physics, chemistry, biology and a modern language before beginning the study of medicine. This applies to all graduates of 1919 and thereafter. Matriculants for the session of 1918-19 (graduates of 1922) and thereafter must have completed *two years* of premedical college work.

Little Rock

UNIVERSITY OF ARKANSAS MEDICAL DEPARTMENT, Markham and Center Streets.—Organized in 1879 as the Medical Department of Arkansas Industrial University. It assumed the present title in 1899. In 1911 the College of Physicians and Surgeons united with it and the new school was made an integral part of the University of Arkansas. The first class was graduated in 1880. The faculty consists of 17 professors and 43 lecturers and assistants, total 60. Entrance requirements in 1918-19 and thereafter will be two years of collegiate work beyond a four-year high school course. The course of study covers four years of thirty-two weeks each. The fees are \$50 each year. The Dean is Dr. Morgan Smith. Total registration 1916-17 was 43; graduates, 15. The thirty-ninth session begins Sept. 17, 1917, and ends May 29, 1918.

CALIFORNIA

California, population 2,848,275, has seven medical colleges. Four are located in San Francisco, a city of 448,502 inhabitants. They are Leland Stanford Junior University School

of Medicine, College of Medicine of the University of California, the College of Physicians and Surgeons, and the Hahnemann Medical College of the Pacific. The College of Physicians and Surgeons, Medical Department of the University of Southern California is situated in Los Angeles, population 465,367. The Oakland College of Medicine and Surgery is in Oakland, population 190,803. The College of Medical Evangelists is located at Loma Linda, a village of 110 people.

To secure licenses to practice medicine in California under the "physician's and surgeon's" certificate, students matriculating in medical colleges in and after the session of 1915-16, prior to such matriculation, must have completed at least one year of recognized collegiate work including college courses in physics, chemistry, biology and a modern language. This applies to all graduates of 1919 and thereafter.

Berkeley-San Francisco

UNIVERSITY OF CALIFORNIA MEDICAL SCHOOL, University Campus, Berkeley; Second and Parnassus Avenues, San Francisco.—Organized in 1863 as the Toland Medical College. The first class graduated in 1865. In 1872 it became the Medical Department of the University of California. In 1909 the College of Medicine of the University of Southern California, at Los Angeles, by legislative enactment, became a clinical department. This Los Angeles portion was changed to a graduate school in 1914. In 1915 the Hahnemann Medical College of the Pacific was merged, and elective chairs in homeopathic materia medica and therapeutics were provided for. *Two years* of collegiate work are required for admission. The work of the first year and a half is given at Berkeley and the work of the last two and a half years at San Francisco. The faculty is composed of 39 professors and 100 associates and assistants, a total of 139. The course covers five years of nine months each, the fifth year to consist of an internship or of special work in a department of the medical school. Fees for the four years, respectively, are \$195, \$155, \$160 and \$150. The Dean is Dr. Herbert C. Moffitt, San Francisco. Total registration for 1916-17 was 129; graduates, 26. The forty-fifth session begins Aug. 20, 1917, and ends April 27, 1918.

Loma Linda-Los Angeles

COLLEGE OF MEDICAL EVANGELISTS.—Organized in 1909. The faculty numbers 52. The first class graduated in 1914. The course extends over four years of nine months each. *Two years* of college work are required for admission. The total fees for the four years, respectively, are \$166, \$161, \$136 and \$146. The Dean is Dr. P. T. Magan. The total registration for 1916-17 was 55; graduates, 13. The ninth session begins Sept. 2, 1917, and ends May 30, 1918.

Los Angeles

COLLEGE OF PHYSICIANS AND SURGEONS, MEDICAL DEPARTMENT OF THE UNIVERSITY OF SOUTHERN CALIFORNIA, 516 East Washington Street.—Organized in 1903, first class graduated in 1905; became Medical Department, University of Southern California, Aug. 11, 1909. The course covers four years of nine months each. *Two years* of collegiate work are required for admission. The faculty consists of 21 professors and 82 associate professors, lecturers and instructors, a total of 103. The fees for the four years, respectively, are \$220, \$217, \$202 and \$227. The Dean is Dr. Charles W. Bryson. The registration for 1916-17 was 136; graduates, 49. The next session begins Sept. 4, 1917, and ends June 6, 1918.

Oakland

OAKLAND COLLEGE OF MEDICINE AND SURGERY, Thirty-First and Grove Streets.—Organized in 1900, opened in 1902. The first class graduated in 1906. The faculty numbers 44. One year of college work is required for admission. The course covers four years of nine months each, and the classes are limited to ten students each. The total fees for each of the four years, respectively, are \$185, \$178, \$150 and \$175. The Registrar is Dr. Edward N. Ewer. The total registration for 1916-17 was 16; graduates, 4. The sixteenth session begins Aug. 20, 1917, and ends May 14, 1918.

San Francisco

COLLEGE OF PHYSICIANS AND SURGEONS, 344 Fourteenth Street.—Organized in 1896. The first class graduated in 1897. The faculty numbers 39. The course covers four years of nine months each. The fees for each of the first three years are \$192.50 and \$217.50 for the fourth year. The Dean is Dr. L. W. Spriggs. Registration for 1916-17 was 77; graduates, 8. The twenty-first session begins Sept. 3, 1917, and ends June 6, 1918. *Reported not recognized by licensing boards of thirty-nine states.*

San Francisco-Palo Alto

LELAND STANFORD JUNIOR UNIVERSITY SCHOOL OF MEDICINE, University Campus, Palo Alto, and Sacramento and Webster Streets, San Francisco.—Organized in 1908 when, by an agreement, the interests of Cooper Medical College were taken over. The first class was graduated in 1913. The faculty consists of 49 professors and 48 lecturers, assistants, etc., a total of 97. Three years of collegiate work are required for admission. The course covers five years of nine months each, including a year of practical or intern work. The total fees for the first four years, respectively, are \$160, \$155, \$150 and \$150. The Dean is Dr. W. Ophüls, San Francisco. The total registration for 1916-17 was 100; graduates, 23. The eighth session begins Oct. 1, 1917, and ends June 13, 1918.

COLORADO

Colorado, with a population of 935,799, has one medical college, the University of Colorado School of Medicine. The

first two years of the course are given at Boulder, the seat of the university, while the last two, or clinical years, are given in Denver, which has a population of 253,161.

The Colorado State Board of Medical Examiners will register without further examination graduates of medical colleges in good standing who present licenses issued after examination by any other licensing board. The law permits any one, graduate or nongraduate, to try the board's written examination. No graduate of 1914 or thereafter is eligible to obtain a license in Colorado, or indorsement of his credentials, unless he graduated from a medical college which, at the time he matriculated, required at least *two years'* study, without conditions, in an accredited college of liberal arts, and this work must have included courses in physics, chemistry, biology and one modern language.

Boulder-Denver

UNIVERSITY OF COLORADO SCHOOL OF MEDICINE.—Organized in 1883. Classes were graduated in 1885 and in all subsequent years except 1898 and 1899. Denver and Gross College of Medicine was merged Jan. 1, 1911. The faculty embraces 14 professors, 18 associate and assistant professors, and 57 lecturers, instructors and assistants, a total of 89. The work embraces a graded course of four years of nine months each. The entrance requirements are *two years* of college work counting toward a degree in arts in an accredited college or university. The tuition is \$75 per year for residents of Colorado, \$100 for nonresidents. Laboratory fees are \$10 for each of the first two years. The Dean is Dr. Charles N. Meader. The total registration for 1916-17 was 85; graduates, 21. The thirty-sixth session begins Sept. 10, 1917, and ends June 5, 1918.

CONNECTICUT

Connecticut, with a population of 1,223,583, has one medical college, Yale University, School of Medicine, located in New Haven, population 147,095.

Candidates for license to practice medicine in Connecticut who graduate in 1914 or thereafter are not eligible unless, prior to entering on the study of medicine, they had completed, in addition to an accredited four-year high school education, at least nine months of collegiate work including college courses in physics, chemistry and general biology.

New Haven

YALE UNIVERSITY SCHOOL OF MEDICINE, 150 York Street and Congress Avenue and Cedar Street.—Chartered in 1810 as the Medical Institution of Yale College. Organized in 1812; instruction began in 1813; first class graduated in 1814. A new charter in 1879 changed the name to the Medical Department of Yale College. In 1884, the Connecticut Medical Society surrendered such authority as had been granted by the first charter. In 1887, Yale College became Yale University. The faculty consists of 21 professors and 54 lecturers and assistants, a total of 75. The requirements for admission are *two years* of collegiate work plus evidence of satisfactory completion of courses in general physics, general inorganic chemistry, general biology, organic chemistry and physical chemistry or laboratory physics, all reasonably equivalent to the courses in these subjects in Yale University. The student also must have a reading knowledge of German. The course covers four years of nine months each. The fees for the four years, respectively, are approximately \$205, \$200, \$200 and \$210. The Dean is Dr. George Blumer. The total registration for 1916-17 was 77; graduates, 10. The 105th session begins Sept. 27, 1917, and ends June 19, 1918.

DISTRICT OF COLUMBIA

The District of Columbia, population 358,679, has three medical colleges; George Washington University Medical School, Georgetown University, School of Medicine and Howard University, School of Medicine.

WASHINGTON

GEORGE WASHINGTON UNIVERSITY MEDICAL SCHOOL, 1325 H Street, N.W.—Organized in 1825 as the Medical Department of Columbian College. Also authorized to use the name National Medical College. Classes were graduated in 1826 and in all subsequent years, except 1834 to 1838, and 1861 to 1863, inclusive. The original title was changed to Medical Department of Columbian University in 1873. In 1903 it absorbed the National University Medical Department. In 1904, by an act of Congress, the title of George Washington University was granted to the institution. The faculty is composed of 37 professors and 57 instructors, demonstrators and assistants, a total of 94. *One year* of collegiate work will be required for admission for the session of 1917-18; thereafter *two years* of college work will be required. The course covers four years of thirty-two weeks each. The total fees are \$175 each year. The Dean is Dr. William C. Borden. The total registration for 1916-17 was 114; graduates, 41. The ninety-sixth session begins Sept. 26, 1917, and ends June 5, 1918.

GEORGETOWN UNIVERSITY SCHOOL OF MEDICINE, 920 H Street, N.W.—Organized in 1851. The first class graduated in 1852. The faculty contains 24 professors, 67 instructors and assistants; total, 91. *Two years* of collegiate work are required for entrance. The course of study covers four terms of eight and one-half months each. The fees for the first year are \$165, and for each of the other three years, \$150. The Dean is Dr. George M. Kober. The registration for 1916-17 was 60; graduates, 13. The sixty-seventh session begins Sept. 26, 1917, and ends June 12, 1918.

HOWARD UNIVERSITY SCHOOL OF MEDICINE, Fifth and W Streets, N.W.—Chartered in 1867. Organized in 1869. The first class graduated in 1871. Colored students compose a majority of those in attendance. The faculty comprises 18 professors and 21 lecturers and assistants, 39 in all. The admission requirements are *two years* of collegiate work, including physics, chemistry, botany and zoology, English and two years of French or German. The course covers four years of thirty-two weeks each. The fees of each of the four sessions, respectively, are \$140, \$130, \$130 and \$137. The Dean is Dr. Edward A. Balloch. Registration for 1916-17 was 111; graduates, 13. The fiftieth session begins Oct. 1, 1917, and ends June 5, 1918.

GEORGIA

Georgia, population 2,816,289, has two medical colleges, University of Georgia, Medical Department, located in Augusta, population 49,848, and the Emory University School of Medicine in Atlanta, a city of 184,873 population.

Atlanta

EMORY UNIVERSITY SCHOOL OF MEDICINE, Butler and Armstrong Streets.—Organized in 1854. Classes graduated 1855 to 1861, when it suspended. Reorganized in 1865. A class graduated in 1865 and each subsequent year except 1874. In 1898 it merged with the Southern Medical College (organized in 1878), taking the name of Atlanta College of Physicians and Surgeons. In 1913 it merged with the Atlanta School of Medicine (organized in 1905), reassuming the name of Atlanta Medical College. Became the Medical Department of Emory University in 1915; assumed present title in 1917. *One year* of collegiate work is required for entrance; *two years* will be required for the session of 1918-19 and thereafter. It has a faculty of 39 professors and 83 instructors, assistants, etc., a total of 122. The course of study is four years of thirty-two weeks each. The fees for each of the four years, respectively, are \$172, \$160, \$155 and \$180. The Dean is Dr. W. S. Elkin. Total registration for 1916-17 was 149; graduates, 63. The next session begins Sept. 24, 1917, and ends May 28, 1918.

Augusta

UNIVERSITY OF GEORGIA, MEDICAL DEPARTMENT, University Place.—Organized in 1828 as the Medical Academy of Georgia, the name being changed to the Medical College of Georgia in 1829. Since 1873 it has been known as the Medical Department of the University of Georgia. Entire property transferred to the university in 1911. Classes were graduated in 1833 and in all subsequent years except 1862 and 1863. The faculty includes 18 professors and 31 assistants, 49 in all. *One year* of collegiate work is required for entrance; *two years* will be required for the session of 1918-19 and thereafter. The course is four years of thirty-four weeks each. Fees are \$150 each year for nonresidents of Georgia; for residents the fees for the four years, respectively, are \$55, \$50, \$50 and \$60. The Dean is Dr. W. H. Doughty, Jr. The total registration for 1916-17 was 55; graduates, 11. The eighty-sixth session begins Sept. 12, 1917, and ends May 29, 1918.

ILLINOIS

Illinois, population 6,069,519, has eight medical colleges, two of which give instruction at night, all located in Chicago, a city of 2,447,045 inhabitants, and are as follows: Rush Medical College, Northwestern University Medical School, University of Illinois College of Medicine, Hahnemann Medical College and Hospital, Loyola University School of Medicine, Chicago College of Medicine and Surgery, Jenner Medical College, and the Chicago Hospital College of Medicine.

To be eligible for license to practice medicine in Illinois, students matriculating in the session of 1915-16 and thereafter, in addition to an accredited four-year high school education, must have completed at least a year of collegiate work including courses in physics, chemistry, biology and a modern language, to be taken either in a preliminary year given by a recognized medical college, or in an approved college of liberal arts. Graduates of 1923 and thereafter shall have completed over a year's internship in a hospital.

Chicago

RUSH MEDICAL COLLEGE.—This school was founded in 1837, organized in 1843, was the medical department of Lake Forest University from 1887 until 1898, when it became affiliated with the University of Chicago. The first class graduated in 1844. The faculty is composed of 107 professors, 167 associates, instructors, etc., a total of 274. The requirements for admission are *two years* of college work, including courses in college chemistry, physics and biology, and a reading knowledge of German or French. Classes are limited to 100 students in each of the freshman and sophomore classes, and to 120 students in each of the clinical years. No application for admission is accepted after September 1. The course covers four years of eight and a half months each, and a fifth year, consisting of a hospital internship or of a fellowship in one of the departments. All freshman and sophomore studies are given at the University of Chicago. The clinical years are given in the building at the corner of Wood and Harrison Streets. The tuition fees are \$180 each year. A matriculation fee of \$5 is paid but once, and there are incidentals amounting from \$5 to \$7 annually. The Dean is Dr. John M. Dodson. Total registration 1916-17 was 567; graduates, 124. The seventy-fourth session begins Oct. 1, 1917, and ends June 15, 1918.

NORTHWESTERN UNIVERSITY MEDICAL SCHOOL, 2431 South Dearborn Street.—Organized in 1859 as the Medical Department of Lind Univer-

sity. First class graduated in 1860. In 1864 it became independent as the Chicago Medical College. It united with Northwestern University in 1869, but retained the name of Chicago Medical College until 1891, when the present name was taken. Became an integral part of Northwestern University in 1905. The faculty comprises 60 professors and 88 lecturers and assistants, a total of 148. The requirements for admission are such as will admit to the College of Liberal Arts of Northwestern University, plus *two years* of college work, including courses in physics, chemistry, biology and a modern language. The course covers four years of eight months each. The fees for the four years, respectively, are \$190, \$195, \$190 and \$206. The Dean is Dr. Arthur I. Kendall. The total registration for 1916-17 was 247; graduates 42. The fifty-eighth session begins Oct. 2, 1917, and ends June 8, 1918.

UNIVERSITY OF ILLINOIS COLLEGE OF MEDICINE, Honore and Congress Streets.—Organized in 1882 as the College of Physicians and Surgeons. The first class graduated in 1883. It became the Medical Department of the University of Illinois by affiliation in 1897 and an integral part in 1910. The relationship with the university was canceled in June, 1912, but restored in March, 1913, when the present title was assumed. The American Medical Missionary College was absorbed in 1910. *Two years* of collegiate work are required for admission. The faculty is composed of 48 professors, 80 assistants and instructors, a total of 128. The total fees for the four years, respectively, are \$155, \$160, \$150 and \$165. The Dean is Dr. Albert C. Eycleshymer. The thirty-sixth session begins Oct. 1, 1917, and ends June 12, 1918.

CHICAGO COLLEGE OF MEDICINE AND SURGERY, 706 South Lincoln Street.—Organized in 1901 as the American College of Medicine and Surgery (Chicago Eclectic Medical College). The latter part of the name was dropped in 1902 and it became the Medical Department of Valparaiso University. Eclecticism was dropped in 1905. The present title was assumed in 1907. One year of collegiate work, including courses in physics, chemistry and biology, is required for admission. The course covers four years of eight months each. The faculty numbers 172. The total fees of each of the four years are \$155; matriculation fee, \$5. The Secretary is Dr. G. E. Wyneken. The total registration for 1916-17 was 415; graduates, 182. The seventeenth session begins Sept. 25, 1917, and ends May 28, 1918.

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL OF CHICAGO, 2811 Cottage Grove Avenue.—Organized in 1859. The first class was graduated in 1861. Absorbed the Chicago Homeopathic Medical College in 1904. The faculty includes 56 professors and 27 lecturers, assistants, etc., a total of 83. *Two years* of collegiate work are required for admission. *Two years* of collegiate work are to be required from and after 1918. The course extends over four years of eight months each. The tuition fees for the four years, respectively, are \$176.50, \$161.50, \$176.50 and \$191.50. The Dean is Dr. Joseph P. Cobb. The total registration for 1916-17 was 76; graduates, 30. The fifty-eighth session begins Sept. 24, 1917, and ends June 6, 1918.

LOYOLA UNIVERSITY SCHOOL OF MEDICINE, Fulton and Ada Streets.—Organized in 1868 as the Bennett College of Eclectic Medicine and Surgery. Dropped Eclecticism and became Bennett Medical College in 1909. In 1910 it absorbed the Illinois Medical College and in 1911 the Reliance Medical College. The first class graduated in 1870. Became an integral part of Loyola University in 1915. Present title in 1916. The faculty numbers 111. The course covers four years of thirty-two weeks each. One year of collegiate work is required for admission, including courses in physics, chemistry and biology. The fees are \$150 each year; matriculation fee, \$5; graduation fee, \$25. The Acting Dean is Dr. Alfred de Roulet. The total registration for 1916-17 was 228; graduates, 83. The next session begins Sept. 25, 1917, and ends June 1, 1918.

JENNER MEDICAL COLLEGE, an afternoon and night school, located at 701 South Wood Street.—Organized in 1892. Classes were graduated in 1896 and all subsequent years. The fees for each of the four years, respectively, are \$140, \$135, \$135 and \$175. The Secretary is Dr. John D. MacKellar. Total registration for 1916-17 was 118; graduates, 14. The next session begins Sept. 19, 1917, and ends June 22, 1918. *Reported not recognized by the licensing boards of thirty-eight states.*

CHICAGO HOSPITAL COLLEGE OF MEDICINE, another afternoon and night school, located at 3832 Rhodes Avenue.—Organized in 1911; chartered in 1912. Total registration for 1916-17 was 53; graduates reported, 7. *Official reports indicate that the diplomas from this college are not recognized by the licensing boards of thirty-eight states.*

INDIANA

Indiana, population 2,798,142, has one medical college, the Indiana University School of Medicine, located at Indianapolis, a city of 265,578 people, except that the work of the first year is offered also at Bloomington, the seat of the University.

Candidates for license to practice medicine in Indiana who matriculated between Jan. 11, 1910, and Jan. 1, 1911, must have completed one year of collegiate work, in addition to an accredited four-year high school course, prior to beginning the study of medicine. Those matriculating subsequent to Jan. 1, 1911, must have completed *two years* of work in a recognized college of liberal arts.

Bloomington and Indianapolis

INDIANA UNIVERSITY SCHOOL OF MEDICINE.—Organized in 1903, but did not give all of the work of the first two years of the medical course until 1905. In 1907, by union with the State College of Physicians and Surgeons, the complete course in medicine was offered. In 1908 the Indiana Medical College, which was formed in 1905 by the merger of the Medical College of Indiana (organized in 1878), the Central College of Physicians and Surgeons (organized in 1879), and the Fort Wayne College of Medicine (organized in 1879), merged into it. The first class was graduated in 1908. The faculty consists of 65 professors and 76 lecturers, associates and assistants, a total of 161. *Two years* of collegiate work are required for admission. The work of the first year is emphasized only at Bloomington. The work of the other three years is

all at Indianapolis. The fees for the four years, respectively, are \$100, \$100, \$130 and \$130. A fifth optional intern year leading to the "M.D. cum laude" has been added. The Secretary at Bloomington is Dr. B. D. Myers; the Dean is Dr. Charles P. Emerson, Indianapolis. The total registration for 1916-17 was 175; graduates, 37. The next session begins Sept. 17, 1917, and ends June 12, 1918.

IOWA

Iowa, population 2,221,038, has two medical colleges. The College of Medicine and the College of Homeopathic Medicine of the State University of Iowa, both located in Iowa City, population 11,200.

Candidates for license to practice medicine in Iowa who graduate subsequent to Jan. 1, 1915, must have completed *two years* of work in an approved college of liberal arts prior to beginning the study of medicine, this preliminary college work to have included courses in physics, chemistry, biology and a foreign language.

Iowa City

STATE UNIVERSITY OF IOWA COLLEGE OF MEDICINE, University Campus.—Organized in 1869. First session began in 1870. First class graduated in 1871. Absorbed Drake University College of Medicine in 1913. The faculty is made up of 27 professors, 24 lecturers, demonstrators and assistants, a total of 51. *Two years* of collegiate work, including courses in physics, chemistry, biology and French or German, are required for admission. The course of study covers four years of thirty-six weeks each. The tuition fee for residents of Iowa is \$85 per year and for nonresidents \$100, plus a matriculation fee of \$10 and a graduation fee of \$10. The Dean is Dr. Lee Wallace Dean, Iowa City. Total registration for 1916-17 was 162; graduates, 20. The forty-eighth session begins Sept. 17, 1917, and ends June 7, 1918.

STATE UNIVERSITY OF IOWA COLLEGE OF HOMEOPATHIC MEDICINE.—Organized in 1877. The first class graduated in 1878. Class each subsequent year except 1914. The faculty is composed of 15 professors and 11 lecturers and assistants, a total of 26. The work of the first two years is taken in classes with the students of the College of Medicine of the State University of Iowa, and it has the same entrance and fee requirements. The Dean is Dr. George Royal. Total registration for 1916-17 was 7; graduate, 1. The fortieth session begins Sept. 17, 1917, and ends June 7, 1918.

KANSAS

Kansas, population 1,807,221, has one medical college. The School of Medicine of the University of Kansas gives its first two years in Lawrence, population 12,915, and the last two years in Rosedale, a suburb of the two Kansas Cities, which together have a population of 392,693.

Candidates for license to practice medicine in Kansas who matriculated in the session of 1910-11 and thereafter must present credentials showing that they matriculated in and graduated from a medical college which required for admission at least one year of collegiate work including college courses in physics, chemistry and biology in addition to an accredited four-year high school course. This applies to graduates of 1914 and thereafter. Students matriculating in 1918-19 (graduates of 1922) and thereafter will be required to have completed *two years* of premedical college work.

Lawrence and Rosedale

UNIVERSITY OF KANSAS SCHOOL OF MEDICINE.—Organized in 1880. It offered only the first two years of the medical course until in 1905, when it merged with the Kansas City (Mo.) Medical College, founded in 1869, the College of Physicians and Surgeons, founded in 1894, and the Medico-Chirurgical College, founded in 1897. First class graduated in 1906. The clinical courses are given at Rosedale. Absorbed Kansas Medical College in 1913. The faculty, including lecturers and clinical assistant, numbers 57. The requirements for admission are *two years* of collegiate work. The course covers four years of nine months each. The total fees are, for each of the first two years, \$60 and for the last two years \$100. The Dean is Dr. S. J. Crumbine; Associate Dean, Dr. M. T. Sudler. The total registration for 1916-17 was 118; graduates, 19. The thirty-eighth session begins Sept. 20, 1917, and ends June 12, 1918.

KENTUCKY

Kentucky, population 2,365,185, has one medical college, the University of Louisville Medical Department, situated in Louisville, a city of 237,012 inhabitants.

To be eligible for license to practice medicine in Kentucky all students matriculating in and after the session of 1914-15 must have completed, in addition to an accredited four-year high school course, at least one year's work in an approved college of liberal arts, including college courses in physics, chemistry, biology and a modern language.

Louisville

UNIVERSITY OF LOUISVILLE MEDICAL DEPARTMENT, First and Chestnut Streets.—Organized in 1837 as the Louisville Medical Institute. The first class graduated in 1838, and a class graduated in each subsequent

year except in 1863. In 1846 the present name was assumed. In 1907 it absorbed the Kentucky University Medical Department. In 1908 it absorbed the Louisville Medical College, the Hospital College of Medicine and the Kentucky School of Medicine. One year of collegiate work is required for admission. It has a faculty of 30 professors and 64 lecturers and assistants, a total of 94. The course covers four years of thirty-two weeks each. The fees for each of the four years, respectively, are \$175, \$176, \$179 and \$183. The Dean is Dr. Henry Enos Tuley. The total registration for 1916-17 was 118; graduates, 66. The next session begins Sept. 25, 1917, and ends June 6, 1918.

LOUISIANA

Louisiana, having a population of 1,801,306, contains one medical college, the School of Medicine of the Tulane University of Louisiana, situated in New Orleans, a city of 366,484.

Candidates for license to practice medicine in Louisiana who graduate in 1919 and 1922 must present evidence that they had successfully completed, at an approved college or university, respectively, one year and *two years* of work including biology, physics, chemistry and a modern language, before entering on the study of medicine. These requirements apply to all students who matriculated, respectively, in 1915 and 1918.

New Orleans

TULANE UNIVERSITY OF LOUISIANA SCHOOL OF MEDICINE, University Campus and 1551 Canal Street.—Organized in 1834 as the Medical College of Louisiana. Classes were graduated in 1835 and in all subsequent years, except 1863-65, inclusive. It was transferred to the Medical Department of the University of Louisiana in 1847 and became the Medical Department of the Tulane University of Louisiana in 1884. Present name in 1913, when it became the School of Medicine of the College of Medicine of the Tulane University of Louisiana. The faculty has 27 professors and 89 assistant professors, instructors, demonstrators, etc., a total of 116. The course covers four years of thirty-two weeks each. One year of collegiate work is required for admission. Two years of college work will be required for admission in 1918 and thereafter. Total fees for each of the four years, respectively, are \$190, \$190, \$185 and \$215. The Dean is Dr. Isadore Dyer. The total registration for 1916-17 was 267; graduates, 52. The eighty-third session begins Sept. 26, 1917, and ends June 5, 1918.

MAINE

Maine, population 767,638, has one medical college, the Bowdoin Medical School, located in Brunswick and Portland, the latter having a population of 62,161.

Brunswick-Portland

BOWDOIN MEDICAL SCHOOL. The Medical Department of Bowdoin College. The first two years are given at Bowdoin College, Brunswick, the last two at Portland, building located on Chadwick Street.—Organized in 1820 as the Medical School of Maine. The first class graduated in 1821. Present title assumed in 1915. The faculty numbers 66. *Two years* of collegiate work, including courses in physics, chemistry and biology are required for admission. The course covers four years of eight months each. The total fees for each of the four years, respectively, are \$120, \$120, \$110 and \$110. The Dean is Dr. Addison S. Thayer, 10 Deering Street, Portland. The total number of students in 1916-17 was 54; graduates, 10. The ninety-seventh session begins Oct. 11, 1917, and ends June 20, 1918.

MARYLAND

Maryland, with a population of 1,351,941, contains two medical colleges, located in Baltimore, a city with 584,605 inhabitants. They are as follows: Johns Hopkins University Medical Department, and the University of Maryland School of Medicine and College of Physicians and Surgeons, the last two having been merged.

To be eligible to practice medicine in Maryland, all students matriculating in the session of 1914-15 and thereafter, in addition to a four-year high school education, must have completed a year of college work including courses in physics, chemistry, biology and French or German, prior to beginning the study of medicine. Students matriculating in 1918-19 and thereafter must have completed *two years* of college work.

Baltimore

JOHNS HOPKINS UNIVERSITY MEDICAL DEPARTMENT, Washington and Monument Streets.—Organized in 1893. The first class graduated in 1897. The faculty consists of 48 professors and 129 clinical professors, etc., a total of 177. The requirements for admission demand that the applicant either has (a) completed the chemical-biologic course which leads to the A.B. degree in the university, or (b) graduated at an approved college or scientific school and has a knowledge of French and German, physics, chemistry and biology, such as may be obtained from a year's course. The course extends over four years of eight and one-half months each. The total fees are \$257 each year. The Dean is Dr. J. Whitridge Williams. Total registration for 1916-17 was 359; graduates, 92. The twenty-fifth session begins Oct. 2, 1917, and ends June 11, 1918.

UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE AND THE COLLEGE OF PHYSICIANS AND SURGEONS, Lombard and Green Streets.—Organized in 1807 as the College of Medicine of Maryland. The first class graduated in 1810. In 1812 it became the University of Maryland School of Medicine. Baltimore Medical College was merged into it in 1913. In 1915 the College of Physicians and Surgeons was merged and the present name assumed. The combined faculty numbers 166. A year of collegiate work is required for admission. Beginning with the session of 1918-19 *two years* of college work will be required. The course covers four years of eight months each. The total fees are \$170 each year; graduation fee, \$20. The Dean is Dr. J. M. H. Rowland. Total registration for 1916-17 was 298; graduates, 82. The one hundred and eleventh session begins Oct. 1, 1917, and ends June 3, 1918.

MASSACHUSETTS

Massachusetts, population 3,662,339, has four medical colleges: Medical School of Harvard University, Boston University School of Medicine, College of Physicians and Surgeons and Tufts College Medical School. They are all situated in Boston, a city of 745,139.

Boston

MEDICAL SCHOOL OF HARVARD UNIVERSITY, 240 Longwood Avenue.—Organized in 1782. The first class graduated in 1788. It has a faculty of 57 professors and 187 instructors and assistants, a total of 244. Candidates for admission must present a college degree or two years of work leading to such a degree with standing in the upper third of the class. The college work must include a year of physics, biology, general chemistry, a half year of organic chemistry, and a reading knowledge of French or German. The total fee for each year is \$225. The Dean is Dr. Edward H. Bradford. The total registration for 1916-17 was 357; graduates, 67. The one hundred and thirty-sixth session begins Sept. 24, 1917, and ends June 20, 1918.

BOSTON UNIVERSITY SCHOOL OF MEDICINE, 80 East Concord Street.—Organized in 1873. In 1874 the New England Female Medical College, founded in 1848, was merged into it. The first class graduated in 1874. *Two years* of collegiate work are required for admission. The faculty includes 23 professors, 46 associates, etc., making a total of 69. The course covers four years of eight months each. Total fees for each of the four years, respectively, are \$170, \$157, \$157 and \$180. The Dean is Dr. John P. Sutherland. Total registration for 1916-17 was 62; graduates, 24. The forty-fifth session begins Oct. 4, 1917, and ends June 5, 1918.

TUFTS COLLEGE MEDICAL SCHOOL, 416 Huntington Avenue.—Organized in 1893 as the Medical Department of Tufts College. The first class graduated in 1894. It has a faculty of 41 professors and 83 assistants, lecturers, etc., a total of 124. One year of collegiate work is required for admission. *Two years* of college work will be required for the session of 1918-19 and thereafter. The course covers four years of eight months each. The total fees for each of the four years are \$159.50, \$162, \$155 and \$155. The Dean is Dr. Charles F. Painter. Total registration for 1916-17 was 383; graduates, 76. The twenty-fourth session begins Sept. 20, 1917, and ends June 17, 1918.

COLLEGE OF PHYSICIANS AND SURGEONS, 517 Shawmut Avenue.—Organized in 1880. The first class graduated in 1882. Total attendance of medical students during 1916-17 was about 53. There were 11 graduates. *This college has been reported not recognized by the Massachusetts Medical Society and by the licensing boards of thirty-nine states.*

MICHIGAN

Michigan, population 3,015,442, has three medical colleges. Two of these, the University of Michigan Department of Medicine and Surgery and the Homeopathic Medical College of the University of Michigan, are located at Ann Arbor, a city of 14,979 people. The Detroit College of Medicine and Surgery is located at Detroit, a city of 554,717 inhabitants.

To be eligible for license to practice medicine in Michigan, all students matriculating in and after the session of 1914-15, in addition to an accredited four-year high school education, must have completed at least one year's work in an approved college of liberal arts, including college courses in physics, chemistry, biology and French or German, prior to beginning the study of medicine. Students matriculating in 1918-19 (graduates of 1922) and thereafter will be required to have completed *two years* of such college work.

Ann Arbor

UNIVERSITY OF MICHIGAN MEDICAL SCHOOL.—Organized in 1850 as the University of Michigan Department of Medicine and Surgery. The first class graduated in 1851. Present title assumed in 1915. It has a faculty composed of 22 professors and 69 associates, instructors, etc., a total of 91. The entrance requirements are *two years* of college work, including courses in chemistry, physics and biology, with laboratory work, and a reading knowledge of one modern language. The curriculum embraces four years of nine months each. The total fees for Michigan students for each of the four years, respectively, are \$112, \$102, \$102 and \$112, and for nonresidents, respectively, \$147, \$122, \$122 and \$132. The Dean is Dr. Victor C. Vaughan. The total registration for 1916-17 was 322; graduates, 62. The sixty-eighth session begins Oct. 2, 1917, and ends June 27, 1918.

UNIVERSITY OF MICHIGAN HOMEOPATHIC MEDICAL SCHOOL.—Organized in 1875. The first class graduated in 1877. The work of the first two years is taken in the same classes with the Medical School of the University of Michigan, and the fees charged are the same. The entrance requirements are *two years* of collegiate work. The Dean is Dr. W. B. Hinsdale. The total registration for 1916-17 was 48; graduates, 8. The next session begins Oct. 2, 1917, and ends June 27, 1918.

Detroit

DETROIT COLLEGE OF MEDICINE AND SURGERY, 250 St. Antoine Street.—Organized as the Detroit College of Medicine in 1885 by consolidation of Detroit Medical College, organized in 1868, and the Michigan College of Medicine, organized in 1880. Reorganized with present title in 1913. The first class graduated in 1886. Entrance requirements for 1917-18 are one year of collegiate work; thereafter *two years* of college work will be required. The faculty embraces 23 professors, 147 lecturers, etc., a total of 170. The course covers four years of eight months each. The fees for the four years, respectively, are \$165, \$155, \$150 and \$130. The Secretary is Dr. W. H. MacCracken. The total registration for 1916-17 was 161; graduates, 64. The thirty-third session begins Sept. 24, 1917, and ends May 29, 1918.

MINNESOTA

Minnesota, population 2,226,761, contains one medical school, the University of Minnesota Medical School, situated in Minneapolis, a city of 353,460 inhabitants.

Candidates for license to practice medicine in Minnesota who graduated subsequent to June 1, 1912, in addition to an accredited four-year high school education, must have completed *two years* of work the equivalent of that done in the liberal arts department of the University of Minnesota, including courses in physics, chemistry and biology, prior to beginning the study of medicine.

Minneapolis

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL.—Organized in 1883 as the University of Minnesota College of Medicine and Surgery, reorganized in 1888 by absorption of St. Paul Medical College and Minnesota Hospital College. The first class graduated in 1889. In 1908 the Minneapolis College of Physicians and Surgeons, organized in 1883, was merged. In 1909 the Homeopathic College of Medicine and Surgery was merged. Present title in 1913. The faculty includes 54 professors and 91 instructors and assistants, a total of 151. The curriculum covers four years of nine months each and a year's internship in an approved hospital. The entrance requirements are *two years* of university work which must include one year each of physics, general chemistry, qualitative analysis, zoology or botany, and French or German, all in addition to a four-year high school course, including two years of Latin. Students entering hereafter will be required to secure a degree of B.S. or A.B. before the M.D. is granted. Total fees are \$150 each year. The Dean is Dr. E. P. Lyon. The total registration for 1916-17 was 265; graduates, 17. The thirtieth session begins Oct. 10, 1917, and ends June 20, 1918.

MISSISSIPPI

Mississippi, population 1,926,778, has one medical college, the Department of Medicine of the University of Mississippi, which is located at Oxford, a city of 2,014 inhabitants.

Candidates for license to practice medicine in Mississippi who matriculate in the session of 1915-16 and thereafter, in addition to a standard four-year high school education, must have completed a year's work in an approved college or university, including courses in physics, chemistry, biology and a modern language, before entering on the study of medicine.

Oxford

UNIVERSITY OF MISSISSIPPI SCHOOL OF MEDICINE.—Organized in 1903. Gives only the first two years of the medical course. In 1908 a clinical department was established at Vicksburg, but was discontinued in 1910 after graduating one class. The session extends over eight and a half months. Entrance requirements for 1917-18 are one year of collegiate work in addition to an accredited four-year high school education; thereafter, *two years* of college work will be required. The total fees each year are \$122. The faculty numbers 18. The Dean is Dr. W. S. Leathers. The total registration for 1916-17 was 60. The fifteenth session begins Sept. 19, 1917, and ends June 4, 1918.

MISSOURI

Missouri, population 3,391,789, has eight medical colleges. St. Louis, population 745,988, contains four of these, viz., the School of Medicine of St. Louis University, Washington University Medical School, the Medical Department of the National University of Arts and Sciences, and the St. Louis College of Physicians and Surgeons. Kansas City, with a population of 289,879, has three colleges, the Eclectic Medical University, the Kansas City College of Medicine and Surgery and the Southwest School of Medicine and Hospital. The School of Medicine of the University of Missouri is at Columbia, a town of 12,103 people.

Columbia

UNIVERSITY OF MISSOURI SCHOOL OF MEDICINE.—Organized at St. Louis in 1845; was discontinued in 1855, but was reorganized at Columbia in 1872. Teaching of the clinical years was suspended in 1909. The faculty includes 10 professors and 15 assistant professors, lecturers, etc., a total of 25. The course covers two years of nine months each. The entrance requirements are *two years* of college work including French

or German, 8 hours; general zoology, 8 hours; physics, 8 hours; inorganic chemistry, 8 hours, and general bacteriology, 3 hours. Total fees are \$73 for the first and \$45 for the second year. The acting Dean is Dr. Guy L. Noyes. Total registration for 1916-17 was 85. The next session begins Sept. 17, 1917, and ends June 5, 1918.

Kansas City

ECLECTIC MEDICAL UNIVERSITY, 309 East Tenth Street.—Organized at Kansas City, Mo., in 1898 with the present title. Moved to Kansas City, Kan., in 1907, and took the name of Western Eclectic College of Medicine and Surgery. Returned to Kansas City, Mo., in 1909 and resumed the present title. First class graduated in 1900. The faculty numbers 34. Total fees are \$150 per year. The Secretary is Dr. Samuel McCubbin. The total registration for 1916-17 was 31; graduates, 11. The next session begins Sept. 10, 1917, and ends May 3, 1918. *Reported not in good standing by the Missouri State Board of Health and by thirty other state licensing boards.*

KANSAS CITY COLLEGE OF MEDICINE AND SURGERY, Eclectic, Twenty-Third and Holmes Streets.—An offshoot of the Eclectic Medical University, organized in 1915. Total registration for 1916-17 was 114; graduates, 21. Since this school is an offshoot of a Class C medical college and is *reported not recognized by the Missouri State Board of Health*, no higher rating can be granted to it, pending an inspection.

St. Louis

WASHINGTON UNIVERSITY MEDICAL SCHOOL, Kingshighway and Euclid Avenue.—Organized in 1842 as the Medical Department of St. Louis University. In 1855 it was chartered as an independent institution under the name of St. Louis Medical College. The first class graduated in 1843. In 1891 it became the Medical Department of Washington University. In 1899 it absorbed the Missouri Medical College. The faculty comprises 30 professors and 78 lecturers, instructors, etc., a total of 108. *Two full years* of college work are required for admission, including courses in English, physics, chemistry and biology and a reading knowledge of German. The course is four years of eight months each. The total fees for the four years are, respectively, \$155, \$150, \$150 and \$155. The Dean is Dr. Philip A. Shaffer. The total registration for 1916-17 was 125; graduates, 31. The next session begins Sept. 27, 1917, and ends June 13, 1918.

ST. LOUIS UNIVERSITY SCHOOL OF MEDICINE, 1402 South Grand Avenue.—Organized in 1901 as the Marion-Sims-Beaumont Medical College by union of Marion Sims Medical College, organized in 1890, and Beaumont Hospital Medical College, organized in 1886. First class graduated in 1902. It became the Medical Department of St. Louis University in 1903. The faculty is composed of 45 professors, 75 lecturers and assistants, a total of 120. One year of college subjects preliminary to the four years of medical subjects is given in the medical school. After Nov. 1, 1917, *two years* of collegiate work will be required for admission. The curriculum covers four years of thirty-two weeks each. The total fees are \$155 each year. The Dean is Dr. Hanau W. Loeb. The total registration for 1916-17 was 254; graduates, 41. The next session begins Oct. 1, 1917, and ends June 1, 1918.

NATIONAL UNIVERSITY OF ARTS AND SCIENCES, Medical Department, Garrison and Lawton Avenues.—Organized in 1873 as the American Medical College, and Eclectic Institution. Eclecticism dropped in 1910. Absorbed the Barnes Medical College in 1911. Became the Medical Department of the National University of Arts and Sciences in 1912. St. Louis College of Physicians and Surgeons was merged in 1915, but withdrew in 1916. Two classes were graduated each year from 1874 to 1883, inclusive. Since then one class has graduated each year. The Secretary is Dr. E. L. Cooley. The total registration for 1916-17 was 64; graduates, 38. The next session begins June 1, 1917, and ends Feb. 5, 1918.

ST. LOUIS COLLEGE OF PHYSICIANS AND SURGEONS, Jefferson and Gamble Streets.—Organized in 1869. Classes graduated in 1870 and each subsequent year until 1873 when it suspended. Reorganized in 1879. Classes graduated in 1880 and subsequent years until 1915 when it merged with the Medical Department of the National University of Arts and Sciences. Reestablished in 1916. Total fees each year are \$140; graduation fee, \$25. The Secretary is Dr. E. L. Marks. Registration during 1916-17 was 46; graduates, 11. The next session begins Oct. 1, 1917, and ends June 3, 1918.

NEBRASKA

Nebraska, population 1,258,624, has three medical colleges. The University of Nebraska College of Medicine and the John A. Creighton Medical College of Omaha, population 135,455, and the Lincoln Medical College at Lincoln, population 46,028.

Lincoln

LINCOLN MEDICAL COLLEGE, Eclectic, Corner 13th and P Streets, Lincoln.—Organized in 1890 as the Lincoln Medical College. The first class graduated in 1891. Became Cotner University Medical College in 1911. Affiliation with Cotner University canceled and present title resumed in 1915. The Dean is Dr. F. L. Wilmett. The total registration for 1916-17 was 25; graduates, 4. The next session begins Sept. 15, 1917, and ends June 1, 1918. *Official reports indicate that diplomas from this college are not recognized by the licensing boards of thirty-five states.*

Omaha

JOHN A. CREIGHTON MEDICAL COLLEGE, Fourteenth and Davenport Streets. It is the Medical Department of Creighton University.—Organized in 1892. The first class graduated in 1893. It has a faculty of 18 professors and 36 associates, lecturers and assistants, a total of 54. One year of collegiate work is required for admission. Beginning with the session of 1918-19 *two years* of collegiate work will be required. The course of study embraces four years of eight months each. The total fees each year for the four years are, respectively, \$157, \$147, \$147 and \$152. The Dean is Dr. James Ross Clemens. Total registration for 1916-17 was 108; graduates, 43. The thirty-sixth session begins Sept. 21, 1917, and ends June 1, 1918.

UNIVERSITY OF NEBRASKA COLLEGE OF MEDICINE, Forty-Second Street and Dewey Avenue.—Organized in 1881 as the Omaha Medical College. The first class graduated in 1882. It became the Medical Department of Omaha University in 1891. In 1902 it affiliated with the University of Nebraska, with the present title. The first two years were given at Lincoln and the last two in Omaha until 1913, when all four years were transferred to Omaha. The faculty is composed of 22 professors and 44 lecturers and instructors, total 66. *Two years* of collegiate work are required for admission, including courses in physics, chemistry, zoology and German. The fees for each of the four years, respectively, are \$135, \$130, \$120 and \$120. The Dean is Dr. Irving S. Cutter. Total registration for 1916-17 was 143; graduates, 16. The next session begins Sept. 13, 1917, and ends June 12, 1918.

NEW HAMPSHIRE

New Hampshire, population 440,584, has one medical college, located at Hanover, population 2,075.

To be eligible for license to practice medicine in New Hampshire, all students matriculating in and after the session of 1915-16, in addition to a four-year high school education, must have completed at least *two years* of work in an approved college of liberal arts, prior to beginning the study of medicine.

DARTMOUTH MEDICAL SCHOOL.—Organized as New Hampshire Medical Institute in 1797. The first class graduated in 1798. It is under the control of the trustees of Dartmouth College. Clinical teaching was discontinued in 1914. The faculty is made up of 10 professors and 2 instructors, a total of 12. *Two years* of collegiate work are required for admission. The course covers nine calendar months in each year, or eight months of actual teaching. Candidates for the B.S. degree in Dartmouth College may substitute the work of the first two years in medicine for that of the junior and senior years in the academic department. Candidates for the A.B. degree may make a similar saving of one year. The fees for the two years in medicine are, respectively, \$172 and \$173. Dean, Dr. John M. Gile; Secretary, Colin C. Stewart. The total registration for 1916-17 was 40. The next session opens Sept. 20, 1917, and ends June 19, 1918.

NEW YORK

New York State, population 10,086,568, has ten medical colleges. Seven of these, College of Physicians and Surgeons (Columbia University), Long Island College Hospital, New York Homeopathic Medical College and Hospital, New York Medical College and Hospital for Women, Cornell University Medical College, the University and Bellevue Hospital Medical College and Fordham University School of Medicine, are located in New York City, population 5,468,190. Albany Medical College is located in Albany, a city of 103,580 people. The University of Buffalo Medical Department is situated in Buffalo, population 461,335. The College of Medicine, Syracuse University, is in Syracuse, a city of 152,534 inhabitants.

Albany

ALBANY MEDICAL COLLEGE, Lancaster and Jay Streets.—Organized in 1838. The first class graduated in 1839. It became the Medical Department of Union University in 1873. In 1915 Union University assumed full control. The faculty is composed of 8 professors and 60 instructors, assistants, etc., a total of 68. One year of collegiate work, including college courses in physics, chemistry, biology, English, and French or German is required for admission. Beginning with the session of 1918-19, *two years* of college work will be required for admission. The curriculum covers four years of eight months each. The fees for the four years, respectively, are \$195, \$175, \$170 and \$165. The Dean is Dr. Thomas Ordway. The total registration for 1916-17 was 110; graduates, 42. The eighty-seventh session begins Sept. 24, 1917, and ends June 7, 1918.

Buffalo

UNIVERSITY OF BUFFALO MEDICAL DEPARTMENT, High Street, near Main.—Organized in 1846. The first class graduated in 1847. It absorbed the Medical Department of Niagara University in 1898. The faculty is composed of 30 professors and 82 lecturers, assistants, etc., a total of 112. One year of collegiate work, including college courses in physics, chemistry, biology, English and French or German are required for admission—*two years* of college work will be required in and after 1918. The course covers four years of eight months each. The total fees for the four years, respectively, are \$200, \$200, \$175 and \$175. The Dean is Dr. Thomas H. McKee. Total registration for 1916-17 was 196; graduates, 60. The seventy-second session begins Sept. 24, 1917, and ends June 7, 1918.

New York

COLUMBIA UNIVERSITY COLLEGE OF PHYSICIANS AND SURGEONS, 437 West Fifty-Ninth Street.—Organized in 1807 by the regents of the University of the State of New York as their medical department. The first class graduated in 1811. In 1860 it became, by affiliation, the Medical Department of Columbia College. It was made a permanent part of Columbia College by legislative enactment in 1891. That institution became Columbia University in 1896. The faculty is composed of 89 professors and 172 instructors, demonstrators, etc., a total of 261. *Two years* of collegiate work, including courses in physics, chemistry, biology, English and either French or German are required for admission. The work covers four years of eight months each. The Dean is Dr. Samuel W. Lambert. The total fees for the four years, respectively, are \$265, \$251, \$250 and \$275. Total registration for 1916-17 was 491;

graduates, 90. The one hundred and tenth session begins Sept. 26, 1917, and ends June 5, 1918.

CORNELL UNIVERSITY MEDICAL COLLEGE, First Avenue and Twenty-Eighth Street, New York City and Ithaca.—Organized in 1898. The first class was graduated in 1899. The work of the first year may be taken either in Ithaca or New York. The faculty is composed of 51 professors and 77 assistants, lecturers, instructors, etc., a total of 128. All candidates for admission must be graduates of approved colleges or scientific schools or seniors of approved colleges which will permit them to substitute the first year of this medical school for the fourth year of their college course and will confer on them the Bachelor degree on the completion of the year's work. The candidate must also have such knowledge of physics, inorganic chemistry and biology as may be obtained in college by a year's course in these subjects when accompanied by laboratory work. The fees for each of the four years are, respectively, \$190, \$185, \$185 and \$200. The Dean is Dr. William M. Polk. Total registration for 1916-17 was 165; graduates, 27. The twentieth session begins Oct. 1, 1917, and ends June 13, 1918.

FORDHAM UNIVERSITY SCHOOL OF MEDICINE, Bathgate Avenue and Fordham Road.—Organized in 1905 as the School of Medicine of St. John's College. Present title assumed in 1907. First class graduated in 1909. The faculty consists of 56 professors and 55 lecturers and assistants, a total of 111. The course of instruction covers four years of eight and a half months each. Total fees for the four years, respectively, are \$225, \$216, \$212 and \$210. A year's work in a recognized college of liberal arts, including college courses in physics, chemistry and biology is required for admission. *Two years* will be required in 1918 and thereafter. The Dean is Dr. William P. Healy. The total registration for 1916-17 was 297; graduates, 49. The thirteenth session begins Sept. 27, 1917, and ends June 10, 1918.

LONG ISLAND COLLEGE HOSPITAL, Henry Street, near Atlantic Avenue, Brooklyn.—Organized in 1858. The first class graduated in 1860. It has a faculty of 20 professors and 98 assistants, instructors, etc., a total of 118. A year of collegiate work, including college courses in physics, chemistry and biology is required for admission. In and after 1918-19 *two years* of collegiate work will be required for admission. The course covers four years of eight months each. Fees: first year, \$255; second year, \$250; third, \$250, and \$275 for the fourth year. The secretary is Dr. Otto V. Huffman. Total registration 1916-17 was 295; graduates, 70. The sixtieth session begins Sept. 24, 1917, and ends May 31, 1918.

NEW YORK HOMEOPATHIC MEDICAL COLLEGE AND FLOWER HOSPITAL, Eastern Boulevard, between Sixty-Third and Sixty-Fourth Streets.—Organized in 1858. Incorporated in 1860 as the Homeopathic Medical College of the State of New York. The title, New York Homeopathic Medical College, was assumed in 1869. Present title assumed in 1908. The first class graduated in 1861. The faculty consists of 26 professors and 55 assistants, lecturers, etc., a total of 81. The total fees are \$200 each year. The Dean is Dr. Royal S. Copeland. Total registration for 1916-17 was 170; graduates, 42. The fifty-eighth session begins Sept. 25, 1917, and ends May 23, 1918.

NEW YORK MEDICAL COLLEGE AND HOSPITAL FOR WOMEN (Homeopathic), 17-21 West One Hundred and First Street.—Organized in 1863. The first class graduated in 1864. The faculty numbers 73. After Jan. 1, 1918, two years of collegiate work will be required for admission which must include courses in physics, chemistry, biology, English and one modern language. The course covers four years of thirty-two weeks each. The fees for each of the four years, respectively, are \$180, \$175, \$160 and \$180. The Dean is Dr. Cornelia C. Brant. The total registration for 1916-17 was 38; graduates, 12. The fifty-fifth session begins Sept. 19, 1917, and ends May 31, 1918.

UNIVERSITY AND BELLEVUE HOSPITAL MEDICAL COLLEGE, First Avenue and Twenty-Sixth Street.—Organized in 1898 by the union of the New York University Medical College, organized in 1841, and the Bellevue Hospital Medical College, organized in 1861. It is the Medical Department of New York University. First class graduated in 1899. The faculty is composed of 59 professors and 83 instructors, etc., in all 142. The course covers four years of eight months each. Entrance requirements are one year of collegiate work, in addition to a standard four-year high school course, including college courses in physics, chemistry and biology. On and after Jan. 1, 1918 (session of 1918-19), *two years* of college work will be required for admission, including courses in the prescribed sciences and a modern language. The fees are \$200 per year; graduation fee, \$25. The Dean is Dr. Samuel A. Brown. Total registration for 1916-17 was 429; graduates, 64. The next session begins Sept. 26, 1917, and ends June 12, 1918.

Syracuse

SYRACUSE UNIVERSITY COLLEGE OF MEDICINE, 307-311 Orange Street.—Organized in 1872, when the Geneva Medical College, chartered in 1834, was removed to Syracuse, under the title "The College of Physicians and Surgeons of Syracuse University." Present title assumed in 1875, when a compulsory three-year graded course was established. The first class graduated in 1873 and a class graduated each subsequent year. In 1889 the amalgamation with the university was made complete. Course extended to four years in 1896. *Two years* of a recognized college course are required for admission. The course covers four years of thirty-five weeks each. The fees are \$200 annually; graduation fee, \$10. The faculty is composed of 28 professors and 67 associate and assistant professors, lecturers and instructors. The Dean is Dr. John L. Heffron. The total enrolment for 1916-17 was 124; graduates, 29. The forty-seventh session begins Sept. 18, 1917, and ends June 12, 1918.

NORTH CAROLINA

North Carolina, population 2,371,095, has three medical schools, each of which gives only the first two years of the medical course. The School of Medicine of the University of North Carolina is located at Chapel Hill, population 1,149. The Leonard Medical School is at Raleigh, population 19,980. Wake Forest College School of Medicine is at Wake Forest, population 1,443.

Graduates of 1918 (matriculants of 1914-15) and thereafter must have completed one year of college work including

courses in physics, chemistry and biology in addition to 14 units of high school work to be eligible for a license to practice medicine in North Carolina.

Chapel Hill

UNIVERSITY OF NORTH CAROLINA SCHOOL OF MEDICINE.—Organized in 1890. Until 1902 this school gave only the work of the first two years, when the course was extended to four years by the establishment of a department at Raleigh. The first class graduated in 1903. A class was graduated each subsequent year, including 1910, when the clinical department at Raleigh was discontinued. *Two years* of collegiate work are required for admission. The faculty is composed of 12 professors and 12 lecturers, assistants, etc., a total of 24. The total fees for the two years, respectively, are \$124.50 and \$122.50. The Dean is Dr. I. H. Manning. The total registration for 1916-17 was 64. The thirty-second session begins Sept. 11, 1917, and ends June 5, 1918.

Raleigh

LEONARD MEDICAL SCHOOL.—Colored. This department of Shaw University was established in 1882. Classes were graduated in 1886, 1888 and in all subsequent years, including 1914 when clinical teaching was discontinued. A year of collegiate work is required for admission. It has a faculty of 8. The course covers four years of eight months each. The total fees for each year are \$115. The Dean is Dr. George H. Stoddard. Total registration for 1916-17 was 8. The thirty-sixth session begins Sept. 26, 1917, and ends May 9, 1918.

Wake Forest

WAKE FOREST COLLEGE SCHOOL OF MEDICINE.—This school was organized in 1902. The faculty, including the professors of chemistry, physics and biology, numbers 11. Only the first two years of the medical course are offered after the completion of freshmen and sophomore college work, and on this combined course the B.S. degree is conferred. Each annual course extends over nine months. The fees for each year aggregate \$115. The Secretary is E. B. Earnshaw. The total registration for 1916-17 was 32. The sixteenth session begins Sept. 4, 1917, and ends May 24, 1918.

NORTH DAKOTA

North Dakota, population 713,083, has one medical college, the School of Medicine of the University of North Dakota, which is situated at University, a suburb of Grand Forks, a city of 15,332 people. It gives only the first two years of the medical course.

Candidates for license to practice medicine in North Dakota who graduated in 1912 and thereafter, in addition to a four-year high school education, must have completed *two years* of work in an approved college of liberal arts including courses in Latin, physics, chemistry, botany and zoology, prior to beginning the study of medicine. Beginning in 1918 every applicant for a license must show evidence of having spent at least one year as an intern in a hospital.

University

UNIVERSITY OF NORTH DAKOTA SCHOOL OF MEDICINE.—Organized in 1905. The faculty is composed of 4 professors and 12 instructors, a total of 16. The course consists of *two years* of academic work and two years of medicine, occupying nine months each year. The total fee for each of the medical years is \$50. The Dean is Dr. Harley L. French. The total registration for 1916-17 was 33. The twelfth session begins Oct. 6, 1917, and ends June 26, 1918.

OHIO

Ohio, population 5,038,627, has five medical colleges. Two of these, the Medical College of the University of Cincinnati and the Eclectic Medical College, are located in Cincinnati, a city of 406,706 inhabitants. Cleveland, population 656,975, contains one medical school, Western Reserve University School of Medicine. Columbus, population 209,722, contains the two departments of the Ohio State University, the College of Medicine and the College of Homeopathic Medicine.

Cincinnati

UNIVERSITY OF CINCINNATI COLLEGE OF MEDICINE, Eden Avenue, Cincinnati General Hospital.—Organized in 1909 by the union of the Medical College of Ohio (founded in 1819) with the Miami Medical College (founded in 1852). The Medical College of Ohio became the Medical Department of the University of Cincinnati in 1896. Under a similar agreement, March 2, 1909, the Miami Medical College also merged into the University, when the title of Ohio-Miami Medical College of the University of Cincinnati was taken. Present title assumed in 1915. *Two years* of college work are required for admission. The faculty consists of 43 professors, 113 associates, assistants, etc., a total of 156. The course covers four years of eight months each. The fees for each of the first three years are \$150 and for the fourth year, \$170. The Dean is Dr. Christian R. Holmes. The total registration for 1916-17 was 94; graduates, 14. The next session begins Oct. 2, 1917, and ends June 15, 1918.

ECLECTIC MEDICAL COLLEGE, 630 West Sixth Street.—Organized in 1833 at Worthington as the Worthington Medical College. Removed to Cincinnati in 1843. In 1845 it was chartered as the Eclectic Medical Institute. In 1857 the American Medical College, organized in 1839, was merged into it, and in 1859 the Eclectic College of Medicine and Surgery, organized in 1856, was merged into it. In 1910 it assumed its present title. Classes were graduated in 1833 and in all subsequent

years except 1839 to 1843, inclusive. It has a faculty of 26 professors and 8 lecturers and assistants, a total of 34. One year of college work is required for admission. The course covers four years of eight months each. The fees are \$120 for each year; matriculation fee, \$5; graduation fee, \$10. The Secretary is Dr. John K. Scudder. Total registration for 1916-17 was 97; graduates, 29. The next session begins Sept. 14, 1917, and ends May 14, 1918.

Cleveland

WESTERN RESERVE UNIVERSITY SCHOOL OF MEDICINE, 1353 East Ninth Street.—Organized in 1843 as the Cleveland Medical College. The first class graduated in 1844. It assumed the present title in 1881. In 1910 it absorbed the Cleveland College of Physicians and Surgeons. The faculty includes 40 professors and 67 lecturers, assistants, etc., a total of 107. The curriculum embraces four years of eight and one-half months each. Three years of college work are required for admission. The total fees for each of the four years are, respectively, \$175, \$160, \$154 and \$155. The Dean is Dr. C. A. Hamann. The total registration for 1916-17 was 165; graduates, 32. The seventy-fifth session begins Sept. 27, 1917, and ends June 13, 1918.

Columbus

OHIO STATE UNIVERSITY COLLEGE OF MEDICINE, Buttles Avenue and Park Street.—Organized in 1907 as the Starling-Ohio Medical College by the union of Starling Medical College (organized 1847) with the Ohio Medical University (organized 1890). In 1914 it became an integral part of the Ohio State University with its present title. The faculty consists of 30 professors and 61 lecturers, demonstrators, etc., a total of 91. *Two years* of collegiate work are required for admission. The course covers four years of eight months each. Tuition fees are \$152 each year. The Dean is Dr. E. F. McCampbell. The total registration for 1916-17 was 142; graduates, 65. The next session begins Sept. 18, 1917, and ends June 18, 1918.

OHIO STATE UNIVERSITY COLLEGE OF HOMEOPATHIC MEDICINE.—Organized in 1914, when the property of the Cleveland-Pulte Medical College of Cleveland was transferred to the Ohio State University. The faculty numbers 26. *Two years* of college work are required for admission. The students are taught largely in the same classes and by the same teachers as students of the College of Medicine during the first two years. Tuition fees are \$152 each year. The Dean is Dr. Claude A. Burrett. The total registration for 1916-17 was 36; graduates, 8. The third session begins Sept. 18, 1917, and ends June 18, 1918.

OKLAHOMA

Oklahoma, population 2,114,307, has one medical college, the School of Medicine of the University of Oklahoma. The work of the first and second years is given in the academic laboratories at Norman, a city of 3,724 inhabitants. The work of the third and fourth years is given in Oklahoma City, which has a population of 88,158 and which is eighteen miles north of Norman.

To be eligible for license to practice medicine in Oklahoma, all students matriculating in 1914-15, in addition to a four-year high school education, must have completed at least one year of work in an approved college of liberal arts, including courses in physics, chemistry, biology and a modern language prior to beginning the study of medicine. For students matriculating in and after 1917-18, *two years* of preliminary college work will be required.

Norman and Oklahoma City

UNIVERSITY OF OKLAHOMA SCHOOL OF MEDICINE.—Organized in 1900. Gave only the first two years of the medical course at Norman until 1910, when a clinical department was established at Oklahoma City. It has a faculty of 49 professors and 17 instructors, a total of 66. *Two years* of collegiate work are required for admission. The course is four years of nine months each. An optional course of six years is offered for the degrees of B.S. and M.D. The total fees for the four years are, respectively, \$43, \$23, \$25 and \$25. The Dean is Dr. Leroy Long, 325 East Fourth Street, Oklahoma City. The total registration for 1916-17 was 85; graduates, 24. The eighteenth session begins Sept. 18, 1917, and ends June 4, 1918.

OREGON

Oregon, population 809,490, has one medical college, the University of Oregon Medical School, located in Portland, a city of 272,833 population.

Portland

UNIVERSITY OF OREGON MEDICAL SCHOOL, Lovejoy and Twenty-Third Streets.—Organized in 1887. The first class graduated in 1888. A class graduated each subsequent year except 1898. Became an integral part of the University of Oregon in 1910. The Willamette University Medical Department was merged in 1913. It has a faculty of 20 professors and 58 lecturers, assistants, etc., a total of 78. Entrance requirements are *two years* of college work or its equivalent. The course is four years of eight months each. Fees: Matriculation, \$5; tuition, \$150 each year. The Dean is Dr. K. A. J. Mackenzie. The total registration for 1916-17 was 72; graduates, 12. The thirty-first session begins Oct. 1, 1917, and ends June 1, 1918.

PENNSYLVANIA

Pennsylvania, population 8,383,992, has six medical colleges. Of these, Philadelphia, having a population of 1,683,664, contains five, as follows: University of Pennsyl-

vania School of Medicine, Jefferson Medical College, Hahnemann Medical College and Hospital, Woman's Medical College of Pennsylvania and Temple University Department of Medicine. The other school, the School of Medicine of the University of Pittsburgh, is situated in Pittsburgh, a city of 571,984.

To be eligible for license to practice medicine in Pennsylvania, students matriculating in the session 1914-15 and thereafter, in addition to a four-year high school education, must have completed a year's work either in an approved college of liberal arts or in a preliminary year in the medical college, including college courses in physics, chemistry and biology, before beginning the study of medicine. He must also have completed an internship of at least one year in an approved hospital.

Philadelphia

UNIVERSITY OF PENNSYLVANIA SCHOOL OF MEDICINE, Thirty-Sixth Street and Hamilton Walk.—Organized in 1765. Classes were graduated in 1768 and in all subsequent years except 1772-79, inclusive. The original title was the Department of Medicine, College of Philadelphia. The present title, School of Medicine of the University of Pennsylvania, was adopted in 1909. It granted the first medical diploma issued in America. In 1916 it took over the Medico-Chirurgical College of Philadelphia to develop it as a graduate school. The faculty consists of 86 professors, associate, adjunct and assistant professors, and 163 lecturers, associates, instructors, etc., a total of 249. The minimum requirements for admission are a standard four-year high school course or its equivalent, plus *two years* of work in an approved College of Arts and Science, including courses in French or German, and in physics, chemistry and general biology or zoology, with appropriate laboratory exercises. The course embraces four years of study of thirty-four weeks each. The total fees for each of the four years are, respectively, \$233, \$210, \$210 and \$214. The Dean is Dr. William Pepper. Total registration for 1916-17 was 585; these figures including 184 students who were formerly enrolled in the Medico-Chirurgical College, and of whom, 86 graduated. The one hundred and fifty-second session begins Sept. 28, 1917, and ends June 19, 1918.

JEFFERSON MEDICAL COLLEGE, Tenth and Walnut Streets.—Organized in 1825 with its present title as the Medical Department of Jefferson College, Canonsburg, Pa. Classes have been graduated annually since 1826. In 1838 a separate university charter was granted without change of title, since which time it has continued under the direction of its own board of trustees. It has a faculty of 25 professors, associate and assistant professors, and 132 associates, lecturers, demonstrators and instructors, a total of 157. Entrance requirements are a completed standard four-year high school or college preparatory course, or the equivalent, and in addition *two years* of work in an approved college of arts and science amounting to at least 60 semester hours, including specified courses in physics, chemistry and biology with laboratory work amounting to 8 semester hours each. The course of study covers graded work of four years of eight and a half months each. The tuition is \$210 a year with a matriculation fee of \$5 paid on admission. The Dean is Dr. Ross V. Patterson. The total registration for 1916-17 was 540; graduates, 140. The ninety-third session begins Sept. 24, 1917, and ends June 1, 1918.

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA, Twenty-First and N. College Avenue.—Organized in 1850. Classes were graduated in 1852 and in all subsequent years except 1862. It has a faculty of 11 professors and 50 assistants, lecturers, etc., in all 61. Entrance requirements are a completed course in a standard secondary school, and in addition *two years* of collegiate work, including courses in physics, chemistry, biology and two foreign languages, one of which must be French or German. The curriculum covers four years of eight months each. Fees for each of the four years are, respectively, \$192, \$176, \$183 and \$179.50. The acting Dean is Dr. Martha Tracy. The total registration for 1916-17 was 43; graduates, 17. The seventy-eighth session begins Sept. 19, 1917, and ends June 5, 1918.

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL OF PHILADELPHIA, 226 North Broad Street.—Organized in 1848 as the Homeopathic Medical College of Pennsylvania. In 1869 it united with the Hahnemann Medical College of Philadelphia, taking the latter title. Assumed present title in 1885. The first class graduated in 1849. Entrance requirements are a completed course in a standard secondary school and in addition *two years* devoted to college courses including English and either French, German or Spanish, physics, chemistry and biology. It has a faculty of 55 professors and 31 lecturers, instructors, etc., in all 86. The work covers four years of eight and a half months each. Total fees for each of the first years are \$185 and for the fourth year \$200. The Dean is Dr. William A. Pearson. The total registration for the college year 1916-17 was 111; graduates, 37. The seventieth session begins Oct. 1, 1917, and ends June 6, 1918.

THE TEMPLE UNIVERSITY DEPARTMENT OF MEDICINE, Eighteenth and Buttonwood Streets.—Organized in 1901. The first class graduated in 1904. The faculty numbers 91. One year of college work is required for admission. The fees for each of the four years, respectively, are \$175, \$170, \$160 and \$161. The Dean is Dr. Frank C. Hammond. The total registration for 1916-17 was 83; graduates, 28. The seventeenth session begins Sept. 24, 1917, and ends June 15, 1918.

Pittsburgh

UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE, Bigelow Boulevard.—Organized in 1886, as the Western Pennsylvania Medical College and in 1908 became an integral part of the University of Pittsburgh, removing to the university campus in 1910. The first class graduated in 1887. The faculty is composed of 15 professors and 93 associates, assistants, etc., 108 in all. Entrance requirements are *two years* of recognized college work, to have included essentially courses in English, chemistry (inorganic and organic), physics, biology and a reading knowledge of French or German, Italian or Spanish. It is possible for students to get the degree of B.S. and M.D. in six years. The course of study for medicine alone is four years of eight and a half months each. The tuition fee is \$250 a year; matriculation fee,

\$15; diploma fee, \$5. The Dean is Dr. Thomas S. Arbuthnot. The total registration for 1916-17 was 117; graduates, 20. The thirty-second session begins Oct. 1, 1917, and ends June 2, 1918.

SOUTH CAROLINA

South Carolina, population 1,607,745, has one medical college, situated in Charleston, a city of 60,427 people.

Graduates of 1922 (matriculants of 1918-19) and thereafter, to be eligible for license to practice medicine in South Carolina must have completed, in addition to 14 units of high school work, *two years* in an approved college, including courses in English, physics, chemistry and biology.

Charleston

THE MEDICAL COLLEGE OF THE STATE OF SOUTH CAROLINA, Lucas and Calhoun Streets.—Organized in 1823 as the Medical College of South Carolina. The first class graduated in 1825. In 1832 a medical college bearing the present title was chartered and the two schools continued as separate institutions until they were merged in 1838. Classes were graduated in all years except 1862 to 1865, inclusive. In 1913, by legislative enactment, it became a state institution. It has a faculty of 32 professors and 27 lecturers, instructors, etc., a total of 59. The course covers four years of eight months each. *Two years* of collegiate work including courses in physics, chemistry, biology and a modern foreign language are required for admission, in addition to a standard high school preparation. The total fees are \$150 for each of the first two years and \$145 for each of the last two years. The Dean is Dr. Robert Wilson, Jr. Total enrolment for 1916-17 was 59; graduates, 24. The eighty-ninth session begins Sept. 28, 1917, and ends June 6, 1918.

SOUTH DAKOTA

South Dakota, population 680,046, has one medical college, the University of South Dakota College of Medicine, located at Vermilion, a town of 2,187 people.

To be eligible for license to practice medicine in South Dakota, graduates of 1915 and thereafter must show that they matriculated in and graduated from medical colleges which required at least *two years* of collegiate work for admission, including courses in physics, chemistry, biology and a modern language. This affects all students who matriculated in the session of 1911-12 and thereafter.

Vermilion

UNIVERSITY OF SOUTH DAKOTA COLLEGE OF MEDICINE.—Organized in 1907. Offers only the first two years of the medical course. *Two years'* work in a college of liberal arts are required for admission. The fees are \$60 each year. The faculty numbers 10. The Dean is Christian P. Lommen, B.S. The total registration for 1916-17 was 17. The eleventh session begins Sept. 20, 1917, and ends June 12, 1918.

TENNESSEE

Tennessee, population 2,271,379, has four medical colleges. Of these Vanderbilt University Medical Department and Meharry Medical College are situated in Nashville, a city with a population of 115,978. The College of Medicine of the University of Tennessee and the University of West Tennessee College of Medicine and Surgery are located in Memphis, population 146,113.

To be eligible for a license to practice medicine in Tennessee students matriculating in the session of 1914-15 (graduates of 1918) and thereafter must have completed one year of collegiate work, including courses in physics, chemistry, biology and a modern language, in addition to a four-year high school course before entering on the study of medicine.

Memphis

UNIVERSITY OF TENNESSEE COLLEGE OF MEDICINE, three buildings, 879 Madison Avenue.—Organized in 1876 at Nashville as Nashville Medical College. First class graduated 1877, and a class graduated each subsequent year. Became Medical Department of University of Tennessee 1879. In 1909 it united with the Medical Department of the University of Nashville to form the joint Medical Department of the Universities of Nashville and Tennessee. This union was dissolved in 1911. The trustees of the University of Nashville by formal action of that board named the University of Tennessee College of Medicine as its legal successor. In 1911 it moved to Memphis, where it united with the College of Physicians and Surgeons. The Memphis Hospital Medical College was merged in 1913. Lincoln Memorial University Medical Department was merged in 1914. The faculty includes 29 professors and 76 assistants, instructors, etc., a total of 105. Entrance requirements are a completed secondary education plus one year of collegiate work—*two years* of college work will be required in and after 1918. Students taking the two-year premedical course in Knoxville may secure the B.S. and M.D. degrees. The fees are \$102 per year for bona fide residents of the state, and \$152 per year for nonresidents; for the fourth year, \$177. The Acting Dean is Dr. L. Junius Desha. Total registration for 1916-17 was 122; graduates, 58. The next session begins Sept. 22, 1917, and ends June 5, 1918.

UNIVERSITY OF WEST TENNESSEE COLLEGE OF MEDICINE AND SURGERY, Colored. 1190 South Phillips Place.—Organized in 1900. The first class

graduated in 1904, and a class graduated each subsequent year. It has a faculty of 24. The course covers four years. Two years of college work are required for admission. The fees are \$60 per year; graduation, \$10 extra. The Dean is Dr. M. V. Lynk. Registration for 1916-17 was 20; graduates, 4. The eighteenth session begins Sept. 17, 1917, and ends May 7, 1918. *Official reports indicate that the diplomas of this college are not recognized as an acceptable qualification for the license by the licensing boards of thirty-nine states.*

Nashville

VANDERBILT UNIVERSITY MEDICAL DEPARTMENT.—This school was founded in 1874. The first class graduated in 1875. The faculty consists of 25 professors and 59 lecturers, a total of 84. One year of collegiate work is required for admission. The course covers four years of nearly eight and a half months each. The total fees for each of the first three years are \$150, and for the fourth year, \$175. The Dean is Dr. L. E. Burch. The total registration for 1916-17 was 152; graduates, 75. The forty-fourth session begins Oct. 1, 1917, and ends June 12, 1918.

MEHARRY MEDICAL COLLEGE. Colored. First Avenue, South, and Chestnut Street.—This school was organized in 1876 as the Medical Department of Central Tennessee College, which became Walden University in 1900. First class graduated in 1877. Obtained new charter independent of Walden University in 1916. The faculty is made up of 13 professors and 12 instructors, demonstrators, etc., 25 in all. The work embraces four years of thirty weeks each. The total fees for each of the first three years are \$70 and for the fourth year, \$80. The President is Dr. G. W. Hubbard. Total registration for 1916-17 was 255; graduates, 96. The forty-second session begins Sept. 25, 1917, and ends May 9, 1918.

TEXAS

Texas, population 4,343,710, has three medical colleges. The University of Texas Department of Medicine is located at Galveston, a city of 41,076 inhabitants. The Fort Worth School of Medicine is at Fort Worth, population 99,528. The Baylor University College of Medicine is located in Dallas, population 118,482.

To be eligible for a license to practice medicine in Texas, students matriculating in the session of 1914-15 and thereafter must have completed a year of collegiate work, including courses of physics, chemistry, biology and a modern language, in addition to a standard four-year high school course, before entering on the study of medicine.

Dallas

BAYLOR UNIVERSITY COLLEGE OF MEDICINE, 720 College Avenue.—Organized in 1900 as the University of Dallas Medical Department. In 1903 it took its present name and became the Medical Department of Baylor University at Waco. It acquired the charter of Dallas Medical College in 1904. The first class graduated in 1901. The faculty numbers 54. Entrance requirement is one year of college work in addition to a four-year high school education. For the session of 1918-19 and thereafter *two years* of collegiate work will be required for admission. The course is four years of eight months each. The fees are \$115 each year; matriculation fee of \$5, paid but once; graduation fee, \$25. The Dean is Dr. E. H. Cary. Total registration for 1916-17 was 45; graduates, 11. The eighteenth session begins Oct. 1, 1917, and ends May 31, 1918.

Fort Worth

FORT WORTH SCHOOL OF MEDICINE, Medical Department of Texas Christian University, Calhoun and Fifth Streets.—Organized in 1894 as the Fort Worth School of Medicine. It was the Medical Department of the Fort Worth University until 1911, when it was affiliated with Texas Christian University. The first class graduated in 1895. Its faculty consists of 28 professors and 40 instructors, assistants, etc., a total of 68. A combined scientific and medical course of six years' duration is offered. The two degrees of A.B. and M.D. are conferred simultaneously at the end of the sixth year. All students entering after Jan. 1, 1918, will be required to conform to the six-year course. The total fees for the four years, respectively, are \$115, \$125, \$115 and \$110. The Dean is Dr. Samuel A. Woodward. The total registration for 1916-17 was 55; graduates, 17. The twenty-fourth session begins Oct. 1, 1917, and ends June 8, 1918.

Galveston

UNIVERSITY OF TEXAS DEPARTMENT OF MEDICINE, on the Strand, between Ninth and Tenth Streets.—Organized in 1891. The first class graduated in 1892. It has a faculty of 18 professors and 23 lecturers, a total of 41. The curriculum embraces four years of eight months each. The entrance requirement is *two years* of collegiate work in addition to a four-year high school education. The total fees for the four years, respectively, are \$77.25, \$47.25, \$29.75 and \$17.25. The Dean is Dr. William S. Carter. Total registration for 1916-17 was 255; graduates, 50. The twenty-seventh session begins Oct. 1, 1917, and ends May 31, 1918.

UTAH

Utah, population 424,300, has one medical college, the School of Medicine of the University of Utah, situated at Salt Lake City, which has 113,567 people.

To be eligible to secure licenses to practice medicine in Utah, students matriculating in and after the session of 1912-13, in addition to a four-year high school education, must have completed at least one year of collegiate work prior to beginning the study of medicine, this preliminary

college work to have included college courses in physics, chemistry and biology.

Salt Lake City

UNIVERSITY OF UTAH SCHOOL OF MEDICINE.—Organized in 1906. Gives only first two years of medical course. Each course covers thirty-six weeks. *Two years* of collegiate work are required for admission. The medical faculty consists of 10 professors and 13 lecturers and assistants, a total of 23. The fees are \$100 each year for residents, and \$125 each year for nonresidents. The Dean is Dr. Perry G. Snow. Total registration for 1916-17 was 22. The eleventh session begins Sept. 13, 1917, and ends June 7, 1918.

VERMONT

Vermont, population 362,452, has one medical school, located at Burlington, a town of 21,432 people.

Students matriculating in and after the session of 1912-13 who desire to practice medicine in Vermont must have obtained a preliminary training of at least one year of collegiate work in addition to a standard four-year high school education, this additional year's work to include college courses in physics, chemistry and biology.

Burlington

UNIVERSITY OF VERMONT COLLEGE OF MEDICINE, Pearl Street, College Park.—Organized with complete course in 1822. Classes graduated in 1823 to 1836, inclusive, when the school was suspended. It was reorganized in 1853 and classes were graduated in 1854 and in all subsequent years. The faculty numbers 37. One year of college work in addition to a four-year high school education is required for admission. The course of study covers four years of nine months each. The total fees for each of the first three years are \$145, and \$170 for the fourth year. The Dean is Dr. H. C. Tinkham. The total registration for 1916-17 was 82; graduates, 18. The next session begins Sept. 6, 1917, and ends June 26, 1918.

VIRGINIA

Virginia, population 2,171,014, has two medical colleges, one the Department of Medicine of the University of Virginia, situated in Charlottesville, population 6,765, and the Medical College of Virginia at Richmond, population 154,674.

Only graduates of medical colleges registered by the Virginia State Board of Medical Examiners are eligible to obtain licenses to practice medicine in this state. Medical colleges to be so registered must require of all students admitted in the session of 1914-15, completion of at least one year, and in the session of 1917-18 and thereafter *two years* of collegiate work, including courses in physics, chemistry, biology and a modern language, preferably German, in addition to a four-year high school education.

Charlottesville

UNIVERSITY OF VIRGINIA DEPARTMENT OF MEDICINE.—Organized in 1827. Classes were graduated in 1828 and in all subsequent years except 1865. It has a faculty of 16 professors and 20 lecturers, instructors, assistants, etc., a total of 36. The requirements for admission are the completion of a four-year high school course, or its equivalent, and *two years* of college work devoted to English, mathematics, chemistry, physics and biology, and French or German. Total fees for each year are \$140; matriculation fee, \$10. The Dean is Dr. Theodore Hough. The total registration for 1916-17 was 108; graduates, 23. The eighty-ninth session begins Sept. 13, 1917, and ends June 12, 1918.

Richmond

MEDICAL COLLEGE OF VIRGINIA, Marshall and College Streets.—Organized in 1838 as the Medical Department of Hampden Sydney College. Present title was taken in 1854. In 1913 the University College of Medicine was merged. In 1914 the North Carolina Medical College was merged. Classes were graduated in 1840 and in all subsequent years. It has a faculty of 44 professors and 88 lecturers, instructors, etc., a total of 132. The requirement for admission is a four-year high school education and in addition *two years* of collegiate work, including courses in physics, chemistry, biology and French or German. The course embraces four years of eight months each. Fees, \$170 for each of the first three years and \$200 for the fourth. The Dean is Dr. Stuart McGuire. The total registration for 1916-17 was 227; graduates, 113, including 21 students of the North Carolina Medical College and 17 who were granted degrees by the latter. The eighty-ninth session begins Sept. 18, 1917, and ends June 4, 1918.

WEST VIRGINIA

West Virginia, population 1,359,474, has one medical college, the School of Medicine of West Virginia University, which offers the first two years of the medical course. It is located at Morgantown, a city of 12,974 population.

Graduates of 1921 (matriculants of 1917-18) and thereafter, in order to secure licenses to practice medicine in West Virginia, must have completed, in addition to a high school education, one year of collegiate work, including courses in physics, chemistry and biology, before entering on the study of medicine.

Morgantown

WEST VIRGINIA UNIVERSITY SCHOOL OF MEDICINE.—Organized in 1902, and gives only the first two years of the medical course. *Two years* of college work are required for admission and the Bachelor's degree will be granted to those who finish the two years in medicine. Session extends through nine months. The faculty numbers 15. Fees: For residents of the state, \$25 each year; for nonresidents, \$50; matriculation fee, \$10. The Dean is Dr. John N. Simpson. The total registration for 1916-17 was 34. The next session begins Sept. 17, 1917, and ends June 12, 1918.

WISCONSIN

Wisconsin, population 2,473,533, has two medical colleges, the Medical School of the University of Wisconsin, which teaches the first two years of the medical course, and is located at Madison, a city of 30,084 people, and the Marquette University School of Medicine, located at Milwaukee, a city of 428,062 people.

To be eligible for licenses to practice medicine in Wisconsin, students matriculating in the session of 1915-16 (graduates of 1919) and thereafter, prior to entering a medical school, must have completed, besides a four-year high school course, *two years* of collegiate work, including courses in physics, chemistry, biology and a modern language.

Madison

UNIVERSITY OF WISCONSIN MEDICAL SCHOOL.—Organized in 1907. Gives only the first two years of the medical course. For matriculation at least *two years* in a college of arts and science or an equivalent training are required, including two years of Latin, a reading knowledge of French or German, and at least a year's work in physics, chemistry and biology. It has a faculty of 15 professors and 17 lecturers, instructors, etc., a total of 32. Tuition fees: For residents of the state, \$70 each year; for nonresidents, \$194. The Dean is Dr. Charles R. Bardeen. The registration for 1916-17 was 132. The tenth session begins Sept. 24, 1917, and ends June 26, 1918.

Milwaukee

MARQUETTE UNIVERSITY SCHOOL OF MEDICINE, Fourth Street and Reservoir Avenue.—Organized in December, 1912, by the merger of the Milwaukee Medical College and the Wisconsin College of Physicians and Surgeons. It has a faculty of 9 professors and 92 assistants, instructors, etc., a total of 101. The entrance requirements include, in addition to a four-year high school education, *two years* of college work, including courses in physics, chemistry, biology and a modern language. The curriculum is for four years of thirty-four weeks each. The total fees for the four years, respectively, are \$175, \$170, \$170 and \$195. The Dean is Dr. Louis F. Jermain. The registration for 1916-17 was 57; graduates, 13. The sixth session begins Sept. 13, 1917, and ends June 14, 1918.

CANADA

The Dominion of Canada has nine medical colleges, all but one of which require a five-year course, including in the first year courses in physics, chemistry and biology. This course is practically equal to that in the colleges of the United States which require one year of college work for admission, including the science courses named. None of the Canadian colleges has a minimum requirement of two years of collegiate work, or its equivalent, preliminary to or as a part of the medical course. The medical school at Edmonton, Alberta, gives only the first two years of the medical course, or three years including the preliminary science year.

Alberta

UNIVERSITY OF ALBERTA, FACULTY OF MEDICINE, Edmonton.—Organized in 1913. Offers only the first three years of the five-year medical course, including the preliminary science year. The faculty numbers 15. Fees for the first year are \$62; for the second and third years, each \$87. The registrar is Cecil E. Race, B.A. The registration for 1916-17 was 33. The fifth session begins Oct. 1, 1917, and ends May 16, 1918.

Manitoba

MANITOBA MEDICAL COLLEGE, Winnipeg.—It is the Medical Faculty of the University of Manitoba. Organized in 1883, first class graduated in 1886 and a class graduated each subsequent year. The faculty numbers 58. The fees are \$170 for the first year and \$155 for each subsequent year. The entire course covers five years, the first year including premedical courses in physics, chemistry and biology. The Dean is Dr. S. Willis Prowse. Total registration for 1916-17 was 120; graduates, 32. The next session begins Sept. 25, 1917, and ends May 11, 1918. War session began May 1, 1917, and will end Nov. 30, 1917.

Nova Scotia

DALHOUSIE UNIVERSITY, FACULTY OF MEDICINE, Halifax, N. S.—Organized in 1867. Incorporated as the Halifax Medical College in 1875. Reorganized as an examining faculty, separate from the Halifax Medical College in 1885. In 1911, in accordance with an agreement between the Governors of Dalhousie University and the Corporation of the Halifax Medical College, the work of the latter institution was discontinued and a full teaching faculty was established by the University. By an arrangement between Dalhousie University and the Provincial Medical Board of Nova Scotia, the final professional examinations are conducted conjointly by the university and the board, and candidates may qualify at the same time for their academic degrees and the provincial license. First class graduated in 1872. It has a faculty of 30 professors, lecturers and demonstrators. Requires matriculation examination and a graded course of five years, including pre-

medical courses in physics, chemistry and biology. The fees are \$100 for each of the first two years and \$110 for each of the other three. Total registration for 1916-17 was 71; graduates, 14. The Secretary is Prof. D. Fraser Harris. The next session begins Sept. 25, 1917, and ends May 30, 1918.

Ontario

UNIVERSITY OF TORONTO, FACULTY OF MEDICINE, Toronto.—Organized in 1843 as the Medical Faculty of King's College. Abolished in 1853. Reestablished in 1887. In 1902 it absorbed Victoria University, Medical Department, and in 1903 absorbed Trinity Medical College. The course of study covers five years of eight months each, the first year including premedical courses in physics, chemistry and biology. It has a faculty of 49 professors and 152 lecturers, associates, etc., a total of 201. The fees are \$150 each year; graduation fee, \$20. The Secretary is Dr. A. Primrose. The total registration for 1916-17 was 470; graduates, 100. The next session begins Sept. 25, 1917, and ends June 1, 1918.

QUEEN'S UNIVERSITY FACULTY OF MEDICINE, Kingston.—Organized 1854, first class graduated in 1855, and a class graduated each subsequent year. The faculty was originally a department of the university, but a separation took place in 1866, when the school was conducted under the charter of the Royal College of Physicians and Surgeons at Kingston. In 1892 the school again became an integral part of Queen's University. The faculty includes 17 professors and 25 assistants, instructors, etc., a total of 42. The fees amount to \$115 each year; fee for M.D., C.M. degrees, \$30. The course covers five years of thirty teaching weeks each, the first year including courses in physics, chemistry and biology. The total registration in 1916-17 was 277; graduates, 56. The Dean is Dr. J. C. Connell. The next session begins Sept. 26, 1917, and ends May 29, 1918.

WESTERN UNIVERSITY, FACULTY OF MEDICINE, London.—Organized in 1881, first class graduated in 1883, and a class graduated each year subsequently. The Faculty of Medicine became an integral part of Western University in 1913. The faculty numbers 57. The course is five years of eight months each, the first year including premedical courses in physics, chemistry and biology. The total fees each year are \$115; matriculation fee, \$5; graduation fee, \$25. The Dean is Dr. H. A. McCallum. Total registration for 1916-17 was 71; graduates, 14. The next session begins Oct. 1, 1917, and ends May 31, 1918.

Montreal

MCGILL UNIVERSITY, FACULTY OF MEDICINE.—Founded 1824 as Montreal Medical Institution; became the Medical Faculty of McGill University in 1829; first class graduated under the university auspices in 1833. No session between 1836-39 owing to political troubles. In 1905 it absorbed the Faculty of Medicine of the University of Bishop College. The course extends over five years of eight months each, including the preliminary year devoted largely to physics, chemistry and biology. The faculty numbers 131. The total fees for the five years, respectively, are \$174, \$174, \$181, \$174 and \$204. The total registration for 1916-17 was 335; graduates, 63. The Registrar is Dr. John W. Scane. The next session begins Oct. 3, 1917, and ends May 24, 1918.

MONTREAL SCHOOL OF MEDICINE AND SURGERY, Montreal.—Organized in 1843, incorporated in 1845. In 1891, by act of parliament, the Medical Faculty of Laval University (organized in 1878) was absorbed. Present name assumed in 1911. A class was graduated in 1843 and in each subsequent year. The faculty numbers 75. The course extends over five years, including premedical courses in physics, chemistry and biology. The total fees for the five years, respectively, are \$110, \$118, \$126, \$126 and \$138. The Dean is Dr. E. P. Lachapelle. The total registration for 1916-17 was 192; graduates, 29. The next session begins Oct. 3, 1917, and ends June 30, 1918.

Quebec

LAVAL UNIVERSITY FACULTY OF MEDICINE, Quebec.—The Quebec School of Medicine, organized in 1848, became in 1852 the Medical Department of Laval University; first class graduated in 1855, and a class graduated each subsequent year. The faculty numbers 29. The fees are \$75 each year. The course extends over five years, the first year including courses in physics, chemistry and biology. The Dean is Dr. Edwin Turcot, Quebec. Total registration for 1916-17 was 87; graduates, 7. The next session begins Sept. 18, 1917, and ends June 1, 1918.

FOREIGN MEDICAL COLLEGES

This list has been prepared from data collected by the Council on Medical Education.

ARGENTINE REPUBLIC

Buenos Ayres.—Universidad Nacional de Buenos Aires.
Cordoba.—Universidad Nacional.

AUSTRALIA

Adelaide.—University of Adelaide.
Melbourne.—University of Melbourne.
Perth.—University of Perth.
Sydney.—University of Sydney.

AUSTRIA

Graz, Styria.—K. K. Karl Franzens Universität.
Innsbruck, Tyrol.—K. K. Leopold Franzens Universität.
Krakow, Galicia.—C. K. Uniwersytet Jagiellonski w Krakowie.
Lemberg, Galicia.—C. K. Uniwersytet Imienia Cesarza Franciszka I.
Prague, Bohemia.—K. K. Deutsche Karl Ferdinands Universität.
Prague, Bohemia.—C. K. Česká Universita Karlo-Ferdinandova.
Vienna, Nether Austria.—K. K. Universität.

BELGIUM

Brussels.—Université Libre de Bruxelles.
Ghent.—Université de l'Etat de Gand.
Liege.—Université de Liège.
Louvain.—Université Catholique.

BOLIVIA

La Paz.—Universidad de La Paz.
Sucre.—Universidad de Sucre.

BRAZIL

Bahia.—Faculdade de Medicina, Cirurgia e Pharmacia.
Porto Alegre.—Faculdade Livre de Medicina e Pharmacia.
Rio de Janeiro.—Faculdade de Medicina, Cirurgia e Pharmacia.

CANADA

Edmonton, Alberta.—University of Alberta, Faculty of Medicine.
Halifax, Nova Scotia.—Dalhousie University.
Kingston, Ontario.—Queen's University.
London, Ontario.—Western University.
Montreal, Quebec.—McGill University.
Montreal, Quebec.—Montreal School of Medicine.
Quebec, Quebec.—Université Laval.
Toronto, Ontario.—University of Toronto.
Winnipeg, Manitoba.—University of Manitoba (Manitoba Medical College).

CHILE

Santiago.—Universidad de Chile.

CHINA

City	Province	College
<i>Canton</i>	<i>Kwangtung</i>	—Chung-fa Medical College.
<i>Canton</i>	<i>Kwangtung</i>	—Hackett Medical College (Women).
<i>Canton</i>	<i>Kwangtung</i>	—Kung Yee Medical College.
<i>Canton</i>	<i>Kwangtung</i>	—Kwangtung Provincial Medical College.
<i>Canton</i>	<i>Kwangtung</i>	—Kwang Wa Medical College.
<i>Canton</i>	<i>Kwangtung</i>	—Liang Yueh Medical College.
<i>Changsha</i>	<i>Hunan</i>	—Hunan-Yale College of Medicine.*
<i>Chengtzu</i>	<i>Szechuan</i>	—West China Christian University School of Medicine.
<i>Foochow</i>	<i>Fukien</i>	—Union Medical College.
<i>Hangchow</i>	<i>Chekiang</i>	—Chekiang Provincial Medical College.
<i>Hangchow</i>	<i>Chekiang</i>	—Hangchow Medical Training College.
<i>Hankow</i>	<i>Hupeh</i>	—Union Medical College.
<i>Hongkong</i>	<i>Hongkong</i>	—Hongkong University School of Medicine
<i>Mukden</i>	<i>Manchuria</i>	—Mukden Medical College.*
<i>Mukden</i>	<i>Manchuria</i>	—South Manchuria Medical College.
<i>Peking</i>	<i>Chihli</i>	—Board of Education Medical College.
<i>Peking</i>	<i>Chihli</i>	—Union Medical College.*
<i>Peking</i>	<i>Chihli</i>	—Union Medical College for Women.
<i>Shanghai</i>	<i>Kiangsu</i>	—German School of Medicine.
<i>Shanghai</i>	<i>Kiangsu</i>	—Pennsylvania St. John's Medical School.*
<i>Soochow</i>	<i>Kiangsu</i>	—Elizabeth Blake Medical Training College.
<i>Soochow</i>	<i>Kiangsu</i>	—Kiangsu Provincial Medical College.
<i>Soochow</i>	<i>Kiangsu</i>	—Woman's Medical College.
<i>Tientsin</i>	<i>Chihli</i>	—Army Medical College.
<i>Tientsin</i>	<i>Chihli</i>	—Navy Medical College.
<i>Tsinanfu</i>	<i>Shantung</i>	—Shantung Christian University School of Medicine.*

The five colleges indicated by an asterisk (*) are eligible to membership in the Association of Medical Colleges of China. Membership in that association is limited to such colleges as provide a four-year medical course, preceded by adequate college courses, with laboratory work, in physics, chemistry and biology, based on high school graduation.

COLOMBIA

Bogota.—Universidad de Bogota.

CUBA

Havana.—Universidad de la Habana.

DENMARK

Copenhagen.—Kjobenhavns Universitet.

ECUADOR

Quito.—Universidad Central de Ecuador.

EGYPT

Cairo.—Kasr il Aini (School of Medicine).

ENGLAND

Birmingham.—University of Birmingham.
Bristol.—University of Bristol.
Cambridge.—University of Cambridge.
Durham.—Durham University (Durham College of Medicine).
Leeds.—University of Leeds.
Liverpool.—University of Liverpool.
London.—University of London (including the following Medical Schools: (a) St. Bartholomew's Hospital, (b) Charing Cross Hospital, (c) St. George's Hospital, (d) Guy's Hospital, (e) King's College, (f) London Hospital, (g) St. Mary's Hospital, (h) Middlesex Hospital, (i) St. Thomas Hospital, (j) University College, (k) Westminster Hospital, and (l) Royal Free Hospital (School of Medicine for Women)).
Manchester.—Victoria University (Owen's College, founded in 1851, was merged into Victoria University in 1905).
Oxford.—University of Oxford.
Sheffield.—University of Sheffield.

FRANCE

Faculties of Medicine (to degree of doctor in medicine, including the five required examinations).
Bordeaux.—Université de Bordeaux.
Lille.—Université de Lille.
Lyons.—Université de Lyon.
Montpellier.—Université de Montpellier.
Nancy.—Université de Nancy.
Paris.—Université de Paris.
Toulouse.—Université de Toulouse.
Preparatory Schools of Medicine.—Graduates of the 16 following schools are allowed to take the first two examinations if they are presided over by some member of a medical faculty:
(a) "Full Exercise," or complete course (covering the work of 16 trimesters).

Algiers (Africa).—Académie d'Alger.

Marseilles.—Université d'Aix Marseille.

Nantes.—Ecole de Plein Exercice de Médecine et de Pharmacie (part of the University of Rennes).

Rennes.—Université de Rennes.

(b) *Reorganized Schools*.—(Completing the first 12 trimesters).

Amiens.—Ecole Préparatoire de Médecine et de Pharmacie (part of the University of Lille).

Angers.—Ecole Préparatoire de Médecine et de Pharmacie (part of the University of Rennes).

Besancon.—Université de Besancon.

Caen.—Université de Caen.

Clermont.—Université de Clermont.

Dijon.—Université de Dijon.

Grenoble.—Université de Grenoble.

Limoges.—Ecole de Médecine et de Pharmacie (part of the University of Poitiers).

Poitiers.—Université de Poitiers.

Reims.—Ecole Préparatoire de Médecine et de Pharmacie (part of the University of Paris).

Rouen.—Ecole de Médecine et de Pharmacie (part of the University of Caen).

Tours.—Ecole Préparatoire de Médecine et de Pharmacie (part of the University of Poitiers).

GERMANY

Berlin, Prussia.—Königliche Friedrich-Wilhelm Universität.

Bonn, Prussia.—Rheinische Friedrich-Wilhelms-Universität.

Breslau, Prussia.—Königliche Universität.

Erlangen, Bavaria.—Königliche Friedrich-Alexanders Universität.

Freiberg, Baden.—Grossherzogliche Badische Albert-Ludwigs-Universität.

Giessen, Hesse.—Grossherzogliche Hessische Ludwigs-Universität.

Göttingen, Prussia.—Königliche Georg-August-Universität.

Greifswald, Prussia.—Königliche Universität.

Halle, Prussia.—Vereinigte Friedrichs-Universität, Halle-Wittenberg.

Heidelberg, Baden.—Grossherzogliche Ruprecht-Karls-Universität.

Jena, Thuringia.—Grossherzogliche und Herzogliche Sächsische Gesamt-Universität.

Kiel, Prussia.—Königliche Christian-Albrechts-Universität.

Königsberg, Prussia.—Königliche Albertus-Universität.

Leipzig, Saxony.—Universität.

Marburg, Prussia.—Universität.

Munich, Bavaria.—Königliche Bayr. Ludwig-Maximilians-Universität.

Rostock, Mecklenburg.—Universität.

Strassburg, Alsace-Lorraine.—Kaiser-Wilhelms-Universität.

Tübingen, Württemberg.—Königliche Eberhard-Karls-Universität.

Würzburg, Bavaria.—Königliche Julius-Maximilians Universität.

GREECE

Athens.—National University.

GUATEMALA

Guatemala.—Facultad de Medicina.

HAITI

Port au Prince.—L'Ecole Nationale de Médecine.

HONDURAS

Tegucigalpa.—Facultad de Medicina.

HUNGARY

Budapest.—Budapesti Királyi Magyar Tudomány-Egyetem (Royal Hungarian University).

Klausenburg.—Kolozsvári Magyar Királyi Ferencz-József Tudomány-Egyetem (Royal Hungarian Franz-Joseph University).

Pressburg.—Royal Hungarian University.

ICELAND

Reykjavik.—Loeknaskoli (School of Physicians).

INDIA

Bombay.—University of Bombay (Grant Medical College).

Calcutta.—Belgachia Medical College. This is said to be a "private enterprise, managed entirely by Bengali medical men." It is affiliated with and holds the same educational standards as the medical school of the University of Calcutta.

Calcutta.—University of Calcutta (Medical College of Bengal)

Lahore.—Punjab University (Lahore Medical College).

Lucknow.—King George's Medical College.

Madras.—University of Madras (Madras Medical College).

Ceylon (Columbo).—The Ceylon Medical College.

Note.—The colleges named above are accredited by the examining board in England. Minor medical colleges, which it is understood are not so accredited, are located at Agra, Ahmedabad, Dacca, Dibragarh, Hyderabad, Lahore, Poona, Rangoon, Rayapuram, Tanjore and Vizagapatam. At the beginning of the present year (1916) the first college for women in India, known as the Hardinge Women's Medical College, was opened at Delhi.

IRELAND

Belfast.—Queen's University.

Dublin.—National University of Ireland (including University College, Dublin; University College, Cork; University College, Galway).

Dublin.—University of Dublin (The School of Physic in Ireland, Trinity College; Catholic University Medical School).

Dublin.—Royal College of Surgeons in Ireland (Schools of Surgery (including the Carmichael College of Medicine and the Ledwich School of Medicine)).

ITALY

Bologna.—Regia Università degli Studi.

Cagliari, Sardinia.—Università degli Studi.

Camerino.—Libera Università degli Studi. Gives only the first four years of the six-year medical course and does not grant degrees.

Catania.—Regia Università degli Studi di Catania.

Ferrara.—Libera Università degli Studi di Ferrara.
Florence.—Regia Istituto di Studi Superiori, Practici e di Perfezionamento.
Genoa.—Regia Università degli Studi.
Messina.—Regia Università degli Studi.
Modena.—Regia Università degli Studi.
Naples.—Regia Università degli Studi.
Padua.—Regia Università degli Studi.
Palermo.—Regia Università degli Studi.
Parma.—Regia Università degli Studi.
Pavia.—Regia Università degli Studi.
Perugia.—Università Libera degli Studi.
Pisa.—Regia Università degli Studi.
Rome.—Regia Università degli Studi.
Sassari.—Regia Università degli Studi.
Siena.—Regia Università degli Studi.
Turin.—Regia Università degli Studi.

JAPAN

Chiba.—Chiba Special Medical School.
Fukuoka.—Kyushu Imperial University, Medical College.
 (Formerly a part of Kyoto Imperial University.)
Kanazawa.—Kanazawa Special Medical School.
Kumamoto.—Kumamoto Special Medical School.
Kyoto.—Kyoto Imperial University, Medical College.¹
Kyoto.—Kyoto Prefecture, Special Medical School.
Mukden.—South Manchuria Medical School.
Nagasaki.—Nagasaki Special Medical School.
Nagoya.—Aichi Prefecture, Special Medical School.
Niigata.—Niigata Special Medical School.
Okayama.—Okayama Special Medical School.
Osaka.—Osaka Prefecture, Higher Medical School.¹
Sendai.—Tohoku Imperial University, Medical College.¹
Sendai.—Tohoku Imperial University, Special Medical Department.
 (This is a reorganization of the old Sendai Special Medical School. Made a part of Tohoku Imperial University in March, 1912, under the name of Special Medical Department.)
Tansui, Taiwan.—Taiwan (Formosa) Medical School.²
Tokyo.—Nippon Special Medical School.³
Tokyo.—Sai Sai Medical College (Extinct August, 1903).
Tokyo.—Tokyo Charity Hospital Special Medical School.
Tokyo.—Tokyo Imperial University, Medical College.¹
Tokyo.—Tokyo Woman's Special Medical School.³

1. For admission require graduation from the "Third Department of the Higher Schools," which covers three years of premedical training following graduation from the Middle Schools.

2. A medical school conducted by the Japanese Government, primarily for the aborigines of Taiwan (Formosa). Only a common school education required for admission. Graduates licensed to practice in Tansui only.

3. Graduates not licensed by the Japanese Government unless they pass a special examination.

JAVA

Batavia.—School Tot Opleiding van Inl. Artsen.

KOREA

Seoul.—Union Medical School.

MADAGASCAR

Tananarive.—L'Ecole de Médecine.

MALAYA

Singapore.—Malaya Medical School.

MEXICO

Guadalajara.—Escuela de Medicina y de Farmacia de Jalisco.
Mexico.—Escuela Nacional de Medicina.
Monterey.—Escuela de Medicina de Nuevo Leon.

NETHERLANDS

Amsterdam.—Universiteit van Amsterdam.
Groningen.—Rijks-Universiteit te Groningen.
Leyden.—Rijks-Universiteit.
Utrecht.—Rijks-Universiteit.

NEW ZEALAND

Wellington.—University of New Zealand (affiliated with the University of Cambridge, England).

NICARAGUA

Leon.—Universidad de Nicaragua.

NORWAY

Christiania.—Kongelige Frederiks Universitet.

PERSIA

Urumia.—Urumia College Medical Department.

PERU

Lima.—Universidad Mayor de San Marcos.

PORTUGAL

Coimbra.—Universidade de Coimbra.
Lisbon.—Escola Medico-Cirurgica.
Oporto.—Escola Medico-Cirurgica.

ROUMANIA

Bukharest.—Universitatea din Bucuresti.
Jassy.—Universitatea din Jasi.

RUSSIA

Helsingfors, Finland.—Kejsarliga Alexanders Universitet.
Jurjev (formerly Dorpat).—Imperatorski Jurjevskij Universitet.

Kazan.—Imperatorskij Kasanskij Universitet.
Kharkov.—Imperatorskij Charkovskij Universitet.
Kief.—Imperatorskij Universitet Sv. Vladimira.
Moscow.—Imperatorskij Moskovskij Universitet.
Odessa.—Imperatorskij Novorossiiskij Universitet.
Tomsk, Siberia.—Tomskij Universitet.
Warsaw.—Imperatorskij Varsavskij Universitet.

SANTO DOMINGO

Santo Domingo.—University of Santo Domingo.

SCOTLAND

Aberdeen.—University of Aberdeen.
Dundee.—University of St. Andrews (University College).
Edinburgh.—University of Edinburgh.
Edinburgh.—School of Medicine of the Royal Colleges (including the Surgeons' Hall School).
Glasgow.—University of Glasgow (including Queen Margaret College).
Glasgow.—Anderson's College Medical School.
Glasgow.—St. Mungo's College and Glasgow Royal Infirmary.
Glasgow.—Western Medical School.

SIAM

Bangkok.—Royal Medical College.

SOUTH AFRICA

Cape Town.—South African Medical College.

SPAIN

Barcelona.—Universidad de Barcelona.
Cadiz.—Facultad de Medicina.
Granada.—Universidad de Granada.
Madrid.—Universidad de Central de Espana.
Santiago.—Universidad.
Saragossa.—Universidad.
Seville.—Universidad de Sevilla. (To this university also belongs the Medical Faculty at Cadiz.)
Valencia.—Universidad.
Valladolid.—Universidad.

SWEDEN

Lund.—Kungl. Karolinska Universitetet.
Stockholm.—Karolinska Institutet (Medico-Chirurgical Institute).
 (This institute has the same chancellor as the universities at Lund and Upsala, and is guided by a similar constitution.)
Upsala.—Kungl. Universitetet i Upsala.

SWITZERLAND

Basel.—Universität.
Berne.—Kantonale Universität.
Fribourg.—Universität.
Geneva.—Université de Genève.
Lausanne.—Université.
Neu-Chatel.—Universität.
Zurich.—Universität.

SYRIA

Beirut.—Syrian Protestant College.
Beirut.—Université Saint Joseph de Beyrouth.

TURKEY

Constantinople.—University of Constantinople. (Another medical department of this university is located at Damascus.)

URUGUAY

Montevideo.—Universidad.

VENEZUELA

Caracas.—Universidad Central de Venezuela.

WALES

Cardiff.—University of Wales (Cardiff School of Medicine).
 (Gives only the first three years of the medical course.)

MEDICAL COLLEGES OF THE WORLD

Nation.	Colleges	Nation.	Colleges
Argentina	2	Java	1
Australia	4	Korea	1
Austria	7	Madagascar	1
Belgium	4	Malaya	1
Bolivia	2	Mexico	3
Brazil	3	Netherlands	4
Canada	9	New Zealand	1
Chile	1	Nicaragua	1
China	26	Norway	1
Colombia	1	Persia	1
Cuba	1	Peru	1
Denmark	1	Portugal	3
Ecuador	1	Roumania	2
Egypt	1	Russia	9
England	21	Santo Domingo	1
France	7	Scotland	3
Germany	20	Siam	1
Greece	1	South Africa	1
Guatemala	1	Spain	9
Haiti	1	Sweden	3
Honduras	1	Switzerland	7
Hungary	3	Syria	2
Iceland	1	Turkey	1
India	7	Uruguay	1
Ireland	4	United States	96
Italy	20	Venezuela	1
Japan	19	Wales	1

Total medical colleges in all countries.....331

There are also about 20 sectarian schools in the United States, the graduates of which treat diseases, giving this country a total of 116

**THE JOURNAL OF THE
AMERICAN MEDICAL ASSOCIATION**

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address . . . "Medic, Chicago"

Subscription price Five dollars per annum in advance

*Contributors, subscribers and readers will find important information
on the second advertising page following the reading matter*

SATURDAY, AUGUST 18, 1917

**MEDICAL EDUCATION—SEVENTEENTH
ANNUAL REPORT**

THE JOURNAL publishes this week, for the seventeenth consecutive year, statistics regarding medical education in the United States. During these seventeen years there has been a most encouraging improvement. At the present time it can be stated without exaggeration that medical education in this country is equal, if not superior, to that of other leading countries.

FIRST PERIOD, 1900-1905

In 1900, THE JOURNAL began collecting statistics regarding medical colleges, students and graduates, and in 1901 the first Educational Number of THE JOURNAL was published. At that time there were 159 medical colleges, many of which were joint stock corporations, conducted largely for profit. Admission requirements were nominal; few medical schools had endowments or well-equipped laboratories, and only a few had salaried teachers. On the whole, conditions in medical education were far from satisfactory. For the first five years the statistics were thus collected and published by THE JOURNAL, and a beginning was made in the great campaign for the improvement of medical education. The publication of the statistics appeared to have little effect on either the number or the standards of medical colleges, but the knowledge obtained made it clear that if improvements were to be made, a permanent committee and adequate funds would be necessary to enable continuous work to be done. In 1904, therefore, the American Medical Association created a permanent committee—the Council on Medical Education—which in 1905 secured an executive secretary. Then the collection and publication of these statistics naturally became a part of the Council's work.

PROGRESS FROM 1905 TO 1910

During the second five year period, 1905 to 1910, besides the collection and elaboration of these statistics, the Council on Medical Education began holding annual conferences on medical education, at which standards of preliminary and medical education were

discussed. Also, in 1907 and 1909, respectively two complete tours of inspection of the various medical colleges were made in order to secure more complete and accurate data regarding them. From the data thus collected, the first two classifications of medical schools were prepared, the second of which was published in 1910. At the annual conferences and in the published reports of the Council, a special plea was made for the merger of medical colleges in various cities so that one strong medical school might replace the two or more weak institutions in each city. By 1910 such mergers of medical schools had taken place in several cities; thirty-five colleges and eight state licensing boards had adopted higher requirements of preliminary education; new laboratories had been established; more schools had obtained full-time teachers, and hospital facilities had been greatly increased. The number of colleges declined from 162 to 131; the number of medical students from 28,142 to 21,526, and the number of graduates from 5,600 to 4,440. The reductions, as was expected, were due to the merging of the better grade but financially weaker colleges and the extinction of a number of the lowest type institutions. Since in 1907 it had been found that this country had nearly half of the world's supply of medical schools, it was evident that an abnormal oversupply of inferior colleges was giving way to a smaller number of higher grade and better equipped institutions.

PROGRESS FROM 1910 TO 1915

During the third five-year period—1910 to 1915—the Council established the students' register. In this, as in the previous activities, the Council received the cooperation of all the better medical colleges. During these five years also two other complete inspections of medical colleges were made and two new classifications published. This five-year period witnessed a further reduction of medical colleges from 131 to ninety-five, of medical students from 21,526 to 14,891, and of medical graduates from 4,440 to 3,536. This reduction in the number of medical colleges again was due to the merger of twenty medical schools with others, and to the closing of nineteen Class C institutions. Although the sum total of colleges was further decreased, there was a marked increase in the number of stronger and well-equipped institutions. The number of medical colleges which had adopted for admission one or two years of college work, in addition to a four-year high school education, was further increased from thirty-five (27 per cent.) to eighty-three (88 per cent.). Through a closer cooperation of the colleges with the Council in reports regarding new students enrolled, the methods employed by each institution in admitting students and the strictness in the enforcement of entrance standards were known with

fair accuracy. The continuous agitation for better conditions and publicity regarding the needs of medical education resulted in a marked increase in the endowments of medical schools, and large gifts for medical buildings, new laboratories, scholarships, endowed chairs and teaching hospitals had become of frequent occurrence. The fall of 1914 witnessed the general adoption by the majority of medical colleges of the standard of preliminary and medical education, which in 1905 the Council on Medical Education had referred to as "ideal."

PROGRESS SINCE 1915

During the last two years, entrance requirements have been further extended to two years of college work, in addition to a high school education. While this exceeded the original ideal standard, it was a more practical requirement, since the arrangement of the curriculum in colleges and universities did not permit them to offer three heavy science courses, with laboratory work, in a single year. By June, 1916, the two-year standard had been adopted by forty-six medical schools and by seventeen state licensing boards. At the meeting of the House of Delegates of the American Medical Association in 1916, the Council was instructed not to retain in Class A after Jan. 1, 1918, any medical college which was not requiring two years of college work for admission. The House of Delegates also adopted a recommendation that the two-year standard represented the highest preliminary qualification that should be required in this country.

Under the increased entrance requirements, a material reduction in the number of medical students was to be expected. Statistics have shown, however, that after a year or so has been allowed for rearrangements under the higher standards, the enrolments in medical schools are again increased. It is noteworthy, therefore, that during the last three years the number of freshman students has increased in medical colleges which had adopted the higher standards three or more years previously. Although the total numbers of medical students and graduates still shows a decrease, that decrease for the last few years has been in the students and graduates of the Class C colleges—and these the country can very well dispense with. It should be a matter of congratulation that there are now between sixty and seventy medical schools in the United States graduating physicians trained as well as, if not better than, those from institutions in Europe, and that in the last fifteen years the numbers of medical students and graduates from these higher grade institutions¹ have been increased more than threefold.

HAY-FEVER AND POLLEN

The attention which has been paid in recent years to the problems of hay-fever has clearly established the exciting cause in the noxious pollen of a variety of plant forms. The species involved have in common the feature that they are all wind-pollinated, so that the large quantity of pollen that they produce is distributed by the air and can readily reach the nasal passages. Scheppegrell¹ has pointed out that the responsibility of the noxious plants for hay-fever depends, first, on the proximity of these plants, and, secondly, on the size of the pollen, which has an effect on their buoyancy. For example, the pollen of corn, though very toxic, is rarely responsible for hay-fever because the comparatively large size of the particles (80 microns) limits the potential area of its distribution to a few yards from the plant; whereas the pollen of the common ragweed (measuring only 15 microns) has a buoyancy so great that a wind velocity of twenty miles will carry it several miles. A spiculated surface tends to add to the buoyancy.

Knowledge of the distribution of the plants most commonly associated with hay-fever in different parts of the country, together with a better understanding of the mechanisms of pollen dissemination, ought to pave the way for remedial procedures. It has been remarked that when we observe the stringent laws enacted by various states for the exclusion of parasites injurious to their agricultural interests, suitable legislation for the protection of the large number of sufferers from hay-fever should present no difficulty. The first item of importance is to learn the facts on which appropriate progress must depend. It is now appreciated that the fall hay-fever of the Eastern states is due almost entirely to the pollen of *Ambrosia elatior*, the common ragweed. According to the recent report of Scheppegrell,¹ however, the situation in the Pacific and Rocky Mountain states is more complicated, owing to the fact that in those regions the fall hay-fever is caused by the pollen of a larger number of plants. These involve specimens of the *Artemisias*, *Ivas* and *Gaertnerias*, which include the popularly named mugwort and bur marsh elder.

The time has arrived when special efforts should be made to eliminate all such species as far as possible from the neighborhood of populated areas. Suitable grass-weed ordinances have already been proclaimed in certain regions. The grass pollens are responsible for much of the early (vernal) form of hay-fever; and their exclusion presents the least difficulty, perhaps, because they have a considerable size and are not carried to a great distance. When more details are known about other noxious forms, an educational campaign ought to be followed by success in amelioration of a most annoying factor that perennially recurs.

1. Report of the Council on Medical Education, Table 1, THE JOURNAL A. M. A., June 9, 1917, p. 1758.

1. Scheppegrell, William: Hay Fever, Pub. Health Rep., July 20, 1917, p. 1135.

CONTACT INFECTION

One of the great dangers to health from the assembling of large numbers of soldiers in barracks and camps is contact infection. Under this head are included such modes of conveyance as the inhalation of the minute microbe-laden droplets sprayed out from the mouth in the act of sneezing, coughing, laughing or speaking, the contamination of the fingers from handled objects of all sorts, and other multifarious methods by which living pathogenic microorganisms are transferred. Running all through the phenomena of contact infection is the significant fact that the transference of disease germs is fairly direct and immediate and that the share of inanimate objects—fomites—is relatively unimportant. It is the freshly smeared door-knob or push-button, the man who is in the same company or who sleeps in the adjoining bed that is most commonly the source of infection. Under natural conditions the majority of the bacteria pathogenic for man do not seem to multiply outside of the human body, but progressively die off when once they leave their sheltering host. It is the direct contact, the fresh secretions that are most dangerous.

Although these facts are known, practical control over contact infection is a matter of much difficulty. The methods of quarantine and isolation that have long been practiced are in themselves but roughly adapted for this purpose. The well-recognized clinical case of typhoid, diphtheria or epidemic meningitis constitutes only a small part of the danger against which it is necessary to guard. The missed cases and the carrier cases complicate the whole problem enormously. A person who suffers from a mild infection often does not call a physician but continues to associate with his fellows and may communicate disease to many others. He and they alike are ignorant of what is taking place. The discovery of such mild or atypical cases is one of the familiar objects of medical school inspection; it is equally important in military camps.

But this procedure again, even if successful, removes only part of the difficulty. In some diseases the dissemination of infection may occur before the manifestation of definite symptoms. The precocious carriers are a real menace in some infections. There is no need to dwell here on the importance of the convalescent carriers and healthy carriers in spreading disease. Specific pathogenic bacteria persist in a certain proportion of persons long after complete clinical recovery has taken place; pathogens are also found in some persons who apparently have never suffered from the specific disease and who show no symptoms of infection at the time of this finding or later. The healthy carrier can be detected only by a bacterial examination; and such an examination is by no means practicable in all cases.

The problem of preventing contact infection in military encampments is, therefore, one not readily solved. In epidemic meningitis, for instance, which experience has shown is likely to occur in winter camps, it is possible to isolate frank cases and to a certain extent those known to have been in close personal contact with such cases, but there are obvious practical limits to the isolation of contacts and to the degree of bacterial supervision that can be exercised over the troops. The changing personnel of the camp with the likelihood of the frequent introduction of fresh foci of infection is one difficulty. Again, a regiment may be required by military exigencies to depart for the front even before the medical authorities have been able to determine whether or not healthy meningococcus carriers are present in it. It is plain that under some conditions the work of medical and sanitary control must be directed toward lessening contact infection as far as practicable rather than preventing it altogether. It is probably true that increased liability to certain infections must be looked on as an unavoidable hazard of war.

All this does not mean that any legitimate measure for preventing contact infection can be relaxed or ignored. But the situation does suggest the employment as far as possible of measures other than isolation and segregation, not to the neglect of the latter, but as a partial substitute and reinforcement for them when they cannot be completely carried out. The avoidance of overcrowding in camp and barracks is a considerable safeguard against extensive contact infection, and wherever, as in the training of recruits, suitable preparation is possible, the provision of ample space for living quarters is a matter of the most elementary prudence. Early detection of illness, even of apparently slight ailments, is an important preventive measure in which noncommissioned officers may be trained to give much help. Probably something can be effected, too, by the instruction of officers and soldiers in personal hygiene. Personal cleanliness, hand-washing before eating, the proper care of "colds" for oneself and for one's associates, the avoidance or removal of "predisposing factors," such as constipation, unnecessary exposure to extremes of cold and heat, improper habits of eating, and the like, are all measures that will lessen the spread of infection by contact. Every one knows that under conditions of actual warfare all precautions of this sort must often go by the board. It must be remembered, however, that a large amount of trouble from contact infection has been caused among troops not only in the field, but also in the training camps. There would seem to be a chance not merely to protect the men against infection from direct contact with disease carriers, but also to educate them in those procedures of personal hygiene which will render them less likely to pick up infection and to transmit infection to others, and also

to impart some knowledge of the circumstances which weaken and predispose to infection. Instruction of this sort may fall on stony ground, but some will take root and bear fruit. Medical officers connected with the various cantonments and training camps may have opportunities for effective public health education and instruction in personal hygiene.

TUBERCULOSIS OF THE LYMPH NODES

The relations of tuberculosis of the lymph glands to tuberculous processes in other organs have received much attention, but there still are differences of opinion, and careful observations are therefore of much interest. Harbitz¹ has just published the results of an extensive and painstaking study of tuberculosis of the lymph nodes. He says:

In general one may say that in children most of the tuberculous infections have their point of departure in tuberculosis of the lymph nodes; the tubercle bacilli are deposited here after they have passed through mucous membranes or the skin; here they proliferate enormously or remain latent but virulent for a long time, years and years, eventually escaping and infecting other organs. Most frequently the dissemination occurs by the lymph vessels, but also by the blood vessels, and probably more often than now believed.

The observations are based on 2,906 necropsies in Christiania, Norway, during a period of twelve years, 2,489 of persons over 15 years, and 417 of children. Of the entire number, 431, or 14.8 per cent., died of tuberculosis, 351, or 14 per cent., being adults, and eighty, or 19 per cent., children. In 203 cases there was considerable involvement of the lymph nodes, and on analysis Harbitz finds that there were fifty-seven cases of primary tuberculosis of the bronchial lymph nodes, with eight somewhat doubtful; ten of primary extensive tuberculosis of the cervical glands, all in adults; nine of primary tuberculosis of the abdominal lymph nodes; forty of chronic tuberculosis of the lymph glands of the neck and chest; four of primary contemporaneous old tuberculosis of the cervical and the abdominal lymph glands; twenty-two of tuberculosis of the thoracic and abdominal nodes, and sixty-one of general lymph-node tuberculosis. The last group he considers the most interesting and the most important; it contained twenty-nine children, and in twenty of these the disease developed during the first three years of life, and with one exception tuberculosis caused death. There was marked involvement of the lymph nodes of the neck, chest and abdomen. The process is often a descending one in the neck, the swelling being most marked above and decreasing downward, whereas in the thorax it is ascending, less marked along the upper portion of the trachea and increasing toward the bifurcation and the hilum of the lung, where the

enlargement is greatest. A more isolated process may be observed in the abdomen which from an anatomic point of view would not suggest continuous spread along lymph channels but rather repeated infection at various points from different sources. This is especially indicated when processes are present that evidently are of different age. In cases of extensive tuberculosis of all the groups of lymph nodes, a continuous spread from group to group or a hematogenous dissemination may be assumed. Ungermann is cited as believing that in such cases the infection is by the blood stream, usually by way of the thoracic nodes, which in turn are infected from the lung following inhalation of tubercle bacilli.

According to Harbitz, in about half the cases of lymph-node tuberculosis in children, death results from pulmonary tuberculosis, in about one fourth from tuberculosis of the intestinal tract with the primary lesion in the abdominal lymph nodes presumably, and in the remaining fourth from miliary tuberculosis or tuberculous meningitis.

The general lymph-node tuberculosis was found in thirty-two adults, and in thirty it was fatal. It would seem that the infection may originate at different times and in different ways at the various points, especially when the process is discontinuous and of different ages in the various locations. Cases of generally disseminated, apparently continuous tuberculosis of all the important groups of lymph nodes are the more numerous, and the process is usually of long standing.

The condition of the nodes in the neck and the chest is much the same as in the children of this group; but in the abdomen the process is somewhat more extensive. There may be enlargement of the mesenteric nodes, sometimes accompanied by intestinal ulcers; involvement of the retroperitoneal nodes, especially those behind the stomach and pancreas; and farther down there may be swelling of the nodes along the iliac vessels to the inguinal region, decreasing in size downward. The infection plainly seems to have come about by a continuous extension along the lymph vessels from one of the groups of lymph nodes, a procedure easily within the limits of possibility, taking into account the generally accepted reversal of the lymph stream under pathologic conditions and the limited means of communication between the lymphatic systems of the various organs. In an earlier article, Harbitz² maintained that this mode of extension was both frequent and important. Tendello and Staub both support this view, the latter having apparently demonstrated the spread of tuberculosis along lymph vessels, particularly from the abdominal lymph nodes to the liver and spleen. A plausible explanation seems to be that one or more groups of nodes become infected, and the process spreads from node to node

1. Harbitz, Francis: Jour. Infect. Dis., 1917, **21**, 196.

2. Harbitz, Francis: Jour. Infect. Dis., 1905, **2**, 142.

in the infected group or groups and to the internal organs adjacent, and thence to other lymph nodes and vessels. In adults as well as in children it seems probable that in many cases distribution takes place by way of the blood.

That the process is not arrested may be due to the virulence of the organisms or to repeated infections together with a lowered resistance. Death from tuberculosis is the usual termination of lymph-node tuberculosis, and in the opinion of Harbitz most of the cases of pulmonary tuberculosis in patients with lymph-node involvement are derived from infection of the lymph nodes either by direct perforation of a node into the lung or by hematogenous invasion.

Whether much of the tuberculosis in adults is a result of tuberculous infection in childhood or of infection in later life is an open question. Andvord, Römer, Much and Hamburger support the former view. According to Andvord's experience only about 20 to 30 per cent. of fatal adult tuberculosis was due to primary infection, whereas in from 70 to 80 per cent. the infection probably began in childhood. Tillich, while satisfied from clinical experience of the dependence of a certain amount of tuberculosis in adults on infection during childhood, was disappointed by his inability to prove this on the basis of pathologic anatomy. Harbitz points out, however, that from his first series of cases in 1901-1902, he estimated that from 15 to 20 per cent. of all cases of pulmonary tuberculosis in adults arise from tuberculosis in other organs, particularly the lymph nodes, by way of the blood. In the later report on lymph-node tuberculosis the death rate from tuberculosis was 14.8 per cent., and in 18 per cent. of those dying the anatomic picture clearly indicated tuberculous infection in childhood; this, we see, corresponds well with his earlier observations. That tubercle bacilli may live and retain their virulence over long periods of time has been abundantly proved, and lends support to the theory of autoinfection.

This study will tend to renew interest in tuberculosis of the lymph nodes and the many unsolved problems connected therewith. The results emphasize again such fundamental questions as the nature of the affinity of the tubercle bacillus for lymphatic tissue, reinfection from the outside and autoinfection of the tuberculous, the different degrees of virulence of the bacillus and of resistance on part of the host as expressed in the variable course of tuberculosis, and others. But the results also have direct practical significance as they emphasize the great importance, immediate and remote, even under the most conservative view, of lymph-node tuberculosis in children, which to some extent at least may be prevented by securing for children clean food, clean surroundings, and freedom from direct contact with the tuberculous.

Current Comment

REPORT ON PREMEDICAL EDUCATION

The highest desirable standard of education preliminary to medicine is two years of college work based on a four-year high school education. This standard has now been generally adopted by the medical colleges of the United States. Aside from the general understanding that this college work should include courses in physics, chemistry, biology and possibly a course in a modern language, no attempt has heretofore been made to outline the subject content of this two-year premedical college course. Last February a special committee was selected to study the problem and to suggest the subjects which could be included in this two-year course whereby it would best prepare the student for his subsequent medical studies. Besides representatives of the Council on Medical Education and the Association of American Medical Colleges, a representative was chosen by the Association of American Universities, and another member of the committee is closely identified with the work of the North Central Association of Colleges and Secondary Schools. Although of great importance to medical education, this is a matter depending on the colleges of arts and sciences, and for that reason the associations of such colleges are represented on the committee, and presidents and deans of such colleges have been freely consulted in the study of the problem. The preliminary report of this special committee, printed in this issue,¹ will be of special interest to those interested in medical education.

OPPORTUNITIES FOR WOMEN IN LABORATORY WORK

The disarrangement of scientific and professional life that has come with the war is filling some needs as well as creating them. College and university women in increasing numbers are finding opportunities for the utilization of their training in many lines other than the pedagogic. This is true especially of work in scientific laboratories, particularly bacteriologic and public health laboratories. The draft of young men into the Army and the immediate demand for experienced laboratory men in field service and Red Cross sanitation will create numerous vacancies in municipal, hospital and waterworks laboratories which can often be well filled by trained women. In many respects women are peculiarly well suited for such positions as require a mastery of bacteriologic technic. The accuracy and attention to detail involved in certain manipulations are often manifested by women in a high degree. It seems desirable under present conditions to encourage women to enter on the training necessary to fit them for laboratory assistants and helpers. There should be no slurring over of the essential preliminaries, such as the fundamental courses in chemistry; and, in giving advice to prospective students, more than ever must due regard be

1. See page 546.

paid to personal aptitude. The vital relation of public health and diagnostic work to the welfare of the nation is reason for insisting on a high competence and exceptional personal qualifications in all entering this field. Given these, numerous opportunities for laboratory service will soon be open for the skilled woman worker. Heads of university laboratories may consider whether they should not offer special encouragement to women contemplating this work. The bacterial control of important water filtration plants, and the work at hospitals and at public health laboratories must not get into incompetent hands. An abundant supply of well-trained laboratory women will avoid some of the difficulties before us. The competent woman laboratory worker may be assured of satisfactory opportunities.

PATRIOTISM RAMPANT

At a recent meeting, the Michigan State Board of Registration in Medicine adopted the requirement of a two-year college course as the minimum standard of preliminary education for all students matriculated in the session of 1918-1919. It is stated that this course should include chemistry, physics, biology, English and a foreign language. The board voted, however, that no credit be allowed for any courses in German. While there can be only the highest praise for the action of the board in raising its requirements for preliminary education, its peculiar action regarding the German language, based, without doubt, wholly on the present war, is not to be commended. The achievements of German scientists, of French and British scientists, of scientists of all nations, are imperishable. That Robert Koch, Ehrlich and other German scientists happened to be born under the dominance of a militaristic monarchy is not to the discredit of their scientific achievements.

AN IMPROVED MEDICAL PROFESSION

Following the Civil War, the number of medical schools in the United States was increased by leaps and bounds. These schools were largely of the proprietary type. The course at that time extended over only two years following a year with a preceptor, but that was practically all the time required to obtain a training in the medical knowledge of the time. During the same period, however, the factors were developing which would eventually demand an entirely different type of medical teaching institution. The discovery of bacteria resulted in definite knowledge regarding the origin, course and treatment of many of the common diseases, and greatly extended the field of medical knowledge. Prior to 1900, few of the medical schools in the United States had succeeded in keeping pace with this rapid increase in medical knowledge. Many institutions realized the need of improvement, but were hindered from progress not only by the lack of money but also by severe competition. Without waiting for an increased financial income from state aid or private endowments, stronger institutions were established through the merger of two or more weaker

institutions in each of several cities.¹ The teaching of modern medicine, however, required something more than improved medical schools. It required better preliminary education than was furnished by the ordinary high school course. Hence the increase in admission requirements for a high school education to one year, and later two years, of college work was essential in order that the students might master the modern medical course. The highest desired standard of preliminary education has been reached, and an oversupply of comparatively low grade institutions has given way to a smaller but adequate supply of high grade, thoroughly equipped medical schools. Although the total number of medical students is considerably less than that of fifteen years ago, the number admitted with one or two years of college education has increased several-fold, and the proportion of well trained physicians each year has likewise been increased. Moreover, the rank and file of the profession has been greatly improved by a campaign against the quack and the nostrum vender. The field of medicine has, therefore, been largely cleansed of low type educational institutions and of pretenders, who have found a temporary ambush in the ranks of the drugless cults—and the responsibility for them does not rest with the medical profession.

MEDICAL STUDENTS AND CONSCRIPTION

As stated last week, there were, all told, 13,764 medical students enrolled in our medical colleges for the session 1916-17. Of these, 3,379 were recently graduated, leaving 10,385 to be regarded as medical students. Of these, 4,107 were freshmen, 3,117 sophomores, 2,866 juniors, and 295 seniors who were not graduated. Of the 10,385 we have had replies from 6,474, up to the time of going to press. Of these, 5,552 are subject to draft, 777 are exempt on account of age—637 being under, and 140 over, the draft age; 40 are aliens, and 105 have already enlisted in some form of military service.

Class	Total Replies	Total to be Drafted		First Call		Second Call		Later Call		Age Ex-empt		Aliens	Enlisted
		No.	%	No.	%	No.	%	No.	%	Under	Over		
Freshmen...	2,176	1,708	79.4	448	26.2	307	17.9	953	55.8	375	33	17	43
Sophomores	2,071	1,817	87.7	482	26.5	366	20.1	969	53.3	170	46	13	25
Juniors.....	1,601	1,486	92.8	461	31.0	300	20.2	725	48.8	41	43	8	23
Seniors.....	218	206	94.5	82	39.8	44	21.3	80	38.8	5	5	2	..
Not stated..	408	335	83.0	134	40.0	55	16.4	146	43.6	46	13	..	14
Totals.....	6,774	5,552		1,607		1,072		2,873		637	140	40	105
Percentages	.....	85.7		28.9		19.3		51.8		9.8	2.2	0.6	1.6

Of the 5,552 subject to draft, it is estimated that 1,607 (28.9 per cent.) are included in the first call; 1,072 (19.3 per cent.) in the second call, and 2,873 (51.8 per cent.) in the third or later calls. Present indications are that the estimate for the first call was entirely too low, and that instead of being 28.9 per cent. it will likely be nearer 40 per cent. In any event, 35 per cent., from present indications, will be none too high as a basis for estimation. The returns

1. All together, fifty-three institutions were thus merged with others. But still the number of schools was more than adequate to meet the needs of this country.

already received indicate that of the 10,385 medical students, 8,900 would be subject to the draft, the remaining 1,485 have previously enlisted or are exempt on account of age or alien birth. As will be noted, age limitations come mostly among students in the lower classes, and the higher classes, therefore, are more seriously depleted.

MEDICAL STUDENTS AND THE SHORTAGE OF INTERNS

In January, 1915, less than six months after the war had started, the question as to the future supply of physicians in Great Britain had become so serious that, as stated in our London Letter dated Jan. 15, 1915, an army order was issued giving permission to any medical student who had gone to the front to return home to complete his studies. One of the reasons for this action was that at that time, owing to the impossibility of obtaining interns for the hospitals, senior students were being employed in their places. This condition developed in the hospitals of Great Britain and France at the outset of the war, and the hospitals of those countries have been handicapped in this regard ever since. Already in this country the same condition is developing. All of the interns in some hospitals have either already made application for positions in the Medical Reserve Corps or have been drafted. Many of these hospitals were preparing themselves to fall back on the senior students, but now that these students will be no longer available, these hospitals will be most seriously handicapped. In our Correspondence columns is a letter from Dr. S. S. Goldwater, chairman of the Committee on Hospitals of the Mayor's Committee on National Defense, of New York, in which he states that Judge Hughes—former Justice of the U. S. Supreme Court—believes that there is no relief for the drafting of medical students except by act of Congress. How thoroughly Judge Hughes investigated the question before he gave this decision we do not know. In any event, if no remedy rests with the Secretary of War or with the President, the question is so vitally important that an appeal should be made to Congress. And this appeal should not be made on behalf of the medical profession; not on behalf of medical students, but in the direct interest of the public and of the welfare of our Army.

Plethora.—When blood abounds it brings health, and from it sanies is produced, such as we see in incised wounds. Blood becomes superabundant by reason of too much food and drink, and is corrupted by its ill concoction; and where it passes beyond its natural limits, it induces some bodily ailment; and in whatever part it settles it becomes corrupted and exhausts and injures the body. Thus, corrupt blood causes the mouth to burn, vitiates the breath and makes it stink. For when the blood is healthy it contains the breath [or spirit], and maintains the body so that it may support either heat or cold. But when it is superabundant it produces sanies or bile, as it is called, which exhausts the spirit, and this gives rise to the bad odor. A substance is also produced called acid or bitter bile, which is regarded as the substance of disease, for it excites the production of heat. Phlegm produces chafing and pain in the intestine. It causes distention, which inflates the body so that it seems as though it would burst.—Ancient Pathology.

Medical Mobilization and the War

Increase Personnel at Training Camps for Medical Reserve Officers

During the past week additional medical reserve officers have been ordered to the various training camps so that there are now 1,000 physicians or more at each of the training camps. In addition, some 130 colored physicians are in training with colored troops at Fort Des Moines, Iowa. Of those physicians who were in the first training camp beginning June 1, some 30 per cent. have been recommended for promotion to higher rank than that held at the time they reported for active duty. The recommendation was based on proficiency and adaptability to the service. Many physicians who reported to the camps, June 1, have now been ordered elsewhere for active duty.

Reporting for Duty Before Receipt of Commission

A number of men who made application for appointment to the Medical Reserve Corps have written that while they have not received their commission they have received telegrams asking them to accept, and later ordering them to active duty in spite of the fact that the commission had not yet been received. The explanation is, as we have mentioned previously, that there has been considerable delay in issuing commissions to men who have been recommended, the delay occurring chiefly in the Adjutant-General's Office. So as not to prevent ordering medical officers to early training, the Surgeon-General's Office has adopted the plan of telegraphing those recommended that they have been recommended and asking them whether or not they will accept. If the reply is satisfactory, the officer may then be ordered to active duty, the commission reaching him in due time. Those who report at the training camps who have not already taken the oath of allegiance are sworn in at the camps.

Minimum Equipment for Medical Reserve Officers Ordered to Active Duty

Inquiries are continually coming as to the minimum equipment which a medical reserve officer should have when reporting for active duty at a training camp. The articles listed below may be considered a minimum requirement. They may be purchased from the Quartermaster's Department; the prices are approximate.

1. Hat, service, and cord	\$1.04
2. Shirts, o. d., 2, each	2.38
3. Breeches, khaki, o. d., 2, each	2.31
4. Shoes, 2 pair, each	2.81
5. Blankets, 2 pair, each	3.08
6. Cot, gold medal	2.06
7. Mattress	
8. Socks, light wool, 6 pairs, each .....	.13
9. Leggings, 1 pair	1.81 and up
10. Insignia for collar	
11. Folding chair	
12. Towel	
13. Toilet articles	
14. Pillow	

Other articles, most of which are not costly, may be purchased piece by piece as needed.

Army Rank for Red Cross Workers

The President has accepted the cooperation and the assistance of the American National Red Cross with the land and naval forces of the United States. To facilitate the discharge of their duties, members of the Red Cross, other than units, sections and individuals accepted for service by the War Department and incorporated in the enlisted strength of the Medical Department of the Army, will be recognized by titles with assimilated rank. This rank extends from Major-General down to Private. To the chairman of the central committee and to the chairman of the War Council are given the rank of Major-General; members of the War Council and vice chairman of the central committee, Brigadier-General; director general, Colonel; the assistant director general and commissioner, Lieutenant-Colonel; directors, Major, and assistant director, Captain and First Lieutenant. A secretary will receive the rank of Sergeant-Major, and base hospital employees will receive the rank of Sergeant, Corporal and Private, according to the various duties which

they will perform. *These commissions confer no military authority or obligation, nor right to the pay or allowances of similarly described grades in the United States Army.* They are merely certificates of identity indicating that the officials of assimilated rank are persons in whom the Commander-in-Chief of the Army and Navy and the American Red Cross have confidence. Insignia and special uniforms to be supplied by the American National Red Cross will indicate the rank of those mentioned. *The use of the military titles, rank and uniform is authorized only for American National Red Cross representatives actually in foreign countries constituting the theater of active war.*

Women Physicians Organized

A committee of women physicians has been added to the General Medical Board of the Advisory Commission of the Council of National Defense. Dr. Rosalie Slaughter Morton of New York has been appointed chairman. Plans are being formulated under which the new committee will operate. The other members of the committee are: Drs. Caroline M. Purnell, Caroline Towles, Florence N. Ward, Mary Lapham, Emma B. Culbertson, Cornelia C. Brant and Marion Craig Potter.

New Hospital Ship

On the urgent recommendation of Surgeon-General Braisted, Washington, D. C., the steamship *Havana* of the Ward Line has been acquired for service as a naval hospital ship. The work of remodeling has already been commenced, and the hospital ship will be able to accommodate about 300 patients. It is probable that another hospital ship will be obtained later.

Higher Grade for Naval Reserve Officers

A correspondent of the *Army and Naval Journal*, in its August issue, calls attention to the apparent injustice of the rank of officers in the medical reserve in the Navy, as compared with that of the Army. In the latter organization, commissions are first issued as lieutenants, but promotions to captain or major may be obtained; in the Navy, the only appointment is that of surgeon or lieutenant, junior grade.

Physicians Recommended for Commission in the Reserve Corps

During the week ending Aug. 11, 1917, 914 physicians were recommended for commission in the Medical Reserve Corps, the proportion being ten majors, 102 captains and 802 lieutenants.

For Conspicuous Gallantry and Devotion to Duty

It is apparently the opinion of the public that the work of the medical officer in war is somewhat of a sinecure. All he has to do, according to the common belief, is to stay in some safe place back of the firing line and acquire surgical experience. It is not necessary to say that his work is not altogether a sinecure and that there is some danger connected with it. As a matter of fact, the medical officer has opportunity to display courage and heroism fully equal to that of the officer of the line. Each week the British journals carry announcements of honors awarded to medical officers. A few of these are cited as evidence of bravery and of the type of work in which medical officers are engaged.

DISTINGUISHED SERVICE ORDER

TEMP. CAPT. JAMES HARDING BARRY, M.C., R.A.M.C., attached to London Regiment, for conspicuous gallantry and devotion to duty in attending to the wounded under exceptionally trying conditions. Under very heavy shell fire he dug out five men who were buried and amputated two men's legs on the spot. He showed utter disregard of any personal risk and his example was splendid.

MAJOR LIONEL WILFRED BOND, Australian A.M.C., for conspicuous bravery and devotion to duty. When in charge of advanced collecting and forwarding posts his total disregard of danger under a terrific hail of gas shells, H. E., and shrapnel fire gained him the confidence of all ranks, and greatly assisted the evacuation of the wounded. Later, although wounded and partly gassed, he refused to leave his post, and his bravery and devotion saved a very critical situation.

TEMP. CAPT. JAMES HENRY FLETCHER, M.C., R.A.M.C., for conspicuous gallantry and devotion to duty. He showed the utmost bravery and coolness when commanding the bearers. He worked continuously under artillery and machine-gun fire. It was largely due to his gallant conduct that so many wounded were safely evacuated.

BAR TO THE MILITARY CROSS

TEMP. CAPT. CHARLES BROMLEY DAVIES, M.C., R.A.M.C., for conspicuous gallantry and devotion to duty. He was in command of the bearer division when evacuation was most difficult. He showed great gallantry and resource in pushing forward under heavy fire and rescuing several wounded men.

TEMP. CAPT. HAROLD GARNETT JANION, M.C., R.A.M.C., attached R. H. A., for conspicuous gallantry and devotion to duty. He was assisting to remove the pilot from a wrecked aeroplane when the spot came under heavy fire from a hostile battery. Several of the bearers were wounded, but by his courage and example this officer collected fresh bearers and conveyed the wounded men to safety. This task was carried out under continuous shell fire.

MILITARY CROSS

TEMP. CAPT. HENRY JOSEPH COTTER, R.A.M.C., attached Lincolnshire Regiment, for conspicuous bravery and devotion to duty. Although wounded on the previous day, he declined to be relieved, and continued to dress wounded in the open under heavy fire, going through heavy barrage to reach some men lying out in an exposed condition.

TEMP. CAPT. ALBERT VICTOR CRAIG, R.A.M.C., attached R. F. A., for conspicuous gallantry and devotion to duty. Though suffering himself from the effect of gas shells, he displayed the greatest bravery and the most untiring energy in attending to the wounded under fire of heavy guns and gas shells. He risked his life day and night without the slightest hesitation.

TEMP. LIEUT. CYRIL DUNCAN, R.A.M.C., for conspicuous bravery and devotion in attending wounded close to a large ammunition dump which was on fire, with splinters and shrapnel shells flying about, and later, though partially gassed, attended wounded under heavy gas shell fire.

TEMP. CAPT. CHARLES REGINALD RALSTON HUXTABLE, R.A.M.C., attached Lancashire Fusiliers, for conspicuous gallantry and devotion to duty. He showed the utmost skill and bravery in attending to and evacuating wounded. When seven of his bearers were buried by a shell he at once, despite the intense hostile bombardment, organized a party and dug them out.

CAPT. CYRIL CHARLES MINTY, Australian A.M.C., for conspicuous gallantry and devotion to duty. He showed the greatest courage and fearlessness in attending wounded whilst exposed to heavy shell fire and gas fumes, and assisting to carry them to the collecting post. The stretcher-bearers had suffered severe casualties, and it was owing to his magnificent example that they maintained their courage and endurance.

TEMP. CAPT. JOHN FINLAYSON MCGILL SLOAN, R.A.M.C., for conspicuous gallantry and devotion to duty. His dressing station being blown in on the top, he dressed over 200 cases under very difficult conditions. He had to change his dressing station twice.

TEMP. CAPT. DONALD ALEXANDER WARREN, R.A.M.C., attached Royal Warwickshire Regiment (Lieutenant C.A.M.C.), for conspicuous gallantry and devotion to duty. He continued to attend wounded for over an hour under heavy artillery and machine-gun fire and in full view of the enemy. Later he established an aid post, and carried it on for forty-eight hours without rest under continuous fire.

Orders to Officers of the Medical Corps

Major Charles Y. Brownlee, M. C., to Governors Island, N. Y., for duty as assistant to department surgeon.

First Lieut. Robert E. Parrish, M. C., to station and duty at Fort Slocum, N. Y.

Sick leave two months to Major John A. Murtagh, M. C., Fort Sam Houston.

Major Albert G. Love, M. C., to Washington, for duty.

Major Ernest G. Bingham, M. C., to Fort Des Moines for duty as C. O. of base hospital to be established there.

Officers of M. C. will proceed to place specified after their names for duty as C. O. of base hospital to be established: Capt. Jay D. Whitham, Camp Upton, Yaphank, L. I., N. Y.; Capt. William L. Sheep, Camp Travis, Fort Sam Houston; Capt. Omar H. Quade, Camp Meade, Annapolis Junction, Md.; Major Ferdinand Schmitter, Camp Lee, Petersburg, Va.; Capt. Joseph A. Worthington, Camp Taylor, Louisville, Ky.; Capt. Shelley U. Marietta, Camp Gordon, Atlanta, Ga.

Capt. George B. Foster, Jr., M. C., to station and duty at Atlanta, Ga.

Capt. William B. Meister, M. C., on relief treatment at Letterman Hospital, to Presidio of San Francisco, for duty.

First Lieuts. Charles L. Gandy and William W. Vaughan, M. C., on arrival in United States, to Allentown, Pa., for duty.

Orders to Officers of Medical Reserve Corps

ALABAMA

To FORT OGLETHORPE, for duty, Lieut. James K. Miller, Epes.

To FORT SAM HOUSTON, for duty, Lieuts. Raymond B. Ramage, Lafayette, and Llewellyn H. Ledbetter, Goodwater.

ARIZONA

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, SOUTHERN DEPT., for assignment to duty, Capt. Charles H. Bowker, Warren.

ARKANSAS

To FORT BENJAMIN HARRISON, for instruction, Lieut. Horace F. Villars, Little Rock.

To FORT OGLETHORPE, for duty, Lieut. Victor K. Allen, Hope.

CALIFORNIA

To ALLENTOWN, PA., with Ambulance Co. No. 2 for duty, Capt. Albin Powell, Berkeley.

TO AMERICAN UNIVERSITY, Washington, with 10th Engineers for duty, Lieut. Alfred L. Phillips, San Francisco.

TO LETTERMAN GENERAL HOSPITAL, Presidio of S. F. for duty, Capt. Morton R. Gibbons, San Francisco.

TO PRESIDIO OF SAN FRANCISCO, for duty with Provisional Field Hospital Co. A., Major George F. Shields, San Francisco; with Field Hospital Co. No. 2, Capt. Gulbert M. Barrett, Lieut. William L. Moore, San Francisco; for duty, Lieut. Harold W. Wright, San Francisco.

TO REPORT BY TELEGRAPH TO COMMANDING GENERAL, WESTERN DEPARTMENT, for assignment to duty, Majors Harry R. Oliver and Alanson Weeks, San Francisco; Capt. Samuel M. Alter, Los Angeles; William L. Dunn, Oakland; B. O. Adams, Riverside; Robin C. Howe and Jule B. Frankenheimer, San Francisco; Lieuts. Charles B. Alexander, Alhambra; Walter L. Ellis, Calexico; Thomas S. Long, Cambria; Louis J. E. Gougnet, Chico; Wallace A. Reed, Covina; Otto P. Floreth, Dixon; Pernice A. Mix, Exeter; Henry Ehlers, Fowler; Allan N. Kerr, Hawthorne; Roderick H. Shippey, Long Beach; Charles B. Adams, John I. Boyer, Miles A. Heffelfinger, Clarke L. McClish, Los Angeles; Franklin M. Seibert, Mayfield; Henry M. Fine, Oakland; Charles H. Freeman, O. Anderson, Ocean Park; Alva D. S. McCoy, Pasadena; Arthur L. Brown, Riverside; Howard McD. Cameron, Arthur L. Munger, Sacramento; Nathan P. Barbour, Hugh K. Berkley, Walter W. Fenton, Ernest D. Hatch, Obe H. Hoag, San Francisco; Wood C. Baker, San Mateo; Rafael G. Dufficy, San Rafael; and L. J. Schermerhorn, Stockton.

TO SAN FRANCISCO for duty, Major Henry S. Kiersted, Burlingame; Lieut. Francis B. Dwire, Gardena.

Resignation of Capt. Edward Von Adelung, Oakland, is accepted.

COLORADO

TO DENVER, enlisting personnel of Red Cross Ambulance Co., No. 30, Capt. Thomas M. Hopkins, Denver.

TO FORT DAVIS, ALASKA, Lieut. H. C. Burson, Pueblo.

TO SAN FRANCISCO, for duty, Lieut. Frank N. Stiles, Grand Junction.

CONNECTICUT

TO FORT BENJAMIN HARRISON, for instruction, Lieut. John J. Carden, Bridgeport.

DISTRICT OF COLUMBIA

TO AMERICAN UNIVERSITY, Washington, with 10th Engineers for duty, Major James G. McKay, Washington.

TO FORT BENJAMIN HARRISON, for instruction, Lieuts. John M. Stanley, and Ernest K. Stratton, Washington.

FLORIDA

TO ALLENTOWN, PA., for duty, Capt. Owen H. Kenan, Palm Beach.

TO FORT BENJAMIN HARRISON, for instruction, Lieut. Bascom H. Palmer, Tampa.

Honorably discharged, Lieut. Robert E. Godard, Quincy.

ILLINOIS

TO FORT BENJAMIN HARRISON, for instruction, Lieuts. Frederick A. Blesse, John E. Robinson, Chicago; and Edward S. Murphy, Dixon.

TO CHICAGO, as instructor in military roentgenology, Capt. Edward S. Blaine, Chicago.

TO FORT CONSTITUTION, N. H., for duty, Lieut. W. P. MacCracken, Chicago.

TO FORT DES MOINES, IOWA, for duty, Lieut. Julian Dawson, Galesburg.

TO FORT RILEY, for duty, Lieut. S. R. Johnson, Divernon.

TO FORT SHERIDAN, ILL., for duty, Lieut. Harry S. Gradle, Chicago; with Ambulance Co. No. 9, Capt. Stephen V. Balderston, Evanston, and Lieut. James E. McNeel, Chicago.

TO REPORT BY TELEGRAPH TO COMMANDING GENERAL, WESTERN DEPT., for assignment to duty, Lieut. Arthur Betts, Chicago.

So much of Par. 72, S. O. 165, War Dept., July 18, 1917, as relates to Lieut. Robert H. Lowry, Jr., Chicago, is revoked.

INDIANA

TO FORT BENJAMIN HARRISON, for instruction, Lieuts. Arlie J. Ullrich, Aurora; and Chester A. Stayton, Indianapolis.

TO FORT OGLETHORPE, for duty, Lieut. Charles P. Major, Indianapolis.

TO FORT SNELLING, MINN., for duty, Lieut. Kenneth L. Craft, Indianapolis.

TO INDIANAPOLIS, for duty, Lieuts. Ernest D. Wales, Indianapolis; enlisting personnel of Red Cross Ambulance Co. No. 18, M. B. Light, Indianapolis.

TO REPORT BY TELEGRAPH TO COMMANDING GENERAL, WESTERN DEPARTMENT, for assignment to duty, Lieut. Frederick Falk, Indianapolis.

So much of Par. 161, S. O. 171, War D., July 25, 1917, as relates to Lieut. M. H. Krebs, Huntington, is revoked.

Resignation of Lieut. Fred E. Hickson, Indianapolis, is accepted.

IOWA

TO NEW YORK CITY, for duty, Capt. James F. Taylor, Sioux City.

TO FORT BENJAMIN HARRISON, IND., Lieut. Ward S. Wells.

KANSAS

TO FORT LEAVENWORTH, for duty, Lieut. John DeW. Riddell, Salina.

TO TOPEKA, KAN., enlisting personnel of Red Cross Ambulance Co. No. 44, Lieut. Charles H. Lerrigo, Topeka.

KENTUCKY

TO FORT BENJAMIN HARRISON, for instruction, Lieut. James W. Bruce, Louisville.

TO FORT DES MOINES, IOWA, for duty, Lieut. V. J. Davis, Paducah.

LOUISIANA

TO FORT DES MOINES, IOWA, for duty, Lieut. W. Wallace, Shreveport.

TO FORT SAM HOUSTON, TEXAS, for duty, Lieut. T. B. Bird, New Orleans.

MAINE

TO FORT DES MOINES, IOWA, for duty, Lieut. H. White, Portland.

MARYLAND

TO FORT BENJAMIN HARRISON, Lieuts. Hertel P. Makel and Edwin E. Mayer, Baltimore.

MASSACHUSETTS

TO FORT ADAMS, R. I., for duty, Lieut. B. M. Latham, Mansfield.

TO ALLENTOWN, PA., for duty, Lieut. Otho L. Schofield, Newton Lower Falls.

TO BOSTON, as instructor of military roentgenology, Major Ariel W. George, Brookline.

TO PITTSFIELD, MASS., enlisting personnel of Red Cross Ambulance Co. No. 13, Lieut. Harry J. Tate, Pittsfield.

So much of Par. 47, S. O. 172, July 26, War D., as relates to Major Fred B. Lund, Boston, is revoked.

Honorably discharged, Lieut. Austen F. Riggs, Stockbridge.

MEXICO

TO REPORT BY TELEGRAPH TO COMMANDING GENERAL, SOUTHERN DEPARTMENT, for assignment to duty, Lieut. Charles C. Cooke, Vera Cruz.

MICHIGAN

TO DETROIT, enlisting personnel of Red Cross Ambulance Co., No. 28, Capt. Griffith A. Thomas, Detroit.

TO FLINT, MICH., enlisting personnel of Red Cross Ambulance Co. No. 21, Capt. Walter H. Winchester, No. 42, F. A. Roberts, Flint.

TO FORT BENJAMIN HARRISON, for course of instruction, Lieut. Glenn L. Coan, Detroit.

TO FORT LEAVENWORTH, for duty, Lieut. Eugene Hall, Reading.

TO MEMPHIS, TENN., enlisting personnel of Red Cross Ambulance Co. No. 45, Capt. Walter R. T. Sharpe, Romeo.

TO REPORT BY TELEGRAPH TO COMMANDING GENERAL, SOUTHERN DEPARTMENT, for assignment to duty, Lieut. Cullen H. Hendry, Detroit.

TO duty with Sixth Engineers, N. A., Lieut. Glenn B. Carpenter, Detroit.

MINNESOTA

TO FORT BENJAMIN HARRISON, for instruction, Lieut. Cleon J. Gentzkow, Minnciska.

TO LITTLE ROCK, for duty, Lieut. Frank H. Clay, St. Charles.

TO MINNEAPOLIS, enlisting personnel of Red Cross Ambulance Co. No. 37, Lieut. Ralph T. Knight, Minneapolis.

Honorably discharged, Lieut. Hugh F. McGaughey, Winona.

MISSISSIPPI

TO FORT DES MOINES, IOWA, for duty, Lieut. B. T. Williamson, Greenwood.

TO FORT SAM HOUSTON, for duty, Capt. Erskine P. Odeneal, Gulfport; Little B. Neal, Jackson, and Albert C. Lofton, Williams.

TO VICKSBURG, enlisting personnel of Red Cross Ambulance Co. No. 38, Capt. N. Stewart, Jackson.

Honorably discharged, Capt. Harry Greenberg, Fayette.

MISSOURI

TO FORT DES MOINES, IOWA, for duty, Lieut. S. H. Warfield, Louisiana.

TO FORT RILEY, KAN., Lieut. E. T. Anderson, Kirhyville.

TO KANSAS CITY, MO., enlisting personnel of Red Cross Ambulance Co. No. 24, Capt. Ernest W. Cavaness, Kansas City.

TO SAN FRANCISCO, in time to sail for Hawaii for duty, Capt. Richard S. Bryan, St. Louis.

So much of Par. 10, S. O. 166, War D., July 19, 1917, as relates to Capt. Richard S. Bryan, St. Louis, is revoked.

MONTANA

TO REPORT BY TELEGRAPH TO COMMANDING GENERAL, WESTERN DEPARTMENT, for assignment to duty, Lieut. Karl H. Kellogg, Stevensville.

NEBRASKA

TO REPORT BY TELEGRAPH TO COMMANDING GENERAL, WESTERN DEPARTMENT, for assignment to duty, Lieut. Bryant R. Simpson, Adams.

NEW JERSEY

TO BUTLER, N. J., enlisting personnel of Red Cross Ambulance Co. No. 33, Capt. William H. Lawrence, Jr., Summit.

TO FORT DES MOINES, IOWA, for duty, Lieut. Clarence S. Janifer, Newark.

TO MONMOUTH PARK, N. J., for duty, Lieut. B. A. Furman, Newark.

TO NEW YORK, Transport Service for duty, Lieut. Peter G. Fagone, Hackensack.

NEW MEXICO

TO REPORT BY TELEGRAPH TO COMMANDING GENERAL, SOUTHERN DEPARTMENT, for assignment to duty, Lieut. Dwight Allison, Gallup.

NEW YORK

TO ALLENTOWN, PA., for duty, Lieut. Conde de Salcs Pallen, New York.

TO FORT BENJAMIN HARRISON, for instruction, Capt. Daniel W. Wynkoop, Babylon; Lieuts. Roland A. Davison, Brooklyn; Paul B. Johnson, and Richard S. Moynan, New York.

TO FORT DES MOINES, IOWA, for duty, Lieut. Hudson Oliver, Asbury Park.

TO FORT OGLETHORPE, for duty, Capt. Douglas Brown, New York.

TO FORT TOTTEN, N. Y., for duty, Lieut. W. E. Fitch, New York.

TO NEW YORK, to duty examining N. Y. N. G., for tuberculosis and cardiovascular diseases, Lieuts. Thomas Ellis, Geza Kremer, Frank McLean, Thayer A. Smith and Henry C. Thacher, New York.

TO EASTERN DEPARTMENT TRANSPORT SERVICE for duty, Lieut. Renato J. Azzari, New York.

TO REPORT BY TELEGRAPH TO COMMANDING GENERAL, WESTERN DEPARTMENT, for assignment to duty, Lieut. Harry H. Hemstreet, Brooklyn.

TO SYRACUSE, N. Y., for duty, Lieut. W. S. Cooke, Otego.

To WASHINGTON, in office of Surgeon-General for duty, Lieut. Hans Zinsser, New York.

NORTH CAROLINA

To FORT DES MOINES, IOWA, for duty, Lieut. R. S. Vass, Burlington.
To REPORT BY TELEGRAPH TO COMMANDING GENERAL, WESTERN DEPARTMENT, for assignment to duty, Lieut. William H. Boon, Durham.

OHIO

To FORT BENJAMIN HARRISON, for instruction, Lieuts. Harold O. Brown and Stanley G. Odom, Cincinnati.

To FORT DES MOINES, IOWA, for duty, Lieut. Romeo A. Johnson, Columbus.

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, SOUTHERN DEPARTMENT, for assignment to duty, Lieut. James W. Henry, Berlin Crossroads.

OKLAHOMA

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, SOUTHERN DEPARTMENT, for assignment to duty: Capt. Floyd H. Racer, Woodward; Lieuts. Thomas F. Renfrow, Billings; William R. Barry, Bradley; Alexander B. Montgomery, Checotah; Harman B. McFarland, Cleveland; Montie C. Comer, Clinton; Glenn L. Harker, Elk City; Robert C. McCreery, Erick; George A. Nylund, Gate; Robert E. Calloun, Hallett; Samuel W. Wilson, Lindsay; Charles R. Ozias, Linn; James L. Patterson, Mutual; J. Lewis Day, Norman; Frank M. Bailey and George Hunter, Oklahoma; Carl Puckett, Pryor; Ernest E. Nunery, Quinton; Harry McQuown, Stillwater, and George H. Clulow, Tulsa.

OREGON

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, SOUTHERN DEPARTMENT, for assignment to duty, Lieut. Harold T. Allison, Heppner.

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, WESTERN DEPARTMENT, for assignment to duty, Lieuts. Smith J. Mann, Brandon; Ira B. Bartle, North Bend; Benjamin F. DeVore, Oakland; Walter E. Hempstead, Oregon City; Charles Billington, Stanley B. Dickinson and Richard B. Dillehunt, Portland; Eugene Kester, Springfield; Carl J. Bartlett, Vale; Orta E. Patterson, Wendling, and Willis D. Butler, Wilsonville.

PENNSYLVANIA

To ALLENTOWN, for duty, Lieuts. Sydney E. Bateman and Robert B. Grimes, Jr., Philadelphia.

To AMERICAN UNIVERSITY, Washington, with Tenth Engineers for duty, Lieuts. Martin G. Barrett, Erie, and Walter A. Blair, Norristown.

To FORT BAYARD, N. M., A. and N. Hospital for duty, Lieut. Sidney J. Repplier, Philadelphia.

To FORT BENJAMIN HARRISON, for instruction, Lieuts. Raymond A. Tomassene, Butler; Andrew J. Griest, Harrisburg, and Daniel C. Haukey, Pittsburgh.

To FORT DES MOINES, IOWA, for duty, Lieut. De Haven Hickson, Coatesville.

To duty with chief mustering officer, N. G. of Pa., for making examinations in their specialty of personnel, Lieuts. Edward A. Strecker and Samuel Leopold, Philadelphia.

To DUTY WITH FIFTH ENGINEERS, N. A., Lieuts. Henry C. Flood and Paul H. Walter, Pittsburgh.

To MONMOUTH PARK, N. J., for duty, Lieut. Douglas MacFarlan, Philadelphia.

To PITTSBURGH, as instructor in military roentgenology, Major George C. Johnston, Pittsburgh.

To WASHINGTON, for duty, Capt. William H. Walsh, Philadelphia.

So much of Par. 53, S. O. 162, July 14, 1917, War D., as relates to Lieut. Charles H. Haralson, Mont Alto, is revoked.

Resignation of Lieut. Thomas H. Snowwhite, Braddock, is accepted.

PORTO RICO

To CANAL ZONE, for duty, Lieut. Antonio Mayoral, Ponce.

SOUTH CAROLINA

To FORT BENJAMIN HARRISON, for instruction, Lieut. Albert B. Pavy, Charleston.

To duty at Greenville, S. C., enlisting personnel of Red Cross Ambulance Co. No. 32, Capt. James E. Daniel, Greenville.

Resignation of Capt. William C. P. O'Driscoll, Charleston, is accepted.

SOUTH DAKOTA

To FORT BENJAMIN HARRISON, for instruction, Lieut. Earle D. Quinell, Sisseton.

TENNESSEE

To FORT BENJAMIN HARRISON, for instruction, Lieuts. James W. McClaran, Jackson, and Henry E. Fraser, Nashville.

To FORT DES MOINES, IOWA, for duty, Lieuts. J. D. Carr, Knoxville, and G. W. Bugg, Nashville.

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, WESTERN DEPARTMENT, for assignment to duty, Lieut. William H. Daniel, McEwen.

TEXAS

To FORT BENJAMIN HARRISON, IND., for instruction, Lieuts. Douglas Mebane, Robert K. Simpson and Paul H. Streit, Galveston, and Frank M. Moose, Weatherford.

To FORT DES MOINES, IOWA, Lieut. A. E. Punche, Cleburne.

To NORTH FORT WORTH, enlisting personnel of Red Cross Ambulance Company No. 40, Lieut. W. S. Horn, Fort Worth.

To HOUSTON, enlisting personnel of Red Cross Ambulance Company No. 36, Lieut. Claude C. Cody, Houston.

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, SOUTHERN DEPARTMENT, for assignment to duty, Major Thomas G. Howe, Atlanta; Capt. Thomas C. Brooks, Bay City; Newton H. Bowman, Beeville; Woods W. Lynch, Midland; Lieuts. John P. Hower, W. Auda Vee, Abilene; George S. Murphy, Amarillo; Edgar G. Mathis, Austin;

George McAlpin Liddell, Axtell; Harry D. Nifong, Britton; Frank T. Blow, Call; C. Hyder, Commerce; Emmett B. Bruton, Hubbard K. Hinde, Ezra H. Mathewson, John J. Tribble, Dallas; Herbert O. Darnall, El Paso; E. W. Arnold, Arthur J. Mynatt, Houston; Charles M. Kent, Kenedy; Ernest H. Hamilton, Kilgore; Robert E. Hearn, Mabank; Paul J. Connor, Madisonville; Frank H. Sbaw, Marlin; Cranz Nichols, Maxwell; Ellery McR. Outlaw, Montalba; Edward E. Collins, Premont; Forrest F. Fowler, Round Rock; Thomas A. Presely, Runge; Henry S. Keller, Santo Tomas; Henry C. Ricks, Sherman; Henry W. Pickett, Sulphur Springs; Shelby P. Roaten, Swenson; Robert I. Grimes, Sylvester, and William L. Baber, Winnsboro.

UTAH

To FORT DOUGLAS, UTAH, Lieut. Kenneth A. Crismon, Salt Lake City.

To SALT LAKE CITY, enlisting personnel of Red Cross Ambulance Company No. 27, Capt. Hugh B. Sprague, Salt Lake City.

VERMONT

To RUTLAND, enlisting personnel of Red Cross Ambulance Company No. 25, Lieut. W. Stickney, Rutland.

VIRGINIA

To FORT DES MOINES, IOWA, Lieut. Douglas B. Johnson, Petersburg.

To SAINT ASPAH, for duty with Twelfth F. A., Lieut. B. H. Kyle, Lynchburg.

WASHINGTON

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, WESTERN DEPARTMENT, for assignment to duty, Capt. William H. Morse, Spokane; Lieuts. Walter R. Johnson, Chehalis; Ezra F. Mertz, Concrete; Earle F. Ristine, Coupeville; Diederich G. Brunjes, Dayton; Charles W. Jones, Elma; Conner O. Reed, Friday Harbor; Frank H. Collins, Goldendale; Hubert L. Miller, McMurray; Nathaniel E. Roberts, Olympia; Shirley Q. Elmore, Pasco; Claire D. Hopper, Richland; Walter Everly and William C. Kintner, Seattle; Charles M. Frazee, William H. Payne, Sedro Wooley, Ralph Hendricks and William M. O'Shea, Spokane; James S. Purdy, Sultan; Frank J. Delaney and Joseph P. Kane, Tacoma.

So much of Par. 42, S. O. 168, July 21, 1917, War Dept., as relates to Capt. Samuel E. Lambert, Spokane, is revoked.

WEST VIRGINIA

To CHARLESTON, enlisting personnel of Red Cross Ambulance Company No. 22, Capt. Timothy L. Barber, Charleston.

WISCONSIN

To FORT RILEY, GA., Lieut. Judson A. Palmer, Arcadia.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

Typhoid Fever.—Several cases of typhoid fever have developed at Paragould, and an investigation of the water and milk supplies of the city has been instituted.

Books Donated by Medical College.—Mrs. W. B. Welch, widow of the late Dr. W. B. Welch, Fayetteville, has donated the medical library of Dr. Welch to the University of Arkansas Medical Department, Little Rock.

State Medical Board Election.—At the annual meeting of the state medical board, Dr. Francis Taylor Isbell, Horatio, was elected president; Dr. Thomas J. Stout Brinkley, secretary, and Dr. Edward F. Ellis, Fayetteville, treasurer.

Health Survey Begun.—The health survey of the territory surrounding Little Rock and Argenta was commenced, July 20, when Surg. Leslie Leon Lumsden and Henry Charles Yarbrough arrived from Washington, D. C., to assist Senior Surg. Claude C. Pierce, San Francisco, U. S. P. H. S., in the sanitary work preparatory to the reception of the soldiers to be stationed there, the twelfth Army cantonment.

Personal.—Dr. Samuel Neely Hutchinson, Argenta, has been appointed resident physician of the American Bauxite Company at Bauxite.—Dr. Vernon Robins, city chemist and bacteriologist of Louisville since 1902, has accepted the position of county and city health officer at Helena.—The offices of Drs. John T. Cheers, David T. Cheers and David P. Terry, Tillar, were destroyed by fire, July 26, with a loss of \$3,000.—Dr. Frank Vinsonhaler, Little Rock, has been appointed director of the chapters of Arkansas for the American Red Cross.

ILLINOIS

Chicago Graduate Lectures.—Dr. William Snow Miller, Madison, Wis., of the University of Wisconsin recently delivered a lecture on the "Architecture of the Lung" before

the faculty and students of the graduate summer quarter in medicine of the University of Illinois.

Sanatorium Patients Strike.—Because of an alleged food grievance, fifty-five patients of the Chicago Winfield Tuberculosis Sanitarium left the institution, August 3, with multifarious complaints regarding their treatment. The authorities of the sanatorium say that the complaints are groundless.

Personal.—Dr. Alice Barlow-Brown, Winnetka, has received an appointment abroad, and expects soon to leave for Compiegne, France, to work under the Chicago branch of the American Fund for French Wounded.—Dr. Harry A. Pattison, Rockford, has been appointed, by the National Association for the Study and Prevention of Tuberculosis, a medical field secretary to organize preventive work in the cantonment camps, and to follow up the men rejected for the Army on account of tuberculosis.

Medical Military Announcement.—The medical detachment of the Third Illinois Infantry, mobilized at Rockford, has the following officers: Major Arthur E. Lord, Plano, and Lieuts. Pliny R. Blodgett, Harvard; Harry H. Davis, Monroe Center, and Fred E. Scheppler, Aurora. Two of the sergeants, Hospital Corps, are sons of the late Major Carlton E. Starrett, who served with the regiment during the war with Spain. The Adjutant-General has announced the appointment of the following administrative staff for the Medical Department: Lieut.-Col. Jacob Frank, Chicago; Major John A. Wheeler, Auburn, and Major George U. Lipschulch.

Chicago

Should Boil Milk.—Milk consumers of Chicago have been advised by the health commission to boil milk for a period of several days, on account of the prevalence of anthrax in the Burlington and Hampshire districts of Kane County, from which a large portion of the supply of milk for the city is received.

Tuberculosis Board Appointed.—Lieut. Samuel M. Marcus, M. R. C., U. S. Army, formerly a member of the staff of the Cook County Tuberculosis Sanatorium and the Municipal Sanatorium, has been appointed head of the tuberculosis board for the district of Chicago. The examining physicians are Drs. John Ritter, Ethan Allen Gray, Willard W. Dicker, Harry G. Hartt, James Cole, Daniel W. Rogers, George Gardner, William R. Abbott, Edward Heacock, B. Westcott Rogers, Robert Hayes and Nathaniel C. Nelson. The board is being assisted by the following volunteers: Drs. Frederick Tice, Maurice L. Goodkind, William Edward Putz, Jacob W. Bolotin and George Hiram Robbins. Physicians who have had special training in tuberculosis and volunteer to assist for a few hours in the examinations of the enlisted men of the new Army are requested to notify Dr. Marcus by calling telephone Franklin 5510.

IOWA

Personal.—Drs. Henry Matthey and Walter Matthey, Davenport, are reported to have been indicted, August 2, on charges of treason and conspiracy.—Dr. Frank J. Murphy, Sioux City, has succeeded Dr. William Runyon as physician of the Woodbury County Tuberculosis Sanatorium.—Dr. S. D. Boyce, Washington, has been elected medical director of the Grand Army of the Republic of the State of Iowa.

Hospital Items.—The hospital at Denison, built about ten years ago, and which passed into the hands of Drs. Carl E. Conn and George A. Hartley, Battle Creek, Mich., and Dr. August H. Rosburg, Denison, will, it is announced, be sold at a referee's sale.—Funds are said to be now available for the new Children's Hospital, Iowa City, which will be erected at a cost of \$150,000.—An addition to the Institution for the Blind, Vinton, will be erected at a cost of \$20,000.—Contracts for an addition to the Scott County Public Hospital, Davenport, were awarded, July 19.

LOUISIANA

State Board Meeting.—At the meeting of the state board of health, July 20-21, the vice presidency and finance committee of the board were abolished because of the ruling of the attorney-general that neither the officers nor the committee had any legal status. Resolutions were adopted, praising and thanking Dr. Oscar Dowling, president of the board, for his work on health conditions at various government military camps, and also for his research work on malaria.

Personal.—Dr. Benjamin F. Gallant, New Orleans, formerly surgeon at the Charity Hospital, has been secured by the Louisiana State Board of Health to make a survey of the

Charity Hospital, Shreveport.—Dr. John Gartman Martin, Lake Charles, has resigned as president of the state board of medical examiners, on account of his entrance into the military service.—Dr. Thomas Martin, New Orleans, has resigned as a member of the staff of the Charity Hospital, New Orleans, to accept service in the Army.

War on Hay-Fever.—New Orleans has taken actively in hand the prevention of hay-fever, and the mayor has issued the following proclamation:

Scientific investigations having demonstrated that hay-fever is due to pollen of plants, the majority of which are worthless weeds, the cutting of these weeds at this time will greatly reduce the amount of pollen in the air, and prevent, or at least relieve, the sufferings of hundreds of persons in New Orleans subject to hay-fever. New Orleans is already prominent for its activities and achievements in matters pertaining to health and sanitation, and our citizens, I am sure, will cheerfully and promptly cooperate with the local authorities—the Department of Public Property and the City Board of Health—as well as the American Hay-Fever Prevention Association, in a proper enforcement of the ordinances providing for the extermination of weeds which cause hay-fever.

Now, in order to be of material assistance in the proposed weed-cutting campaign, and as an endorsement of the admirable efforts being made by the American Hay-Fever Prevention Association in this direction, I, Martin Behrman, Mayor of New Orleans, do hereby proclaim Friday, August 10, as "Public Weed-Cutting Day," and urge all citizens to assist in the success of a work the results of which must obviously prove so beneficial to a large percentage of our population.

Given under my hand and the seal of the city of New Orleans this 3rd day of August, 1917.

MARTIN BEHRMAN,

Mayor.

A true copy:

JOHN P. COLEMAN, Secretary to the Mayor.

Six special inspectors have been placed on duty to cover the entire city and to take action against all owners of property who have failed to cut weeds and high grass. The department now has about 250 employees and prisoners at work cutting weeds.

MARYLAND

Infantile Paralysis.—Infantile paralysis has been appearing from time to time in Allegany and Garrett counties, and during the past week two cases were discovered in Baltimore County.

Correction.—In THE JOURNAL, June 30, it was erroneously announced that Dr. Joseph W. Roberts, Salisbury, had been appointed superintendent of the Maryland General Hospital, Baltimore. The new appointee is Dr. Joseph J. Roberts, a graduate of the University of Maryland, class of 1916.

Personal.—Governor Harrington has appointed Dr. Edward Bennett Matthews a member of the Maryland Council of Defense, to fill the vacancy caused by the death of Dr. William Bullock Clark. Chairman Gray of the Maryland Council of Defense has appointed Dr. Matthews chairman of the committee on natural resources and highways, to fill the vacancy caused by the death of Dr. Clark.—The War Department has announced the assignment of three contract surgeons of the United States Army to active duty under orders to report in person to the chief mustering officer of the National Guard at Baltimore to ascertain whether any of its members have tuberculosis. The surgeons so assigned are: Wilbur Pledge Stubbs, John A. Leutscher and Harry D. McCarthy.—Dr. Clement A. Penrose, Baltimore, chairman of the Food Economy Commission, addressed a meeting of the Rotary Club during a luncheon at the Hotel Rennert in which he traced the work, and stated that there would be no doubt that the commission would be of the greatest aid in helping the government to prosecute the war to the limit. Dr. Penrose's trip to England in the interest of his work made his talk particularly interesting.—At a recent meeting of the Baltimore Committee of the Women's Homeopathic Base Hospital recently held at the Hotel Emerson, Dr. Marie Letetia Ingram read an address on the work which women physicians are doing in the war.—Dr. Alexander D. McConachie, Baltimore, was operated on for appendicitis, August 1, and is reported to be doing well.—Dr. C. Frank Jones has been appointed assistant health commissioner of Baltimore, and acting head of the division of communicable diseases.

MICHIGAN

Board Appointments.—The governor has reappointed George Barnes, Howell, and Dr. Henry J. Hartz, Detroit, members of the board of trustees of the state tuberculosis sanatorium, Howell.—Dr. Edward A. Ward, Saginaw, has been appointed to succeed Dr. Bruce L. Hayden, Saginaw, as a member of the board of osteopaths, registration and examination.

Upper Peninsula Physicians Meet.—The annual meeting of the Upper Peninsula Medical Society was held in Escanaba, August 1-3, under the presidency of Dr. Robert Bennie, Saulte Ste. Marie. The following officers were elected: president, Dr. Harry W. Long, Escanaba; vice presidents, Drs. Henry T. Sethney, Menominee, and Richard Burke, Diorite. The next meeting will be held in Menominee.

MINNESOTA

Teaching Fellowships.—The Graduate School in Medicine of the University of Minnesota offers teaching fellowships in medicine, surgery, obstetrics, pediatrics, nervous and mental diseases and ophthalmology and otolaryngology. These fellowships are to cover courses of three years' duration, with a service of eleven months in each year, under stipends of \$500, \$750 and \$1,000. On satisfactory completion of these fellowships, the degree of Doctor of Science or Doctor of Philosophy, qualified by the specialty selected, is conferred by the university. Application blanks for these fellowships may be secured on request to the dean of the Graduate School, University of Minnesota, Minneapolis.

MISSOURI

Personal.—Lieut. George W. Belshe, M. R. C., U. S. Army, Trenton, while in camp at Fort Riley, Kan., August 7, was struck by lightning and severely injured.—Dr. Jabez N. Jackson, Kansas City, has been appointed a member of the general medical advisory board of the Army.—Dr. William H. Coon, public health commissioner of Massachusetts for ten years past and recently made health director of Kansas City, has entered on his duties, succeeding Dr. Herman E. Pearse, resigned.—Dr. William L. Whittington has severed his connection with the State Hospital for the Insane, St. Joseph.—Dr. Herbert Breyfogle has been certified by the civil service board of Kansas City as physician for the fire department.

NEW YORK

Examination of Aviators.—At a special meeting of the Medical Society of the County of Erie, held at Buffalo Medical College, July 30, Major Isaac Jones, M. R. C., U. S. Army, explained the details of the examination of aviators, illustrated by motion pictures and demonstrations. It is proposed to establish an aviation examination unit in Buffalo.

Personal.—Dr. Albert Warren Ferris, Saratoga Springs, medical expert and superintending director for the New York State Reservation Commission, has resigned as chairman of the Saratoga County Home Defense Committee, and has returned to his former position as senior medical officer at Glen Springs.—Dr. Walter S. Goodale, Buffalo, has been appointed superintendent of city hospitals and dispensaries.

Sanatorium Notes.—Proposals have been received by the building and supply committee of the board of supervisors of Rensselaer County for the proposed county tuberculosis sanatorium.—The Buffalo Association for the Relief and Control of Tuberculosis is now located in its new building on Swan Street.—The tuberculosis dispensary is also conducted at this address. About 135 patients are examined each month at the dispensary. The association has also a summer camp with accommodations for about eighty patients.

New York City

New Knickerbocker Hospital.—Plans have been filed for a new building for the Knickerbocker Hospital, which will occupy the entire block fronting on the west side of Convent Avenue between One Hundred and Thirtieth and One Hundred and Thirty-First streets. The estimated cost of the new structure is \$350,000. The main building will be six stories high. Two floors will be devoted to private wards containing about 200 rooms, and the general ward rooms will provide for about 200 additional patients. The Knickerbocker Hospital was formerly known as the J. Hood Wright Hospital.

Millions Available for Hospital.—By an agreement between the executors of the estate of the late James Buchanan Brady and his heirs, the major part of his fortune, estimated at \$3,000,000, becomes immediately available for the New York Hospital. This agreement enables the trustees and executors to carry out the testator's plans for the establishment of the James Buchanan Brady Foundation of Urology. Eventually a building will be erected for the foundation to cost about half a million dollars, which will include departments for investigation along chemical, bacteriologic and pathologic

lines. The plans for the foundation are in the hands of Dr. Oswald S. Lowsley, who was named by Mr. Brady as director.

Will Appeal Decision Regarding "Formula Disclosure Ordinance."—The recent decision of the appellate division of the supreme court declaring invalid the ordinance of the sanitary code requiring manufacturers of "patent medicines" to file the formula of their preparation with the department of health is regarded by the department as a demonstration of the enormous power wielded by "patent medicine" interests, and will be appealed. It is pointed out that the courts have upheld other sections of the sanitary code, and that there is no question of the validity of this section. Pending the final decision on the section in question, the department will continue its war on "patent medicine" fakers under other sections of the sanitary code.

Nutrition Clinics.—As the result of a cooperative investigation carried on by the Bureau of Child Hygiene of the department of health and the New York Association for Improving the Condition of the Poor, five clinics devoted to the care of cases of defective nutrition have been established in this city. These clinics are intended mainly for the treatment and supervision of the large number of schoolchildren who show marked evidence of defective nutrition. A large part of the work will be educational in character, and instruction of the mothers in the proper feeding of the family will play an important rôle. These five clinics are as follows: Bellevue, under the direction of Dr. Charles Hendee Smith; Bowling Green, 98 Washington Street, under Dr. John L. Kantor; Cornell, under Dr. May G. Wilson; Post-Graduate, under Dr. Morris Stark; Brooklyn Association for Improving the Condition of the Poor, under Dr. Oswald Joerg.

The Feeding of Children from 2 to 7 Years Old.—The health department, observing that the many leaflets on the subject of dietetics now being published give very little attention to an important group in the community, namely, children between the ages of 2 and 7 years, requested four members of the department's advisory council, Drs. Luther Emmett Holt, Graham Lusk, Linnaeus E. La Fetra and Godfrey R. Pisek, to meet this need. As a result of their work, an authoritative statement on this subject has been published in the *Weekly Bulletin of the Department of Health*, July 28. The leaflet is designed chiefly for the use of visiting nurses, social service workers and others who come into contact with those most in need of instruction in food economics. It gives the amount of food required, the proportion of the various food elements, the cost of various articles of diet per calorie, some points on cooking, and sample diets for children from 2 to 4 and from 5 to 7 years of age.

NORTH DAKOTA

Personal.—Dr. Arley J. Ostrander has been appointed junior surgeon for the Minneapolis, St. Paul and Saulte Ste. Marie Railway at Enderlin.—Dr. Ellis S. Swarthout, Lisbon, has been commissioned first lieutenant in the medical corps, North Dakota National Guard.

Honor to Military-Medical Men.—The medical fraternity of Minot tendered a banquet, at the Leland Hotel, July 27, to Lieuts. Alexander J. McCannel, and Johnston C. Jackman, and Major Frank E. Wheelon, M. C., North Dakota National Guard, who have been assigned to the Second Infantry.

OHIO

Akron Opens Municipal Dispensary.—The Municipal Dispensary, Akron, was opened, August 6, in the Organized Charities Building. Dr. Fred Read is in temporary charge of the institution.—A municipal tuberculosis clinic will be opened this month, and a municipal nursing bureau is established.

Building for Doctors and Dentists.—The Physicians and Dentists' Building Company was incorporated recently for the purpose of erecting a sixteen-story building, fourteen stories of which will be devoted to offices for physicians and dentists. The other two floors will contain clinic rooms and assembly hall and club rooms.

New Health Council.—A law abolishing the state board of health and creating a state department of health became effective. The new state council of health is composed of Mr. R. M. Calfee, an attorney of Cleveland, Drs. George D. Lummis, Middletown, and Charles O. Probst, Columbus, and Dr. W. J. Jones, a dentist of Columbus. Dr. Lummis has been designated as chairman of the board, which held its first meeting in the governor's office, August 3.

Examiners for Aviators Appointed.—Dr. Christian R. Holmes, Cincinnati, has been appointed director of the local medical examining board for the Aviation Corps. The out-door clinic of the Cincinnati General Hospital will be utilized for examinations. Dr. Holmes will be assisted by the following staff: Samuel Iglaue, Walter E. Murphy, Charles C. Jones, Horace F. Tangeman, Edward King, Robert Sattler, Victor Ray, Derrick Tilton Vail, Fred W. Vail, Wylie McLean Ayres, Mark A. Brown, A. C. Bachmeyer, Oscar Berghausen, E. A. Wagner, A. E. Osmond, Julian Benjamin and Herman H. Hoppe.

Personal.—Dr. Henry Baldwin, Xenia, has resigned as superintendent of the district tuberculosis hospital, Springfield. —Dr. John Darby, Cleveland, has been appointed assistant lieutenant to Col. Joseph A. Hall, chief surgeon, M. C., Ohio N. G. It is expected that Dr. Darby will be assigned to duty as chief sanitary officer. —Dr. David E. Rouse has been appointed chief sanitary officer of the sanitation district about Camp Sherman, the Chillicothe cantonment. —Dr. Don Hughes, Findlay, has been reelected Medical State Director of the Modern Woodmen of America. —Dr. E. H. Caldwell, Vinton, has been appointed physician at the Boys' Industrial School, Lancaster, succeeding Dr. J. W. Clouse, resigned. —Dr. Howell B. Vail, Scio, was shot and seriously wounded by an insane man at Scio, July 26. —Charges of blackmail filed against Dr. George H. Matson, Columbus, secretary of the state medical board, were proved unfounded after the trial, held July 25. The charge against Dr. Matson was based on his activities in prosecuting charges against a Cleveland man who was indicted for the illegal practice of medicine, last May. —Dr. John James McShane, head of the health board of Akron, has resigned to accept a position with the Illinois State Board of Health. —Dr. Courtney P. Grover, surgeon at the National Military Home, Dayton, has resigned to accept a position as surgeon at the Wilbur Wright aviation field. —Capt. Earle W. Cliffe, M. C., Ohio N. G., Youngstown, has been assigned to duty with the Tenth Ohio Infantry.

PENNSYLVANIA

Homeopaths Offer Services.—At the annual meeting of the state homeopathic society, held at the Bellevue-Stratford, August 8, fifteen physicians offered their services to the Medical Reserve Corps of the Army.

Organize Medical Club.—The Thompson Medical Club was organized at Franklin, July 30, at a dinner given to Drs. Arduis C. Thompson and Edgar V. Thompson, M. R. C., U. S. Army. Dr. Louis E. McBride was elected chairman; Dr. Alexander M. Brown, secretary, and Dr. Harry F. McDowell, treasurer.

No Fear of Smallpox at Camp.—Although the wife of Lieutenant McCollough has been stricken with smallpox, no apprehension is felt by officers of the Army Ambulance Corps concentration camp. All the recruits were vaccinated shortly after they reached camp, and Mrs. McCollough never visited the camp.

Ambulance Troopers Examined.—August 6, work was begun by a War Department board of five physicians examining all the soldiers of the United States Ambulance Camp at Allentown. The board consists of Drs. Rae S. Dorsett, head surgeon, Albert E. Blackburn, John R. Robrecht, Louis Jurist and William S. Wray, all of Philadelphia.

Personal.—Dr. Edward L. Davis, Berwick, recently underwent operation in the Berwick Hospital. —Dr. Evan W. Evans, Easton, is reported to be critically ill in Lankenau Hospital, Philadelphia. —Dr. Francis M. B. Schramm, Johnstown, city bacteriologist, who has been ill with pneumonia, has resumed his duties with the city health department. —The salary of Dr. Richard G. Burns, Pittsburgh, acting director of the Pittsburgh Department of Health, has been increased to \$7,000. —Dr. Charles F. Furnec, Harrisburg, has been commissioned captain in the Medical Corps, Pa. N. G., and assigned to the Sixteenth Infantry.

Philadelphia

Veterinarians to Aid Army.—C. J. Marshall, Philadelphia, state veterinarian, and Louis A. Klein, dean of the School of Veterinary Medicine at the University of Pennsylvania, have been appointed members of an advisory board by Surg.-Gen. William C. Gorgas, Washington, D. C.

Decrease in Whooping Cough Epidemic.—The report of the health bureau for the week ending August 11 shows 152 cases of whooping cough as compared with 236 for the preceding week. Dr. Andrew A. Cairns, chief medical inspector,

believes the cause of the spread of the disease is the failure of physicians to report cases of the disease.

Red Cross Hospital.—August 7, work of demolition of the Medico-Chirurgical College was begun. Four buildings of this institution, including a part of the hospital, will be razed, but the main portion of the latter will be reserved during the war, where the American Red Cross will establish the first general Red Cross hospital in this country. It will be known as Red Cross General Hospital No. 1, and \$20,000 has been appropriated for the current expenses. The building will be altered and reconstructed, and will contain 250 beds.

Baby Saving Station to Be Built.—A baby health center and dispensary is to be established at Seventh and DeLancey Place by the Babies Hospital. Eight dwellings on the east side of Seventh Street have been purchased as a site for a large four-story "airolite" building and yard that will involve an expenditure of almost \$100,000. According to plans for the new building, it will be the most modern and best equipped center in the country. There will be a roof garden where mothers may take their babies on hot summer nights, rooms for daily clinics for sick babies, for prenatal clinics, for prophylactic clinics, lecture hall and laboratories. Home supply and social service departments will be important branches of the work. The home supply department will provide bed clothing, cribs and everything pertaining to baby comfort to the poorer people of the congested districts of the city.

Personal.—Capt. Milton H. Fussell, First Lieut. David Riesman and Lieut. Augustus A. Eshner have been ordered to Gettysburg to examine men for tuberculosis. The three physicians later will work in the Army cantonments to prevent tuberculosis from developing among officers or men. —Dr. Alexander C. Abbott, member of the local board of health, and professor of hygiene at the University of Pennsylvania Medical School, has been commissioned a captain in the Medical Reserve Corps, and will examine all the new cantonments for the Army to insure perfect sanitation. —Dr. John D. McLean has been appointed to succeed Dr. Abbott on the bureau of health. —Major William F. Manges, chief roentgenologist of the Jefferson Medical College, is conducting a school for the instruction of members of the Medical Reserve Corps in Roentgen-ray work. The school is held in the basement of the Jefferson Hospital, and six physicians are in the first class. —Dr. John Rouse, Fox Chase, was severely injured in an automobile accident near Jenkintown, August 7. —Dr. Asa F. Copeland has been appointed by the mayor as outdoor physician of the Bureau of Charities, with a salary of \$540. —Dr. Theodore H. Weisenburg has been appointed to the National Committee on Mental Hygiene.

CANADA

Hospital News.—A new Canadian military hospital has been opened at Liverpool, England. It receives soldiers whom the medical board has slated for "further treatment in Canada." Troops fresh from Canada, who fall sick, will also be detained in that institution. Lieut.-Col. J. L. Biggar is the commanding officer. He went to England with the Thirteenth Field Ambulance from Victoria, B. C. —Capt. A. W. Wakefield, C. A. M. C., who was on board a hospital ship which ran ashore near Halifax, N. C., recently, has arrived in Montreal. Captain Wakefield went overseas with the Newfoundland Medical Corps at the beginning of the war, but was soon transferred to the Royal Army Medical Corps.

Personal.—Dr. A. S. Moorhead, F. R. C. S., Toronto, has sailed for France, having accepted an appointment in the Royal Army Medical Corps, in the surgical department of one of the casualty hospitals under Dr. Herbert A. Bruce. —Surg.-Gen. George S. Ryerson, Toronto, is spending the summer at Tadousac, Que. —Lieut.-Col. E. B. Hardy, Toronto, O. C. Toronto Military Base Hospital, has been elected president of the Toronto branch of the Great War Veterans' Association of Canada. —Lieut.-Col. D. W. McPherson, Toronto, officer commanding the Ontario Military Hospital, Orpington, England, has been created a C. M. G. —Capt. Andrew Macphail, Montreal, editor of the *Journal of the Canadian Medical Association* and the *University Magazine*, is the second Canadian physician ever honored with an invitation to address the Cavendish Society, Sir William Osler having been the other. —Surg. Major Napier Kcefer, M.D., Toronto (retired), has sent to King George a gift of \$47,500, which is to be distributed as follows: Star and Garter Home for Paralyzed Soldiers, \$10,000; Nurse Cavell Homes, \$10,000; Auxiliary Officers' Consumption Hospital, \$5,000; Prisoners' of War Fund, \$2,500; orthopedic treatment,

\$10,000; treatment of deaf soldiers, \$10,000.—Capt. Frank Muir Walker, M.B., University of Toronto, 1913, has been awarded the Military Cross for gallantry and devotion to duty under heavy fire. He went through a heavy barrage to some wounded men and tended them in the open for an hour. His home is in Stoney Creek, Ont.—Major Harold Parsons, M.D., Toronto, who has been with the University of Toronto Base Hospital at Saloniki since October, 1915, reached London, England, July 1.—Dr. Ingersoll Olmstead, Hamilton, Ont., is spending the summer in Cape Breton, N. S.

GENERAL

Personal.—Dr. Thomas W. Huntington, San Francisco, has been appointed a member of the committee to go to Italy and advise with the military authorities on Red Cross matters.—Dr. Wilfred T. Grenfell of Labrador has been spending a few days in London after three months in hospitals on the western front.

Next Examination of National Board.—The third examination of the National Board of Medical Examiners will be held in Chicago, Oct. 10-18, 1917. It is contemplated that another examination will be held in New York in the early part of December. The secretary of the board is Dr. John S. Rodman, 2106 Walnut Street, Philadelphia.

Tri-State Society Meeting.—The annual meeting of the Tri-State District Medical Society of Illinois, Iowa and Missouri will be held at Dubuque, Iowa, September 4-6. The headquarters are to be at the Hotel Julian. At the annual meeting, held on the third evening, Dr. Arthur D. Bevan, Chicago, will preside as toastmaster, and the governors of the three states, the presidents of the three medical societies, and the president of the American Medical Association are expected to be present.

Society of Military Surgeons.—It is planned by the executive council of the Association of Military Surgeons of the United States to hold a meeting, October 8, at Indianapolis. The meeting of the society, which was to have been held in Chicago last year, was called off because of the absence of many of the members on the Mexican frontier. It is problematical whether a large proportion of the membership of the society will be able to be present at Indianapolis on account of existing war conditions.

Bequests and Donations.—The following bequests and donations have recently been announced:

German Hospital, Philadelphia, \$20,000; Philadelphia Polyclinic and College for Graduates in Medicine, and Philadelphia Lying-In Charity, each \$10,000, by the will of William B. Baltz, Devon, Pa.

Episcopal Hospital, Philadelphia, \$5,000; Samaritan and Children's hospitals, and Philadelphia Home for Incurables, each \$1,000, by the will of Harriet Shaw.

St. Mary's Free Hospital and the Sea Breeze Association for Improving the Condition of the Poor, New York; Morristown (N. J.) Memorial Hospital, and All Souls' Hospital, each \$10,000, by the will of Annie A. Peckham.

PARIS LETTER

PARIS, July 26, 1917.

The War

KIDNEY WOUNDS CAUSED BY WAR PROJECTILES

Dr. Barnsby has reported to the Société de chirurgie de Paris five cases of isolated wounds of the kidney that he has encountered, purposely leaving out of account the renal lesions that are a frequent complication of penetrating wounds of the abdomen. Primary hematuria may be divided into two classes: (1) either the hematuria is slight and the general health good, in which case one should postpone operation, since a cure is usually effected spontaneously, or (2) the hematuria is abundant and the general condition grave, in which case operation should be resorted to. Nephrectomy is not indicated except in cases of rupture of the kidney, which makes conservation impossible. Partial lesions of the parenchyma, whether of the convex border or of the inferior pole (provided the section is not complete), should cause the surgeon to reconsider and to adopt conservation. When there are repeated hematurias, we usually have to deal with a projectile which has become embedded in the parenchyma. The methods of localization (*repérage*)—which have been so perfected in our day—should lead to the removal of the projectile and to conservation of that organ. The method of choice is without doubt the extraction under intermittent roentgenoscopic control, which permits the exteriorization of the kidney, a conservative incision, removal of the projectile and a diminution of the traumatism. The use of calipers, since they do not permit exteriorization, makes the operation

laborious. When there is a primary dribbling of the urine or a traumatic urinary fistula, it is evidently a serious case which points to a lesion of the renal pelvis, or the calices majores. Sometimes there are cases in which nephrectomy is unavoidable, but one should not reach this conclusion hastily. If the surgeon has lost no precious time, he can incise and drain, curet cautiously, cauterize several times, and refrain from interfering radically until all attempts at conservation have failed. In these conservative operations one must learn to act with caution. Any exteriorization of the kidney which should prove laborious, in cases of this kind, would be almost sure to lead the surgeon to a total excision. Barnsby concludes his report by saying that one can carry conservation very far when it is a question of isolated kidney wounds.

STATUS OF MEDICAL STUDENTS

According to a recent decree, medical students not matriculated in the Ecole principale du Service de Santé de la marine de Bordeaux who, at the time of mobilization, had twelve credits toward their doctor's degree may be appointed to the rank of médecin auxiliaire de 2-e classe (physician's assistant) after the completion of at least one year of service in the capacity of médecin auxiliaire de 3-e classe of the navy.

AMERICAN AND FRENCH RED CROSS

The Central Committee of the French Red Cross, wishing to welcome the American Red Cross, invited its representatives to a friendly gathering which was held at the headquarters of the Société de secours aux blessés militaires. Among the invited guests were the American ambassador, Mr. Sharp, and wife, and Major Murphy, the American Red Cross commissioner for Europe, together with the officers of his staff, who were received by the delegates of the three societies of which the French Red Cross is composed. Admiral Touchard was the spokesman of the Central Committee of the Red Cross, and in its name gave expression to the gratitude of France to the United States. Mr. Sharp replied to this address, saying that the American Red Cross felt itself deeply indebted to its French co-workers for the warm welcome that had been accorded to it.

THE AMERICAN AMBULANCE CORPS AT NEUILLY

The closing ceremonies of the American ambulance corps took place recently at the lycée Pasteur at Neuilly, and was presided over by Justin Godart, undersecretary of state for the military medical service. Among the distinguished guests were Mr. Sharp, the American ambassador; Mr. Benet, president of the administrative council of the ambulance; Dr. Winchester du Bouchet, chief surgeon; Major Peed; Medical Inspectors Lannes and Sieur, and others. Mr. Benet, in turning over the American hospital at Neuilly to the government of the United States, said that this occasion, after three years' effort, would bring sadness to the founders if this session did not mark the entrance of the great American republic into the conflict. M. Justin Godart warmly thanked the friends of France for their devotion.

A few days before these closing ceremonies were held, General Pershing, commander-in-chief of the American expeditionary force, took occasion to visit the American ambulance at Neuilly. He was conducted through the hospital by the chief surgeon, Dr. du Bouchet, and inspected the different services: the operating rooms, the laundry, the pharmacy, the kitchens, the apartments reserved for wounded officers, those set apart for the soldiers, and lastly, the rooms for mechanotherapy. On leaving the hospital, General Pershing warmly congratulated Dr. du Bouchet on the perfect condition in which the hospital was kept.

FRANCO-AMERICAN CELEBRATION

A brilliant Franco-American celebration organized for the benefit of the Society for the Protection of Invalid Soldiers took place recently at the Trocadéro in the presence of Mr. Sharp, American ambassador; General Pershing; M. Viviani, minister of justice; M. Painlevé, minister of war, and others.

SPANISH MEDICAL MISSION VISITS FRANCE

A very important medical mission accredited by the Spanish minister of foreign affairs arrived at Paris recently. The mission intends to leave shortly for a visit to the hospitals on the French front and later to those on the British front. The chairman of this mission is Dr. Martinez Vargas, professor at the Facultad de medicina de Barcelona, and among the members of the party are Dr. Raventos, delegate of the Academia de medicina de Barcelona; Dr. Turo, physician of the "dispensaire français" of Barcelona; Professor Peyri;

Agrégé Professors Vallori and Moralès; Professors Firmat and Nogueras of the Facultad de medicina de Salamanca, and a great number of physicians of Majorca, Bilbao, Barcelona, and Salamanca.

This Spanish mission was received by a number of distinguished scientists, among whom we may mention Professors d'Arsonval and Moureu of the Académie des Sciences and of the Académie de médecine; Professors Robin and Gilbert of the Académie de médecine; E. Perrier, director of the Muséum, member of the Académie des sciences, and others.

ALIMENTARY HYGIENE

The minister of food control has received a delegation of the Société scientifique d'hygiène, which consisted of Professors Richet, Gley, and others. The delegation called the attention of the minister to the fact that the scientific principles on which the process of nutrition in man is based should lie at the basis of the questions pertaining to food control. This delegation also informed the minister that the Société scientifique d'hygiène alimentaire was at his disposal as regards information of a scientific nature to be furnished the administrators charged with the study of food questions and with the introduction of food restrictions. If there were any measures to be adopted for which it would be well to prepare the public in advance, the society would always be ready to lend its aid in the form of lectures or publications explaining the situation in simple language.

Personal

Dr. Moureu, member of the Académie des sciences, and professor at the Ecole supérieure de pharmacie de Paris, has been appointed professor of organic chemistry at the Collège de France.

LONDON LETTER

LONDON, July 31, 1917.

The War

THE HEALTH OF MUNITION WORKERS

An important report to the government Committee on the Health of Munition Workers has just been published. Dr. H. M. Vernon has conducted an elaborate investigation for the committee, the members of which realize that the data at their disposal are not yet ample enough to permit them to express a final judgment on the whole question of hours of labor in relation to output, on the one hand, and the well-being of the employes, on the other. But they are strongly of opinion that the evidence collected by Dr. Vernon, and his conclusions merit the immediate and earnest consideration of all concerned in industrial organization at the present time. (a) Observations extending over a period of thirteen and one-half months on the output of workers employed in making fuses showed that a reduction of working hours was associated with an increase of production both relative and absolute. The rate of production changed gradually, and did not reach an equilibrium value before the expiration of four months. Thereafter it remained steady during the period of from three and one-half to five months during which it was observed. The gradual change negatives the suggestion that the effect was a mere consequence of the desire to earn the same weekly wage as before the hours were shortened. (b) Owing to the reduction of the working time first by a change from a twelve hour day to a ten hour day, and subsequently by the abolition of Sunday labor, it was possible to compare output under three conditions. The group of women (numbering from eighty to one hundred) engaged in the moderately heavy labor of turning aluminum fuse bodies provided the following comparative results: (1) When actually working 66 hours a week and nominally 74.8 hours, their relative hourly production was 100 and their relative gross production 100. (2) When actually working 54.8 hours and nominally working from 58.5 to 66 hours, their hourly production was 134 and their gross production 111. (3) When actually working 45.6 hours and nominally working from 49.5 to 58.5 hours, their hourly production was 158 and their gross production 109. It is to be inferred, therefore, that had these women been working uniformly, a nominal 50 hour week their gross output would have been as large as when they were working a nominal 66 hour week, and considerably greater than when they were working a 77 hour week. In other words, a considerable addition to the leisure time of the operatives would have substantially improved the total output of the factory. (c) A group of forty women engaged in the light labor of milling a screw thread on the fuse bodies improved their gross output by 2 per cent. when actually

working 54.8 hours a week, the standard being their gross output when working 64.9 hours per week. A further reduction of actual working hours to 48.1 resulted in such an improvement of hourly output that the gross output was 1 per cent. less than when the actual working time was 16.8 hours more. (d) A group of fifty-six men engaged in the heavy labor of sizing the fuse bodies improved their hourly output by 37 per cent. and their gross output by 21 per cent. when actually working 51.2 hours, the standards being the hourly and gross outputs observed when the actual weekly hours were 58.2. (e) Fifteen youths engaged in the light labor of boring top caps by means of automatic machines produced only 3 per cent. less output when their actual weekly hours of work were 54.5 hours than when they were 72.5 hours. (f) A part of the improvement in output was due to the workers starting work more promptly when on shorter hours. At one period the women engaged in turning fuse bodies lost on the average thirty-seven minutes daily by starting work after, and stopping before, the nominal time. Nine months later, when their hourly output was 25 per cent. better, they lost only twenty-six and one-half minutes daily in these ways. (g) A rest from work on Sunday is followed by a relatively low output on Monday, and this output steadily rises in the course of the week, owing to the increased efficiency produced by practice. Generally, the cumulative effects of fatigue neutralize and overpower this increased efficiency, and the output may fall after the second day (or night) of the working week if the hours are long and the work laborious, or not till after the third, fourth or even fifth day, if the hours are shorter. In the absence of a Sunday rest, the fatigued worker has no opportunity for complete recuperation, and his output, though more uniform, remains permanently at a lower level than that shown on Monday by a worker who has rested on Sunday.

THE UNITED STATES MEDICAL STAFF ON THE BRITISH FRONT

The impression made by the American physicians, nurses and orderlies who arrived on the British front in advance of their fighting men and took over six large base hospitals is thus described by Mr. Philip Gibbs, the war correspondent of the *Daily Telegraph*: "The American intonation is a new note on the western front, where the voices of many races mingle. It brings a new type of manhood on to this stage of war, and one feels instantly the freshness and the vigor of it. They are quiet, businesslike, alert fellows, these young college men and other volunteers who have come out as orderlies and stretcherbearers and staff clerks with the American Medical Corps. The members of the administrative and professional staffs, surgeons and physicians from great American hospitals have settled down to this work of taking over British hospitals—not an easy task when wounded are coming in all the time—with an orderly method, a complete absence of fuss and red tape, which shows the quality of their character, direct, quick in the grasp of principles and details, getting down to the job in hand without unnecessary words or worry. So it seemed to me. Some of these men have seen service in the Philippines. All of them have had long experience in American hospitals, where the wreckage of human life in peace has trained them for the greater wreckage of war. All of these have a look in their eyes, as though conscious of the enormous tragedy into which they have come, and of the greatness of the task they have undertaken; yet bright and cheerful, and sure of themselves."

MEDICAL JOURNALS AND THE WAR

It is nearly three years since we entered the greatest of the world's wars, during which we have had to create an army adequate for the occasion, which meant summoning the whole of the young men of the country. Needless to say, our national life has been greatly modified; but the remarkable fact is that the change has not been greater. This fact is exemplified by our medical journals. The price of paper is now four times what it was before the war. Advertising is greatly reduced. Subscription lists necessarily diminish, for not only is there what may be called the normal death rate of subscribers, but nearly half the profession is at the front and therefore less likely to subscribe. Even the physicians killed in action form an item. But so far only one medical journal has ceased publication. The others are diminished in size to about one half. Thus the half-yearly volume of the *Lancet* is now about 1,000 pages, while before the war it was 1,800. In some cases the form of publication has been altered. Thus, the *Clinical Journal* is published monthly instead of weekly, and the *British Journal of Children's Diseases* quarterly instead of monthly. The causes of reduction of size are sev-

eral. Not only is paper much more expensive, but printing, engraving and all other costs have increased. Moreover, the withdrawal of such a large proportion of the medical profession from civil practice has caused those who remain to be exceedingly busy, with little time for writing. In spite of the great flow of "war" articles, the total output is diminished.

FOOD CONTROL

Lord Rhondda, the food controller, is introducing an elaborate system to prevent as far as possible increase in the cost of food. While the cost of food has on an average rather more than doubled, the cost of living to the wage earner has increased by over 75 per cent. In some cases wages have advanced sufficiently to cover the increased cost of living, while in others there has been only comparatively small advance and in some cases none at all. By the exercise of a little self-sacrifice and the avoidance of waste on the part of the community generally, it is possible both to maintain adequate supplies of food and to reduce substantially the price of the chief necessities of life. The submarine menace has so far led to little deprivation on our part, but the effect of the loss of tonnage is cumulative, and until the shipbuilding program of the Allies results in replacing vessels as rapidly as they are sunk, we shall not be out of danger. The government policy is to fix the prices of those articles of prime necessity over the supply of which it can obtain effective control at all stages, from the producer down to the retailer. Such prices will, as far as possible, be fixed on the principle of allowing a reasonable prewar profit for those engaged in the production and distribution of the particular commodity. Every effort will be made to prevent speculation, and unnecessary middlemen will be eliminated. Existing agencies will be utilized for the purposes of distribution under license and control, and under the supervision of a local food controller to be appointed by the local authorities. Bread is by far the most important food to be dealt with. The 4 pound loaf now costs 24 cents. The government proposes to reduce the price to 18 cents, which will go far to ease the situation in many thousands of poor homes. It purposes to attain this end by taking over all the flour mills of any importance, as many have been taken over already. From the mills flour will be sold to the bakers at a uniform price calculated to correspond with the price of 18 cents for a quartern loaf. Bakers obtaining flour at that price will be expected to sell the loaf over the counter at a maximum price of 18 cents, but they will be allowed to make an additional charge for delivery and in cases in which they give credit. They will be allowed to charge more for cash counter sales only if they prove to the satisfaction of the ministry or local authorities that they have had specially high working costs. The amount realized by the millers from the bakers for flour at the uniform price will be met by the subsidy from the exchequer. The amount of that subsidy cannot be definitely estimated because the price which will have to be paid for imported wheat is still uncertain. Those in other parts of the world who are not under the control of the Ministry of Food will have the highest price they can exact from the various competitors for the food which they provide, and the British government cannot afford to risk the loss of any essential article of food by refusing to pay whatever price will be necessary in order to secure it. How the government will cheapen the article when it has secured it is a question of ways and means, and the government's intention is to take the short cut by establishing the price by law, reducing the price to the poor, and making up the difference from the exchequer.

The fixing of the price of meat has presented special difficulties owing to the unprecedented rise in the cost of storage during the last few months. Steps are being taken to determine what margin between the price of cattle and the price of beef will yield a dealer or butcher a fair profit. Great attention has been paid to developing national economy in food consumption. An important step will be the establishment, when local circumstances suggest that they are required, of central or communal kitchens. They will be run with the idea of economizing and not as charitable institutions. Economies both in food and in coal can be effected by this means.

MEDICAL EXAMINATION OF RECRUITS TRANSFERRED TO A CIVILIAN AUTHORITY

Considerable dissatisfaction has arisen with regard to the medical examination of recruits by the present boards. A man rejected at one examination has been passed as quite fit at a subsequent examination. The greatest cause of complaint is that the reports of civilian physicians are overridden

by army surgeons. A committee appointed by the government to investigate the subject has reported that in view of the evidence a change of system should be made at once and that the whole organization of recruiting medical boards and of the medical examination and reexamination should be transferred from the War Office to the Local Government Board, the body which controls the civil medical administration of the country.

Sir James Mackenzie, in giving evidence before the committee, said that before the war army surgeons dealt with men who were fit and wanted to join the army, which was an easy matter. Now individuals of impaired health are recruited for the lower classifications. Army surgeons are not trained to deal with men of that description. Mistakes and differences of opinion are bound to occur. "As a young man" he said, "I told people with heart murmurs that they were in a bad way, but they did not die, and I began to separate the murmurs—the innocent ones from those of importance. Some physicians have ignored this advance, and that is how you sometimes get a man who has been rejected passed 'A' by a physician who recognizes that a murmur is of no importance. Then it comes as an enormous shock to the man who is passed 'A.'" Sir James Mackenzie is able to distinguish the important from the unimportant murmurs with fair certainty, and thinks that the ordinary physician, if he had not been spoiled, could be taught to do the same. Some murmurs might mean anything, and the man might be in perfect health. He would pass a man "A" without hesitation if an innocent murmur was his only trouble. He had seen a lad who had been rejected on account of heart murmurs. He found that he was the leading athlete of his school, and that the following day he won a prize for running the longest race in record time. Men were continually being rejected for life insurance through heart murmurs. He gave a certificate to a man who had been rejected seven times. That man had now been in the fighting and was quite well.

Marriages

LIEUT. JARRETT M. HUDDLESTON, M. O. R. C., U. S. Army, Washington Barracks, to Miss Helen MacLain of Asheville, N. C., at Washington, D. C., July 26.

LIEUT. CHARLES RAY TOMPKINS, M. O. R. C., U. S. Army, Chicago, to Miss Jessie McLean of Grafton, N. D., at Chicago, recently.

SAMUEL BENJAMIN NICKELS, M.D., Big Stone Gap, Va., to Miss Louise Parsons of near Petersburg, Va., at Richmond, Va., July 28.

ASST.-SURG. DOZIER GIBBS, U. S. Navy, Washington, D. C., to Mrs. Lulu May Lacy of Nashville, Tenn., at Portsmouth, Va., July 28.

ASST.-SURG. DANIEL TRIGG, U. S. Navy, Norfolk, Va., to Miss Mary Balmer of Hampton, Va., at Norfolk, Va., July 26.

EVERETT MONROE ELLISON, M.D., Washington, D. C., to Miss Alberta Bayne Hunt of Alexandria, Va., Dec. 30, 1916.

EARL KENDALL HOLT, M.D., Logansport, Ind., to Pearl Evelyn Hyatt, M.D., of Syracuse, N. Y., at Cincinnati, July 31.

WILLIAM DAVID CLELAND, M.D., Harlansburg, Pa., to Miss Mary G. Long of New Wilmington, Pa., July 24.

SAMUEL ARTHUR KLEGER, M.D., New York City, to Miss Elizabeth Edna McColley of Minneapolis, July 3.

ASST.-SURG. STEPHEN ROY MILLS, U. S. Navy, to Miss Nelle Layton Kinter, both of Bradford, Pa., July 25.

HERMAN JOHN BOLLINGER, M.D., Baltimore, to Miss Fannie Jeanette Millahub of Wichita, Kan., July 29.

LEON WOODFORD KELSO, M.D., Paxton, Ill., to Miss Eleanor Watts of Carlinville, Ill., at Paxton, July 21.

GEORGE RUDOLPH VEHR, M.D., to Miss Esther Genieve Stoddard, both of La Grande, Ore., June 5.

ASST.-SURG. EDWARD A. BROWN, U. S. Navy, to Miss Lucile Dodson, at Norfolk, Va., July 21.

STEPHEN EARLE VOSBURGH, M.D., to Miss Ruth Cartridge, both of Augusta, Me., Aug. 1.

ROBERT H. HERBST, M.D., Chicago, to Miss Marion Mable Steeves of Boston, recently.

LEO KILLIAN, M.D., Blair, Neb., to Miss Lois Peters, at St. Louis, recently.

Deaths

Linus E. Russell, M.D., Springfield, Ohio; Eclectic Medical Institute, Cincinnati, 1872; aged 68; formerly professor of clinical surgery and operative gynecology in his alma mater; surgeon to the Seton Hospital, and local surgeon of the Big Four and Panhandle System; associate editor of the *Eclectic Medical Journal*; who for seventeen years maintained an office in Cincinnati; died at his home, August 2, from cerebral hemorrhage.

Lieut. V. A. Magenheimer, M. O. R. C., U. S. Army, Mooresville, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1898; aged 42; a member of the Indiana State Medical Association; on duty at Fort Benjamin Harrison; died in the post hospital, July 29, from injuries received in a collision between an automobile in which he was riding and an inter-urban car, near Fort Benjamin Harrison.

Lieut. Augustus Abraham Greenberg, M. O. R. C., U. S. Army; Brooklyn; Eclectic Medical College of the City of New York, 1904; Long Island College Hospital, Brooklyn, 1909; aged 39; a member of the visiting staff of Gouverneur, Mount Sinai and Beth Israel hospitals; died in the Jewish Hospital, Brooklyn, August 6, from septicemia, which, it is said, followed an infected mosquito bite.

William L. Dickinson, M.D., Saginaw, Mich.; University of Buffalo, N. Y., 1879; aged 53; a Fellow of the American Medical Association; formerly professor of rectal diseases in the Michigan College of Medicine and Surgery, Detroit; rectal surgeon to the Woman's Hospital, Saginaw; died at his home, June 8, from leukemia.

Charles Horace Lincoln Moseley, M.D., Brooklyn; New York University, New York City, 1890; aged 52; founder of the Central Hospital, Brooklyn, later known as the Bushwick Hospital; a member of the visiting staff of the Jamaica Hospital and German Hospital, Brooklyn; died in Poughkeepsie, N. Y., July 30.

George Alexander Kirker, M.D., Detroit; Starling Medical College, Columbus, Ohio, 1878; formerly a Fellow of the American Medical Association; a member of the Michigan State Medical Society, and once president of the Wayne County Medical Society; died at his home, July 14.

Blake Edwin Ray, M.D., Cuba, Ill.; College of Physicians and Surgeons, Chicago, 1913, aged 26; a member of the Illinois State Medical Society, and secretary-treasurer of the Fulton County Medical Society; died at the home of his parents in Cuba, July 25, from acute nephritis.

Marcus Boynton Austin, M.D., Brunswick, Mo.; Marion-Sims College of Medicine, St. Louis, 1897; aged 47; local surgeon of the Wabash Railway; a member of the National Association of Railway Surgeons; died in the railway hospital, Moberly, Mo., July 22, from septicemia.

Charles Richard Palmer, M.D., Tusculumbia, Ala.; Vanderbilt University, Nashville, Tenn., 1883; aged 58; formerly a Fellow of the American Medical Association; a member of the Medical Association of the State of Alabama; died at his home, about July 27.

Bertha S. Park, M.D., Denver; Denver College of Physicians and Surgeons, 1909; aged 39; died in a hotel in Chicago, August 6, from the effects of chloroform, self-administered, it is believed, with suicidal intent, while suffering from melancholia due to ill health.

Philander W. Payne, M.D., Franklin, Ind.; Jefferson Medical College, 1858; aged 86; for several years trustee of Franklin College, and of the Indiana College of Physicians and Surgeons, Indianapolis; died at the home of his daughter in Indianapolis, July 30.

Kenneth Evernghim Kellogg, M.D., New Britain, Conn.; College of Physicians and Surgeons in the City of New York, 1878; aged 43; a Fellow of the American Medical Association; died in the Hartford (Conn.) Hospital, June 10, from meningitis.

Lieut. Floyd Smith Bates, M. C., N. G. Mo., assigned Second Infantry; Adrian, Mo.; University Medical College of Kansas City, Mo., 1910; aged 30; while in camp at Fort Riley, Kan., August 7, was struck by lightning and instantly killed.

Thomas A. Carey, M.D., Pen Argyl, Pa.; Jefferson Medical College, 1884; aged 71; formerly a member of the Medical Society of the State of Pennsylvania; also a druggist; died in the Jefferson Hospital, Philadelphia, July 25.

Rollin Alexander Kirkpatrick, M.D., Troy, N. Y.; Albany (N. Y.) Medical College, 1898; aged 58; a Fellow of the American Medical Association; died in the Samaritan Hospital, Troy, July 28, from cerebral hemorrhage.

Vernon M. Reynolds, M.D., Bristow, Okla.; College of Physicians and Surgeons, Keokuk, Ia., 1885; aged 60; health officer of Creek County, Okla.; died at his home, April 22, from heart disease following exposure.

George Eugene Bliss, Owosso, Mich. (license, Michigan, years of practice, 1900); aged 71; a practitioner for forty-four years; a veteran of the Civil War; died at his home, July 23, from cerebral hemorrhage.

John Tate Haden, M.D., Crawfordsville, Ark.; Vanderbilt University, Nashville, Tenn., 1876; aged 64; for forty-three years a practitioner of Arkansas; died at his home, July 2, from cerebral hemorrhage.

Ernest E. Best, M.D., Cameron, Tex.; Grand Rapids (Mich.) Medical College, 1903; aged 39; a member of the State Medical Association of Texas; died at his home, June 18, from tuberculosis.

James E. Lay, Jr., M.D., Sweet Home, Tex.; Tulane University, New Orleans, 1901; aged 38; formerly a Fellow of the American Medical Association; died at his home, April 25, from heart disease.

Ralph Frederick Koons, M.D., El Reno, Okla.; University of Michigan, Ann Arbor, 1901; aged 41; a Fellow of the American Medical Association; died at his home, July 1, from uremia.

Alwine Kattenbracker, Davenport, Ia. (license, Iowa, years of practice, 1887); aged 77; until a year ago a practitioner of Le Claire, Ia.; died at her home, July 31, from heart disease.

Leonidas W. Tandy, M.D., Creighton, Mo.; Eclectic Medical Institute, Cincinnati, 1885; aged 67; a member of the Missouri State Medical Association; died at his home, June 5.

George W. Holding, M.D., Breakabean, N. Y.; Albany, (N. Y.) Medical College, 1884; aged 60; for twenty years a practitioner of Watervliet, N. Y.; died in Troy, N. Y., July 25.

Robert Andrew Kerr, M.D., Peoria, Ill.; Rush Medical College, 1881; aged 60; formerly a member of the Illinois State Medical Society; died in Petoskey, Mich., August 3.

McMillan Jones, M.D., Acme, Wyo.; University of the South, Sewanee, Tenn., 1905; died at the home of his parents in Paris, Ill., July 27, from malignant disease.

Anton Angelsberg, Marshalltown, Ia. (license, Iowa, years of practice, 1887); aged 62; a practitioner since 1877; died at his home, July 27, from heart disease.

Napoleon B. Davis, Sullivan, Ind. (license, Indiana, 1897); aged 70; for forty years a practitioner; died at the home of his son in Farnsworth, Ind., July 30.

John Coleman Kilgour, M.D., Harrison, Ohio; Pulte Medical College, Cincinnati, 1877; aged 71; a Confederate veteran; died at his home, July 23.

Alonzo Givens, M.D., Mandeville, La.; Tulane University, New Orleans, 1857; aged 82; a Confederate veteran; died at his home, about July 22.

Josiah Gates, M.D., La Plata, Mo.; Eclectic Medical Institute, Cincinnati, 1859; aged 85; died in the St. Joseph (Mo.) Hospital, July 24.

Thomas Pettway Davis, M.D., Alexandria, Tenn.; Vanderbilt University, Nashville, Tenn., 1879; aged 59; died at his home, July 18.

James Cowper Hannan, M.D., New York City; New York University, New York City, 1873; aged 71; died at his home, August 2.

Thornton Daggy, M.D., Indianapolis; Eclectic Medical College of Indiana, Indianapolis, 1908; aged 37; died at his home, July 29.

Capt. Lewis Emerson Clark, Canadian A. M. C., Vancouver, B. C.; McGill University, Montreal, 1913; aged 29; was killed in action in France, in June.

Mary Herrick Baynum, M.D., Dexter, Me.; Boston University, 1885; died at the home of her niece in Dexter, July 14, from cerebral hemorrhage.

Charles A. De Cou, M.D., Pontiac, Mich.; Michigan College of Medicine, Detroit, 1884; aged 55; died at his home, about July 17.

Frederick C. Strong, M.D., Denver; Denver Homeopathic College, 1898; aged 60; died at his home, April 27, from nephritis.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

SOME MISCELLANEOUS NOSTRUMS*

Limestone Phosphate.—As the nostrum "Orangeine" is not even remotely related to the orange, so "Limestone Phosphate" is devoid of "limestone." No one would learn this fact, however, without purchasing the preparation, for the newspaper advertisements give no hint of the misleading character of the name of this nostrum. Probably with the idea of forestalling any action on the part of the federal authorities on the ground that it was misbranded, the trade package admits: "This product is not derived from limestone." Many of the newspaper advertisements of Limestone Phosphate are prepared in such a way as to simulate reading matter. There is nothing in the heading to show that the article that follows is a "patent medicine" advertisement, and even the tell-tale "*Adv.*" at the end of the advertisement, which a government ruling demands, is not always found. Limestone Phosphate in the advertisements is not capitalized, but is so printed as to give the reader the impression that it is an official pharmaceutical product. Most of the headlines of the advertisements urge the drinking of hot water or "phosphated hot water." "Says Hot Water Washes Poisons from the Liver," "Says We Become Cranks on Hot Water Drinking," "Hot Water For Sick Headaches," "Drink Hot Water and Rid Joints of Rheumatic Rust"—these are some of the headlines of the "reading matter" advertisements urging the use of Limestone Phosphate. The nostrum has been analyzed by several chemists. The results of these analyses agree essentially in giving the composition of Limestone Phosphate as a mixture of baking soda and sodium acid phosphate. As soon as this mixture is put in water it effervesces, due to the reaction between the acid sodium phosphate and the alkaline baking soda, giving off carbonic acid gas and leaving behind what is virtually a solution of sodium phosphate in water. Those who are averse to paying a fancy price for a misleading name can purchase their sodium phosphate at any drug store under its own name. The average price for sodium phosphate which, as an official product, can always be counted on as being pure and of standard strength is about twenty-five cents a pound; Limestone Phosphate sells at the rate of \$1.40 a pound.

Parmint.—This preparation emanates from the same city as the Sargol fraud, Binghamton, N. Y., and is exploited by individuals who do business under the somewhat imposing trade-name, "International Laboratories, Inc." "Catarrhal deafness, head noises, catarrh of the stomach, catarrh of the bowels, loss of smell, lung trouble, asthma, bronchitis" and various other conditions should, according to the Parmint advertising, be treated with this nostrum. The preparation comes in one ounce bottles for which 75 cents is charged. The purchaser is told to empty the ounce of Parmint into a half pint bottle which should then be filled with sugar syrup. The state chemists of Connecticut analyzed Parmint, and in the report of the Connecticut Agricultural Experiment Station for 1916 it is declared that "Parmint appears to be an alcoholic solution containing sugar, glycerin, a small amount of chloroform and a mixture of volatile oils with oil of anise predominating."

Varnesis.—This stuff used to contain 18 per cent. alcohol and, according to the state chemists of Connecticut, "less than 1 per cent. vegetable extractives chiefly derived from emodin-yielding (laxative) drugs and capsicum (cayenne pepper)." The preparation as now put on the market contains 15 per cent. alcohol. The manufacturers used to claim in the trade

package (and the claims in all trade packages of "patent medicines" are subject to the federal Food and Drugs Act) that the preparation was a "Great Stomach and Rheumatic Remedy." These claims have now disappeared. The claim used to be made that "Varnesis has cured and is today curing hundreds"; this claim has also disappeared. It used to be "the most perfect combination of roots and herbs ever put together"; but it is so no longer. It used to be said: "Varnesis corrects all disorders of the stomach and restores vigor to all the organs of the body . . . Varnesis stimulates, purifies and enriches the blood, soothes the nerves and gives the vigor of youth . . . Varnesis restores sleep." All of these claims have been abandoned. "Varnesis" is sold as a cure for rheumatism, and the directions state that it should be taken six times a day, two tablespoonfuls to the dose. As "Varnesis" contains 15 per cent. alcohol, this means that the person taking it according to these directions is getting as much alcohol as he would obtain from the consumption of a half-pint of raw whisky every four and one-half days; or, to put it another way, it is the alcohol equivalent of about twelve bottles of beer a week.

Fruitatives.—According to a booklet sent out by the concern that exploits it, "Fruitatives" consists of

"Fruit Liver Extract	$\frac{7}{8}$ of a grain
"Special Extract of Nux Vomica Fruit	$\frac{1}{20}$ of a grain
"Howard's Hydrochlorate of Quinine	$\frac{1}{3}$ of a grain
"Extract of Quassa	Q.S."

This alleged formula is, of course, a joke and would be so regarded by any druggist or physician. "Fruit Liver Extract" is the mysterious element that all falsely and misleadingly advertised "patent medicines" require for the purpose of successfully humbugging the public. "Special Extract of Nux Vomica Fruit" is probably nothing more mysterious than Extract of Nux Vomica, a drug long used in medicine and the one from which the deadly poisons strychnin and brucin are obtained. The medical properties of nux vomica are those of strychnin and brucin. "Hydrochlorate of Quinine" is one of the numerous salts of quinin and has the well-known action of quinin. "Extract of Quassa" is probably a misprint for Extract of Quassia, a simple "bitter." The methods by which "Fruitatives" are exploited are typical of the quack-medicine school. Advertisements claiming by inference that "Fruitatives" will cure "paralysis," "consumption," "rheumatism," etc., have appeared in various American and Canadian newspapers. It is probable that "Fruitatives" possess no virtues that are not to be found in the common aloin, belladonna and strychnin laxative pill.

Correspondence

THE ROLL OF HONOR

To the Editor:—I note with a great deal of satisfaction your reference to "No Need for Drafting the Medical Profession" as referred to in your editorial (THE JOURNAL, Aug. 11, 1917). Doubtless there are very few laymen today who realize or appreciate to any degree the sacrifices which many members in our profession are making.

I know of one instance where a physician gave up a practice of \$100,000 per year to accept the pay of a major. This man is now working in France. I know another connected with one of the large resorts in this country in which he receives thousands of dollars a year, yet who is willing to sacrifice that and accept the commission of a captain that he may serve his country and give aid to the boys on the firing line.

While there are thousands of cases similar to these, there are many slackers who are standing back and waiting for the other fellow to go, that this slacker may profit by the absence of the hero. I am indeed glad to note that you propose to publish an honor roll. I think it is unfortunate that you cannot also publish a dishonor roll, showing up at least to the medical profession those who, for pecuniary benefit,

* This material, with much additional, appears in the new edition of the pamphlet "Miscellaneous Nostrums," price 15 cents.

are willing to sacrifice their patriotism to their country and their loyalty to the medical profession.

I believe it would be an excellent idea if the Surgeon-General would order every physician in the country who has accepted a commission in the Medical Reserve Corps to don his uniform, whether he is on duty or not, and in this way give an outward expression to the world that he is willing to undergo any sacrifice to serve his country and to be a striking example to the slacker. I believe this would do more to stimulate interest among the physicians, especially the younger men, than anything else.

One has only to look over the list of the great men of this country who have sacrificed practice, family ties, and self-interest, and gone to the front, to know who are the great physicians of this country.

I wish to take this opportunity to express to you my appreciation of *THE JOURNAL*, and of the way in which you have kept the medical profession, and especially those who have gone in the service, thoroughly informed regarding the movements of the profession in the war. You surely have been doing your bit.

CAPT. H. H. ROBERTS, M. R. C., South Poland, Me.

To the Editor:—In Saturday's edition of *THE JOURNAL* (Aug. 11, 1917, p. 476) I find a paragraph concerning the "Roll of Honor" which you are to publish in the near future.

I wish to state that I sent in my application for commission in the Medical Reserve Corps sometime in June, and being an officer in Base Hospital Unit No. 11, I understand that these commissions will not be issued until sometime in the fall so as not to disrupt the organization of the Base Hospital Unit No. 11 by ordering the various officers to different camps. My name as well as those of the other officers who have sent in their commission will not be placed in this "Roll of Honor" for the reason that we have not had a chance to return the acceptance of the commission.

Would it not be advisable therefore if you would add the personnel of the various base hospitals throughout the United States on this "Roll of Honor"? Of course, this is only a suggestion, as there is certainly no doubt in my mind that membership in the base hospitals necessarily obliges the holders to accept service at any time.

HENRY SCHMITZ, M.D., Chicago.

To the Editor:—In *THE JOURNAL* last week you promise to publish the "Roll of Honor," the names of those physicians who have accepted commissions in the Medical Reserve Corps. There is also a list which should be put in a subroll at least, and that is the 2,000 physicians who volunteered for the service and were rejected for physical defects. All honor to those who have volunteered and have been accepted but no stigma should attach to those who made an honest effort but were not physically qualified.

F. W. STARR, M.D., Stanley, Wis.

EXEMPTION OF MEDICAL STUDENTS

To the Editor:—I was so much impressed by the figures that you published in *THE JOURNAL* last week, showing the large percentage of medical men of military age who have been called for military service, that this morning, at a meeting of the New York City District Board, I brought the matter to the notice of Judge Charles E. Hughes, who is serving as our chairman. Judge Hughes pointed at once to General Crowder's instructions to district boards, to the effect that medical students could not be exempted under the law, and that district boards had no power to grant such exemptions. At first Judge Hughes suggested that an effort be made to obtain from the President, through the Secretary of War, an appropriate supplement to the regulations which govern the work of the district boards. Later in the day, after a careful rereading of the statute itself, Judge Hughes advised me that the President had no power to act in the

matter and that no relief could be obtained otherwise than through an act of Congress. I thereon dispatched the following telegram to Major Franklin Martin:

"Charles E. Hughes, Chairman New York District Board, advises that we cannot exempt medical students from draft. Fifty per cent. of medical students in first and second draft groups threatens welfare of country. Judge Hughes advises only remedy is through act of Congress. Will you take action? Would like something done before joint meeting of all New York State District Boards on Thursday sixteenth."

It seems to me that the welfare of the country is bound up in this matter to a very large degree, and it would be a pity if the danger were not averted merely because the medical profession as a body failed to act. You are perhaps in a better position than any one else to facilitate concerted action in an emergency of this sort, and it is for this reason that I am writing to you on the subject.

S. S. GOLDWATER, M.D., New York.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

THE STATUS OF MEDICINE AND SURGERY

To the Editor:—I have been requested to prepare an article on the subject of "The State of Medicine and Surgery in the United States Today." Will you please inform me where I can get the necessary data? In regard to medical education, I can find it in my files of *THE JOURNAL*.

GEORGE H. JUILLY, M.D., San Francisco.

ANSWER.—The following is a list of references to articles on this subject:

- Nichols, J. B.: American Achievement in Medicine, *Washington Med. Ann.*, May, 1917.
- Craig, F. A.: Progress of Medicine During the Year 1913, *Internat. Clin.*, 1, 193.
- Jackson, T. T.: The Advance of Good Surgery, *Texas State Jour. Med.*, March, 1917.
- Crile: Contemporary American Surgery, *Brit. Jour. Surg.*, July, 1916.
- Cowden, C. N.: The Trend of the Times in Medicine and Surgery, *Jour. Tennessee Med. Assn.*, April, 1917.
- Parallel Between American and French Surgery, Paris Letter, *THE JOURNAL*, March 14, 1914, p. 821.
- Crile, G. W.: Contemporary American Surgery, *Brit. Jour. Surg.*, April, 1915.
- Boyd, F. D.: Development of American Medicine, *Texas State Jour. Med.*, June, 1915.
- Literature on Recent Medical Discoveries, Queries and Minor Notes, *THE JOURNAL*, Jan. 17, 1914, p. 224.
- Mock, Harry E.: Industrial Medicine and Surgery: The New Specialty, *THE JOURNAL*, Jan. 6, 1917, p. 1.
- Van Sweringen, G.: Medicine, *Indiana State Med. Assn. Jour.*, January, 1915. (This number contains papers by various men on advances in each branch of medicine and surgery.)

NO ACTION ON LAW REGARDING OSTEOPATHS IN ARMY

To the Editor:—I should like to know if Congress has recently or ever made a ruling which gives osteopaths the privilege of entering the Medical Corps of the Army or Navy in the same rank as a physician of the regular school. I have seen in the papers recently that this law was passed in Congress, and I wish to know whether the item was authentic.

W. H. MINER, M.D., Farmer City, Ill.

ANSWER.—An amendment to the effect that one osteopath should be assigned to each thousand troops in the United States Army, the osteopath to be given the rank of first lieutenant in the Medical Corps, was recently introduced in Congress. No action has been taken on this amendment.

HIGH CALORY DIET IN TYPHOID FEVER

To the Editor:—Please give me a working outline of the high calory diet in typhoid fever referred to by Dr. Warren Coleman, New York, in his article in *THE JOURNAL*, Aug. 4, 1917.

A. L. GLAZE, JR., M.D., Athens, Ala.

ANSWER.—Coleman has suggested various combinations of milk, cream and lactose to be given in the earlier stages of the disease. Eggs may be added to make up the protein requirement. Some of the cream may be given in the form of ice cream. In certain cases if patients have no difficulty with

mastication, custards, mashed potato, cocoa, apple sauce and cereals are given, although these articles are usually more suitable later in the course of the disease. It is difficult to give more than 3,000 calories a day in the early part of the disease. When the temperature is falling and in convalescence, from 4,000 to 6,000 calories may be given. Examples of some of the milk, cream and lactose mixtures are as follows:

	Calories		
For 1,000 calories a day:			
Milk, 1 quart (1,000 c.c.)	700		
Cream, 1 $\frac{3}{4}$ ounces (50 c.c.)	100		
Lactose, 1 $\frac{3}{4}$ ounces (50 gm.)	200		
This furnishes eight feedings, each containing:			
Milk, 4 ounces	80		
Cream, 2 drams	15		
Lactose, 6 drams	24		
For 2,000 calories a day:			
Milk, 1 $\frac{1}{2}$ quarts	1,000		
Cream, 8 ounces (240 c.c.)	500		
Lactose, 4 ounces (125 gm.)	500		
This furnishes seven feedings, each containing:			
Milk, 7 ounces	150		
Cream, 1 ounce	60		
Lactose, 18 gm.	72		
For 3,000 calories a day:			
Milk, 1 $\frac{1}{2}$ quarts	1,000		
Cream, 1 pint (480 c.c.)	1,000		
Lactose, 8 ounces	1,000		
This furnishes eight feedings, each containing:			
Milk, 6 ounces	120		
Cream, 2 ounces	120		
Lactose, 1 ounce (30 gm.)	120		
The following is a sample diet for a day in which 3,910 calories are to be given:			
	Hours	Total	Calories
Milk, 6 ounces	9 a. m.; 1, 3, 7 p. m.	1,260 c.c.	860
Cream, 2 ounces	10 p. m.; 1, 4 a. m.	420 c.c.	840
Lactose, 10 gm.		70 gm.	280
			1,980
At 11 a. m.:	Calories	At 5 p. m.:	Calories
Egg, 1	80	Egg, 1	80
Mashed potato, 20 gm.	20	Cereal, 3 tablespoonfuls	150
Custard, 4 ounces	250	Cream, 2 ounces	120
Toast (or bread), 1 slice	80	Apple Sauce, 1 ounce	30
Butter, 20 gm.	150	Tea	...
Coffee	...	Cream, 3 ounces	180
Cream, 2 ounces	120	Lactose, 20 gm.	80
Lactose, 20 gm.	80		640
	780		
At 7 a. m.:	Calories		
Egg, 1	80		
Toast, 1 slice	80		
Butter, 20 gm.	150		
Coffee	...		
Cream, 2 ounces	120		
Lactose, 20 gm.	80		
	510		

Lactose lemonade may be substituted for the milk mixture at 3 o'clock. The article from which the foregoing diet was taken appears in Musser and Kelly, Practical Treatment, Volume IV.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

- ALASKA: Juneau, Sept. 4. Sec., Dr. S. P. Dawes, Juneau.
- ARIZONA: Phoenix, Oct. 2-3. Sec., Dr. John Wix Thomas, 306 Goodrich Bldg., Phoenix.
- COLORADO: Denver, Oct. 2. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.
- HAWAII: Honolulu, Sept. 10-13. Chairman, Dr. Grover A. Batten, 1141 Alakea St., Honolulu.
- IDAHO: Pocatello, Oct. 2. Sec., Dr. Charles A. Dettman, Burke.
- MASSACHUSETTS: Boston, Sept. 11-13. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.
- MINNESOTA: Minneapolis, Oct. 2-5. Sec., Dr. Thomas S. McDavitt, Lowry Bldg., St. Paul.
- MONTANA: Helena, Oct. 2. Sec., Dr. William C. Riddell, Power Bldg., Helena.
- NEW YORK: Albany, Buffalo, New York City and Syracuse, Oct. 2-5. Chief, Examinations Division, Harlan S. Horner, State Education Bldg., Albany.
- PORTO RICO: San Juan, Oct. 2. Sec., Dr. M. Quevedo Baez, San Juan.
- RHODE ISLAND: Providence, Oct. 4-5. Sec., Dr. Byron O. Richards, State House, Providence.
- UTAH: Salt Lake City, Oct. 1-2. Sec., Dr. G. F. Harding, Templeton Bldg., Salt Lake City.

Social Medicine, Medical Economics and Miscellany

OBSERVATIONS ON THE PHYSICAL EFFECTS OF FLYING

HARRY L. SCHURMEIER, M.D.
Captain, Medical Reserve Corps, United States Army
FORT SNELLING, MINN.

The year and a half during which I was constantly associated with the flying at the aerodrome at North Island, San Diego, Calif., gave me ample opportunity to observe the physical status of the flyers. Two things must be discounted in considering this matter: first, the equable climate of San Diego, and secondly, the excellent physical and nervous stamina of the men participating. Regarding the former, San Diego presents practically the same climate as southern Italy; in consequence, the diseases which are of daily occurrence in more rigorous climates are rarely seen there. The men are chosen from the Army at large, practically every corps being represented with the exception of the medical corps. The applicants are subjected to a most strenuous physical examination, in which not only the general physical and nervous system is considered but also the temperament of the man. Men showing marked nervous tendencies are frequently turned down. Special attention is given to the vision and to the organs of equilibrium; any defect in the latter would obviously unfit a man for service in which any position at any angle is of constant occurrence.

It may readily be seen, therefore, that men subjected to so careful a selective process, and living in such an equable climate, would have fewer physical ailments than have flyers in general. From my observations, I came to the conclusion that the effects of flying on the individual were manifest chiefly on the nervous system and on the general health indirectly, through the nervous system. One of the main barometrics of fluctuation in the status of a healthy individual's nervous tone is the blood pressure. Fear, unusual nervous tension, or, in fact, any definite variation of the emotions, will cause fluctuations in blood pressure.

BLOOD PRESSURE EXPERIMENTS

The blood pressure experiments were carried out as follows: Certain men, twenty in all, were selected, and their blood pressures taken daily, immediately before and after each flight. The experiments were carried out over a period of six weeks. It was not found feasible to make observations in the air on account of the noise and vibrations of the machines. As a result of these experiments it was found that the mean general average of blood pressure compared very favorably with the normal of that age. It was the comparative readings before and after flight which were of interest. These readings were shown to be definitely higher in nearly every case immediately before flying than on returning to the ground. The few exceptions to this rule were in men showing marked nervous fatigue or to whom some disagreeable incident had occurred in the air. In these men the blood pressure was higher on their return to the ground and remained so for several hours afterward. The fluctuations of the diastolic pressure were synchronous with those of the systolic, but to a lesser degree, showing an average of three points less. These findings are attributed to the fact that the moderate excitement attending the anticipation of flight, combined with the naturally increased mental and nervous activity, caused the rise in blood pressure. On the finishing of the flight the immediate nervous relaxation is shown by the drop in pressure. The differences in the readings occurring before and after flight were more marked in the newer flyers when first placed under instruction, showing their increased nervous tension at that time. The older and more experienced flyers showed scarcely any variations in pressure readings before and after flight, and their general average was lower

than the newer men. The records showed no fluctuation of sufficient degree to be suggestive of anything pathologic, merely accentuating the fact of the increased nervous strain to which the aviator is at all times subjected, and showing the gradual adaptation of the individual to this strain.

Occasionally men complained of feeling stale, tired, and not up to the mark. This was ordinarily due to late hours, need of a vacation, or lack of stamina, on the part of the individual. Irritability on the part of some of the instructors was quite marked at times; their work is unquestionably very trying, and their number of hours in the air greater than the others.

EFFECT OF ALTITUDE FLIGHTS

Regarding altitudes and the physical effect on the flyers, it might be noted here that the mean atmospheric pressure at sea level will balance a column of mercury 30 inches high, and that in ascending there is a direct fall in pressure of 1 inch of mercury to every thousand feet ascended. The relative proportion of the constituent gases of the atmosphere remains the same with the exception of the watery vapors, which are confined to the lower levels. As the aviator ascends, the tension of the gases in the bodily fluids balances that of the surrounding air. Obviously the quantity of oxygen per cubic foot of air becomes progressively less as the pressure decreases; further, there is a drop in the arterial blood pressure of the flyer.

The latter factor is slight in a healthy adult, and of minimum importance up to 6,500 feet; above this altitude the blood pressure drops more rapidly. In older men with some hardening of the arteries, there is a much more decided drop in pressure, which change is evidenced by slight headache, vertigo, and tinnitus aurium. This fact may be noticed any day in crossing the mountains in a railway train. If the portly, florid man is questioned, he will acknowledge these symptoms, which are largely due to lack of elasticity of the blood vessels and consequent inability on their part to contract and establish rapid equilibrium between the arterial pressure and the lowered atmospheric pressure.

As has been previously stated, the watery vapors are confined to the lower strata, and as these are instrumental in retaining the heat of the sun's rays, the atmosphere becomes cooler as one ascends. It will thus be seen that in making altitude flights, three main factors must be considered; first, there is less oxygen to breathe; second, the arterial blood pressure is less, and last there is a decided drop in temperature. Some interesting and valuable data have been gathered at various times both in this country and abroad in regard to the effects of altitudes on the individual; these experiments have been carried out on the peaks of high mountains. It has in the first place been shown that among mountain climbers much more energy is expended by the untrained than by the trained climber; further, that men living in high altitudes develop a higher percentage of erythrocytes and hemoglobin. This variation has been shown to be approximately 5 million red cells per cubic millimeter, at sea level, to 8 million at 14,000 feet. The hemoglobin is increased from 20 to 30 per cent.

SCARCITY OF OXYGEN MAY CAUSE SICKNESS

The reason for this can be readily seen; the amount of oxygen per cubic foot of air is much less at high altitudes; the bodily oxygen demand remains constant; therefore, any sudden muscular activity would bring the margin of oxygen safety down to the danger zone. In consequence, nature compensates by giving the blood more oxygen-carrying and storing elements so that in case of any excessive exertion the body would have an adequate supply of this necessary gas. Altitudes have a tendency to increase the chest capacity, in this way increasing the oxygen intake. Mountain sickness, a malady which is directly attributable to the scarcity of oxygen at the higher levels, occurs in Europe as low as 9,800 feet, in the United States as a rule at considerably higher points. The symptoms of this disease are a heavy oppressed feeling in the chest, with dyspnea and cyanosis. There are also varying degrees of mental depression, accompanied by nausea and vomiting. These symptoms are unquestionably

tionably accentuated and brought on at a lower level by the mountain climber, owing to the excessive physical effort in making the ascent. Sitting quietly in the aeroplane, we should not expect such severe symptoms, nor should we expect any difficulty at all at such low altitudes.

Some men complain of slight vertigo and headache when flying at altitudes of between 12,000 and 16,000 feet; these symptoms are dispelled by deep inhalation. Some men who have flown at high altitudes constantly over a long period of time have developed a definite susceptibility to the effects of altitudes. One of the most pronounced cases of this kind is that of Lieutenant Cowdin, an American in the French Army. Mr. Cowdin has won the Croix de Guerre, the Medaille Militaire, the cross of the Legion of Honor, and the War Cross. He has brought down some seventeen of the machines of the enemy, but at the present time is unable to fly at an altitude of over 3,000 feet without experiencing most annoying palpitation of the heart and dyspnea. The more severe symptoms of altitude sickness are immediately relieved by the inhalation of a few whiffs of oxygen or the administration of some cardiac stimulant. The direct causative factor of this condition seems to be a definite weakening of the myocardium, owing to an inadequate supply of oxygen; this being supplied, the heart immediately resumes its normal functioning. This all tends to emphasize the value of training and the need of excellent physical form for the aviator. It is suggested that men who are going out after altitude records should live in the higher mountain regions for a time so that the body will be in the best possible condition to meet the demands of the occasion. This not being practicable, a small oxygen tank with an inhaler may be taken along. This procedure corresponds to the necessary carburetor adjustment with which the aeroplane is provided on these occasions.

PHYSIOLOGIC EFFECT OF ACCIDENTS

Two distinct phenomena stand out vividly in my mind in connection with men who have been subjected to a fall of any severity. These are, first, the immediate effects, and secondly, the more remote after-effects. I have seen men pulled out of wrecked machines after a fifty-foot fall or a bad side slip, suffering from extreme shock, as evidenced by a weak pulse, subnormal temperature and pallor, with either an active delirium or a stupor. These men may recover and come back and fly as well as ever. Other men, who were only moderately shocked at the time of the accident, later developed vague nervous symptoms which persisted for months, incapacitating them for work of any kind. Some of these men are forever afterward machine shy. One aviator had a slight mishap; on landing, the machine was turned over, but no one was hurt. For a long time afterward, this man consistently overcontrolled and spoiled all his landings.

HYPNOTIC EFFECT AS A CAUSE OF ACCIDENTS

Another rather interesting condition, of less frequent occurrence, is that in which the flyer apparently experiences a lapse or a period during which he remembers nothing and is unconscious of everything which has occurred. A few men have acknowledged to me that they have had such an experience. The most glaring of these lapses occurred to Mr. Herbert Latham, who at the time was flying an Antonette monoplane on Dominicus field in 1911. Latham came down on top of the grand stand and smashed his machine. He explained the affair by stating that at his last recollection of anything he was flying level at an altitude of some 500 feet; the next thing he knew he was on top of the grandstand. The general consensus seems to be that the monotonous drum of the propeller, combined with the entire removal from external stimulus, has a hypnotic effect and that this effect is much increased if the aviator looks steadily at the propeller. In other words, he should keep interested in the passing show. Many accidents in which the aviator has lost his life, and which are of such a nature as to be entirely inexplicable, may be attributed to this cause. One of the main attributes of the stabilizer with its automatic control, as demonstrated by Mr. Macey in his recent invention, will undoubtedly tend

to prevent accidents of this nature. It has been repeatedly demonstrated that a land machine will float, for a time at least, if unfortunate enough to land in the water. The sad death in 1914, of Lieutenant Gerstner, who endeavored to swim ashore after his machine had gone into the ocean, suggests the advisability of staying with the plane. His companion was saved after being kept afloat for several hours by holding on to the buoyant wings.

I have known many flyers both among the civilian and the military aviators, and have tried to pick a type, a man whose entire physical and mental make-up should enable him to perfect himself in the art of flying. My conclusions are that the type does not exist. I believe that the early training of athletics is invaluable as a preliminary for flying. Athletics give a man instant perception, quick judgment, with a rapid and facile coordination of the physical, all of which are essential assets in the flying game.

Many of these intrepid pioneers of the air have lost their lives in this most hazardous but most fascinating of all sports. These losses should not be in vain; the cause of each fatality should be carefully determined, so that the mistakes will not be repeated. The American is a composite and should lead in aviation; in him is combined the daring of the French with the ultraconservatism of the English and German, and there are certainly times when both of these factors are needed.

Gas-Heated Appliances and the Air of Workshops

Charles Weisman, sanitary chemist in the United States Public Health Service, has recently described (*Pub. Health Bull.* 31) the effect of gas-heated appliances on the air of workshops. The work was done in connection with the general investigation of the health of garment workers in New York City.

An analysis of air samples in shops of the garment industry was made with reference to the amount of carbon monoxid gas present. Studies were also made of the conditions of gas-heated appliances. Laboratory examinations were made of gaseous combustion products of various kinds of gas-heated pressing irons. Tests were made of the permeability of the walls of various kinds of flexible gas tubing, of the security against leakage of gas connections, and of the hygienic significance of the presence of small amounts of carbon monoxid in the air of confined, inhabited places. Air samples were taken from 244 shops. Of these, twenty-nine, or 11.8 per cent., were found to contain over 100 parts of carbon monoxid per million parts of air, the average for the twenty-nine samples being 325 parts, ranging from 105 to 1,431 parts. In fifty-five shops the carbon monoxid ranged from twenty-five to 100 parts per million, or an average of 47.3 parts. The investigation was conducted during the open window season. During the winter season, with the windows closed, the contamination would undoubtedly be worse. No mechanical system of ventilating was employed in any of the shops. Defective rubber tubing was found in fifty-two of the 244 shops, or 21.3 per cent. of the total. In thirty-six, defective tubing was found, and in the remainder of the fifty-two, in addition, there were found defective gas tubing connections, defective gas irons and defective flexible metal tubing, the last being found in sixteen shops, or 6.5 per cent. of the entire number of shops examined. One out of every four shops examined was using some kind of defective gas tubing, and 7 per cent. had poor gas tubing connections. In a number of reinspections, even higher percentages of carbon monoxid were found in some instances. Sixty-eight permeability tests were made on the walls of thirty pieces of gas tubing, comprising sixteen different varieties of tubing. None were found to be gas-tight; rubber tubing is least permeable to illuminating gas; flexible metal tubing and "composition" tubing give considerable leakages of this gas. Defective and poorly fitting rubber connections, as a rule, are greater sources of leakage than defective gas tubing.

The symptoms of chronic carbon monoxid poisoning, such as might be produced by the amounts of gas found in the investigation in the air of workshops, are headache, pallor,

anemia, derangements of the digestive system, a slow pulse, mental dulness, fatigue after but little exertion, failing memory, palpitation of the heart, and a tendency toward difficult breathing. Carbon monoxid has produced symptoms in different individuals in amounts of 0.3 per cent. for fifty minutes, 0.4 per cent. for forty minutes and twenty-five minutes, 0.25 per cent. for twenty minutes, 0.5 per cent. for 11½ minutes, etc. The injurious effect arises from the affinity of the hemoglobin of the blood for the carbon monoxid.

Book Notices

EXPERIMENTAL PHARMACOLOGY. By Dennis E. Jackson, Ph.D., M.D., Associate Professor of Pharmacology, Washington University Medical School, St. Louis. Cloth. Price, \$4. Pp. 536, with 390 illustrations. St. Louis: C. V. Mosby Company, 1917.

This laboratory manual fully sustains the author's reputation as an investigator and master of technic. The introduction shows not only a detailed knowledge of the actualities and difficulties in physiologic experimentation, but an ability to state prospective difficulties so vividly that the student can benefit to the greatest degree by the work of others. In the beginning of the laboratory work a concise and almost complete list of apparatus is given in such form that an instructor preparing for the work has little to do but order the list. The illustrations are exceptionally good, and profuse. However, one wonders why space and expense should be taken with cuts of beakers, graduates, battery jars, etc., although this is excusable in consideration of the many valuable illustrations not easily found in other works. In this book, as in most works dealing with surgical operations of any kind, the author's methods as illustrated need not be considered as the only methods, but as good methods. After a course in physiology in a good school, many of the details of the operative procedure should be superfluous; but for most students into whose hands this book comes, that time has not yet arrived. Jackson's manual is primarily prepared for the laboratory of pharmacology, but it may be used with profit also in physiology. The drug experiments are excellently presented. More amphibian experiments might be profitably included so that the usefulness of the book should not be limited in places in which mammals are less easily procurable than in the larger cities. There are many valuable suggestions in the concluding chapters on shop work and photography. The list appended of dealers in apparatus, tools, supplies, equipment, etc., is important in itself, and will save the time of many a laboratory worker.

ASTHMA: PRESENTING AN EXPOSITION OF THE NONPASSIVE EXPIRATION THEORY. By Orville Harry Brown, A.B., M.D., Ph.D. With a foreword by George Dock, Sc.D., M.D., Professor of Medicine, Washington University Medical School, St. Louis. Cloth. Price, \$4. Pp. 330, with illustrations. St. Louis: C. V. Mosby Company, 1917.

This book represents nine years of study of asthma by the author, and is chiefly a support of his nonpassive expiration theory. In a foreword to the book, Dr. George Dock states that he has been much impressed by the accuracy of the author's clinical work and by the fulness and symmetry of the literary production. He says further, "The student and the practitioner can find in this book a true picture of the previous speculations and present knowledge of asthma expressed clearly and concisely. . . ."

Dr. Brown's introductory chapter is most interesting. He outlines his method of study, and follows with a short chapter on the definition of the disease. The third chapter, which is perhaps one of the most important in the book, concerns historical observations and theories. There are 470 references to original articles on this subject, and practically every known theory as to the causation of this condition is given, including many that are ridiculous on first thought, as well as others which have borne the test of time and demand more careful consideration. These data are analyzed under fifteen headings, and give in outline the present state of our knowledge of asthma. After the consideration of the anatomy

and physiology of the lungs and the pathology and physiology of dyspnea, the author states his theory. In brief, this is that asthmatic dyspnea is essentially a mechanical interference with the blood and lymph circulation in the lung due to heightened intra-alveolar tension which arises from non-passive expiration. By nonpassive expiration is meant morbid attention to the act of respiration, such as results in coughing, sneezing, etc., which make expiration an active muscular effort instead of a passive one. Numerous physiologic and pathologic factors accompany such efforts, all of these aiding in the production of the asthmatic dyspnea. The author's theory is based on a close study of numerous attacks of the disease.

He then proceeds to coordinate with this theory of asthma other points of relative importance, such as the anaphylactic factors, reflexes, nasal conditions, coincident tuberculosis and emphysema, focal infection, etc. This occupies the first half of the book.

The remainder of the book is devoted to the pathology of asthma, clinical history, physical signs and symptoms, diagnosis, treatment and prophylaxis. In the discussion on treatment, the author describes all of the already known treatments, with particular reference to special treatment adopted toward overcoming the particular pathology which accompanies the nonpassive expiration. The treatment prescribed is rational and inclusive of all tested methods.

THE BABY'S FOOD. Recipes for the Preparation of Food for Infants and Children. By Isaac A. Abt, M.D., Professor of Diseases of Children in the Northwestern University Medical School. Cloth. Price, \$1.25 net. Pp. 143. Philadelphia: W. B. Saunders Company, 1917.

This book is prepared by the author in order to furnish young mothers, nurses and caretakers with recipes for the preparation of commonly used babies' foods. The recipes are collected from numerous reliable sources. The book includes, in addition to a great number of recipes, a table of weights and measures, and lists of mineral constituents and of the caloric value of various foods. The concluding chapters are devoted to diet lists for children of various ages and special diet lists for diarrhea and constipation. Instructions are also given regarding various mechanical and hydrotherapeutic methods for babies. The book will be found of great practical value to those for whom it is intended.

CITY MILK SUPPLY. By Horatio Newton Parker. Cloth. Price, \$5 net. Pp. 493, with 63 illustrations. New York: McGraw-Hill Book Company, Inc., 1917.

This book has chapters dealing with the general physical and chemical characters of milk, the diseases communicated by milk, sanitary milk production, dairy cattle and the dairy farm, transportation of milk, and the milk contractor. There is also an excellent section on control of the public milk supply. The style is clear and objective, and typographic errors are practically absent. The treatment of pasteurization and of the use of the score card is particularly full and discriminating. The discussion of methods of control of the public milk supply is conservative and in line with the best practice in this country. The illustrations are almost uniformly good, and the tabular matter, of which there is a great deal, is well presented. As a whole, the book will prove of great value to all practical public health workers.

THE AMERICAN ENCYCLOPEDIA AND DICTIONARY OF OPHTHALMOLOGY. Edited by Casey A. Wood, M.D., C.M., D.C.L., Professor of Ophthalmology and Head of the Department, College of Medicine, University of Illinois. Volume 10—Lenicet to Muscles, Ocular. Cloth. Price, \$8. Chicago: Cleveland Press, 1917.

The important and outstanding topics in Volume 10 of this splendid work are lenses, military surgery of the eye, and a voluminous article on the ocular muscles which expounds in detail the theories of Savage on the eye muscles and the theoretical brain centers controlling their action. Among other subjects included are localization of foreign bodies, light, massage, ocular complications of measles, and mercury. In every respect the high quality of this great work on the eye is maintained in the present volume.

Medicolegal

Damages for Failure to Remove Gauze and Portion of Tube

(*Baer vs. Chowning (Minn.)*, 161 N. W. R. 144)

The Supreme Court of Minnesota affirms an order denying a motion made by the defendant for judgment or a new trial, after a verdict for \$2,500 had been rendered in favor of the plaintiff. The court says that the plaintiff's right to recover damages was limited to negligence in leaving a gauze pack or sponge and a portion of a rubber drainage tube in her body. There were no other claims of negligence. It was not claimed that the defendant was unskilful or negligent in the performance of the operation. The evidence was that, Aug. 14, 1914, the defendant performed an abdominal operation on the plaintiff. Two incisions were made, one in front and one in the side. The one in the side did not heal. A fistulous opening developed. July 14, 1915, another surgeon performed an operation. He found in the abdominal cavity, according to his testimony, a gauze pack or sponge which had been used in the operation and a portion of a rubber drainage tube. This testimony made the question of the defendant's negligence for the jury. With regard to the amount of the verdict: The plaintiff's suffering had been severe. She had been incapacitated from work. If her testimony and that of others was credited, she was still in bad health and in a nervous and enfeebled condition and far from well. There was no direct testimony that her suffering or her condition resulted from the leaving of the pack and the tube in the body. It was a matter of fair inference for the jury. As soon as they were removed, the wound healed and pains became less. Perhaps the verdict was large. This court cannot say that it was excessive.

Bases for Expert Testimony

(*Chicago, R. I. & P. Ry. Co. vs. Jackson (Okla.)*, 162 Pac. R. 823)

The Supreme Court of Oklahoma, in reversing a judgment rendered against the railway company for damages for personal injuries, says that it is well settled that the opinion of an expert witness is permissible when based on his personal knowledge of the matter under investigation, or on competent evidence in the case, or on both. But the authorities are not in harmony as to the proper limitations that should be placed on the testimony of consulting physicians, in giving expert testimony as to the nature or probable effect of an injury. The great weight of authority appears to support the rule that statements made to a physician by a patient, as to the cause and manner of the happening of an injury, which statements are not made so near in point of time to the fact as to constitute a part of the *res gestae* or essential circumstances of the case, are not admissible in evidence. In many of the cases the testimony of a physician as to statements made to him by a patient in relation to the history of his case—that is, as to his past or previous condition, symptoms, sensations and feelings—is held admissible, when sought to be introduced in connection with the physician's opinion as an expert, as furnishing a basis therefor, or for the reasons on which such opinion is founded. On the other hand, a line of authorities support the rule that the testimony of a physician as to statements made by him to a patient, concerning the history of his case, his past condition, symptoms, pain and suffering, is hearsay and inadmissible. Aside from the question of the statements in proper cases being admissible as a part of the *res gestae*, the correct rule, it would appear, should permit a physician to testify to a statement or narrative given him by his patient in relation to his condition, symptoms, sensations and feelings, both past and present, when made in connection with his own opinion as to the cause of the injury, though the statement may not be received as independent evidence to establish the fact of the injury. When made the basis, in part at least, of the physician's opinion, such testimony is admissible from necessity, because in this way only can the bodily condition of the party, who is the subject of the injury, be ascertained. The rule should not, however, be extended beyond the necessity on which it

is founded. In such circumstances, and, indeed, whenever declarations are admissible, it is for the jury to determine whether they express the real feelings of the party, or whether they are feigned; and for obvious reasons, whenever there appears a motive to manufacture testimony, the declarations should be subject to the closest scrutiny. On the other hand, facts not required for a satisfactory diagnosis, such as the cause of an injury, as to the instrument with which it was inflicted, or the like, constituting a narrative of the incidents of a past transaction, are incompetent. In other words, this court holds that a physician in giving evidence as an expert may testify to a statement made to him by the patient in relation to his condition, symptoms, sensations and feelings, both past and present, when such statements were received and were necessary to an examination, with a view to his treatment, and when made the basis, in part at least, of the physician's opinion; but such testimony cannot be considered as independent evidence of the facts stated, except in cases in which the same is competent as forming a part of the *res gestae*. Facts not required for a satisfactory diagnosis, such as the cause of an injury, the means or manner by which it was inflicted, or which attempt to fix the responsibility for its occurrence, are regarded as a narrative of the incidents of a past transaction, and are accordingly rejected, unless made so near in point of time as to constitute a part of the *res gestae*. Expert testimony of a physician, based on a physical examination of the patient, after action instituted by him to recover damages for an alleged personal injury, though made partly for the purpose of enabling the physician to testify as a witness, is not, on that account alone, incompetent, though constituting a fact which may materially affect his credibility.

Importance and Validity of Vital Statistics Law

(*State vs. Norvell et al. (Tenn.)*, 191 S. W. R. 536)

The Supreme Court of Tennessee holds valid the vital statistics law of that state, Chapter 30 of the Acts of 1913. The court says there can be no question but that this statute will tend to promote the safety, health and well-being of the community. The state of Tennessee maintains a board of health at considerable expense, created for the purpose of fighting and endeavoring to control the diseases to which the inhabitants of the state are subject. Perhaps the most important duty of the state board of health is to take steps, in cooperation with local health officers, for the prevention of disease. This work cannot be intelligently or effectively prosecuted without the information which the statute in question is designed to afford. The various local registrars are required to file the certificates procured by the undertakers with the board of health. From these data the board of health can determine the needs of each particular community in the state, and may employ the necessary measures accordingly. These reports will show where tuberculosis prevails, where typhoid predominates, where there is malaria, and, generally speaking, will indicate the hygienic wants of each section of the state. The board of health will thus be able to take the precautions and administer the relief most needed by every community. Such a system is just as necessary to a successful campaign by the board of health as is information concerning the enemy's movements to the general in command of an army. There can be no specialized or well-directed effort by the board of health without such knowledge. Looking to another aspect of the material welfare of the state, no considerable immigration from one state to another now occurs until those coming in have made inquiries as to the health and death rate of the particular locality to which they intend to move. With the information forthcoming from the operation of the vital statistics law, the board of health will be in a position at all times to reply to such inquiries from those desiring to move into Tennessee. The provisions of the statute with reference to the registration of births, which were not drawn in question on this appeal, will obviously be most useful. A permanent record of the births and parentage of all persons born in the state will be of great service in the administration of estates and in fixing the devolution of property. Such matters are often

questions of doubt in important litigation. The statute makes certified copies of these records *prima facie* evidence. The records of births likewise will prove of much value in the enforcement of the laws against child labor. They will make fraud and deception on the part of parents and employers impossible. The court might mention other beneficent offices of the statute, but sufficient has been said to demonstrate that the act is a wholesome exercise of the police power of the state. Such being the view of the act, it is obvious that the constitutional objections urged against it were not well made, wherefore the court reverses a judgment quashing an indictment of the defendants, who were undertakers who were charged with handling and removing a dead body without a permit for its removal, the motion to quash having been sustained on the ground that the vital statistics law was unconstitutional. It is conceivable, of course, that the attending physician or local registrar or others may prove obstreperous or unmindful of the obligations imposed by the statute; but, in such an event, the undertaker may safely proceed with the disposition of the body. If he is diligent himself to comply with the law, the court will not punish him for the default of others. The duties placed on him by the statute will put him to some trouble. Organized society is entitled to demand such services of any citizen, however, for the health and safety of all, just as for the same reasons, the property of any citizen may be destroyed, without compensation.

Society Proceedings

COMING MEETINGS

Am. Assn. Obstetricians and Gynecologists, Newark, N. J., Sept. 17-19.
American Electro-Therapeutic Association, Atlantic City, Sept. 11-13.
American Roentgen Ray Society, Pittsburgh, Sept. 19-22.
Colorado State Medical Society, Colorado Springs, Sept. 25-27.
Indiana State Medical Association, Evansville, Sept. 26-28.
Michigan State Medical Society, Battle Creek, Sept. 4-6.
Minnesota State Medical Association, St. Paul, Oct. 10-20.
Mississippi Valley Medical Association, Toledo, O., Oct. 9-11.
Missouri Valley Medical Society, Lincoln, Neb., Sept. 20-21.
Pennsylvania State Medical Society, Pittsburgh, Sept. 24-27.
Utah State Medical Association, Salt Lake City, Sept. 12-13.
Vermont State Medical Society, Barre, Oct. 11-12.
West Virginia State Medical Association, Fairmont, Oct. 2-4.
Wisconsin State Medical Society, Milwaukee, Oct. 3-5.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago August, XIV, No. 2

- 1 Epidemiologic Data in Poliomyelitis Epidemic in New York State. M. Nicoll, Jr., Albany, N. Y.—p. 69.
- 2 Infant Welfare Work in War Time. G. L. Meigs, Washington, D. C.—p. 80.
- 3 *Uric Acid Content of Blood in New-Born. J. P. Sedgwick and F. B. Kingsbury, Minneapolis.—p. 98.
- 4 *Effect on Human Milk Production of Diets Containing Various Forms and Quantities of Protein. B. R. Hoobler, Detroit.—p. 105.
- 5 *Congenital Skin Defects. I. A. Abt, Chicago.—p. 113.

3. **Uric Acid Content of Blood in New-Born.**—A parallelism between the high uric acid content of the blood of the new-born and the high excretion of this substance during the first three or four days of life was found by Sedgwick and Kingsbury. They regard this as indirect evidence that human fetal tissues possess no uricolytic power, for it would be difficult to imagine so great a production of uric acid if the tissues themselves possessed the power to destroy it. Whether the decomposition of nuclein material, which must be looked on as the cause of this uric acid increase in the blood, is related to the striking changes in the blood cells, particularly in the changes in the partition of the white corpuscles taking place at this time, or to nuclein destruction in other parts of the body, as yet unknown, or to both, must be left to the future to decide. These results fit in well, however, as the con-

necting link in the theoretical chain of early leukocytosis—fall in leukocytes—flood of uric acid in the blood—high uric acid excretion—uric acid infarcts.

4. Effect of Diet on Human Milk Production.—This problem was studied by Hoobler, the subjects being healthy nursing mothers. He found that a nutritive ratio of 1:6 or narrower seems best adapted to the need of nursing mothers. (This ratio refers to the proportion of digestible protein to digestible fat and carbohydrate, the latter reduced to a carbohydrate basis.) Animal protein is more suitable than vegetable protein in supplying nitrogen for milk and maintenance of nitrogen balance. The protein derived from nuts when fed with other vegetable protein is suitable for supplying milk protein and for maintaining nitrogen equilibrium. A diet composed exclusively of cereals, fruits and vegetables does not supply sufficient protein for elaborating milk protein and causes a severe drain on tissues of mother. Of the various forms of animal protein, that which is derived from cow's milk seems particularly suitable for the production of human milk protein, as well as for the preservation of maternal tissues.

5. Congenital Skin Defects.—In Abt's case there was a defective skin area over each knee. These areas were about 1 by 1½ inches in size; almost identical in size and shape. The skin around the edges was drawn and puckered, presenting the appearance of ulcers with irregular edges. The base was beefy-red and moist. A few small foci on this red, ulcerated surface showed a yellow exudate. A whitish scar seemed to cross the ulcerated area, appearing like a connective tissue band, which indicated the beginning of cicatrization. From week to week the ulcers gradually covered over, so that after five or six weeks the denuded, red areas were replaced by shiny, white patches, somewhat lighter in color than the surrounding skin. The healing process was complete, and the baby appeared normal in every respect.

American Journal of Physiology, Baltimore

August, XLIV, No. 1

- 6 Bio-Assay of Veratrum Viride. J. D. Pilcher, Omaha, Neb.—p. 1.
- 7 *Production in Dogs of Pathologic Condition Which Closely Resembles Human Pellagra. R. H. Chittenden and F. P. Underhill, New Haven, Conn.—p. 13.
- 8 Contraction of Smooth Muscle Cells in Tissue Cultures. M. R. Lewis and W. H. Lewis.—p. 67.
- 9 *Effect of Emotions on Catalase Content of Liver. W. E. Burge and E. L. Burge.—p. 75.
- 10 Electrodes Used in Electrocardiography. H. E. B. Pardee.—p. 80.
- 11 Response of Respiratory Mechanism to Rapid Changes in Reaction of Blood. J. P. Peters, Jr., New York.—p. 84.

7. Production of Pellagra-Like Conditions in Dogs.—Chittenden and Underhill found that dogs fed on a diet consisting of boiled (dried) peas, cracker meal, cotton seed oil or lard, rapidly develop symptoms indicating abnormal nutrition. This condition eventually terminates in death. Previous to the development of the pathologic manifestations, the dogs are usually in nitrogen balance and exhibit excellent food utilization. The nitrogen partition of the urine is normal when compared to that of animals maintained on the same level of nitrogen intake. The pathologic symptoms at times can be made to disappear and the normal conditions of nutritive rhythm can be reestablished by addition of meat to the dietary. In the production of the symptoms, it is immaterial whether the transition from a diet containing meat to one of vegetable origin is sudden or gradual. The final outcome is the same in both cases. The intake of a large quantity of peas is less detrimental than smaller amounts. In the development of the pathologic condition, the level of nitrogen intake as such plays little or no rôle. The typical symptoms may be induced in dogs, but with much greater difficulty when a diet containing meat, cracker meal and lard is fed in appropriate quantities. For the production of the diseased condition, the meat intake must be reduced to a certain undefined minimum. Under these circumstances less than 50 per cent. of dogs exhibit pathologic symptoms and these may appear in periods of two to eight months. From the facts enumerated the conclusion seems tenable that the abnormal state may be referred to a deficiency of some essential dietary constituent or constituents, presumably belonging to the group of hitherto unrecognized but essential components of an adequate diet.

9. Effect of Emotions on Catalase Content of Liver.—Evidence is presented by the Burges to show that the fighting emotions, and probably exercise, increase greatly the catalase content of the liver, and that this catalase is given off to the blood and is carried to the tissues to be used presumably in producing increased oxidation.

American Journal of Public Health, Boston

July, VII, No. 7

- 12 Tuberculosis in France. H. Biggs, New York.—p. 606.
- 13 Observations and Experiments on Dishwashing. W. A. Manheimer and T. Ybanez, New York.—p. 614.
- 14 Enforcement of Registration of Births and Deaths in Metropolitan Areas—History, Methods, Results and Checks. W. H. Guilfoyle, New York.—p. 619.
- 15 Use of Vital Statistics in Epidemiologic Studies. A. W. Freeman.—p. 624.
- 16 Modern Hygiene of Typhus Fever. Its Application at Port of New York. J. R. Hicks.—p. 628.
- 17 Present Status of and Necessity for Mouth Hygiene. S. J. Rauh.—p. 631.
- 18 Monthly Schedule for Health Officers. H. B. Wood, Charleston, W. Va.—p. 637.
- 19 Stammering in Connection with Military Service. E. Tompkins, Los Angeles.—p. 638.

American Journal of Syphilis, St. Louis

July, I, No. 3

- 20 Treatment of General Paresis; Report of Fifty-Five Cases. H. S. Ogilvie, New York.—p. 509.
- 21 *Response in Treatment of Syphilis of Central Nervous System. H. F. Swift, New York.—p. 524.
- 22 *Complement Fixation in Syphilis. L. Thompson, Hot Springs, Ark.—p. 555.
- 23 Six Cases of Aortic Aneurysms and Dilatations. P. G. Woolley, Cincinnati.—p. 582.
- 24 Serologic Examination of Over Two Hundred Children from Open Air Schools of St. Louis. C. D. Johnson, St. Louis.—p. 606.
- 25 Value of Complete Examination of Ear in Syphilis. J. W. Downey, Jr., Baltimore.—p. 616.
- 26 Presenting Symptoms in Three Hundred Consecutive Cases of Syphilis. R. H. Lafferty and S. R. Thompson, Charlotte, N. C.—p. 624.
- 27 Provocative Wassermann Test in Clinical Diagnosis of Syphilis. J. H. Stokes and P. A. O'Leary, Rochester, Minn.—p. 629.
- 28 Cases of Hypertrophic Cirrhosis of Liver. P. G. Woolley, Cincinnati.—p. 649.
- 29 Luetin Reaction in Cardiovascular-Renal Diseases; Report of Thirty-Three Cases. D. Fulton and R. Cummings, Los Angeles.—p. 663.
- 30 Treatment of Syphilis with Galyol. L. Thompson, Hot Springs, Ark.—p. 665.

21. Treatment of Syphilis of Central Nervous System.—Swift calls attention to the fact that before undertaking the treatment of a patient with any form of cerebrospinal syphilis, it is important to determine what symptoms are due to inflammation or exudation and what are due to degeneration of tracts or cortex. It is also advisable to determine the intensity of the irritative condition as indicated by the cerebrospinal fluid. In general, the lesions due to inflammation or exudation are much improved or eliminated by the general treatment of the patient. Those due to degeneration are little, if any, affected. Treatment should be directed not only toward the elimination of symptoms, but toward the elimination of the underlying process, namely, syphilis. In most patients with early meningitis, and in those with what was formerly termed tertiary syphilis of the central nervous system, the symptoms due to exudation respond in a satisfactory manner to the general administration of salvarsan, mercury and potassium iodid. Occasionally, a case is met in which intraspinal treatment seems to be necessary in order to eradicate completely the central nervous lesions. Likewise in tabes dorsalis, many cases respond satisfactorily to the general administration of salvarsan and mercury. On the other hand, in a considerable number of tabetics, the addition of intraspinal injections of serum to intravenous treatment with salvarsan seems to hasten the elimination of abnormal elements in the cerebrospinal fluid and lead to a permanent arrest of the degeneration. It is advisable to continue the treatment of patients suffering from cerebrospinal syphilis or tabes dorsalis until the cerebrospinal fluid is normal and remains so. A possible exception may be made in reference to excess globulin, for an increased globulin is not infre-

quently found years after all other abnormal elements have disappeared from the fluid.

In paralytic dementia, while much benefit may be expected in increasing the number and length of remissions, the ultimate hope for recovery is slight. When a paretic type of gold curve is found in the fluid of patients in whom the clinical diagnosis of paresis is not justified, the most intensive form of treatment should be instituted from the beginning. It is probable that the finding of this paretic type of gold curve often helps us to make a diagnosis of paresis before clinical symptoms of the disease are present. This early diagnosis with consequent early treatment may be of extreme importance in preventing the development of the outspoken condition. Finally, treatment must be individualized, given in courses, and the condition of the fluid determined at the end of each course and at the beginning of the subsequent course. In this way, the indication for kind of treatment, as well as the manner of response, is much more certainly determined than if one depends on clinical symptoms and objective findings alone.

22. Complement Fixation in Syphilis.—The patient's serum is used in the fresh, noninactivated state in quantities sufficient to insure the presence of sufficient syphilitic antibodies to bind complement when such antibodies are present at all; the complement is derived from the patient's serum and is accurately titrated; the amboceptor is the serum of rabbits immunized against human red blood cells; the antigen is the acetone insoluble lipoids of Noguchi and Bronfenbrenner, while the corpuscles are thoroughly washed human erythrocytes from any convenient source, usually from one of the patients whose serum is being tested.

Arkansas Medical Society Journal, Little Rock

July, XIV, No. 2

- 31 Fibroid Uterus in Young; Report of Cases. E. L. Beck, Texarkana.—p. 34.
- 32 Hematoma of Skull. H. H. Rightor, Helena.—p. 35.
- 33 Paraffin Treatment for Burns. N. Mumey, Little Rock.—p. 36.
- 34 Fracture of Left Patella. J. M. Lemons, Pine Bluff.—p. 38.

Boston Medical and Surgical Journal

August 2, CLXXVII, No. 5

- 35 *When Is Diagnosis of Tuberculosis Without Positive Sputum Justified? D. R. Lyman, Wallingford, Conn.—p. 135.
- 36 *Diagnosis of Tuberculosis in Children. H. D. Chadwick and R. Morgan, Westfield, Mass.—p. 138.
- 37 What Should Constitute Reportable Tuberculosis. F. G. Curtis, Newton, Mass.—p. 141.
- 38 Definitions and Diagnostic Standards in Diagnosis of Pulmonary Tuberculosis in Adults. J. B. Hawes, Boston.—p. 145.
- 39 Clinical Data of Gallbladder Disease. R. W. French, Fall River, Mass.—p. 151.
- 40 Occupational Diseases in Massachusetts. T. F. Harrington, Boston.—p. 153.

35. Diagnosis of Tuberculosis Without Positive Sputum.—The records of 1,638 cases of tuberculosis discharged from Gaylord Farm in the past twelve years show 1,076 in which the sputum was positive and 562 with no bacilli. The 562 negative cases were divided as follows: incipient, 244; moderately advanced, 297; far advanced, 21; more than half showing well-developed lung signs. In fifty-one cases there was tuberculosis elsewhere; eighteen had pleurisy with effusion, 126 had hemorrhage—and these included only frank hemorrhage, and not blood-streaked sputum—ninety-seven gave positive tuberculin reactions to doses ranging from 1 to 7 mg. of old tuberculin given subcutaneously, and seventy-six died from tuberculosis after discharge. The study of the records of those having positive findings, Lyman points out, emphasizes again the futility of depending on sputum for diagnosis. In 213 of these 1,076 cases with positive sputum, the sputum was negative occasionally; in 56 it was negative as often as positive; in 42 negative twice for each positive finding; in 63 negative three times for each positive finding; in 70 negative five times; and in 39 negative ten times for each positive finding. Thus of 1,076 positive cases, in 483 the sputum at times would have failed to support the clinical diagnosis, and of 1,638 cases, in only 593 was the sputum positive at all examinations. Lyman says that in making a diagnosis of pulmonary tuberculosis in the face of negative

sputum findings the data necessary are: first, the history of the case; second, the symptoms presented; and, third, the physical signs.

36. Diagnosis of Tuberculosis in Children.—Summarizing the essentials for a minimum standard necessary in the diagnosis of tuberculosis in children, Chadwick and Morgan emphasize the importance of symptoms indicating tuberculin absorption, namely: weakness, undue fatigue, fever, poor appetite, failure to gain, or loss of weight, and nervous irritability. The local symptoms are cough, hoarseness and occasionally streaked sputum. The usual physical signs are dullness in the interscapular region radiating into the apices at the back, frequently not elicited in front. There may or may not be changes in the respiratory sounds. Râles may or may not be present. Symptoms both constitutional and local, together with a history of exposure, are to be given greater weight in making a diagnosis of active tuberculosis than the presence or absence of physical signs. Percussion is more important than auscultation. A thickened area in the lung or region of the bronchial glands does not in itself mean active tuberculosis. It may be a healed lesion that needs no treatment. Such thickening may also be caused by other diseases than tuberculosis. The child showing constitutional symptoms, even without local signs of disease in the chest, should be considered suspicious, kept under careful observation and hygienic treatment instituted in the home. The case with signs in the chest, without constitutional symptoms, indicates an old inactive infection that needs no treatment. Individualization and common sense must be used to weigh all the factors in the case, and, with experience as a guide, few errors in diagnosis will be made.

Canadian Medical Association Journal, Toronto

July, VII, No. 7

- 41 Canadian Medical Association. A. D. Blackader, Montreal.—p. 577.
- 42 Slight Variations from Normal Structure and Function, and Their Clinical Significance. T. C. Janeway, Baltimore.—p. 589.
- 43 Corpus Callosum: Morphologic and Clinical Study. J. Cameron, Halifax.—p. 609.
- 44 Pyelitis. J. R. Fraser, Montreal.—p. 617.
- 45 Classification of Cases of So-Called Shell Shock. H. P. Wright.—p. 629.
- 46 Fragilitas Ossium; Report of Case. A. Goldbloom, Montreal.—p. 636.
- 47 Traumatic Extraperitoneal Rupture of Bladder with Fracture of Pelvis. M. O. Klotz, Ottawa.—p. 641.

Journal of Experimental Medicine, Baltimore

August, XXVI, No. 2

- 48 *Studies in Glomerulonephritis. Quantitative Study of Reaction of Kidney to Diphtheria Toxin. H. K. Faber, San Francisco.—p. 139.
- 49 Id. Form of Acute Glomerulonephritis Produced with Diphtheria Toxin and Bacillus Coli. H. K. Faber, San Francisco.—p. 153.
- 50 *Experimental Studies on Lymphocytes. Action of Immune Serums on Lymphocytes and Small Thymus Cells. A. M. Pappanheimer, New York.—p. 163.
- 51 *Mechanism of Urea Retention in Nephritis. F. C. McLean, New York.—p. 181.
- 52. Experiments on Causation and Amelioration of Epinephrin Pulmonary Edema. J. Auer and F. L. Gates, New York.—p. 201.
- 53 *Effects of Experimental Plethora on Blood Production. O. H. Robertson, New York.—p. 221.
- 54 *Experimental Study of Organization in Lobar Pneumonia. B. S. Kline, New York.—p. 239.
- 55 Growth of Ovarian Follicle of Guinea-Pig Under Normal and Pathologic Conditions. L. S. N. Walsh, St. Louis.—p. 245.
- 56 *Relation of Apical Tuberculosis of Adults to Focal Tuberculosis of Children. E. L. Opie, St. Louis.—p. 263.
- 57 Cicatrization of Wounds. Influence on Healing of Wounds of Variations in Osmotic Tension of Dressing. A. Carrel, P. L. du Noüy and A. Carrel, France.—p. 279.

48. Studies in Glomerulonephritis.—Faber found that diphtheria toxin of known strength, injected intravenously into rabbits in single doses, produces lesions which are first evident in the endothelium of the tufts, and possibly in the intertubular capillaries. Evidence is presented to show that epithelial damage in the tufts and especially in the tubules is secondary to the vascular injury. The severity of the lesions was roughly proportional to the amount of toxin injected. It is suggested that the localization of lesions in the tufts is due to the concentration of toxin in the blood that follows the loss

of water at this point. It is further suggested that this inference may be extended to explain the pathogenesis of the so-called intracapillary form of glomerulonephritis.

50. Action of Immune Serums on Lymphocytes and Thymus Cells.—Pappenheimer's experiments indicate that the lymphotoxic and agglutinative factors are to a considerable degree distinct from the hemolytic and hemagglutinative ones, since they can be separated from one another by absorption. Evidence is presented that the small thymus cells are biologically related to, if not identical with, the lymphocytes derived from lymph glands.

51. Urea Retention in Nephritis.—Urea retention, in the sense of a relatively increased concentration in the blood, McLean believes is the result of increased resistance to the excretion of urea through the kidneys. The relatively increased concentration of urea in the blood overcomes the increased resistance to excretion, and the organism is thereby maintained in nitrogenous equilibrium. The laws formulated by Ambard for the excretion of urea apply in the condition of urea retention under a widely varying range of conditions as to nitrogen intake and excretion. The numerical value of Ambard's constant changes in urea retention, but the relation of the variable factors to one another remains otherwise unchanged. In certain individuals, with otherwise normal findings in regard to urea excretion, an unusual degree of constancy, to which McLean applies the term fixation, has been found in the numerical results obtained by the application of Ambard's laws. These individuals are regarded, as the result of this study, as probably abnormal, but the pathologic significance of the fixation has not been determined.

53. Experimental Plethora and Blood Production.—The finding by Robertson that the activity of the bone marrow can be depressed by the introduction of a large quantity of blood into the circulation accounts for the diminished bone marrow activity which sometimes occurs after transfusion in pernicious anemia. In such cases there is a marked drop in the number of reticulated cells and other evidence of bone marrow depression; the patient shows no benefit from transfusion or may grow rapidly worse. The cause of this depression is best explained on the basis that in severe instances of the disease where exhaustion of the bone marrow is imminent, the stimulus of the anemia is only just sufficient to keep the marrow functioning. A sudden lowering of this stimulus is brought about by the introduction of a large quantity of blood into the circulation and the result is a fall in the activity of the bone marrow. It follows from this that in pernicious anemia with a feebly reacting bone marrow as indicated by the number of reticulated red cells, small transfusions are preferable to large ones.

54. Organization in Lobar Pneumonia.—Experiments reported by Kline give evidence that in unresolved lobar pneumonia, the persistence of the exudate, followed by organization, depends on the presence of serum in the exudate.

56. Tuberculosis of Adults and of Children.—The following observations by Opie indicate that apical tuberculosis of adults is not the result of infantile tuberculosis but is caused by subsequent infection: (a) Apical tuberculosis does not have its highest incidence, in accordance with common belief, in early adult life when focal infections acquired in childhood are relatively fresh and active, but is more common in later life when the focal lesions of childhood have in most instances completely healed. It is noteworthy that most of these apical lesions of later life pursue a chronic course and are discovered at necropsy in individuals who have died from other causes; (b) the well characterized lesions of tuberculosis acquired in childhood and found in adults with apical lesions are almost invariably calcified and healed. The apical lesion is in most instances relatively fresh and caseous whereas the focal pulmonary lesion and associated lesions of regional lymphatic nodes exhibit no evidence of activity; (c) in a large proportion of instances of associated focal and apical tuberculosis the focal lesion is in one lung, whereas the apical lesion is limited to the opposite apex. This relation affords no support to the view that tuberculous lesions may be transmitted to the apex by way of the lymphatics.

Journal of Infectious Diseases, Chicago

August, XXI, No. 2

- 58 *Epidemiology of Pellagra in Nashville, Tennessee. J. W. Jobling, W. F. Petersen, B. G. Tucker and F. C. Costen, Nashville, Tenn.—p. 109.
- 59 *Development of Antibodies for *Bacillus Typhi-Exanthematici* in Typhus Fever Contacts. G. Baehr, New York.—p. 132.
- 60 Fecal Examinations of Regiment Infected with *Bacillus Paratyphosus A*, with Special Reference to Normal Carriers. C. Krumwiede, Jr., New York.—p. 141.
- 61 Isolation of Typhoid Bacilli from Urine. Kan-Ichiro Morishima and O. Teague, New York.—p. 145.
- 62 *Results of Blood Cultures in Rheumatoid Arthritis. V. H. Moon and S. R. Edwards, Indianapolis.—p. 154.
- 63 Correlations in Colon Aerogenes Group. L. V. Burton and L. F. Rettger, New Haven, Conn.—p. 162.
- 64 *Tuberculosis of Lymph Nodes. Frequency, Origin and Relation to Other Tuberculous Lesions, Especially Pulmonary Tuberculosis. F. Harbitz, Christiania, Norway.—p. 196.
- 65 Comparisons of Rate of Gas Production by Certain Bacteria in Raw and in Pasteurized Milk. P. W. Allen, Urbana.—p. 219.

58. Epidemiology of Pellagra.—As a result of the surveys carried on by Jobling and Petersen during the past two years in the city of Nashville, some fairly well established facts are presented. Considering the relation of the diet to pellagra, two factors stand out which are contradictory. On the one hand, a definite number of cases develop in individuals partaking of a diet as varied and as wholesome as could be demanded by any advocate of the dietary theory, and cases of pellagra have developed in breast-fed infants of non-pellagrous mothers. On the other hand, at least half of the cases develop in persons living on a ration low in protein, high in carbohydrates, and monotonous in character. Admittedly, too, the pellagrous condition is favorably influenced by a change in diet.

59. Antibodies in Typhus Fever Contacts.—Twenty persons who did not have typhus fever clinically were examined as to blood antibodies. Specific antibodies in high titer were found. Every one of these twenty individuals had recently been in intimate contact with typhus fever. They were either physicians, nurses and hospital attendants who were handling typhus fever patients, or they were friends or members of families in which typhus fever had recently occurred. Of these twenty typhus contacts, three, after their exposure to infection, had had vague, general symptoms indistinguishable from an influenza. All the others had been well. Baehr holds that the observation that individuals after exposure to typhus fever may fail to develop the disease, and yet may react with the production of specific antibodies against *Bacillus typhi-exanthematici* is incontrovertible evidence as to the etiologic significance of the *Bacillus typhi-exanthematici*.

62. Blood Cultures in Rheumatoid Arthritis.—Forty cases of acute arthritis and 83 cases of chronic arthritis were examined bacteriologically by Moon and Edwards. Non-hemolytic streptococci were found in 13 of the acute cases; hemolytic streptococci in one case; *Bacillus mucosus-capsulatus* in 2 and a diphtheroid bacillus in 2; staphylococcus aureus in one case; 21 were negative. In the chronic cases nonhemolytic streptococci were found in 18 cases; *Bacillus mucosus-capsulatus* in 3; diphtheroid bacilli in 3; unidentified organisms in 1 case; 58 were negative. The probable source of infection was not always determined, but, tonsils and teeth stand out prominently. The results of autogenous vaccine treatment when consistently carried out were for the most part gratifying, especially in the chronic cases, though there were cases in which little or no improvement was evident. In making a statement regarding results of vaccine treatment the authors have not lost sight of the tendency of infection to spontaneous improvement or recovery, nor of the fact that in most of these cases improved hygienic conditions, rest and tonics were also factors. Little permanent improvement is to be secured in chronic progressive arthritis by improved hygienic conditions, rest and tonics alone, yet a number of cases showed a marked permanent improvement when these measures were combined with autogenous vaccines.

64. Tuberculosis of Lymph Nodes.—Harbitz's observations are based on 2,906 necropsies, of which 2,489 were of adults, that is, persons over 15, and 417 children, that is, persons

under 15. Of these cases, 431, 14.8 per cent., died of tuberculosis; including advanced tuberculosis in persons dead from other causes, the deaths numbered 501, that is, 17 per cent. Of the adults, 351, 14 per cent., died of tuberculosis; of the children, 80, or 19 per cent. In 203 cases considerable tuberculosis of the lymph nodes was found, that is, in 7 per cent., 127 cases, 5 per cent., being in adults, and 76, 18.2 per cent., in children. Tuberculosis of the bronchial lymph nodes: 57 cases. All were fatal except 2. In most of the cases death resulted from a secondary miliary tuberculosis or tuberculous meningitis. Primary extensive tuberculosis in the cervical lymph nodes: 10 cases, all in adults. Eight died of tuberculosis. Old primary extensive tuberculosis in abdominal lymph nodes: 9 cases, 3 dying of tuberculosis. Extensive old chronic lymph node tuberculosis in the neck and chest: 40 cases, of which 3 are doubtful. Of the 23 who died from tuberculosis, 9 died of a secondary lung tuberculosis, 7 of miliary tuberculosis and tuberculous meningitis, 2 of tuberculosis of the serous membranes, 1 child of spondylitis, 1 adult of intestinal tuberculosis, 2 adults of urogenital tuberculosis, and 1 of secondary amyloid degeneration. Primary contemporaneous old tuberculosis in cervical and abdominal lymph nodes: 1 was fatal. Extensive inveterate tuberculosis of the thoracic and abdominal lymph nodes: 22 cases, 19 fatal. The cause of death was miliary tuberculosis (2); primary (?) intestinal tuberculosis (4); urogenital tuberculosis (3); tuberculosis in the suprarenals with Addison's disease (3); tuberculosis of serous membranes (1); secondary (?) pulmonary tuberculosis (3); tuberculosis in the bone, pericarditic pseudocirrhosis in a boy of 13; and a peculiar symptom complex with fever and anemia. General lymph node tuberculosis: 61 cases. In all these cases with one exception tuberculosis was the cause of death.

The lymph nodes in the neck, in the thorax, and in the abdomen were markedly and extensively affected. Occasionally, there was also a similar process in the axillary and inguinal nodes. Frequently there was a descending process in the neck, most marked above, and reaching down into the supraclavicular spaces; next in the thorax along the trachea, least marked above, down to the bifurcation and pulmonary hilus where the masses usually were largest, and then along the bronchi. Apparently, there was a continuous series of infected lymph nodes, but the extent decreases downward in the neck and upward along the trachea. In the abdomen there was generally a more isolated tuberculosis, either in the mesenteric nodes only or in the retroperitoneal nodes, sometimes in high degree and in the upper part of the abdomen, along the aorta, the celiac axis, or in the hilus of the liver and spleen. Consequently, in general, it does not appear that the coarser anatomic conditions point to a continued and continuous spread along the lymph vessels from one point and from one place to another.

Journal of Nervous and Mental Diseases, Lancaster, Pa.

July, XLVI, No. 1

- 66 Disease and Symptoms. Plea for Wider Generalization. E. W. Taylor.—p. 1.
- 67 *Effect on Papilledema of Removal of Small Quantities of Cerebrospinal Fluid by Lumbar Puncture. W. G. Spiller and G. E. de Schweinitz.—p. 10.
- 68 *Virilism-Forme Fruste. H. K. Marks, New York City.—p. 17.
- 69 Mechanism Producing Hysterical Abdominal Distention. W. I. Lillie, Ann Arbor, Mich.—p. 35.
- 70 *Carcinoma of Spine—Case of Cauda Equina Disease Following Thyroid Metastasis. A. Skversky, New York City.—p. 40.

67. **Removal of Cerebrospinal Fluid.**—In three cases observed by Spiller and de Schweinitz removal of a few cubic centimeters of cerebrospinal fluid had a remarkable effect on swelling of the optic nerves. In the first patient, a decrease of 1 diopter was noticed after each lumbar puncture. Two of these cases from a preliminary examination strongly suggested brain tumor, but after a more careful study the diagnosis of encephalitis was made in one case and of pseudotumor from intoxication or infection in the other.

68. **Virilism.**—On the basis of twenty-two observations, the proposition is made by Marks that a type of virilism exists which corresponds essentially to the clinical picture of the *virilisme surrenal* of Gallais; but which is attenuated and

compatible with life; in a word, a virilism, *forme fruste*. Although postmortem support is lacking, the clinical analogies are striking and constant. That the interrenal tissue plays a rôle, probably the most important rôle in the development of the syndrome is more than likely; but the remaining endocrine glands cannot be left out of account; notably the pituitary, pineal and ovaries. The primary disturbance would seem to lie in the resultant of a balance of power between the cortical tissue and the ovaries. On the hypothesis proposed by Marks, the ovaries would have the function of guarding and conserving the female characters, while at the same time inhibiting the development of male characters. If for any reason, pathologic or physiologic, temporary or permanent, this balance of power falls to the interrenal tissue, then male characteristics tend to appear. Granted the existence of virilism, *forme fruste*, it is apparent that an interesting field of inquiry is opened up from a sociologic and eugenic point of view; likewise questions that touch on the "infantile trauma" of Freud in the origin of homosexual traits.

70. **Carcinoma of Spine.**—Skversky's patient, male, aged 52, complained of pain in both hips, radiating down the legs, so that he was unable to walk for any distance. The illness dated back two years with cutting pains in the left lower limb, commencing above the pelvis, and radiating down the inner side of the ankle. About six months later, he began to experience similar pains in the right lower limb. The pain, which was very severe, was not constant nor definitely localizable, but mostly in his legs and ankles, never in his feet. While in bed he found comfort only when lying on either side, and turning over was accompanied by sharp pains in the back of the pelvis. There was no pain on urination or defecation. He was able to walk slowly and guardedly, with the aid of a cane, but while on his feet appeared to be suffering from pain. Examination of the neck did not reveal any thyroid enlargement; no abnormal masses were felt, nor was any apparent enlargement of the regional lymphatics present. Examination of the spine did not reveal any deformities, rigidity, tender areas or alteration in consistency; in fact, no pathology was found. In the absence of objective organic features, the case was, for the time being, considered to be probably of a functional nature. The roentgenologist reported slight evidence of a defect in the outlines of the left border of the body of the fourth lumbar vertebra, but added that this was probably an artefact and of no significance. Three months later he reported bone defect involving the left half of the body of the fourth lumbar vertebra, also small contiguous portions of the third and fifth vertebrae. The patient began to show evidence of rapid loss of weight, and a peculiar yellowish-brown cachexia. Death occurred inside of two weeks. The necropsy disclosed an adenocarcinoma of the thyroid with metastases in the lower portion of the third and upper portion of the fifth vertebrae, including the intervertebral disks, encroaching on the spinal canal, although not penetrating the meninges. It proved to be thyroid adenoma, replacing atrophic bone, with no evidence of new bone formation. The primary seat of the neoplasm was not recognized for obvious reasons, but the prostate at one time felt suspiciously enlarged, and although toward the end it did not suggest malignancy, it was considered as the probable primary site of the disease. At no time during the clinical course was there anything to suggest thyroid disease.

Nebraska State Medical Journal, Norfolk

July, II, No. 7

- 71 Arteriosclerosis and Hypertensions from Standpoint of General Practitioner. J. C. Waddell, Pawnee City.—p. 347.
- 72 Icterus. A. Sachs, Omaha.—p. 351.
- 73 Chronic Intestinal Stasis, Clinically and Surgically. A. E. Watson, Grand Island.—p. 355.

New Orleans Medical and Surgical Journal

August, LXX, No. 2

- 74 Appendicitis Complicating Pregnancy. A. P. Heineck, Chicago.—p. 113.
- 75 Practical Methods of Preventing Diseases in Communities with Results Accomplished in Shreveport. G. C. Chandler, Shreveport.—p. 127.
- 76 Treatment of Pneumonia in Early Life. L. R. DeBuys, New Orleans.—p. 137.

- 77 Removal of Appendix in Abscess Cases. H. B. Gessner, New Orleans.—p. 148.
78 Hodgkin's Disease; Report of Apparently Cured Case. D. O. Willis, Leesville.—p. 156.
79 Laboratory Contributory Aid in Care of Pneumonia. J. C. Cole, New Orleans.—p. 165.
80 Importance of Early Diagnosis in Mental Disorders. R. M. Van Wart, New Orleans.—p. 170.
81 Extreme Prognathism Relieved by Bilateral Resection of Mandible. H. B. Gessner, New Orleans.—p. 176.

Ohio State Medical Journal, Columbus*August 1, XIII, No. 8*

- 82 Treatment of Third Stage of Labor. J. J. Thomas, Cleveland.—p. 541.
83 Ravages of Alcohol on Central Nervous System. H. H. Drysdale, Cleveland.—p. 544.
84 Case of Small Round Cell Sarcoma of Dura of Spinal Cord. C. E. Kiely, Cincinnati.—p. 549.
85 Printers' Ink—Publicity and Public Health. J. R. McDowell, Columbus.—p. 552.

Public Health Journal, Toronto*July, VIII, No. 7*

- 86 Variola. J. B. Boyle, Casselman.—p. 163.
87 State Wide Education in Social Hygiene. W. T. Foster.—p. 167.
88 Rochester Bureau of Health Consultation. G. W. Goler, Rochester, N. Y.—p. 172.
89 Illegitimate Child. J. J. Kelso.—p. 174.
90 Illegitimacy, Preventive Aspects. M. Patterson, Toronto.—p. 176.
91 Scarlet Fever. J. C. Hutchinson, Grafton.—p. 177.
92 Scavenging; Is Standardization Worth While? D. Little, Winnipeg.—p. 181.

Rhode Island Medical Journal, Providence*August, I, No. 8*

- 93 Recognition and Treatment of Some Conditions of Foot. E. W. Burt, Providence.—p. 167.
94 Study of Internal Secretions; Report of Five Cases. A. H. Ruggles, Providence.—p. 170.
95 Perforation of Duodenum Due to Retroperitoneal Fibrosarcoma. C. S. Christie and H. S. Bernstein, Providence.—p. 175.
96 Case of Malignant Pustule. L. deMello, Providence.—p. 176.

South Carolina Medical Association Journal, Greenville*July, XIII, No. 7*

- 97 Medical Examination of Schoolchildren of City of Florence, S. C. M. R. Mobley, Florence.—p. 599.

Southwest Journal of Medicine and Surgery, El Reno, Okla.*July, XXV, No. 7*

- 98 Focal Infections. A. B. Leeds, Chickasha.—p. 157.
99 Surgical Acidosis. W. E. Dicken, Oklahoma City.—p. 163.
100 Electrotherapy. J. Y. Simpson, Kansas City, Mo.—p. 173.
101 Heat in Cancer of Uterus. F. A. Hoge, Fort Smith, Ark.—p. 176.
102 Focal Infections. W. H. Livermore, Chickasha.—p. 179.

Surgery, Gynecology and Obstetrics, Chicago*August, XXV, No. 2*

- 103 Gas Bacillus Infection in France. J. R. Judd, Honolulu, Hawaii.—p. 113.
104 *Operative Treatment of Inaccessible Vesicovaginal Fistulas. G. G. Ward, Jr., New York.—p. 126.
105 *Surgical Methods of Dealing with Pelvic Infections. T. S. Cullen, Baltimore.—p. 134.
106 Treatment of Cystocele and Uterine Prolapse. T. J. Watkins, Chicago.—p. 147.
107 *Hemolytic Jaundice; Review of Seventeen Cases. H. Z. Giffin, Rochester, Minn.—p. 152.
108 Perforations of Gastric and Duodenal Ulcers. B. B. Davis, Omaha.—p. 162.
109 Peritoneal Adhesions. J. F. Corbett, Minneapolis.—p. 166.
110 *Webs and Pouches of Esophagus; Their Diagnosis and Treatment. H. P. Mosher, Boston.—p. 175.
111 *Surgical Treatment of Banti's Disease; Report of Three Cases. C. D. Lockwood, Pasadena, Calif.—p. 188.
112 Gangrenous Cholecystitis; Report of Case Due to Gas Bacillus. G. G. Cottam, Sioux Falls, S. D.—p. 192.
113 Abuse of Cesarean Section. J. W. Williams, Baltimore.—p. 194.
114 Study of Fetal Maturity in Utero. C. B. Reed, Chicago.—p. 201.
115 Use of Desiccated Placenta. E. Cary, Chicago.—p. 206.
116 Harelip. W. A. Bryan, Nashville, Tenn.—p. 209.
117 Suspension in Bronchoscopy and Esophagoscopy. R. C. Lynch, New Orleans.—p. 213.
118 Radical Treatment of Intestinal Obstruction and Gangrene of Intestine; Report of Two Cases. H. Shoemaker, Los Angeles.—p. 217.

104. Treatment of Inaccessible Vesicovaginal Fistulas.—The following points in the closure of inaccessible vesicovaginal fistulas by the vaginal route are emphasized by Ward.

Schuchardt's incision is the most effective means by obtaining free access to the vaginal vault for operative procedures in difficult cases. Frequent mobilization of the bladder is an essential requisite to the successful closure of inaccessible vesicovaginal fistulas. Displacement of the bladder injury downward, within reach by means of a sound in the bladder used as a lever and counterpoint is a decided aid. The sutures in the bladder and vaginal walls should be placed in such a manner that the lines of incision are not superimposed.

105. Surgical Treatment of Pelvic Infections.—Emphasis is laid by Cullen on the following: When an appendix abscess is opened the appendix can practically always be removed at the same time, provided the abscess is well walled-off with gauze before an attempt is made to open it. In removing a large pus tube that is firmly adherent to the pelvic floor, it is better to begin by excising a wedge of the uterine cornu, and gradually freeing the mesosalpinx. The tube can then be lifted up as a straight rod and carefully walled-off on all sides before it is shelled off from the pelvic floor. Soiling is reduced to a minimum. Pelvic drains that emerge from the vagina should, if possible, be so placed that they do not come in contact with the small bowel. Vaginal drains laid in the pelvis during an abdominal operation should not be removed, as a rule, before the fourth or fifth day on account of the danger of pulling down an adherent loop of small bowel. No case of pelvic abscess should be irrigated. There is danger of rupture of the abscess wall and of the escape of infectious fluid into the abdomen which will set up a general peritonitis. Postpuerperal pelvic infections are found, as a rule, in one or both broad ligaments. Those in the broad ligament can be most satisfactorily opened extraperitoneally through a gridiron incision just above Poupart's ligament. Such accumulations should rarely, if ever, be opened through the vaginal vault.

107. Hemolytic Jaundice.—Seventeen cases of hemolytic jaundice, of which four are probably of the acquired type, are reviewed by Griffin. In twelve splenectomy was performed. An increased fragility of the erythrocytes in the peripheral circulation was a constant finding in all the fifteen patients tested. This increased fragility was found to persist at varying periods after splenectomy in seven of eight patients tested. The values for urobilin and urobilinogen in the duodenal contents were high in six patients in whom they were estimated. There was an appreciable fall in these values following splenectomy. In seven (58 per cent.) of twelve splenectomized patients gallstones were present. The removal of gallstones has not cured hemolytic jaundice. On the other hand, patients with hemolytic jaundice who were splenectomized have been cured of their jaundice and anemia though retaining the gallstones. Of the twelve patients on whom splenectomy was performed, ten are living; nine are in excellent health without jaundice or anemia. There was one operative death. One patient died four months after operation; another patient with a severe form of the acquired type of the disease was in excellent health for eighteen months, had a relapse after two years, and is again in fairly good health after two and one-half years following two transfusions. Four patients have been in excellent health for fourteen months, fifteen months, twenty-three months, and five and one-half years respectively.

110. Webs and Pouches of Esophagus.—Mosher records an original method of treating esophageal pouches by cutting the common wall between the pouch and the esophagus. It has worked well in three cases.

111. Surgical Treatment of Banti's Disease.—Lockwood says that experience thus far in splenectomy for Banti's disease would seem to justify the conclusion that overfunctioning of the spleen, whether of toxic or bacterial origin, is the cause of the anemia and liver changes so characteristic of the disease.

Vermont Medicine, Rutland*July, II, No. 7*

- 119 Infantile Paralysis. C. S. Caverly, Rutland.—p. 169.
120 Diagnosis and Medical Care of Mastoiditis. G. G. Marshall, Rutland.—p. 171.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Medical Journal of Australia, Sydney

June 16, I, No. 24

- 1 Plea for Metric System. F. G. Griffiths.—p. 501.
- 2 War Surgery at Front. C. MacLaurin.—p. 503.
- 3 Control of Hemorrhage in Operation for Repair of Old Lacerations of Cervix Uteri. J. F. Mackenzie.—p. 505.
- 4 Generalized Scleroderma with Sclerodactylia. S. Jamieson.—p. 505.

June 23, No. 25

- 5 Experiences in Mesopotamia. R. M. Allan.—p. 523.
- 6 Fractures at Ankle Joint. H. R. Sear.—p. 526.
- 7 Cancer of Cervix Uteri Following Subtotal Hysterectomy. R. Worrall.—p. 530.

June 30, No. 26

- 8 Dr. Eric Pritchard's Theory and Treatment of Rickets. W. F. Litchfield.—p. 547.
- 9 *Case of Anemia of Pernicious Type in Infant. B. Bradley.—p. 549.
- 10 *Left-Sided Cecum and Ascending Colon with Absence of Transverse Colon. C. E. Corlette.—p. 551.

9. **Anemia of Pernicious Type in Infant.**—Bradley's patient was 11½ months of age. When the child was admitted it was a pale lemon color. There was puffiness of the face and swelling around the ankles. The abdomen was soft. The spleen was palpable an inch below the costal margin anteriorly, and the lower-edge of the liver was felt ½ to 1 inch below the costal margin, both in the midline and to the right side. A blood count showed: red cells, 1,600,000; hemoglobin, 30 per cent.; leukocytes, 14,000. There was marked poikilocytosis, anisocytosis and polychromatophilia. Many microcytes and macrocytes were present. There were considerable numbers of nucleated cells, some of which were megaloblasts. Differential count: polymorphonuclear cells, 37 per cent.; mononuclear cells, 51 per cent.; eosinophil cells, 3 per cent.; large mononuclear cells, 4 per cent.; transitional cells, 5 per cent. The child was given liquor arsenicalis. Six months later the blood count showed: red cells (dupl.), 4,200,000; hemoglobin, 80 per cent. and leukocytes, 7,000. The red cells appeared normal. No nucleated cells were noted. (Giemsa) polymorphonuclear cells, 45 per cent. and mononuclear cells, 55 per cent. The child is still under observation.

10. **Left-Sided Cecum and Ascending Colon with Absence of Transverse Colon.**—A man, 30 years of age, had for years complained of various gastric symptoms and of constipation. The chief gastric symptom was flatulency after meals, but at times he had pain and excessive discomfort, relieved by washing out the stomach. The Roentgen ray disclosed a peculiar abnormality of the intestine. The cecum and ascending colon were to the left of the midline and ascended almost vertically to the splenic flexure, there being an absence of a good deal of colon.

Bulletin de l'Académie de Médecine, Paris

June 26, LXXVII, No. 26, pp. 797-826

- 11 Regulation of Sale of Proprietarys. Committee report. Discussion.—p. 798. To be continued.
- 12 *"Trench Albuminuria." (Néphrites de guerre.) J. Teissier.—p. 806.
- 13 *Proportion between Male and Female Infants Born. (De la masculinité.) F. Maurel.—p. 811.
- 14 Reeducation for War Deafness. A. Castex.—p. 817.
- 15 Operative Treatment of Shell Wounds of the Lung. P. Duval.—p. 819.
- 16 Free School Clinics Needed to Supplement the Work of the Medical Inspector. F. Bussière.—p. 821.
- 17 Food Value of Barley. (L'orge dans le pain de guerre.) E. Weill and G. Mouriquand.—p. 824.

July 3, LXXVIII, No. 27, pp. 1-12

- 18 The Causes of Depopulation. F. Jayle.—p. 3.
- 19 *Mumps Meningitis. E. de Massary, Tockmann and Luce.—p. 6.
- 20 *Production of Urea in Tissues in Course of Necrosis, and Consecutive Azoturia. P. Ameuille.—p. 8.
- 21 Simplification of Technic for Transfusion of Blood. (La transfusion sanguine clinique: Technique hém saline biveineuse mensuratrice sans anastomose.) G. Rosenthal.—p. 10.

12. **Trench Albuminuria.**—Teissier says that there is nothing specific about the kidney troubles of the men in the trenches except the high nitrogen content of the blood, from 0.7 to 1.35 gm., while the content in the urine is below normal,

although the permeability of the kidneys seems unimpaired. The rarity of serious uremia is thus explained. The whole trouble seems to be from accumulation of waste products. This may entail a reflex spasmodic contraction of the bundle of His. This assumption seems to be the only plausible explanation of the peculiar characteristics of the first heart sound in these cases. None has ever proved fatal to date, and consequently anatomic proof is lacking.

13. **Excess of Boy Babies.**—Maurel compares the statistics for the birth rate of male and female infants in various European countries since 1865. The excess of boys is fairly constant at the same figure in most of the countries, but in France it has shown a gradual decline from 106-4 to 104-2 since 1806. The age of the parents seems to have an influence, the father predominantly; the younger the father the larger the proportion of boys, according to some figures published in Norway. Maurel's own research in a large town in the south of France, and elsewhere, showed that among the well-to-do the proportion was only 126 boys to 149 girls. The masculinity was thus only 84.5 per cent.; in other groups only 76. In a group of 100 gouty families there were 52 without children, and in the other 48 per cent. the masculinity was only 75. He does not cite figures in regard to syphilis, but it is his general impression that the surviving girls outnumber the boy babies.

19. **Mumps Meningitis.**—Massary, Tockmann and Luce found lymphocytic meningitis almost constant in their 635 soldiers with mumps since early in 1915. The sugar and albumin content of the cerebrospinal fluid was usually above normal. The constancy, intensity and long duration of the lymphocytic meningitis were in marked contrast to the clinical findings. Slowing of the pulse was the only constant and persisting symptom. No cerebral symptoms were noticed except in 23 per cent. of the cases, and they were transient, and there were no appreciable nervous sequels in any instance.

20. **Production of Urea in Tissues Undergoing Necrosis.**—Ameuille calls attention to the large output of urea when there is extensive suppuration and the patients are eating scarcely anything. In one such case the man took nothing but two glasses of milk per day, but he voided 32 gm. of urea per liter, a total of 40 gm. daily. Necrosis in large suppurating wounds on both legs evidently may induce the production of urea beyond the capacity of the kidneys to eliminate. In the above case the urea content of the blood also ran up, and symptoms of uremia developed.

Paris Médical

June 30, VII, No. 26, pp. 533-548

- 22 *Elephantiasic Edema after War Wounds. Mériel.—p. 534.
- 23 Anesthesia of the Suboccipital Nerve as Sign of Fracture of the Posterior Arch of the Atlas. J. A. Sicard and H. Roger.—p. 540.
- 24 Abortive Epidemic Cerebrospinal Meningitis. H. Rendu.—p. 542.
- 25 Plan for Model Operating Pavilion. R. D. de la Rivière.—p. 543.
- 26 Periodic Eructation. R. Benon.—p. 544.

22. **Elephantiasic Edema.**—Eleven typical cases are related, with illustrations of two showing the permanent edema and pronounced decalcification of some of the bones of leg or hand following a war wound. The edema always stopped abruptly at a certain level, above which the limb was normal. This and other features of the cases suggested that a constricting band had been applied and that the resulting vascular disturbance had entailed the neuritis. The neuritis persists and may permanently incapacitate the man for active service. It is important therefore to cure the edema and prevent its factitious exaggeration. Mériel has found a plaster bandage, reaching to the root of the limb, the best means of prophylaxis. The factitious edema promptly subsides while the constitutional does not. In conclusion, he recalls Sicard's chronic segmentary edema as possibly proving misleading.

Presse Médicale, Paris

June 21, XXV, No. 35, pp. 361-368

- 27 *Abortive Treatment of Typhoid. A. Mauté.—p. 361.
- 28 *Treatment of Fractures of the Femur. H. Judet.—p. 363.
- 29 Diagnosis of Scabies. (Comment diagnostiquer la gale quand on n'est pas dermatologiste.) R. Sabouraud.—p. 364.

June 28, No. 36, pp. 369-376

- 30 Causes and Frequency of Chronic Appendicitis. J. L. Faure.—p. 369.
31 *Rabies in Man. Jourdran and L. Marchand.—p. 371.
32 *Technic for Detection of the Ameba. P. Ravaut and G. Krolunitsky.—p. 373.

27. **Abortive Treatment of Typhoid.**—Mauté is treating typhoid on the principle of injecting a vaccine that has the most powerful modifying action on the body fluids along with the minimum of secondary toxic effects. Typhoid and paratyphoid bacilli are too toxic to be considered for the purpose. After long series of experiments on animals, he succeeded in finding a saprophytic microbe, isolated from spring water, which seems to be nontoxic for all laboratory animals by subcutaneous, intravenous and intraperitoneal injection. He used it in an emulsion made with thirty-six or forty-eight hour cultures, the dose from 100 to 500 millions. In 19 out of 23 typhoid patients thus treated, the temperature dropped abruptly in twenty-four hours to normal or below, and in 12 cases it did not go up again. The effect on the temperature is not so striking as the general benefit. The toxic symptoms subside, the headache, the stupor or delirium disappear. The tongue clears up and the diuresis increases. The pulse may keep high for several days and the diarrhea may persist, but the patient usually gets hungry within three days. There is a chill for ten or twenty minutes after the injection, but nothing at all alarming, no dyspnea nor dwindling of the pulse. Certain other saprophytes seem to display the same action on the organism, and it may yet be possible to isolate the active substance and inject this alone. His results were promising also with the same treatment applied in acute articular rheumatism and pneumonia. The facts observed seem to conflict to a certain extent with the generally accepted views as to specificity. But facts are facts, he declares, and those here related apparently open new horizons for the problem of immunity.

28. **Fracture of the Upper Femur.**—Judet advises continuous extension and a comprehensive plaster cast to combat the inevitable abduction of the upper fragment with subtrochanter fracture of the femur. Illustrations show the special features of fracture at this point. He warns that continuous extension incorrectly applied almost inevitably injures the functioning of the knee. Traction should be on the thigh alone with fracture of the femur, even if traction must be weak. It is better to have a thigh a little shorter than normal than to have a crippling knee.

31. **Rabies.**—In the six cases which developed under Jourdran's eyes, the incubation ranged from twenty-one to fifty-three days. Pasteur treatment was applied the same day the man had been bitten in one case; the fifth, seventh and ninth days in the cases of the three children. The other man had not had any treatment. The onset of the rabies was sudden and severe, in the midst of apparently perfect health. Any noise or the sight of a bright object, or a touch or taste sensation was liable to bring on the convulsions, but headache was rare. The fear of the light and of water comes from the remembrance of the convulsions started by the contact of water with the mucosa in the mouth or the sight of a bright object. This is the explanation of the origin of the term hydrophobia.

32. **Simplified Technic for Detection of Amebas.**—Ravaut says that if the amebas in the feces have still any vitality left, they can be started up to move about by heating the slide as it lies in the microscope. The flame of a match or of a small tampon dipped in alcohol and held under the slide will answer the purpose, or with a dentist's heated rubber bulb a jet of hot air can be directed on the under side of the slide. The cysts can be shown up best by impregnating them with a mixture of 0.5 gm. iodine and 1 gm. potassium iodide in 50 gm. distilled water. If feces are treated with a 5 per cent. solution of liquor formaldehydi the cysts keep well for months. He puts 5 c.c. of this solution in a test tube with a lump of feces about the size of a pea. The tube is plugged with nonabsorbent cotton, and it is shaken up until the contents are well mixed. They will keep then for months and the cysts show up clearly.

Progrès Médical, Paris

June 30, XXXII, No. 26, pp. 217-224

- 33 Oscillometry in Diagnosis and Prognosis of Obliteration of Artery. P. Balard.—p. 217. To be continued.
34 Paraffin Film in Dressing the Eye. (Pansements oculaires à l'Ambrine.) L. Dubar.—p. 218.
35 Ambulance for Optometry. Ginestous.—p. 221.
36 The Baths of Caracalla at Rome. A. Satre.—p. 222.

Correspondenz-Blatt für Schweizer Aerzte, Basel

June 23, XLVII, No. 25, pp. 785-816

- 37 *Kidney Stones and Operative Treatment. (Nierensteine.) F. Suter.—p. 785.
38 *Operative Treatment of Tuberculous Peritonitis. (Tuberkulöse Bauchfellentzündung.) S. Stocker.—p. 800.
39 No Diagnostic Value in Thermoprecipitin Reaction in Gonorrhea. B. Galli-Valerio.—p. 805.

37. **Nephrolithiasis in Switzerland.**—Statistics published seven years ago apparently demonstrated that urinary calculi were becoming more frequent in Switzerland. Lardy published further statistics in 1911 which showed the increasing consumption of meat, especially mutton, in the country, and he attempted to connect these two facts. As the supply of meat, and above all of mutton, has been cut down so low since the war began, it may be possible that urinary stones may become less frequent. Suter here relates that during the years from 1900 to 1905, when he was assistant to a prominent surgeon at Basel, he never encountered any cases of kidney stones, but since then, during his own practice there he has had thirty-four operative cases of nephrolithiasis. In sixteen cases the calculi were of the calcium oxalate type, in twelve the phosphate or carbonate type, and five were urate calculi. The latter were always small, but by plugging the ureter they compelled operative treatment. They were always infected, so that it seems as if they must have been secondary to some infectious process. Urate stones are more readily washed along than others, and require operative measures only when one becomes impacted in the ureter. Oxalate stones induce symptoms early, so that they are found small and easily removed by pyelotomy. Phosphate stones on the other hand develop insidiously to such a size that nephrotomy or nephrectomy is usually required for them. In his operative cases of nephrolithiasis there was very rarely a history of preceding colics. One patient had twenty-nine stones, with a total weight of 116 gm. in one kidney and a single stone weighing 90 gm. in the other, but they were only casually discovered, as the urine persisted turbid after cure of the cystitis which had brought the man of 61 to the physician. In one case after a brief period of pain in the right kidney, pains developed in the left kidney, very severe and protracted, and later in the bladder. After removal of a stone in the right kidney there were no further pains.

With hydronephrosis, the stones float around; in one such patient the outlet became plugged with the stone as he stood, but it evidently floated away as he reclined. Infected stones did not cause any more intense subjective disturbances than the aseptic. Kidney stones can rarely be palpated, but the urine is never normal. If the microscope fails to show any red corpuscles on repeated examination, the probabilities are against nephrolithiasis. Among his thirty-four kidney-stone cases, four of the patients had a single kidney and two succumbed to the results of the total anuria for several days, rallying only temporarily after the operation. The third recovered, as also the fourth after a secondary operation. The fact that no urine is voided does not alarm; the patients apply for relief only when driven by pains. The prognosis with pyelolithotomy is good. With anuria the prognosis depends on its duration, as a rule.

38. **Operative Treatment of Tuberculous Peritonitis.**—Stocker remarks that the time and money spent for a course of heliotherapy in the mountains often goes for naught as, after return to the old environment, the tuberculous peritonitis flares up again. The same is true also of courses of radiotherapy. The peritonitis is extremely rarely the primary localization of the disease. Schlimpert found that 89.9 per cent. of the patients dying with tuberculous peritonitis succumb in reality to tuberculous lesions elsewhere. Stocker had one patient with tuberculous peritonitis and a

slight apical process. She would not consent to the abdominal operation he proposed, and succumbed two years later to the progressive pulmonary process, which had come to entirely overshadow the peritoneal process. On the other hand, he has cured twelve out of fifteen patients and materially improved the others by operative treatment. There was recurrence several years later in the fifteenth case. None has died. Through a median laparotomy he dabs the entire accessible surface with the official tincture of iodine, loosening up adhesions only as necessary to reach all the surface. If necessary for this, he does not hesitate to make a second incision. Adhesions have to be handled very carefully not to tear the bowel or burst a suppurating gland. Tuberculous tubes or ovaries were removed if readily accessible and the general condition permitted. In two cases the appendix was removed. The abdominal wall was always sutured at once; it healed by primary intention in all but the one case in which a suppurating gland burst and an abscess followed in the abdominal wall. In preparation he gave saline infusion, digitalis and camphor. The general aspect improved at once and the patients left the hospital on an average by the seventeenth day. All symptoms subsided and the abdomen felt soft, and any lung processes seemed to share in the benefit.

His cases were all of the dry adhesive form of tuberculous peritonitis and yet all were cured from the subjective standpoint. He ascribes the benefit to the hyperemia induced in the peritoneum. The blood pouring in brings the antibodies which induce retrogressive changes in the tubercles. This is followed by proliferation of connective tissue. The degree of afflux of blood seems to decide the outcome, and hence the iodine is used to enhance the hyperemia. He experimented first with rabbits, and found that a chronically inflamed peritoneum does not absorb the iodine like a sound organ. In the rabbit, the iodine often prevented the development of tuberculosis after inoculation and led to the healing of recently established infection. Hofmann in four (1912), and Falkner in three cases (1913) reported equally favorable results. The interval since has been over one, three or four years in all but three of Stocker's fifteen cases. There was no mortality in the total twenty-two cases.

Gazzetta degli Ospedali e delle Cliniche, Milan

May 27, XXXVIII, No. 42, pp. 625-639

- 40 Military Hygiene in the Present War. A. Secchieri.—p. 625.

May 31, No. 43, pp. 641-648

- 41 *Lumbar Puncture in Treatment of Wounds of the Skull. G. Lerda.—p. 643.

41. **Spinal Puncture after Skull Wounds.**—Lerda cites a number of writers whose experience with lumbar puncture to relieve pressure on the brain after war wounds has been extremely favorable. He has applied this measure himself over a hundred times, noting the spontaneous subsidence of hernia of the brain after lumbar puncture. This insured better conditions for natural drainage of the wound in the skull. No endocerebral drains are necessary when lumbar puncture is repeated as the exposed brain tissue becomes congested and turgid. Even when the effect on the brain hernia is less evident, yet the influence of repeated lumbar puncture seemed to be always favorable. In some cases it was repeated on alternate days ten or twelve times, or even daily, withdrawing 20 or 40 gm. of fluid, with benefit beyond all hopes.

Policlinico, Rome

July 1, XXIV, No. 27, pp. 841-872

- 42 *Typhoid in the Vaccinated. S. Minelli.—p. 841.
43 Vaccination against Typhoid. T. Silvestri.—p. 846.
44 Alveolar Pyorrhea. B. de Vecchis.—p. 848.
45 Plant instead of Animal Albumin in Culture Mediums. M. Mitra.—p. 853.

June, Surgical Section No. 6, pp. 233-272

- 46 *Paraffin Film Treatment of Wounds and Frostbite. G. Masnata.—p. 233; G. Matronola.—p. 248.
47 *Trench Foot. U. Tassone.—p. 254.
48 Femoral Hernia. G. Serafini and A. Carle.—p. 264. Continuation.

42. **Camp Typhoid.**—Minelli analyzes the various peculiar features of typhoid occurring in men who had been vaccinated against the disease, comparing them with the course in the nonvaccinated. In 77 per cent. of 74 vaccinated, the disease

was very mild, while this was the case only in 27 per cent. of 63 nonvaccinated. In 400 cases there was agglutination for typhoid bacilli in 69 per cent., for paratyphoid A in 20, and B in 11 per cent. The mortality among the vaccinated was 5.3 per cent.

46. **Paraffin Film Treatment.**—Masnata reports considerable experimental and clinical study of the paraffin film treatment of wounds. He says that his work has apparently confirmed that the film method is an advance, but that the paraffin alone (melting at 50 or 52 C.) is the sole essential element. No other ingredients are required, as his charts recording the results of parallel tests show that plain paraffin protects and retains its heat practically the same as the proprietary mixtures.

Matronola concludes from the few cases in his experience that film treatment may be useful for sterile war wounds, for frostbite of the second degree and for the granulations left by the eschar from those of the third degree.

47. **Trench Foot.**—Tassone's research on the prophylaxis of trench foot showed that standing still was the main factor in the development of the trouble. The gravest cases did not come from the wettest and coldest trenches, but from those where the men were unable to move about. When relieved from such cramped positions special care should be taken to start the circulation in the feet. He advises for this prolonged soaking in warm water with massage. As numbness is about the earliest symptom of trouble, the men do not realize that anything is wrong until the condition is quite far advanced. Consequently, effectual prophylaxis of trench foot requires daily medical inspection of the feet when conditions predispose to it. Since this has been the rule the cases have been detected in their incipiency. Smearing the feet often with grease not only protects them and keeps in the heat, but it softens the edges of stiff leather.

Riforma Medica, Naples

June 16, XXXIII, No. 24, pp. 629-648

- 49 *Bacterial Nucleoproteids. A. Ferrannini.—p. 629.
50 *Surgical Treatment of Tuberculous Peritonitis. V. Ruffo.—p. 636.
June 23, No. 25, pp. 649-668
51 *Traumatic Reflex and Hysterical Paralysis. L. Ferrannini.—p. 649. Commenced in No. 24, p. 632.
52 *Sycosis from Uricacidemia. C. Vignolo-Lutati.—p. 652.
53 War Wounds of Limbs. S. Salinari.—p. 654. To be continued.

49. **History of Bacterial Nucleoproteids.**—Ferrannini relates that no sooner had nucleoproteids been discovered than Galeotti and Lustig, of the Florence Pathologic Institute, sought and found them in the bodies of bacteria and applied the data thus learned in preparation of antiplague vaccine. Galeotti spent some time at Bombay in the work, and the Galeotti-Lustig antiserum was selected by the Bombay public health authorities as more effectual than the Haffkine, Yersin, Pasteur Institute or Petrograd antisera.

50. **Surgical Treatment of Tuberculous Peritonitis.**—Ruffo reviews the history of surgical treatment of tuberculous peritonitis and reports the ultimate outcome in cases at a Naples hospital. The cure has been complete to date in three cases in which laparotomy had been done in 1894, four in 1896, and others later. One young woman had her abdomen opened four times in 1895 before the disease was conquered. She now has long been in apparently perfect health. Another patient was a young woman, and at the laparotomy 6 liters fluid were withdrawn, and the cavity was flushed copiously with 5 per cent. boric acid solution. Recovery was hindered by collapse, rebellious diarrhea and an eruption resembling measles—probably the result of toxic action from the boric acid solution in such large amounts. Recovery was soon complete and durable. In another case 15 liters of fluid were withdrawn at the laparotomy and the cavity was flushed with 1 per thousand mercuric chlorid solution, sponged dry afterward, and then flushed with boiled water at 40 C. (104 F.). The patient soon left the hospital in good condition. Opinions differ as to the actual curative factors in such cases. D'Urso regards the flushing out of the abdominal cavity as one of the most important factors, as it facilitates the elimination of toxins. He thinks that the peritoneum gets enough irritation to modify it without the necessity for an irritating

chemical. A 3 per cent. solution of boric acid or physiologic saline seems all that is necessary. In the diffuse purulent form the simplest measures are best. The only contraindications he admits are advanced pulmonary lesions or involvement of other viscera.

51. Traumatic Reflex or Hysteric Paralysis.—In two cases of which an illustrated description is given, a bullet wound of the forearm, without direct injury of bones or of the nerves of the muscles involved, was followed by lax paralysis with hypo-esthesia and amyotrophy, no electric but considerable mechanical hyperexcitability, and slight circulatory disturbances. The hand drooped at an acute angle and the visual field was contracted. The disturbances are purely functional and correspond to Babinski's reflex paralysis, but they correspond also to hysteria paralysis, and Ferrannini is convinced that they belong in the hysteria class and that there is no need to set up this new category of "reflex paralysis."

52. Uric Acid Sycosis.—Lutati says that among his seventy cases of idiopathic sycosis during a recent five-year period, there were signs of uricacidemia in forty-two. There seemed to be a primary amicrobian phase in the process, a deep perifollicular dermatitis probably of endogenous origin. When infection became superposed, the resulting lesions ranged from simple folliculitis to furuncles. He suggests that alveolar pyorrhea may have a similar origin. Be this as it may, treatment of the sycosis on the assumption that it was a manifestation of the diathesis of sluggish elimination rapidly improved conditions, even without direct treatment of the sycosis.

Tumori, Rome

April-May, V, No. 2, pp. 129-228

- 54 *Cystic Disease of the Suprarenals. V. Saviozzi.—p. 129.
55 Melanotic Sarcoma of the Choroid. R. Desogus.—p. 148.
56 Pathologic Anatomy and Clinical Results of Resection of the Stomach. G. Fichera.—p. 156. To be continued.
57 Action of Fresh or Autolyzed Spleen Tissue on Grafting and Further Development of Experimental Tumors. G. D'Agata.—p. 200.

54. Cystic Disease of the Suprarenals.—Saviozzi reports a case of a cyst in the left suprarenal capsule as large as the head of an adult. He says it is the seventeenth on record and the ninth operative case. The patient was a man of 76, and the first signs of trouble had been noticed two years before. The clinical picture resembled that in a case that had been in the clinic a short time before in which a blood cyst in the spleen had been responsible for the symptoms. The present patient had complained of dizziness at times, but there was no tendency to sudden pallor or swooning. Four liters of bloody fluid were evacuated from the cyst which was found to be in the left suprarenal capsule. It was adherent to the spleen and diaphragm. The kidney was removed with the cyst, the kidney forming merely a kind of appendix to it. The operation was two hours long, but under spinal anesthesia the elderly man bore it well, although he presented severe advanced arteriosclerosis with edema of the legs and considerable ascites. In the nine operative cases on record, three died of the four treated by suturing the cyst to the skin, and two of the five treated by enucleation of the cyst.

Revista Clinica, Medellin, Colombia

March, I, No. 4, pp. 142-199

- 58 *The Physician Must Refrain from Doing Harm. F. A. U. Mejia.—p. 146.
59 *Probable Phlebitis of Inferior Vena Cava in Parturient. B. Mejia.—p. 148.
60 *Pituitary Treatment in Obstetrics. N. Jimenez.—p. 149.
61 Surgery of the Bile Passages in Colombia. G. J. Gil.—p. 170; G. Gomez.—p. 186.
62 Electric Treatment of Inoperable Epithelioma in the Inside of the Cheek. V. T. Echeverri.—p. 191.

58. Primum non Nocere.—Mejia says that in our efforts to relieve suffering we are liable to forget Hippocrates' admonition. It is our duty to relieve the pain of labor, but we should not do this at the expense of injury to the mother or child. The end does not justify such means. He quotes authorities that the only reliable means to reduce the pains of childbirth is with chloroform *à la reine*, after careful exclusion of contraindications. Even this, he adds, is not free

from dangers and inconveniences. But the preparations recently advertised for the purpose, partoanalgin, tocanalgin, eutocin, lucin and others of this stamp all contain morphin, and each of them has mishaps to its discredit involving the mother and intoxicating the infant to such a degree as to prove frequently fatal. "We should not countenance measures that are inherently dangerous, even to do good with them. Civilization does not sanction our knocking a man down and taking his money even if we give the money to a beggar and we know that it will be spent to relieve much need."

59. Phlebitis of Inferior Vena Cava.—The young and otherwise healthy woman had phlebitis of the left femoral vein at her fourth childbirth. When the fifth child was born there was femoral phlebitis first on one side and then on the other. After both had subsided, rigors and prostration developed suddenly, with intense tenderness and acute pain in the right iliac fossa. The pain gradually spread to include the spine up to the thorax, any touch or movement causing agony. After two weeks of suffering the fever subsided and recovery slowly followed, the anemia and asthenia persisting for a long time. Phlebitis of the inferior vena cava seems the only assumption that would explain the symptoms observed.

60. Pituitary Extract in Obstetrics.—Jimenez describes a few maternity cases in which he used pituitary extract, and relates his impressions as to the availability of this treatment. He declares roundly that it should never be used with a normal delivery. Watchful waiting is the science of the obstetrician, active in its passiveness. He quotes that attempts to hasten labor with pituitary extract are "useful only for the accoucheur and possibly also for gynecologic specialists later." Also that pituitary treatment is never required in a normal childbirth with a normal woman. In one case he was summoned to a woman who had been in labor several hours. All seemed to be normal and he wished to leave as he had other important duties. The family would not consent to his departure, and to hasten matters he gave pituitary extract. Delivery occurred at once, but the deeply asphyxiated child required an hour and a half of active measures before he could safely leave it. If the mother had had hemorrhage or other complication requiring attention, he could not have saved the child. In conclusion, he lists nine formal contraindications against the use of pituitary extract in obstetrics: It should never be given when there is the slightest fear of rupture of the uterus or signs that the fetus is already suffering. It is also irrational with shoulder presentation and in most cases of pelvic presentation. It is also contraindicated in elderly primiparae with rigid perineum. He has seen in such cases that even two or three injections failed to induce any effect, while, on the other hand, the extract is very dangerous under these conditions for the fetus and for the maternal soft parts. It is also contraindicated before the cervix is fully dilated; the cervix may be torn off completely if not fully dilated. Secondary inertia is also a contraindication, when the uterus has wasted its contractile energy against some obstacle which it has been unable to overcome, as with contracted pelvis, tumor, rigid cervix, etc. If the obstacle is unsurmountable, giving pituitary extract may entail the rupture of the uterus or the action of the extract may lead to increased inertia, or the head may be finally expelled but with the application of such force that brain or meningeal hemorrhages soon prove fatal.

Revista de Medicina y Cirugia de la Habana

July 10, XXII, No. 13, pp. 321-346

- 63 Present Status of the Treatment of Syphilis. V. P. Castello.—p. 321.
64 *Strangulated Hernia. E. Stincer.—p. 338.

64. Strangulated Hernia.—Stincer's fifteen cases included one with intestinal hemorrhage and two with paralytic occlusion, fatal in one case. He condemns absolutely all attempts at taxis, and urges immediate incision and evacuation of the contents of the loop if there is the slightest doubt as to its vitality. Pneumonia followed the operation in three cases, probably the work of the ether superposed on the septic intoxication from the gangrenous lesions in the bowel. In one case the inguinal hernia was of the retrograde or W type.

Semana Medica, Buenos Aires

May 17, XXIV, No. 20, pp. 563-590

- 65 Evolution of Obstetrics in Argentina. E. Zarate.—p. 563.
 66 *Examination of Lungs of Recruits. J. A. Lopez.—p. 569.
 67 Lymphocytosis in Syphilitics. C. P. Mayer and A. C. Gourdy.—p. 575. Continuation.
 May 24, No. 21, pp. 591-614
 68 Research on Lactic Acid Bacteria. E. Fynn.—p. 591.
 69 Suppurating Phlegmon of Dental Origin Extending from Mouth to Upper Thorax. I. Justiniano.—p. 594.
 70 History of Public Hygiene in Argentina; Autobiography. E. R. Coni.—p. 595. Continuation.

66. **Detection of Tuberculosis in Recruits.**—Lopez comments on the high percentage of cases of pulmonary tuberculosis in the Argentine navy, and urges greater care in the selection of recruits so as to eliminate the tuberculous. He remarks that when the conscription officer and the examining physician find large numbers of unfit, the former grows nervous for fear he may not be able to make up the quota for his district. In spite of himself, this nervous apprehension becomes imparted to the examining physician, and the latter is unconsciously influenced by it and his judgment as to the compliance with the requirements for service becomes warped. This is a common psychologic phenomenon, but in its influence on the acceptance of recruits it may have disastrous consequences not only for the man himself, but for the state. The tubercle bacilli locate first in the glands at the hilus, as a rule, and attack the lower lobes oftener than the regions above, usually on the right side. But the tuberculous process here encounters so many obstacles that it develops slowly or may heal. In examining recruits this is the first point to be investigated, the hilus, the region around it and the base. In Lopez' extensive experience he has found an isolated tuberculous process at the apex only in a very few cases. Roentgen examination is indispensable in dubious cases to reveal tuberculous glands at the hilus, especially when the general constitution seems to be below par. Pignet's index of robusticity is a great help but the measurements for it should always be taken with uniform technic.

Siglo Medico, Madrid

June 23, LXIV, No. 3315, pp. 445-464

- 71 Dermoid Tumor on the Eyelid. B. Castresana.—p. 446.
 72 Neuralgia and Neuritis in Syphilitics. Sicilia.—p. 449.
 73 Peptic Ulcer. L. Urrutia.—p. 449. Continuation.
 74 Importance of Diathermy in Gynecology. Poblacion.—p. 458. Conclusion.

Grèce Médicale, Athens

XVIII, No. 19-20, pp. 37-40

- 75 *Heliotherapy for Nodose Erythema. J. Cecicas.—p. 37.

75. **Heliotherapy for Nodose Erythema.**—Cecicas says he has only three cases to report, but the heliotherapy was so promptly successful in them that he thinks its action must be regarded as specific. In none of the patients were there other indications of tuberculosis, but the disease was present in the families. Cecicas accepts Landouzy's theory that nodose erythema in a large proportion of the cases is a manifestation of tuberculous bacillemia. This assumption is justified further by the efficacy of heliotherapy. As the morbid cells are destroyed under its influence, antibodies are generated which act from within on nodules remote from the exposed areas. They retrogressed along with the exposed ones. In one of his cases iritis developed in the course of the treatment. The second eye became affected two months later. This patient was a woman of 56 and the nodose erythema had first appeared eight years before. The other patients were a woman of 27 and girl of 12. There has been no recurrence during the months to date.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

May 26, I, No. 21, pp. 1703-1782

- 76 *Injurious Action of Optochin on the Organ of Vision. J. van der Hoeve and W. H. Mansholt.—p. 1710.
 77 Anilin Dyes in Treatment of Wounds. (Wondbehandeling met pyocyaninum caeruleum.) T. M. Mesdag.—p. 1716.
 78 *Traumatic Closure of Outer Ear Passage; Two Cases. P. T. L. Kan.—p. 1719.
 79 *Present Status of Our Knowledge of Typhus. H. Aldershoff.—p. 1726.

76. **Optochin Visual Disturbances.**—In the case described, the previously healthy young man with pneumonia, on an exclusive milk diet, was given optochin in moderate doses (200 mg. six times a day) to a total of 4 gm., when he became totally blind. Vision partially returned later, but with paralysis of accommodation, atrophy of the optic disk and sclerotic changes in the vessels. The impairment of vision was so severe that he was unable to resume his work as bargeman. W. Hess, in 1915, found records of disturbance of vision in 6 per cent., and Uthoff, in 1916, in 3 or 4 per cent. He found Marchi degeneration of the nerve tissue in two cases in which death had followed soon after the optochin had been taken. In the case here related the vascular changes did not develop until several weeks after the first symptoms, but they continued a progressive course while the nerve changes seemed to show a tendency to retrogress.

78. **Traumatic Occlusion of the Auditory Canal.**—Kan obtained good results with Trofimow's technic, cutting perpendicularly through the atresia and then, with an incision back to the ear, turning the outer ear over forward, thus obtaining access to the obstructed portion of the meatus. The obstructing bone or connective tissue was then chiseled out.

79. **Typhus.**—Aldershoff remarks that the occurrence of a few cases of typhus at Amsterdam has made this one of the burning topics of the day in Holland. He does not regard it as proved that transmission of the disease occurs exclusively by lice. He reiterates that treatment can be only symptomatic.

Hygiea, Stockholm

June 16, LXXIX, No. 11, pp. 513-576

- 80 *Cyst of the Common Bile Duct. E. Waller.—p. 513.

80. **Cyst in Bile Duct.**—Waller has found records of 34 cases of an idiopathic cyst of the common bile duct, and gives a summary of each. Operative treatment was applied in all but 5 of the cases. He also refers to a number of cases of cystic dilatation, but some tumor, calculus, or chronic inflammatory process was responsible in this group. The diagnosis was never made in advance, the presumptive diagnosis being pancreas or echinococcus disease or an abscess in the liver. The trouble might have been differentiated, however, from the recurring attacks of pain in the children or young adults, usually accompanied with jaundice and fever, and the development of a cystic tumor fluctuating in size, in the right hypochondrium, not corresponding to the gallbladder. Among the 34 cases summarized there were 14 girls to 5 boys. In 21 cases a fistula was opened into the cyst. These patients all died from the loss of bile, or the icteric afterhemorrhage, or from infection. One young man survived for three years with his fistula, succumbing finally to pulmonary tuberculosis. One girl of 18 died three months later from fulminating hemorrhagic purpura. In 3 other cases an attempt was made to open a communication between the common bile duct and the bowel, but all terminated fatally, as also in 3 in which the sac was removed.

Only 5 of the total 34 patients recovered. In 3 of the successful cases, after a primary fistula had developed, an opening was made from the cyst into the bowel. Three operations were required in one of the cases. In two other cases a side-to-side communication between the bile duct and the duodenum was successfully made. One of these cases is reported by Waller in detail from his own service. The other was published by Bakes in 1907. Both patients were in apparently perfect health one and two years later. The necropsy findings in the fatal cases are summarized. Waller's patient was a girl of 10, who had had several attacks of abdominal pains every year during the last seven years. The operation was done after three days of acute pains, vomiting and a subicteric tint of the sclerotics; the urine was bile colored; pulse 100; temperature 38.1 C., and there was a large tender resistance in the right hypochondrium. When the abdomen was opened, the elastic retroperitoneal tumor was assumed to be a hydronephrosis. It burst during the maneuvers and clear dark green bile escaped. Prompt recovery followed the choledochoduodenostomy.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXIX, No. 8

CHICAGO, ILLINOIS

AUGUST 25, 1917

ROENTGENOGRAPHIC AND MICROSCOPIC STUDIES OF TISSUES INVOLVED IN CHRONIC MOUTH INFECTIONS*

ARTHUR D. BLACK, A.M., M.D., D.D.S.
CHICAGO

The idea that mouth infections often cause serious secondary effects has, in recent years, become definitely crystallized in the minds of physician, dentist and layman. Clinical observation has been supported by careful laboratory investigations. It is now generally recognized that a chronic suppurating focus may lead to any one of a considerable group of diseases, most of which are insidious in their development and extremely chronic in their progress. The chronic focus is therefore properly considered a menace to health, and its removal is demanded. The dental profession is thus confronted with a most serious problem, so serious that the practice of dentistry must be to a considerable extent revolutionized for its solution. The chain of causes and symptoms leading up to these mouth lesions and the peculiar physiologic relationships between the tissues involved present complex problems which have been but partially solved. There are, however, certain outstanding features, the clear recognition of which should form a basis for future study.

The normal person should have thirty-two teeth. At 21 years of age the average number of teeth is about thirty; at 60 years this number has been reduced to possibly ten on the average, many having lost all. With few exceptions the loss has been the result of chronic infection, either alveolar abscess or chronic pericementitis. On the average, each person loses a tooth every year and a half or two years, the number increasing with advancing years, each tooth having been a source of chronic infection for from one to five or ten or fifteen years, so that a large percentage of persons are not free from infection involving the maxillary bones from 20 years of age until death, or until all the teeth are lost. It is safe to say that fully 50 per cent. of persons 25 years old have infections which have destroyed areas of the bone about the teeth sufficient to be easily detected by roentgenoscopy, and that this percentage gradually increases until it closely approaches 100 per cent. in persons who are not edentulous at 50 years of age. The estimate made several years ago by Dr. T. L. Gilmer that 75 per cent. of adults would be shown to have chronic infections involving the maxillary bones is fully supported by statistics thus far gathered.

It would seem desirable to establish the element of danger to health which these infections represent. It is not possible at this time, however, to express in figures the relationship existing between these mouth foci and the systemic effects, because the same systemic effects may result from such a variety of sources. Mouth infections might be considered as causal in proportion of their percentage of occurrence to other original foci, although the defense of the various tissues attacked would doubtless modify such a calculation. It is certainly illogical to conclude that a particular systemic effect is due to a mouth focus unless all other sources have been eliminated. Without question, in many cases, several sources are acting simultaneously.

Apparently the resistance of a large percentage of persons is sufficient to give full protection for years, yet we must ever keep in mind the insidious development of the secondary effects and then ask ourselves if we can be even reasonably certain that one's health is safeguarded so long as there is definite evidence of infection in the mouth.

There are two points of initial attack and two entirely separate routes of progress by which chronic mouth foci become established. The chronic lesions themselves, however, have many characteristics in common. The one begins with dental caries, as a result of which the pulp of the tooth becomes involved directly or indirectly and an inflammation of the periapical tissues is established. The other begins as a gingivitis and progresses alongside the root toward the apex, involving the periodontal tissues. In both, the destructive processes include the periodontal membrane, the bone of the alveolar process and the cementum covering the root of the tooth.

In view of the high prevalence of both forms of these lesions in adults, and of their extreme chronicity and intractability to treatment, to which reference will be made later, our hope for the future lies principally in prevention, and it is this which calls for radical changes in dental practice. Dental caries must be prevented or so treated that there will be the highest possible degree of pulp conservation. This means broader education of the public, and especially of children, to the need and means of better care by themselves, as well as more frequent and regular observation and treatment by the dentist. The dentist must follow more scientific lines in all operations better to control caries, and so to prepare and fill cavities that the pulps will remain vital. Gingival irritation must be reduced by better cleanliness by the patient and there must be improvement of technic in both operative and prosthetic procedures by the dentist so that there will be no irritation, either by margins of fillings, crowns, etc., or by food impaction as a result of faulty forms

* Chairman's address, read before the Section on Stomatology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

or tooth contacts. While these are simple statements which are readily accepted by all, their adoption in practice can come about only as a result of a fuller appreciation by dentists generally of the pathologic problems involved, both at the original foci and in the remote after-effects.

The changes which take place in the peridental tissues, as inflammatory processes progress to the establishment of chronic foci, represent the normal reaction to chronic irritation accompanied by infection, plus certain changes in the specialized elements of these tissues. Noyes¹ has recently shown that the principal route of travel of the infections beginning in the gingivae is by way of the perivascular lymphatics. He called attention to the fact that, in cases of gingival irritation caused by deposits of salivary calculus, the vessels of the gum tissue are followed and the destruction of the bone of the alveolar process is from the gum side. This explains the previous clinical observation of Black² that deposits of salivary calculus do not, as a rule, cause the formation of pockets alongside the roots of the teeth.

In cases of chronic pericementitis, the blood vessels which lie within the peridental membrane are followed. As the course of these vessels is mainly in the direction parallel to the long axis of the tooth, we have an explanation of the more rapid progress of these infections toward the apex, as compared with their progress laterally around the root, resulting in deep, narrow pockets. The fact that chronic alveolar abscesses do not cause a similar destruction of the peridental membrane in the opposite direction is also explained, as the movement of the lymph is from the gingivae apically.

Many specimens³ of the tissues overlying these pockets, some including the teeth and all of the surrounding structures, studied in the research laboratory of Northwestern University Dental School during the past five years, show the changes which have been described by Talbot, Noyes and others. These include the thickening of the walls of the vessels to the point of obliteration, with the gradual disintegration of the surrounding tissues until apparently necrotic areas are formed, the tissue taking the ordinary stains poorly or not at all. These areas involve both the soft tissue and the alveolar process. Eventually the peridental membrane seems to be severed for a space, leaving a portion attached to the cementum of the root and a portion attached to the alveolar process. Areas of absorption of the cementum appear in many specimens; these apparently occur early, as a response to the irritation caused by the approaching destructive process. Later the tissue remaining attached to the cementum dies and disappears, leaving the cementum entirely denuded. The cement corpuscles also die, and the cementum becomes a necrosed, pus-soaked tissue.

The peridental fibers attached to the bone are similarly destroyed, and the bone is also invaded, areas being hollowed out along the lines of the vessels. Black⁴ called attention to the fact that we might expect the fibers of the peridental membrane and the alveolar process to disappear, as a purely physiologic process of absorption, following the severance of the membrane from the cementum, regardless of the continued

progress of the pathologic invasion. Doubtless both processes are factors in most cases.

The rôle which the gingival epithelium plays in these cases is extremely interesting. Many specimens show extensive projections deep into the submucous tissues and into the bone itself. Cross sections of these projections frequently show the cells in concentric rings, suggesting epithelioma. A growth of epithelium down into the pocket is frequent, apparently an attempt to line the pocket and protect the connective tissue. We have also noted, in cases in which the overlying tissue is cut away, exposing the denuded root, that the epithelium of the gum tissue will not only cover the cut surface, but also grow down to the line of attachment to the cementum, thus forming a new gingiva.

Practically the same changes take place in chronic alveolar abscess, except that the progress along the surface of the root is slower, is more likely to include the entire circumference, and a cavity is formed in the bone corresponding to the area of detachment of the cementum. The bacteriology of these cases has been studied by Gilmer⁵ and reported in several papers. The bacteriology of the pus pocket is more complex, and will probably never reveal a specific organism. The paper read before this section last year by Lescohier⁶ gives practically all available information.

As has been pointed out prominently before, the denuded cementum is the factor of prime importance in maintaining the chronicity in both groups of cases. A pus-soaked tissue, analogous to necrosed bone, except that it cannot be exfoliated, it defies reattachment of the adjacent tissue and remains as a continuous irritant. The prompt healing of these areas following the extraction of the teeth is sharp evidence of the rôle which the cementum plays. While the invasion of the surrounding soft tissues by infection is of the greatest importance in considering these areas as a menace to health, it is of very little consequence so far as healing is concerned. The infection is quickly eliminated by the tissues when the irritant—the cementum—is removed.

During the past year I have had roentgenograms made of all the teeth and adjacent bone for about 400 persons, for the special purpose of determining the frequency and extent of the infections of the maxillary bones. It was realized that most roentgenograms are taken because of a definite indication; consequently they do not represent average conditions. In order that these might represent as nearly average conditions as possible, the persons were selected from several sources, and most of them without previous inquiry as to mouth conditions or general health. About 175 are of the mouths of members of the senior class at Northwestern University Dental School, a few were patients of the school, a few were patients of other dentists, a few were selected from the files of Dr. Leach, who did the roentgenographic work, and a limited number were my patients.

For persons under 40 years of age, the figures presented probably represent very nearly average conditions. We were able to select from these roentgenograms a group of thirty full mouth examinations for persons, most of whom had the full complement of

1. Noyes, F. B.: Studies of the Pathology of the Peridental Membrane, *Jour. National Dental Assn.*, April, 1917, p. 375.

2. Black, G. V.: *Special Dental Pathology*, p. 100.

3. Specimens prepared during the past year by E. H. Hatton, M.D., research investigator, Northwestern University Dental School.

4. Black, G. V.: *Special Dental Pathology*, p. 168.

5. Gilmer, T. L.: Chronic Oral Infections, *Arch. Int. Med.*, April, 1912, p. 499. Gilmer, T. L., and Moody, A. M.: A Study of the Bacteriology of Alveolar Abscess and Infected Root Canals, *THE JOURNAL A. M. A.*, Dec. 5, 1914, p. 2023; *Oral Health*, February, 1916.

6. Lescohier, A. W.: The Bacterial Findings and Their Relationship to Pyorrhea Alveolaris and Interstitial Gingivitis, *THE JOURNAL A. M. A.*, Feb. 10, 1917, p. 414.

thirty-two teeth, which show no infection whatever of the maxillary bones, and not one of these thirty persons had had a single pulp of a tooth removed. The 300 films of this group are mounted on a single sheet of celluloid and make an interesting study.

For persons over 40 years of age we were not so fortunate in securing a large majority who did not present evidence of infection before the roentgenograms were ordered. Therefore they show a percentage of infection above the average.

The accompanying table was made from 3,000 roentgenographic films of the teeth and adjacent bone of the mouths of 300 adults.⁷ In each case ten small films were made. The tabulation includes the age, systemic symptoms, number of teeth, disease of the peridental membrane as indicated by destruction of bone along-

inflammation of nose, throat or tonsils? 7. Have there been attacks of appendicitis, ulcers of stomach, cholecystitis or other systemic conditions which might result from focal infection? 8. Does the patient complain of unusual nervousness or fatigue? On reviewing the answers the patient was entered as (1) negative, or (2) presenting occasional muscular, joint or similar symptoms, or (3) as having a well defined case of arthritis, nephritis, appendicitis, etc.

Through a misunderstanding on the part of one of my assistants, this report of systemic symptoms was not secured for sixty-eight persons included in the tabulation. It is realized that 300 cases would not have been sufficient to establish reliable data as to the relationship of these foci to systemic effects, and it is my intention to continue this study until several thou-

TABULATION FROM 3,000 ROENTGENOGRAPHIC FILMS, OF TEETH AND ADJACENT BONE IN MOUTHS OF 300 ADULTS *

Age	Systemic Symptoms					Average number teeth per person	Peridental Membrane			Alveolar Abscess			Summary		Root Fillings			Large Canals			Small Canals			Alveolar Abscesses						
	Number	No History	Negative	Complaint of occasional muscular or joint symptoms	Well defined cases, arthritis, nephritis, appendicitis, etc.		Number of persons, some bone destroyed at sides of roots	Percentage having bone involved	Average number of abscesses per person	Number of persons, some bone destroyed at apexes of roots	Percentage having bone involved	Average number of abscesses per person	Number of persons having peridental or apical infection or both	Percentage of persons having infections of maxillary bones	Number of persons having root fillings	Total number teeth with root fillings	Percentage of all teeth having root fillings	Number of root apexes not clearly shown	Number of good root fillings	Number abscessed with good root fillings	Number of poor root fillings	Number abscessed with poor root fillings	Number of good root fillings	Number abscessed with good root fillings	Number of poor root fillings	Number abscessed with poor root fillings	Total abscessed with root fillings	Number abscessed, no root fillings	Total abscessed	Average number of abscesses per person
Under 25....	86	6	69	6	5	30	7	9	0.3	45	52	1.5	48	56	59	198	7.7	35	57	2	74	60	22	1	69	41	104	24	128	1.5
25 to 29.....	53	2	42	6	3	29	17	32	2.0	28	53	1.6	38	72	38	121	7.9	18	24	6	48	31	26	4	31	23	64	24	88	1.6
30 to 39.....	68	25	27	12	4	26	44	64	7.0	45	66	1.3	59	87	53	236	13.4	50	39	4	89	47	20	1	70	42	94	12	106	1.3
40 to 49.....	53	17	20	5	11	25	40	74	7.0	36	68	2.0	47	89	44	185	13.7	34	28	1	84	55	10	2	45	28	86	13	99	2.0
50 and over..	40	18	4	5	13	23	37	92	11.0	22	55	1.5	40	100	28	111	10.9	15	30	0	43	32	17	2	27	20	54	6	60	1.5
Totals....	300	68	162	34	36	27	155	51	5.0	176	59	1.6	232	77	222	851	9.0	152	178	13	338	225	95	10	242	154	402	79	481	1.6

Large Canals: Upper central incisor, cuspid, second bicuspid, lingual roots of molars, lower cuspid, first and second bicuspid, distal roots of molars.

Small Canals: Upper lateral incisor, first bicuspid, buccal roots of molars, lower incisors, mesial roots of molars.

SUMMARY OF ABSCESSES IN RELATION TO ROOT FILLINGS			Number Abscessed
Good root fillings, large canals.....	178	13	23
Good root fillings, small canals.....	95	10	
Poor root fillings, large canals.....	338	225	379
Poor root fillings, small canals.....	242	154	
Total.....	853	402	

Percentage of abscesses for all root fillings 47; for good root fillings 8; for poor root fillings 65.

* In this tabulation, the figures are probably very nearly correct as applied to all persons of ages below 40 years, as in the large majority, roentgenograms were made without regard to indications. For persons of 40 years and over, a considerable percentage of the roentgenograms were taken because of definite indications of infection, and the figures given are therefore correspondingly at variance from average conditions.

The persons whose mouth conditions are tabulated were selected from various sources, as described in the paper, comparatively few being patients of the writer.

side the roots, alveolar abscess as indicated by destruction of bone at the apexes of roots, the number of teeth having good or poor root canal fillings with the number of abscesses in relation to each group, and the number of teeth without root fillings which were abscessed.

In order to secure as accurate information as possible as to systemic effects, it being impracticable to have a thorough physical examination in these cases, a questionnaire was prepared as follows: 1. Are any of the finger joints enlarged? 2. Has the patient noticed enlargement of other joints? 3. Have other joints or muscles been painful? 4. Is the patient anemic? 5. Is there inflammation of eyes, or impairment of vision, other than astigmatism? 6. Is there

sand persons shall have been examined. The statistics gathered so far are considered as forming a good basis for this work. It may be said now, however, that of those for whom histories were secured, there is a decided increase with advancing years which follows closely the percentage increase of mouth infections.

The average number of teeth per person is interesting. The tabulation shows thirty teeth per person under 25 years, twenty-nine per person of 25 to 30 years, twenty-six per person of 30 to 40 years, twenty-five per person of 40 to 50 years, and twenty-three per person over 50 years.

Destruction of bone about the sides of roots of teeth as a result of infections beginning in the gingivae is shown to increase very markedly after the twenty-fifth year, there being 9 per cent of persons below 25 years having these pockets, and 32 per cent. for the ages from 25 to 30 years. For the succeeding decades the percentage increases to 64, 74 and 92. The number

7. Three thousand three hundred roentgenographic films, on celluloid mountings with illuminating box, were exhibited in connection with the presentation of this paper. These films were prepared and mounted by F. D. Leach, D.D.S., roentgenographer, Northwestern University Dental School, and his assistants.

of pockets per month also shows considerable increase with age.

Fifty-two per cent. of persons under 25 years have chronic alveolar abscess, a much greater percentage than that of pus pockets alongside the roots in the same group. The abscess percentages do not increase as rapidly as the cases of chronic pericementitis, being 53 per cent. for persons from 25 to 30 years, 66 per cent. for persons from 30 to 40 years, 68 per cent. for persons from 40 to 50 years, and only 55 per cent. for persons over 50 years. The smaller number for those over 50 years is evidently because of extractions.

A summary of those having either periodontal infections beginning at the gingivae or periapical infections, or both—persons who have infections involving the maxillary bones—gives rather astonishing results. The percentage is 56 for persons under 25 years of age, 72 for those between 25 and 30 years, 87 for those between 30 and 40 years, 89 for those between 40 and 50 years, and 100 per cent. for those over 50 years.

The youngest person in the tabulation was aged 17 years, and there were but nine out of the eighty-nine in the group under 25 years of age who were under 21, so that the figures for this group might be considered as from 20 to 25. While no tabulation has been made for children, I think I am safe in stating that practically no infection of the periodontal membrane beginning in the gingivae will be found, and comparatively few chronic alveolar abscesses. Therefore, attention may be called to the fact that the tonsils are much more likely to be the seat of original foci in children.

Attention is again called to the fact that the figures for persons beyond 40 years are too high as average figures, especially for periodontal infections, because the roentgenograms for many of these, and especially for persons over 50 years, were taken because the patients presented themselves for consultation.

The tabulation of abscesses in relation to root fillings should be of special interest to dentists. The remark has often been made that roentgenograms show many teeth with imperfect root fillings which are not abscessed, and such observations have doubtless supported continued carelessness in the technic of treating and filling root canals. For this study, the teeth are divided into two groups, those having large root canals, and those having small canals. The root fillings were classified as good or poor. A root filling was classed as good if it extended to or close to the end of the root, and if the filling apparently filled the apical portion of the canal. For some small canals, if the filling did not reach the root apex by 3 or 4 mm. and the canal could not be made out in the roentgenogram beyond this point, the root filling was classed as good. I do not advocate this plan of treating small canals, but wish to impress the fact that I was liberal in classifying root canal fillings as good.

Of the teeth with root fillings in large canals classed as good, but thirteen out of 178 were abscessed; in small canals, but ten out of ninety-five. This is 8 per cent. Of those in large canals classed as poor, 225 out of 338 were abscessed, in small canals 154 out of 242. This is 65 per cent. Could there be presented a better argument, a more imperative demand, for more careful technic in the treatment of root canals?

CONCLUSION

These suppurative detachments of the periodontal membrane are in practically all cases permanent detachments, whether the detachment is at the side

of the root or the apex. The area of bone destroyed about the apex of a root is not so important as the extent of the destruction of the periodontal membrane. There is no hope of reattachment of the surrounding tissue to the root, and if such teeth are permitted to remain in the mouth—excepting those which are operated on by resection—it should be with the definite understanding that they necessarily continue as a menace to the health of the individual, and that the use of such teeth in mastication overbalances this menace to the health. In such cases we are using our best judgment as to the patient's general physical condition and his resistance. We must do this with the thought ever in mind that nephritis, endocarditis, cholecystitis and other secondary effects are so insidious in their onset that the condition is likely to be serious and the patient even beyond the possibility of recovery before it is discovered by the physician.

ABSTRACT OF DISCUSSION

DR. THOMAS L. GILMER, Chicago: To offset the great harm that is being done by infectious mouth foci, our methods of practice must be changed. I have no doubt, as the essayist has said, that mouth foci are blamed for many things for which they are not responsible. There are some dentists and not a few practitioners of medicine who are doubtless going too far in the wholesale removal of teeth. The physicians with whom I have been associated endeavor to eliminate all foci of infection, including the teeth, from all parts of the body. They realize that there are many other parts of the body beside the jaws which may be a cause of metastases. Pyorrhea specialists should take up the subject of pyorrhea in somewhat the same exhaustive way as has been done by Drs. Black and Noyes to determine what its pathology is. Then they may be able to offer rational treatment which will bring about a cure. No one should call himself a specialist unless he does this. Dentists have tremendous problems before them which will take the wisest and best among them to solve. I trust that they will go to work at once to discover the cause and cure of some of the more serious diseases of the mouth.

DR. G. ALDEN MILLS, New York: Dr. Black's analysis and research in this matter take me back to 1876 when I wrote the first articles that were published on this subject of Riggs' disease, except one by Dr. Riggs, and by these articles were initiated the studies on pyorrhea. I studied in sympathy as a student of Dr. Riggs. I had the value of his acquaintance and the value of his treatment on my teeth, and though 86 years old, I am happy to say that I have a good many teeth left. Dr. Smith of Philadelphia has forced on the profession the question of prophylactic treatment. So we have now to say that prophylactic treatment is of immense help in the treatment of this disease.

DR. E. P. R. RYAN, New York: The greatest thing about Dr. Black's paper is the information he has given us of the cases he has reported that are not, and cannot be blamed for systemic infection. Men working every day need some standardization of examination of the roentgenograms that are made. We all have an isolated case here and there that we lay to some systemic condition of the mouth; but what the man in practice wants to know for making a rational diagnosis is, What is the percentage of those cases? We can extract all the teeth in the mouth, but that is not good dentistry, and that is not going to cure the disease. I think the suggestion of the examination of the normal teeth as well as those diseased, and determination of the relative percentages, should be accepted, and some means devised whereby we can all make observations and report them, and arrive at some definite and precise conclusion.

DR. ARTHUR ZENTLER, New York: As the paper of Dr. Black deals with the pathologic study of the tissues involved in infections of the mouth, I feel that it may be appropriate to report the divers findings in the examination of sections obtained in operating for eradication of such oral infections.

The picture seen in the photomicrographs prepared from pathologic laboratory slides is different when obtained from mouths of patients suffering from different types of general disturbance; for instance, arthritis, cardiac lesions; infection due to external trauma (a blow on the chin), which is relatively of acute character, apparently causing no general disturbance; still different when the infection is due to operative trauma, the infection being of long-standing and in a patient of a special diathesis; for instance, tuberculous.

[The discussion was illustrated by lantern slides.]

DR. ARTHUR D. BLACK, Chicago: Among the films exhibited, there is a set of roentgenograms of the mouth of a patient who was under the care of a so-called pyorrhea specialist. The radiographs show that the alveolar process has been destroyed nearly to the ends of the roots of the upper bicusps and molars, and these teeth are apparently being held in place by orthodontia appliances while they are scaled and treated. This case illustrates what I meant when I said the practice of dentistry needs to be revolutionized. Here is a mouth in which it is evident to any one who has studied the problem of focal infections that the teeth should be extracted. There must be developed in the dental profession a sense of recognition of mouth infections before we can make real progress with this subject. The dental profession must recognize that such foci are a menace to health; then it will not be difficult to get action. The more I study these conditions the more I am convinced that more teeth must be extracted.

THE IMPORTANCE OF DIET AS A FACTOR IN THE PRODUCTION OF PATHOLOGIC CHANGES *

WILLIAM SALANT, M.D.

WASHINGTON, D. C.

It has long been known to the medical profession that the etiology of certain diseases is closely associated with, and may indeed be dependent on, the kind of food in daily use by man. This was found to be especially the case when the employment of a particular diet was persisted in for a considerable length of time. But within recent years the conception of a causal relation between diet and disease has taken a more serious turn, leading in some cases to the formation of well defined plans for the establishment of a connection between the food eaten and the manifestation of some morbid processes. The progress made in this direction may be readily appreciated on examination of the literature on this important subject, which bears evidence of numerous painstaking and in some cases exhaustive experimental inquiries that resulted in the accumulation of a considerable store of valuable information. The data at hand, although far from complete, nevertheless justify the conclusion that abnormal changes may be seriously influenced, and sometimes brought about, by the consumption of certain foods.

It has been shown by numerous experiments that a diet from which the juices of certain fruits are absent may cause a condition closely similar to, if not identical with, scurvy in man. The investigations on beriberi have disclosed the important fact that an exclusive diet of polished rice when eaten for some time may produce this condition in the human subject. It has also been definitely established by a number of observers that polished rice alone fed to birds for about

six weeks may cause polyneuritis. Recent studies of pellagra have likewise shown that its etiology is closely associated with deficient diet.

The rôle which diet plays in the causation of disease seems to be even more extensive than that just indicated, different lines of inquiry furnishing evidence of its growing importance in pathology. That it is not confined to the so-called deficiency diseases is suggested by the results of pharmacologic investigations which have been brought to light within the past few years, for it has been shown that a definite relation exists between diet and pathologic changes produced by well defined chemical substances.

A valuable contribution to the subject was made by the investigations of Hunt,¹ whose results indicate the importance which might be attributed to diet as a factor in determining the toxicity of some poisons. In experiments on mice that were fed a large number of different substances, Hunt found that the reaction to acetonitril varied considerably with different diets, some of which increased forty times or more the resistance to this poison. Glucose, oatmeal, liver and kidneys were found to exert a beneficial effect, the toxicity of acetonitril being decreased many times. This is attributed by Hunt in part to a specific effect on the thyroid. He also pointed out that some articles of diet, such as eggs, milk, cheese and various fats may, on the contrary, lower the resistance to acetonitril.

The protective action of diet against drugs has been studied at various times in the pharmacologic laboratory of the Bureau of Chemistry for several years. In studies with caffein, Rieger and I² were frequently impressed by the difference in the reaction to this drug which was exhibited by dogs receiving different amounts of protein.

A high protein diet, it was found, was conducive to increased resistance to this drug. It might be stated that all the animals were given a diet of the same caloric value, but the amount of meat was reduced to 6 gm. daily, which is one third of the amount given in the experiments on a high protein diet. In individuals that received a low protein diet, symptoms developed after much smaller doses. We also found in some experiments that abscesses developed at the site of injection when caffein was given subcutaneously. The same treatment in dogs on a liberal diet of meat was never followed by local infection in any of the experiments with caffein which were performed in my laboratory. Evidence of the effect of diet was also furnished by studies that were carried out with several other chemical substances. In experiments on the toxicity of oil of chenopodium which Nelson and I³ carried out on different animals, we found that fatty oils modify the action of this substance. The toxicity of the oil of chenopodium for cats and rabbits which had received cottonseed or coconut oil was diminished at least 50 per cent. in some cases. The surely fatal dose of this drug was well borne, or caused only slight symptoms in animals which had received this substance with the fatty oils. Evidence was also obtained that diet rich in carbohydrates has a similar effect on rabbits to which the essential oil is administered.

As pointed out in my paper with Smith,⁴ rabbits which were fed carrots resisted much larger doses of the tartrate than those which received oats and cabbage. More than twice the surely fatal dose could be given

* From the Pharmacological Laboratory, Bureau of Chemistry, U. S. Department of Agriculture.

¹ Read before the Section on Pathology and Physiology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Hunt: Bull. 69, Hyg. Lab., U. S. P. H. S.

2. Salant and Rieger: Bull. 148, Bur. of Chem., U. S. Dept. Agric.

3. Salant and Nelson: Am. Jour. Physiol., 1915, **36**, 440.

4. Salant and Smith: Am. Jour. Physiol., 1914, **35**, 239.

without producing symptoms. The investigation of the effect of diet on the toxicity of this substance was resumed recently, and was considerably extended by Swanson and myself.⁵ The observations were made on rabbits and cats with a large number of different diets which were given for some time previous to the subcutaneous injection of tartrate. Striking differences in the toxicity were observed. A dose of 3 gm. per kilogram was survived when young carrots were fed for four days before the tartrate was given. In another series with 3.5 gm. per kilogram, one out of four rabbits survived and another lived six days. The surely fatal dose was found to be not less than 4 gm. per kilogram. The resistance was likewise very marked when carrot leaves were fed from four to eleven days before injecting tartrate, although it was less than in the case of the tuber of young carrots, the minimum fatal dose being about 2.5 gm. per kilogram.

A high degree of resistance to tartrate was also shown when sweet potatoes were fed. A dose of 2.0 gm. per kilogram failed to produce nervous symptoms or furnish evidence of renal irritation. Sodium tartrate proved to be most toxic when the diet consisted of oats. Under certain conditions 0.5 gm. per kilogram injected subcutaneously proved to be fatal in 85 per cent. of the experiments, symptoms of renal irritation and nervous disturbances being noticed; but in some cases it was necessary to give 1 gm. per kilogram to produce typical symptoms and death. In other words, the resistance to tartrate was at least four times as great on a diet of young carrots as on oats. Experiments with tartrate on cats that received different diets failed to show any marked difference, but it may be remarked that in these animals the toxicity was markedly increased in starvation, which was also noticed in rabbits. There is reason to believe that similar effects may be produced not only in starvation, but when the diet is restricted.

That protection is also afforded by diet against the injurious effects of some of the heavy metals was furnished by the results of experiments with zinc malate. Wise and I⁶ found that small quantities of this salt given intravenously to rabbits produced marked albuminuria in twenty-four hours. Zinc malate equivalent to 10 mg. of zinc per kilogram was injected into the ear vein of rabbits which were fed oats or carrots for some time previous to the experiment. Out of six rabbits which received a diet of oats alone, only one survived; two lived three days; the rest died at the end of four, six and eight days. All of them developed a very pronounced albuminuria, approximately 300 to 500 mg. of albumin being present in 100 c.c. of urine. The rabbits which received carrots as the exclusive diet exhibited a decidedly greater resistance to zinc poisoning. Only two fatal cases occurred in the same number of experiments. One of the rabbits died after two days, but in this experiment 1.25 mg. of zinc per kilogram were given, and what may be particularly interesting in this connection was the fact that the appetite of the animal was poor before the zinc was administered. It is worthy of note that but a trace of albumin could be found at any time after the injection of zinc malate in these two rabbits. In all of the other carrot-fed rabbits that survived the injection of zinc, the injury to the kidney was apparently not serious, if it existed at all. In some cases the urine was free from albumin or contained mere traces. Appreciable quantities were

found, however, in the course of observation, but in nearly every case they disappeared within twenty-four hours. This, as is well known to every experimenter who has studied the urine of rabbits, is a frequent occurrence in these animals and may be physiologic. It cannot be attributed, therefore, to zinc. Evidence that a carrot diet protects the kidney against other nephritic poisons was obtained in my laboratory in experiments with oil of chenopodium and coconut oil. Bengis and I⁷ carried out a series of experiments with these two substances on rabbits. Our results have shown that from 0.2 to 0.4 c.c. per kilogram of the oil of chenopodium dissolved in 15 c.c. of coconut oil and fed to rabbits may be followed by albuminuria which was very pronounced in some individuals. The appearance of many granular casts which persisted for several days had also been observed. Another series of rabbits, which had been receiving carrots for several days, were subjected to the same treatment. Indeed, the amount of oil of chenopodium per kilogram that was fed with 15 c.c. coconut oil was even larger than in those rabbits fed on oats, but no evidence of renal disturbance was present. Neither albumin nor casts appeared as a result of this treatment. Furthermore, when the same animals were given oats, and then carrots, the results obtained were similar to those described above. The albumin and casts promptly disappeared when the carrots were substituted for oats. It also happened sometimes that the appetite in some of the carrot-fed rabbits suddenly diminished. This was soon followed by the appearance of urinary symptoms, thus showing again that a carrot diet protects the kidney. Finally, I should like to report the results which Swanson and I⁸ have been fortunate to obtain recently in our studies on the effect of diet on the permeability of the kidney in tartrate nephritis. These experiments, which are still in progress, indicate that the injury to the kidney caused by this salt varies considerably with the diet. From 0.2 to 0.3 gm. of sodium tartrate given subcutaneously may retard the elimination of phenolsulphonephthalein to a very considerable extent in rabbits when fed oats alone. The amount of dye eliminated had decreased by a half to two thirds about five hours after the administration of 0.2 gm. sodium tartrate per kilogram.

The injury was much greater when 0.3 gm. sodium tartrate per kilogram was injected. None, or merely a trace, of the dye appeared in the urine of two rabbits on the day of the injection of tartrate. Three days later phenolsulphonephthalein was injected again. Four per cent. of the dye was eliminated by one rabbit, and 5 per cent. by the other in three hours. In a third experiment 37 per cent. of the dye was eliminated on the day tartrate was injected. A test made two days later indicated that no improvement occurred, the amount of dye eliminated being 30 per cent. In all cases functional tests were made on the two preceding days before injecting tartrate. The amount of dye eliminated varied between 63 and 86 per cent. When the dose of tartrate was raised to 0.5 gm. per kilogram, from 0.5 to 1 per cent. of dye appeared in the urine on the day of injection. Its elimination continued for several days. When carrots alone were given for three to four days previous to the injection of tartrate, and if this diet was continued for some time after the administration of tartrate, renal permeability remained quite satisfactory, although the minimum dose was

5. Salant and Swanson: *Proc. Soc. Exper. Biol. and Med.*, 1917, **14**, 100.

6. Salant and Wise: To be published.

7. Salant and Bengis: *Jour. Pharmacol. and Exper. Therap.*, 1917, **9**, 1529.

8. Salant and Swanson: To be published.

much larger than in experiments on a diet of oats. Functional tests made at the end of five hours after injection of 0.5 gm. of tartrate per kilogram indicated that the elimination of dye was normal, or nearly so, in all cases except one, in which only 31 per cent. of phenolsulphonephthalein was eliminated on the day tartrate was administered. It may be remarked that in this case the permeability of the kidney was found to be below the average during the preliminary period. Corroborative evidence of the favorable effect of this diet was obtained with larger doses. One gm. of sodium tartrate per kilogram caused marked retardation of the elimination of phenolsulphonephthalein in some experiments, but in most cases recovery of renal permeability was observed within one to three days after injecting the tartrate. It is worthy of note that it occurred even when the dose was doubled.

In experiments with 2 gm. of sodium tartrate per kilogram, disturbance of renal permeability was observed at the end of one or two days; but recovery occurred on the second or third day.

The protective action of diet against injury to the kidney had also been pointed out by previous investigators. Ellinger⁹ reported about ten years ago that cantharidin failed to cause nephritis in rabbits which had been receiving carrots. More recently Opie and Alford¹⁰ maintained that a carbohydrate diet protects the kidney, as well as the liver, against different poisons. It may be pertinent to inquire how this action is brought about, and which component of the diet is responsible for the protection afforded. The larger amount of bases causing an alkaline urine may be thought of as the cause, but this can be promptly eliminated from our consideration since other alkaline diets, such as hay or cabbage, do not protect the kidney against tartrate. Whether the large amount of sugar present in carrots, which favors the accumulation of very considerable quantities of glycogen, is a factor is not decided. It appeared to me⁴ at one time that such an assumption might be justified. The explanation may be found perhaps in the effect a carrot diet produces on bacterial growth. It has been shown by Metchnikoff and Wollman¹¹ that indol formation is inhibited in rabbits when fed carrots. Perhaps the formation of cresol and phenol, and other substances which may cause renal irritation, is likewise inhibited by a carrot diet or other diet rich in sugar. Intestinal intoxication may indeed be the important factor, therefore, which operates in modifying the toxicity of various poisons.

Our knowledge of the relation of diet to the action of poisons is, of course, far from being complete. Indeed, it is as yet in its infancy. The evidence which I have presented is not intended as a warrant for generalization, but it should serve rather as a stimulus to further investigation of a difficult but a very important subject full of promise of valuable results to medicine.

ABSTRACT OF DISCUSSION

DR. ROBERT A. HATCHER, New York: Dr. Salant's paper deals with a subject of such extraordinary complexity that no systematic discussion of it is possible in a short time, hence no apology is necessary for limiting my remarks to a few suggestions. It has probably occurred to Dr. Salant that the water present in a diet of carrots might account for some of the difference in the toxicity observed. Intestinal secretion and intestinal movements are also markedly

influenced by the amount of water taken, and it may be recalled that tyramin and histamin, to mention only two active substances, have been found in the circulation during intestinal stasis, and it is easy to understand that these and other poisons may influence the circulation profoundly, and existing pathologic processes secondarily, in the most diverse ways.

We have had occasion to observe a remarkable difference in the toxicity of certain active poisons for vegetarian rodents, including the guinea-pig, rabbit and white rat, on the one hand, and carnivorous animals, such as the cat and dog, on the other. In some cases, at least, we have found this to be due to difference in the capacity of the liver to fix and destroy poisons, as shown by the fact that when the liver of the resistant rat is removed it behaves toward some of these poisons more nearly as the cat or dog does.

I have been tempted to suggest a general, but not universal, development of a tolerance toward vegetable poisons in these animals, which must be subject to frequent accidental poisoning. Dr. Voegtlin recently remarked to me that the effects of diet on the toxicity of poisons indicate some of the precautions to be observed in conducting those biologic tests which are dependent on toxicity, such as the biologic standardization of drugs.

DR. ALFRED F. HESS, New York: The fact that the toxicity of these drugs is increased on an oat diet, which is essentially an acid diet, and is lessened by a diet of carrots, which is essentially an alkaline diet, raises the question whether the reaction of food plays an important part. Dr. Salant touched on this question. He said that carrots and cabbage, which constitute also an alkaline diet, do not have the same effect. Did he give an alkaline diet to any of these animals? Did he try to neutralize the acid effect of the oat diet by a liberal addition of some alkali?

DR. WILLIAM SALANT, Washington, D. C.: The question raised by Dr. Hatcher regarding diuresis being a factor in increasing the resistance to different poisons has been attended to in our studies of the subject, but I did not bring all the experimental material before you on account of the short time allowed for presentation of the paper. Rabbits which were fed oats were given 100 c.c. of water by mouth two or three times a day. Beside, diets which favor diuresis, such as cabbage, have not the same protective effect as a diet of carrots. Furthermore, not all carrots have the same protective action. Old or winter carrots did not produce the same effect as young carrots, although the diuretic action is the same, the amount of urine passed being equally large in both cases. But young carrots differ in chemical composition from old carrots. As regards the alkalinity of the diet, I might add that we fed rabbits on hay. The alkalinity of the urine was much more marked than after carrots. Yet the toxicity of tartrate was about the same as on a diet of oats.

Reducing the Number of Stillbirths.—Report of an experiment in the care of expectant mothers with the idea of reducing the number of stillbirths and the deaths of babies during the first month has been made by the New York Milk Committee. Stillbirths were reduced 22 per cent. and deaths during the first month 28 per cent. These figures were arrived at by a comparison of the results from the experiment carried out by the milk committee with corresponding statistics of the Borough of Manhattan during the period 1912 to the end of 1916. During this period 3,145 expectant mothers were enrolled and given care and supervision for an average of three and one-half months before and one month after confinement. Each mother was visited at her home every ten days by a specially trained nurse, and by a physician whenever it was necessary. Clinical consultation and physical examination and treatment for abnormal conditions before the birth of the baby and during the first month afterward were provided. In the experiment 3,192 babies were born to 3,145 mothers. Of these, 115 were stillbirths, and 86 babies died during the first month. Five mothers died, a rate of 1.5 per thousand, as against a rate of 4.9 in the city at large. This was a reduction of maternal mortality of 69 per cent.

9. Ellinger: München. med. Wehnschr., 1905, 52, 499.

10. Opie and Alford: Jour. Exper. Med., 1915, 21, 21.

11. Metchnikoff and Wollman: Ann. de l'Inst. Pasteur, 1912, 26, 825.

STATE ORGANIZATION FOR MENTAL
HYGIENE *

OWEN COPP, M.D.

Superintendent, Pennsylvania Hospital for the Insane
WEST PHILADELPHIA, PA.

Hygiene comprehends more than conservation of health and prevention of disease. A derivative of the Greek *ὑγιής, ὑγίεια*, latinized in "hygeia," it signifies soundness. In ancient mythology Hygeia, chief daughter of Aesculapius, personified health. Thus, etymologically "hygiene" is as broad in meaning as the term "health" itself, and may, properly, be used as a synonym; hence mental hygiene becomes another form of expression for mental health.

Public agencies in matters of physical health are primarily concerned with prevention of disease and promotion of health, but, inevitably, they encounter insanitary conditions, causes and consequences of disease, its disabilities and its sufferers, whose correction, relief, restoration and care become imperative duties. Nevertheless they are not designated commissions for correction of insanitary conditions or boards for infectious diseases, but are universally known as boards of health, indicative of their beneficent purpose.

In like manner, public agencies, in matters of mental health, have the same primary aims and duties as those concerned with physical health, and, likewise, inevitably are confronted with the great problems of care, provision, treatment and restoration of the afflicted with insanity, feeble-mindedness and epilepsy. Is there any greater necessity for designating such agencies committees of lunacy, or boards of insanity, than for substituting commissions for correction of insanitary conditions, or boards for infectious diseases, for the acceptable title boards of health? Would not the analogy of physical health suggest the appropriateness of boards for mental hygiene?

Insanity, feeble-mindedness and epilepsy are end-products. Their causes are rooted in heredity, environmental maladjustments and adverse social influences. The obvious need of the insane, feeble-minded and epileptic patient appeals to humane instincts and, naturally, first found partial satisfaction in institutional provision. Time was when this summed up the total of public interest and recognized duty. It appeared to be a saving of public money to evade as much of the burden of such afflicted as might be left on the back of the individual and the family, submerged in public unconsciousness. But accumulation of end-products has gone on apace, until their increase, already enormous, presents a still graver outlook.

There is a growing conviction that the policy of evasion and inaction is unwise and uneconomical; that the roots of mental disease and mental defect must be torn out of the community; that underlying causes must be sought by investigation and unremitting quest; that the mental patient must have early and adequate treatment; that the individual and family should be encouraged to accept and seek relief from this burden by the public under suitable safeguards, because its weight is thereby lightened, its strain is less likely to break down more unfortunates, its exactions cease to impoverish, its asperities are softened by measures of alleviation, and its menace of increase of defectives is less threatening.

The separateness, up to recent date, of institutions from outside interests and activities has been notable. Their self-absorption seemed necessary, because of the specialized nature of their work, its magnitude and the scantiness of resources for its accomplishment. Gratitude and reverence are excited by the devotion and public service of founders and managers of institutions. Gradually, however, institutional workers have become conscious of the need to reach out into the community to help and be helped in the wider field of preventive and constructive effort, conscious of their almost exclusive opportunity to acquire knowledge and experience fitting them to advise and direct in such effort, and conscious of their supplemental relation to social, health, educational, charitable and reformatory agencies, that discover and minister to such needs in the community at large.

Mental hygiene is the synthesis of these institutional and communal forces in a common and inspiring purpose. It turns away from sole contemplation of degeneracy, disease and death to constructive achievement, health and life. Mental hygiene thus assumes a broad meaning, inclusive of all the duties and activities, arising out of:

1. Conservation of mental health.
2. Prevention of mental disease and mental defect.
3. Investigation of their nature, causes, consequences, and measures of treatment.
4. Interpretation and diffusion of such knowledge to the public and the medical profession.
5. Promotion of the early recognition and treatment of such afflicted by the family physician who has had, during his medical course, sufficient instruction and clinical experience in psychiatry.
6. Restoration of mental integrity and amelioration of adverse mental states by adequate hospital treatment.
7. Institutional adjustments, affording as nearly normal conditions of living as may be, to promote happiness and usefulness of patients.
8. Community organization facilitating their care at home under suitable safeguards against present dangers and future menace of reproduction of defectives.
9. Determination of the causative relation of mental abnormality to poverty, delinquency, inebriety, sex immorality, and many social evils, with a view to their prevention.
10. Provision for the care of the insane, feeble-minded and epileptic in institutions, so far as necessary, and in the family, so far as permissible under supervision.
11. Interchange by humane and efficient methods between state and national governments of such dependents, in order that they may be supported where they belong and the cost justly apportioned.
12. Solution of the economic problems involved in these undertakings.

The mere enumeration of these duties and activities is impressive in its revelation of the scope and importance of mental hygiene, the complexity of its relationship, the penalties of its neglect, and the necessity of correlation of all the forces of achievement along definite lines of responsibility in a militant attack on the whole problem.

Time does not now permit an attempt at demonstration, but it is almost axiomatic, as well as in accord with the best thought and experience, that the appropriate unit of authority in these great undertakings is the state.

The presentation of a concept of state organization, principles of administration, definition of duties and spheres of responsibility in a state system for mental hygiene in its broad meaning is the purpose of this

* Read before the Section on Nervous and Mental Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

paper. In the early years of state government, these matters received but scant attention. Quite generally their supervision devolved on a single general board in conjunction with health, charitable and reformatory interests. Necessarily in small states such a combination may persist; but in the larger states, experience and recognition of the diversity of such matters, the highly specialized character, wide scope and importance of each, have impelled toward the division of such a general body into separate boards of health, boards of correction, boards of charity and boards of insanity. Hence the initial step in forming a state organization is the creation of a state board for mental hygiene.

SUPERVISION VERSUS CONTROL

What should be the relation of such a board to the institutions and activities within its field? Should it be a supervisory, or a control relation?

The principle of supervision has been established in necessity and experience. Historical fact proves that care of the mentally affected in the home, the almshouse, the county asylum or the state hospital has been unsatisfactory without it. Improvement has necessitated and followed organized state supervision.

The first conception was advisory only. The supervising body, free from direct responsibility for local administration, stood in judicial attitude. Informing itself of the truth of a matter in controversy, it defended or censured local administrators according to the justice or injustice of public criticism. It has been a tower of strength in this relation. Its advice and suggestion, often from wide observation and lifelong service, have furthered the best progress. As a medium of spreading knowledge of activities and methods of one local administration to another, it has tended to coordinate them and unify their standards. The supervisory relation is honorable and attractive to the best citizenship, philanthropic, devoted to public service, able in affairs of business, aspiring to high professional ideals, sympathetic and broad in concept of duty to the unfortunate. Such service has been unpaid and is unpurchasable. Eventually, however, two weaknesses appeared in the form of supervision originally in vogue. In some localities, particularly Western states, local boards of administration did not always rise above considerations of self-interest or friendship in institutional appointments and purchases. In other localities, even the older states of the East, the effectiveness of general supervision became doubtful.

Both weaknesses invited the same remedy, greater control by supervising bodies and concentration of powers in smaller and fewer boards. The reaction, in some instances, drove the pendulum to the far limit, the single paid board of three members, abolition of local boards of administration, centralization of powers in one small body with absolute control without organized supervision. Although such a control régime might be tolerated as a temporizing expedient to oust politics and personal self-interest, it can never be acceptable as a permanent and satisfactory mechanism of achievement in this important field. Nevertheless it has not been devoid of good results. So far as good appointments have been made and stable tenure of office maintained, bad local situations have been improved and progress started. Indeed, initial boards have generally been progressive and efficient in early accomplishment. Experience, however, is revealing certain defects and weak tendencies.

The control régime narrows the circle of friends of these unfortunates in that it abolishes local and general boards of supervision with large membership, whereby many citizens gain their first knowledge of them and, thereafter, become active and lifelong champions of their interests. Such friends widen the circle to include others of their acquaintance, quicken public consciousness of the obligation to minister to the needs of such afflicted, and stand a strong defense against unjust and destructive criticism.

Wide and sustained interest in these classes is not merely humanitarian. It lessens the public burden by encouraging benevolence in their behalf and increasing willingness of relatives to receive them back from institutions to their homes.

The control idea is arbitrary and dictatorial in its nature and tendency, less likely than the supervisory relation to foster initiative, originality and development of local efficiency; and yet virility in any system of management has its roots in the men near the patients, working out their problems and needs, originating ideas and methods for their welfare, constituting the one indispensable requisite to progress. A stream cannot rise above its source. The great, outstanding barrier to achievement in mental hygiene is poverty in men of scientific instinct and ability, thoroughly educated in arts and science, trained in psychiatry and administration, absorbed in their vocation as a life work, encouraged and spurred on by helpful supervision.

At best a general board, supervisory or control, is distant from this fountain head. Neither can be an original source of ideas nor wisely attempt to initiate activities in local units. Their usefulness is restricted largely to correlating and standardizing such activities, disseminating knowledge, coordinating extrarelations and interrelations between local units, formulating general policies and inspiring energies.

Ascendency of the control idea has had a trend away from supremacy of medical and scientific ideals toward lay standards of mere care, housing and utilization of productive labor, within a field preëminently medical in its requirements.

The economic folly of such a trend is shown in a situation recently revealed at the Pennsylvania Hospital. A daughter of a syphilitic father, who had died in an insane hospital, was received in the early stages of juvenile paresis, due to inherited syphilis. Investigation found the mother and five brothers and sisters also infected with syphilis, doubtless from the same source, the father. In such a case the absence of the medical and scientific spirit would stop effort with the humane care of the father, but its supremacy would also afford adequate study and treatment to prevent secondary infections and possibly sixfold increase of expense and untold suffering.

Is there any real economy in the immediate saving, if such there be, which ignores causes and prevention and invites disaster in the inevitable accumulation of end-products?

Furthermore, the control idea leaves other traces of degeneracy, as instability of service, lower average grade of appointments, less average experience and training in a specialized field, increasing liability to political dominance, and utter inadequacy of central organization efficiently to perform great local functions.

Finally, has the control régime, in reality, the justification of greater economy? Ponder the conclusions

of Henry C. Wright and be convinced by reading the detailed statement of his impartial and painstaking inquiry¹ and comparison of methods and results of administration of charities and correction in three great states: Iowa, the oldest and, probably, best example of absolute control, free from politics, by prominent citizens of integrity and ability; New York, representing partial control and greatest persistence of medical standards, and Indiana, staunch adherent of the traditional board of state charities, without control powers, with only supervisory duties and the right to know, to advise, to cooperate and inspire, but, now as for many years, fortified in a membership of "men of exceptional judgment and devotion," who "selected and retained in the office of secretary" "men of marked ability, each of whom has gained a national reputation for knowledge and wisdom with regard to the management of the various classes of state institutions." Mr. Wright affirms in his conclusions, after investigation, that:

Centralization in New York has secured low unit prices, but not economical administration of the institutions; the low unit cost has been largely offset by the delivery of goods of a lower grade than those contracted for; that Indiana secures an economical administration and very satisfactory results under the present form of supervision through the Board of State Charities. Its institutions are managed more economically and more satisfactorily than the institutions in either Iowa with complete centralized control, or in New York with a partial centralization.

IDEAL FORM OF ADMINISTRATION

Nevertheless, in my judgment, neither the pure supervisory idea, nor the pure control idea, is the best expression of an ideal form of administration. Out of present conflict will evolve a happy mean, a stable balance, safeguarding, on the one hand, against arbitrary dictation, and, on the other, against tendencies toward indecision and ineffectiveness.

The prerequisites of such an evolution are:

1. A spirit of amity and deliberation, manifest in conference and cooperation between general and local administrative units.
2. Definiteness of spheres of responsibility within such units, determined by mutual agreement or law.
3. Absolute local control of executive details within such local spheres under principles and rules of procedure, appointment, methods and standards fixed by mutual agreement or law.
4. Absolute control by the general board of extrarelations and interrelations and general policies of local units, under principles and rules of procedure fixed by mutual agreement or law.
5. Right of initiative reserved to such local unit in its sphere of responsibility, but, if not exercised spontaneously, subject to suggestion, even compulsion, by the general supervising board.
6. Requirement of approval, with right of modification and veto by the general supervising board acting under specific provisions of law, of main projects, initiated in local units, before they are undertaken.
7. Unlimited power of the general supervising board to investigate, report and recommend as to any matter within any sphere of activity in any unit.
8. All direct powers of the general supervising board specific and fixed by law.
9. Creation, if found necessary, of a special judicial body, possibly the three senior justices of the state supreme court, to interpret principles and rules and enforce its decisions, under specific provisions of law.

These general principles formulated on a workable basis, extended and perfected by experience, would constitute a democratic system of state administration, stable in balance, conducive to local efficiency and harmony. It would be an adequate mechanism for the discharge of recognized public duties, but it would lack one essential element, supervision by an eye single to the public welfare, undiverted by direct responsibility, except for the truth and justice of its observations and utterances. Pure supervision within both national and state fields would be best afforded by private agencies, organized under the leadership of the National Committee for Mental Hygiene, its state societies and allied associations, such as the New York State Charities Aid Association.

Private agencies are potent in mental hygiene because they are free from politics, unfettered, and altruistic in their aims. They touch many individuals, sources of energy and financial support; they are pioneers in fields of investigation to discover new principles, test their truth and utility and encourage their adoption by public agencies in common usage. They diffuse knowledge, awaken public consciousness of needs and the obligation to meet them. They create and mold public opinion in right form, which controls politicians, legislators and other public officials. They supplement public agencies which, of necessity, are more conservative, because they are the established mechanism for accomplishing routine and essential duties, accountable for results of their recommendations, hesitant in initiative lest the confidence of the government be forfeited by advocacy of projects before their usefulness and economy have been demonstrated.

Private agencies should be sympathetic and appreciative of the difficulties and limitations of public agencies. They should bear in mind that constructive criticism, that contributes something to the solution of public problems, is the only helpful utterance.

Such private and purely supervisory agencies should have the legal right to visit and inspect institutions and all activities within each local and general sphere of responsibility.

They should be required to make, at stated intervals, reports of their findings with recommendations to the state board for mental hygiene. The value of such reports and recommendations would be commensurate with the competency of trained visitors.

Relief from political influence is the foremost requirement in any field of public endeavor. Any system of administration without it is better than the most perfect theory under its domination. Therefore the spirit of civil service should govern and protect all appointments in the field of mental hygiene.

The state board for mental hygiene should have power to divide, and redivide as changing conditions may require, the state into districts for mental hygiene, each in charge of a district board.

Each district should vary in extent and location according to existing centers of population, their prospective growth and needs, constituting a definite sphere of responsibility for all local administrative activities for mental hygiene in its broad meaning. Briefly stated, each district should have its psychiatric hospital with associated preventorium, outpatient mental clinic with social service and educational bureau; its colony with outlying arms near populous centers and family care extension into neighboring communities; its infirmary for the feeble, aged,

1. Made for the New York State Charities Aid Association in 1909.

intractable and dangerous long resident patients suitably classified.

As the district board for mental hygiene should administer these local institutional units and community activities, and should coordinate and standardize extrarelations and interrelations and methods between them through responsible executive heads for each, so, in like manner, the state board for mental hygiene should direct the larger activities and general policies within the state as its sphere of responsibility, and should coordinate and standardize extrarelations and interrelations and methods between districts for mental hygiene, with other states and the national government, in conformity to the general principles before enunciated.

State and district boards for mental hygiene should be appointed, constituted and organized substantially alike. Each board should have a membership of four men and one woman, or, possibly five men and two women, for terms of five or seven years, respectively, nonpartisan in politics, if possible, but otherwise drawn in equal number, so far as practicable, from dominant parties.

All members, except the chairman, should be appointed by the governor and be removable by him for cause; and such members should receive no compensation for services but payment for expenses actually incurred in the discharge of official duties. The chairman of each board should be its chief executive officer, a physician, expert and experienced in psychiatry and mental hygiene, and paid an adequate salary. The chairman of the state board should be appointed by the governor, but only on nomination of a majority of the other members of the board. The chairman of a district board should be appointed by the board, but only after approval of the state board.

All other appointments should be subject to civil service and made only on nomination of the chairman with approval of his board, either specific or as prescribed by its established rules.

General methods of administration and supervision by each board should conform to accepted rules of efficient management in general. Executive details should never be touched by superior authority except through the executive head responsible therefor, recourse for efficiency and control being had to advice, instructions, or, if necessary, removal of such executive head.

Acquisition and accurate comparison of facts, ascertained and verified by expert investigators in each main field, are the potent agencies of supervising authority for developing efficiency and uniformity of methods and standards. They inform, appeal to intelligence and reason, are constructive and helpful. They eliminate personality and necessity of dictation and command cooperation. Rarely, if ever, will they fail in achieving a legitimate purpose.

The state board should hold regular and frequent conferences with district boards and district executives for interchange of knowledge and experience and their accurate comparison, out of which it should formulate and establish general policies, standards and methods under a uniformity which would recognize, in measurable terms, real differences and inequalities of local conditions.

In organization for its own work the state board should provide for a support bureau headed by a psychiatrist, trained in matters of settlement and support, whose agents should investigate, in every

instance, the claims for support of all patients admitted to state institutions under its supervision. All patients found to be unjustly public charges should be removed to other states and countries, where they belong. In like manner the financial ability of patients and their relatives legally liable for their support should be ascertained, of whom such amounts should be collected as they could pay without hardship. Such investigation should not be allowed to delay the care of patients, but should be made after their admission to institutions. Interchange of patients between districts for mental hygiene should be in charge of this bureau.

The inception of a new institution should originate in the establishment of a new district for mental hygiene by the state board. Thereafter, as in existing districts, the newly created district board for mental hygiene should take the initiative and responsibility, under the principles before enunciated, in the location, planning and construction of institutional units and buildings, subject, however, to approval, modification or veto by the state board, acting under specific provisions of law and the general policy established by it, as before described, in conformity to standard specifications as to arrangement, plan, capacity, space allowance, kind and qualities of materials, etc., in such definite terms as would assure uniformity for like conditions and purpose. This would require a competent supervisor of construction as an officer of the state board.

The state board should inaugurate a policy of initiative and adequate performance of its functions through expert investigation and supervision within the various fields of activity for mental hygiene in the state and its districts.

Such a policy would necessitate a trained psychiatrist in the medical and clinical field; a scientific director of laboratories, medical and psychiatric research; a chief of social service; an expert accountant as supervisor of accounts and classification of expenses.

Economical purchase and use of supplies should be standardized by a representative committee, composed of the chairman of the state board, its supervisors of accounts and construction, and the chairmen of district boards, superintendents of district institutional units and district stewards. The district stewards, under the chairmanship of the state supervisor of accounts, should be the executive agency of the committee, whose other members should constitute the supervisory body.

Ceaseless quest should seek the highest standards of medical, scientific and economic efficiency.

Strictest economy consistent with such standards should govern public expenditure, because public funds for such purposes are limited, being rarely sufficient for bare necessities, and should be held as a trust for the unfortunate. To sum up, the faulty planning and locating of institutions; all construction other than that which is plain and simple in design and pleasing in proportions; all overornamentation; failure to attach the chief importance to spacious, durable, sunlit buildings suited to the need; waste in administration; extravagance and graft in any form—all these must be abolished, since every dollar wasted is wrung out of the patients, their health and comfort, their living space, facilities for their treatment, knowledge of their malady, and its prevention and cure. Lack of provision for such afflicted is almost universal, and their overcrowding in existing institutions is extreme in most states. Such overcrowding is, prob-

ably, the greatest hamper to their proper treatment and the gravest menace to their safety and welfare. Elimination of waste would go a long way in relief of this condition.

Scanty expenditure, however, should not be mistaken for wise expenditure. It is foolish to scrimp in original cost by impairment or deprivation of facilities and convenience of work. A small administrative leak continuous for years will more than offset large initial outlay to prevent it.

The field of mental hygiene is broad and rich in opportunity. Its cultivation with diligence, forethought and economy would yield abundant harvest for the public welfare; but there are seeds and roots of evil with momentous portent, unless found and removed. The state and district boards for mental hygiene hold the plow and should strike deep in furrows of investigation, search out causes and needs, formulate the practicable plans and policies to remove or satisfy them, arouse public consciousness of the obligation as well as expediency of action, and constitute always the sustaining energy of achievement.

ABSTRACT OF DISCUSSION

DR. ADOLF MEYER, Baltimore: If there are practical outlets such as Dr. Copp has depicted, it will be a great help in making the medical student feel that he is working toward a well organized field, and that he will not have to make his whole career for himself or depend on the present limited system of institutional psychiatry alone.

DR. E. E. MAYER, Pittsburgh: Dr. Copp's subject has such a practical aspect that I wish to emphasize that everybody should take home these ideas with him and work them out wherever there are state boards of insanity. These boards everywhere are considered to be dealing only with derelicts. The public is apt to look on a man as finished when he is put into an asylum. A board of mental hygiene would look on the whole question with a different attitude and the public would see the broader problems of prevention and treatment. I believe Dr. Copp does not desire to eliminate established commissions and boards of insanity, but merely to enlarge their scope by a change of name. Let us hope that added responsibility will be given to them also.

DR. L. M. CRAFTS, Minneapolis: I do not know what the scheme of arrangement of the different parts of the speaker's plan would be, as Dr. Copp did not have time to go into that in detail, but one important matter would be close articulation with the school board in every city and town, including a large element of control of the activities of both teachers and pupils. Our school curriculums are overcrowded now, and our colleges and many school boards are advocating and moving toward all-year sessions. This would subject even normal children to nervous strain, endangering their stability, and be entirely beyond the endurance of the neuropathic child.

DR. OWEN COPP, Philadelphia: The main idea of my paper is that when we begin to talk of insanity, feeble-mindedness and epilepsy, every one is depressed; but when we talk of mental hygiene it encourages the profession and the public to cooperate.

Birth Returns and the War.—The experience of the nations at war has brought home the fact that war makes orphans. It seems but fair, and one of the least of the things we might do for those who will give their lives for the nation, that we see to it that their children shall in later years be able to prove their parentage, their right to pension and inheritance, and their wives the right to widows' pensions for the rearing of the children in their own homes. The prompt registration of every birth that occurs in the state becomes a patriotic duty, which no physician or midwife can in conscience shirk.—H. Chalmers, M. A., (New York State) *Health News*.

EXOPHTHALMIC GOITER AND OTHER FORMS OF PATHOLOGIC KINETIC DRIVE*

GEORGE W. CRILE, M.D.

Fellow of the American College of Surgeons

CLEVELAND

Among the total of 2,169 operations for goiter which have been performed by my associates and myself, 1,020 have been for exophthalmic goiter. This statement at once suggests the query, On what basis were the cases of exophthalmic goiter differentiated from the other forms of goiter? Our rule has been to class as exophthalmic goiter every case in which, at the time of operation, there are symptoms of increased basic metabolism not due to any current exciting cause, and in which these symptoms are relieved or cured by diminishing thyroid activity.

THE RÔLE OF THE THYROID IN EXOPHTHALMIC GOITER

Among our cases we have seen no normal thyroids, hyperplasia being present in about 70 per cent.; most of the remaining 30 per cent. being adenomas, with a few colloid goiters (Marine, Graham).

That hyperplasia is not a cause but a concomitant effect of exophthalmic goiter is shown by the following facts of the total number of cases of hyperplasia of the thyroid at this moment existing in the United States, only a small, almost a negligible, percentage are co-existent with exophthalmic goiter, for hyperplasia of the thyroid is incident to pregnancy, to adolescence, to many infections, especially tuberculosis, and to cretinism. Hyperplasia of the thyroid is no more the cause of exophthalmic goiter than it is the cause of pregnancy, of tuberculosis or of adolescence. In each and all of these conditions, hyperplasia is an end-effect, not a cause. Here the analogy ends, however, for although resection of the thyroid does not terminate pregnancy, does not cure tuberculosis, does not modify the phenomena of adolescence, it does improve or cure every case of exophthalmic goiter.

If the thyroid does not initiate exophthalmic goiter, then by what means does its excision improve or cure the disease? We have elsewhere pointed out that any excitant of increased basic metabolism, emotion, exertion, infection, etc., when acutely applied, aggravates exophthalmic goiter, and the more intense the case of the disease, the more is it affected, and conversely, the greater the deficiency of the thyroid, the less effective are such excitants as emotion, exertion and infection, the effectiveness of these excitants diminishing progressively with the deficiency of the thyroid to the neutral stupid state of myxedema.

In other words, as the thyroid governs the rate of energy transformation, therefore as the thyroid activity is diminished, the range of metabolic activity will be diminished also.

THE RÔLE OF THE SUPRARENALS IN EXOPHTHALMIC GOITER

The excitants of increased metabolism lead to increased thyroid activity; but, as we have shown elsewhere, they cause also an increased output of epinephrin. Moreover, the symptoms of exophthalmic goiter are identical with those produced by the com-

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

bined administration of epinephrin and of thyroid extract, plus those due to the deterioration produced by the disease in certain organs. Among organs thus damaged are the heart, the brain and the liver. How then, shall we decide which symptoms are due to the suprarenals and which to the thyroid? Epinephrin increases basic metabolism, as is evidenced by increased temperature; it increases the force and frequency of the heart beat, increases the blood pressure; throws the blood from the inner larger arterial trunks to the periphery; dilates the pupils; produces sweating, and increases respiration. But epinephrin alone does not lower the thresholds of the brain; does not cause nervousness and does not cause trembling or insomnia. These are caused by thyroid secretion. These two groups of phenomena, together with the modified function of damaged organs, as the liver, heart and brain, make up the sum total of exophthalmic goiter.

MODIFICATION OF THE KINETIC DRIVE

Neither the suprarenal nor the thyroid has any direct communication with the external or the internal environment except through the nervous system and through hormones. Both the suprarenals and the thyroid respond adaptively to changes in the internal and the external environment through the mediation of the nervous system and hormones; therefore the kinetic drive may be modified in four different ways:

1. By eliminating or diminishing the external and the internal driving stimuli.
2. By depressing the sensitiveness of the nervous system.
3. By diminishing the amount of thyroid tissue.
4. Probably by diminishing the suprarenal tissue.

There are no other organs or tissues that can be controlled in like manner by modifying the internal and the external environments. Therefore in the interrelation of the suprarenals, the thyroid and the nervous system, we may find the key not only to the pathologic physiology of exophthalmic goiter, but also to certain fundamental normal physiologic processes as well.

If an individual with exophthalmic goiter could be made to hibernate like a bear he would probably come out cured; for when the driving mechanism, the brain, rests, then the organism as a whole rests; and if the rest is long enough, certain pathologic states tend to revert to the normal state.

If the thyroid activity is depressed by the ligation of arteries and nerves, by destructive injections or by excision, then the activity of the nervous system at once slows down, because the fabrication and output of specialized activating products is diminished and in consequence action currents will be diminished. Consequently the power of the brain to drive the various organs of the body is diminished, and by so much is the drive diminished.

OTHER FORMS OF PATHOLOGIC KINETIC DRIVE

Worry, fear, grief, infections, overwork, adolescence, autointoxication, etc., are the common exciting causes of exophthalmic goiter. Any one of these excitants may just as readily cause neurasthenia, cardiovascular disease, cardiorenal disease or diabetes. Let us consider that protean disease neurasthenia. It is produced by environmental stimuli that give rise to exophthalmic goiter; it is relieved by rest by controlling work, by eliminating worry, infection,

autointoxication, etc. If the exciting causes of exophthalmic goiter and neurasthenia, and the medical treatment are practically identical, what then is the essential difference between neurasthenia and exophthalmic goiter? In many cases of pathologic drive the diagnosis by one physician will be light exophthalmic goiter, by another neurasthenia. It may be compared to the distinction between wealth and riches—they are apparently varying degrees of similar processes. If the foregoing is true, then it should follow that in exophthalmic goiter as well as in neurasthenia the symptoms will be mitigated by excision of a part of the suprarenal tissue. That this is probable is indicated by the early clinical results in five cases of neurasthenia in which one suprarenal and the anatomically excessive thyroid tissue were excised. It is still too early to reach any final conclusion. The course pursued in these cases is reported here only as a suggestion for further study, and does not stand as a recommended treatment. Among the other phenomena noted was the almost complete and immediate disappearance of the excessive sweating. From the clinical data in certain cases of exophthalmic goiter, therefore, in which resection of the thyroid was followed by increased nervous stability and increased body weight, while there remained a flushed face, sweating and an increase in the frequency and force of the heart beat, we may infer that while the thyroid symptoms of the disease were relieved, the suprarenal group persisted. It may be that the excision of part of the suprarenal tissue will supply the complete cure for such cases as these. Certainly in this study may be foreseen a possible explanation and treatment of the end-results of the overdriving of the organism.

NOTE ON THE OPERATIVE TREATMENT OF EXOPHTHALMIC GOITER

Let us now return to the all inclusive and protean kinetic drive—exophthalmic goiter. These hypersensitive patients may be killed by fear, even by worry; by light infection; by moderate work; by slight injury, or by surgical anesthesia; hence they require associated treatment in the broadest sense, and in severe cases the operation itself must be graded. These frail and explosive patients are carried through the operation most securely as follows: by the highly specialized nurse anesthetist whom the patient securely trusts and does not fear; by local anesthesia with novocain; by feather edge dissection; by gentlest handling. In the most serious cases not only the first but each step of the graded operation is performed with the patient in bed—ligation in bed, lobectomy in bed. The operating room goes to the patient. Moreover, in serious cases we now leave the wound open, guarding against infection by applying dressings moistened with neutral solution of chlorinated soda for from twenty-four to forty-eight hours, the wound being then closed under analgesia in bed. That is to say, we literally make operating "rounds," giving a devitalizing injection of hot water or of quinin and urea hydrochlorid here; doing a ligation there; performing a lobectomy in another room; closing a wound in still another. And with each additional precaution, with each associated step goes a still further lowering of the death rate and of postoperative disturbance. In turn we can successfully handle patients who are moribund; all patients thus managed experience more prompt and secure clinical results; and finally other patients, with the assurance of safety and of slight

discomfort, come with tranquillity instead of dread.

With the progressive unraveling of the mysteries of pathologic physiology in the clinic and in the laboratory, we see appearing more and more clearly a new conception of surgery and physiology, based on total behavior and biologic adaptation. On this basis, health and disease differ only in that health is the result of complete adaptation, while disease implies a failure to achieve complete adaptation.

EXPERIMENTAL HYPERTHYROIDISM *

EDWARD C. KENDALL, PH.D.

ROCHESTER, MINN.

The fact that nitrogen elimination is much increased by administration of the thyroid hormone suggests that one method of investigating thyroid activity would be to study the results of an intense nitrogen metabolism.

About a year ago, I began to administer amino-acids to animals with an accurately timed intravenous injection extending over many hours. During the first part of this investigation the animals were kept under ether and were thyroid-parathyroidectomized. The active constituent of the thyroid was given sometimes at the beginning and sometimes after the injection had proceeded for some time. Later, the animals were trained to lie quietly on the table and were injected without pain and with no distress symptoms, by inserting a needle into the external saphenous vein. Animals may be injected in this manner for many hours under ideal physiologic conditions.

A review of all the data obtained after the injection of more than 100 animals shows that the results may be placed in two groups. In the first group, which comprises a very small number of the total, a typical result was as follows:

1. A continuous and extremely large flow of urine.
2. A temperature that did not drop below normal at any time, and when the maximum reaction was attained, would rise very high, sometimes as high as 114 degrees.
3. A pulse always regular, strong, and increasing in rate, possibly with tachycardia, and, as a maximum response was reached, ranging from 300 to 350 and above.
4. The respiration deep throughout. As the severity of the reaction increased, the respiration became panting. In the crisis it was very rapid and vigorous.
5. Sensitiveness of the animals to touch. At first these animals were not sensitive to touch. As the injection proceeded there would be muscle twitchings and tremors, always beginning in the foreleg, the neck muscles, the eyelids and the facial muscles. These slight tremors slowly increased in vigor and frequency until, by a gentle touch with the hand, a violent general tetany* would be produced, or a convulsion with rigidity of every muscle, opisthotonos, etc. During the spasm the respiratory muscles were contracted and involved in the general convulsion so that the animal became cyanosed. The general picture could not be

differentiated from parathyroid tetany, idiopathic tetany, or from certain phases of epilepsy.

Necropsy of these animals frequently showed hemorrhages throughout the muscles, hyperemia of the intestines, a suprarenal so hyperemic that it resembled a blood clot, a thymus so engorged with blood that it was liver-colored, and a pituitary in the same condition as the suprarenal.

The second group of results, comprising by far the majority, obtained by injecting amino-acids into dogs, was in the typical cases the direct opposite of the first group described:

1. The urine was always of small volume and generally acid.
2. The temperature remained normal if no anesthetic was used. If ether was given, the temperature sometimes dropped as low as 92 degrees.
3. The pulse was very slow, irregular and feeble.
4. The respiration was feeble and indifferent throughout.
5. The animals never became sensitive to touch. They did not show twitches or tremors, and instead of a touch producing tetany, they were difficult to arouse.

It will be seen that, in the first class, there was a violent and extreme reaction resulting in crisis and death. In the second class, there was no less a reaction to the injection but the result was profound depression. All degrees of intensity and combinations of these two types of reaction have been obtained. The animal may at first be depressed and only slowly and gradually develop a vigorous response with tetany, etc., or, occasionally an animal will show a quick and fair reaction, which will pass off and be followed by depression. Some animals will withstand an injection of amino-acids for many hours, and show neither depression nor excitation. One dog has been injected three different times, once for ten hours, and is still well and apparently normal. The question arises: What are the factors determining which effect the injection of amino-acids will produce? One factor is the diet. If the animal has been heavily meat fed, the result of an injection of amino-acids is depression. If the animal has had a diet poor in meat and has been starved for from twenty-four to forty-eight hours, an active response may be expected.

The influence of the thyroid hormone was, when first considered, very confusing, disappointing, and in fact, paradoxical. The most constant condition in so-called hyperthyroidism is an increased metabolism and increased irritability with no signs of depression. It was, therefore, surprising to find that if an animal was injected with the thyroid hormone previous to the injection of the amino-acids, the result was not an active response, but a decided depression. I have never seen an immediate response to the administration of the thyroid hormone in any animal.* This is true of normal animals and of those being injected with amino-acids.

The general conditions which it is possible to produce by an intense nitrogen metabolism having been established by a large number of experiments, steps were taken to try to find a cause for these conditions in some chemical constituent of the blood and urine. The most striking difference in the urine between the two groups of physiologic response is the volume. The volume of the urine of an animal injected with amino-acids that is responding may be enormous. One dog of 11 kg. actually passed 1,740 c.c. in one

* From the Mayo Clinic.

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

hour. The next abnormal finding in the urine is the percentage of the total nitrogen in the form of urea. Urea normally forms 80 to 85 per cent. of the total nitrogen in urine. The urea in the urine of dogs in a toxic condition may be as low as 15 per cent. of the total nitrogen. With the low ureas it was found that the percentage of ammonia was, as a rule, very low. The importance of these observations concerning the ammonia and urea was not at first realized, but after many dogs had been injected it became apparent that the toxic symptoms in the animal were always accompanied by a very low percentage of the total nitrogen, as urea and ammonia, and an attempt was made to relate this finding with the tetany.

One explanation of the constant relation between the tetany and the low urea and ammonia in the urine could be that there is some substance (let us say x) which is an intermediate compound between ammonia and urea, and this substance is highly toxic to the animal organism. If the substance x were produced from ammonia faster than it could be converted into urea or other nontoxic compounds, it would increase in its concentration in the body to the point of producing toxic symptoms. In all the work concerning continuous injection of amino-acids into dogs, ammonia and urea were determined within ten minutes of the time the samples were collected. Now, if the urine from dogs with toxic symptoms contained some substance, x , which would be converted into urea in the body, would any of this substance be converted into urea outside the body simply by allowing the urine to stand? This was tried, and to our surprise and satisfaction it was found that on redetermining the urea after the urine had stood twenty-four hours, the amount had increased as much as 100 per cent. At the same time the ammonia did not change, and in some cases it was somewhat lower after standing twenty-four hours than when at first determined. It was further found that the increase in urea on standing roughly paralleled the toxic condition of the dog. By means of a very high rate of nitrogen metabolism and an extreme diuresis, we had succeeded in separating one of the intermediary compounds in the formation of urea. Furthermore, there is the strongest evidence that this pre-urea compound is concerned in the production of the toxic symptoms by an injection of amino-acids.

Having related the violent reaction and tetany of the first class of reactions to the pre-urea compound, it was not at all difficult to show that in the second class when there was apathy and depression, there were not only no traces of the substance x but the ammonia content of the blood and urine was very high.

Therefore, it seemed probable that the greatest factor in determining which type of reaction any animal would give was whether or not ammonia could be properly metabolized. If the conversion of ammonia into substance x proceeded too slowly, resulting in a high concentration of ammonia throughout the body, depression resulted; if ammonia was converted into substance x too rapidly, faster than it could be converted in urea, irritability and tetany resulted.

Although not yet proved beyond controversy, it seems probable that the agent by which ammonia is supplied to the body is the thyroid hormone. We have some evidence that the agent converting the pre-urea substance into urea is the parathyroid. We were, therefore, prompted to look among the other ductless glands for the agent which converts ammonia

into substance x . All that is known of hyposuprarenal activity suggested that the probable source of the agent which converts ammonia into the pre-urea compound is the suprarenal cortex. The depression and loss of nerve tone and terminal intoxication following suprarenalectomy somewhat resembles the results in which depression was produced on injection of amino-acids. On the other hand, the great stimulation, the increase in the tone of the nerves finally resulting in irritability and tetany, filled out the requirements for an excess activity of the agent that converts ammonia into substance x . Could not these two extremes be explained by hypo-activity and hyperactivity of the suprarenal cortex? We, therefore, tried to determine whether or not the suprarenal cortex could convert ammonia into substance x . A cat was etherized; the blood and suprarenals were removed and a small amount of ammonium carbonate was added to the suprarenals and to the blood, the suprarenals being ground in physiologic sodium chlorid solution. The blood converted a small amount of the ammonium carbonate into something not urea. The suprarenals, even in high dilution, converted practically 100 per cent. of the ammonium carbonate into something not urea.

Thus, on our first attempt, we apparently demonstrated that the suprarenal cortex furnishes an enzyme which, in the tissues and even in the blood, is capable of converting ammonia into something not urea. Other cats were treated similarly. Their blood, suprarenals, muscles and liver were tested in the same way. Entirely negative results were obtained for all these tissues. Finally, suprarenals from beef, freshly killed, were tested. Not only did the suprarenals fail to convert any ammonium carbonate, but the suprarenal substance itself contained a small amount of ammonia. We, therefore, had one strikingly positive result and a number of negative results. For some days we were perplexed and disappointed. It suddenly occurred to me that the conditions under which the first animal had been killed were somewhat abnormal. I was not present in the room at the time, but a chance remark recurred to me that there had been two dogs in the room when the cat was brought in; that these two dogs had frightened the cat and had barked at her for possibly ten or fifteen minutes. The cat was then placed under the etherizing jar, immediately etherized and the suprarenals removed. The possibility, therefore, still existed that the first results were correct and that the suprarenal cortex showed its activity only after it had been stimulated, in this case by fear. The generous frightening of other cats rapidly followed and we soon repeated the first results. In the blood, in the suprarenals and in the tissues of some of these cats, large amounts of the enzyme which acts on ammonium carbonate were present. We then tried electric stimulation of one suprarenal and not the other, and here again in the first animal experimented on we produced a distinct activity in the suprarenal which had been stimulated, while the other was without activity. Subsequent attempts to repeat this have shown that the stimulation of the suprarenal by electric impulse is difficult to accomplish. We have tried various other means of stimulation. Etherizing an animal with the cone, allowing the animal to struggle, produces but slight increase in suprarenal activity as shown by the blood, but more activity does result if a series of etherizations is carried out.

It is known that animals that have had the nerves supplying the suprarenals severed do not die as a result of the operation. Therefore, the suprarenal must be stimulated by some substance in the blood as well as through the nerves. If it is the function of the suprarenal cortex to act on ammonium carbonate, it would seem probable that ammonium carbonate in the blood is the substance which stimulates the gland. We, therefore, tried to inject ammonium carbonate into the blood directly. Instead of producing the desired toxic condition with increased sensitiveness to touch and tetany, in some cases following the injection of ammonium carbonate, we produced the profound depression, cyanosis, and all the symptoms presented by the second group of results mentioned in connection with the injection of amino-acids. Analysis of the blood showed that a large amount of ammonia was present. The significant condition in the animals injected with ammonium carbonate, linking them with those animals that did not respond to the injection of amino-acids, was the respiration. When ammonium carbonate is injected into an animal, the respiration becomes either feeble and indifferent or else deep and vigorous. It seems highly probable that ammonium salts of other acids than carbonic cause the depression, and that as long as these acids are not oxidized and burned to carbonate, the animal continues in a state of depression and the suprarenals are not activated. When, however, ammonium carbonate reaches the suprarenal, it produces a vigorous stimulation.

Unlike the thyroid whose active constituent, the iodine compound, is normally present, and unlike the suprarenal medulla whose active constituent, epinephrin, is normally present, the active constituent of the suprarenal cortex cannot be demonstrated in normal animals except after the gland has been stimulated.

Concerning the conditions which must be present before the suprarenal cortex manifests its activity, it seems essential to have a vigorous oxidation going on within the animal. An animal with a feeble, indifferent respiration and a slow pulse responds to an injection of ammonium carbonate with the state of depression. In an animal that is maintaining a high degree of metabolism, although the first injection of a small amount of ammonium carbonate may not produce a violent tetany, there is, however, an unmistakable response. The respiration immediately becomes deep and more rapid, there is an increase in the pulse rate, slight restlessness and irritability.

These two types of reaction are accompanied by very conclusive chemical evidence, that is, in the first case the urine contains a large amount of ammonia and in the second instance only traces. We can now follow the condition of the animal in the chemical laboratory, two floors removed from the experimental room, in which the animal is being injected, and while we cannot determine the intensity of the reaction, a glance at the analyses of the urine for ammonia and urea is sufficient to tell whether the animal is going into a tetany or a state of depression.

In an animal recently injected, the urinary ammonia was found to be high. It suddenly decreased, remained at a lower figure for three quarters of an hour, and then rapidly increased to a larger amount than before the drop. Inquiry as to the condition of the animal showed that just at this time it had gone through a violent spasm of tetany followed by an

improvement which was later followed by a state of depression.

Many of the most puzzling results obtained in the first months of this investigation are now explained. The reason dogs with a high protein intake always went into a state of depression is they did not convert the ammonia into the pre-urea compound fast enough, that is to say, the suprarenal cortex was not in an active state. The fact that the injection of the thyroid hormone previous to the injection of amino-acids produces a result of depression is explained in the same way. It furnishes evidence that thyroid activity in the absence of a simultaneous suprarenal cortex activity does not produce the usual so-called hyperthyroid symptoms but, instead, a condition of depression. It has long been noted that the administration of the thyroid hormone produces a great variety of clinical results. Some persons are extremely sensitive, responding to very small amounts, others are very resistant. There are on record certain cases of chronic nephritis in which the administration of the thyroid hormone produced a profound depression, a state of uremia and death.

In order to obtain a so-called hyperthyroid reaction, hyperactivity of the thyroid is only one result that must be produced; accompanying this, increased activity of the suprarenal cortex is just as essential.

THE CONSTITUTIONAL DISTURBANCES WHICH COME WITH CHRONIC GOITER *

CHARLES N. DOWD, M.D.

Surgeon to the Roosevelt Hospital

NEW YORK

The most dramatic thyroid problems surround the subject of exophthalmic goiter. The overwhelming character of this malady creates profound impressions on those who observe it, and continually leads to exhaustive studies and painstaking investigations in an effort to master its problems. We may sometimes turn from those who are overwhelmed by excessive toxins to those who live year after year with diminished efficiency and curtailed activities because their thyroids are abnormal. Those who suffer from chronic goiter often need attention as definitely as those who have distinct exophthalmic goiter.

In October, 1915, I reported a study of 137 goiter patients treated by members of the surgical staff of the Roosevelt Hospital. Twenty-five of these patients were classed as showing toxic symptoms in the course of chronic goiter. Since that time I have operated in twelve additional similar cases. This group of thirty-seven cases, selected from a total of 181, represents as fair a selection as can be made and gives for study a definite group which is large enough for the purposes of this paper.

The average noticed duration of the goiters in the patients studied was ten years; the average duration of the more disturbing symptoms was one and one-tenth years.

During the earlier period of their goiters, the patients were disturbed by the mechanical presence of the growth, by its unsightliness, and perhaps by

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

its pressure. They may also have had diminished capability in following their ordinary occupations without realizing it.

During the later acute period, they were distinctly incapacitated for vigorously following their ordinary duties. The pulse was usually accelerated, they tired easily, and were "nervous," uneasy and apprehensive. Some had slight tremor; others had various digestive disturbances; most of them had increased discomfort from the presence of the goiter and felt various degrees of pressure on the trachea and adjoining parts of the neck. According to the commonly accepted standards, these were not cases of exophthalmic goiter, yet the patients were more or less incapacitated. Most of them attended to duties of some sort but were incapable of prolonged and continued exertion without undue fatigue.

Patients of this type have been observed and described during the recorded period of goiter study and goiter treatment. Pierre Marie,¹ Charcot and Gautier may be mentioned among those who make reference to them. Möbius classed goiters which had become associated with exophthalmic goiter symptoms as "formes frustes" and differentiated them from fully developed exophthalmic goiter. He also distinguished primary and secondary exophthalmic goiter; the former developing with a thyroid gland previously normal, the latter developing in connection with a chronic goiter. His secondary cases were usually chronic and often incomplete.

Kraus has described the goiter heart, and Stern considers chronic goiter patients, with tachycardia and irritable heart, as incomplete forms. Kocher asserts we can produce exophthalmic goiter by giving iodothylin in excess to goitrous patients. Berry² discusses the subject of secondary exophthalmic goiter, applying the term to the incomplete forms considered above. Plummer³ states that a young person with adenoma of the thyroid has a definite chance of developing at a later time symptoms so similar to the syndrome associated with hyperplastic thyroid that the best trained diagnosticians are constantly confusing the two conditions.

It is thus evident that our little group of patients corresponds closely to similar groups which have been described by numerous observers.

It is difficult to distinguish those symptoms which arise primarily from thyroid disturbances from those

which are the result of other influences. It is possible for patients to have functional or organic cardiac disease from causes not associated with the thyroid. Different forms of indigestion and asthenia may come from various causes. The menopause is particularly a time when various functional disorders occur, and in the group of thirty-seven cases there would, of necessity, be some patients in whom a thyroid enlargement had less constitutional effect than in others.

The pathology of these goiters is interesting. Wilson⁴ has made exhaustive studies on this subject. He states that the thyroid from a patient who has developed exophthalmic goiter, with exophthalmos, after years of simple goiter, shows advanced colloid change in most of the glands and scattered areas of hyperplastic parenchyma; that the thyroid of a patient who has symptoms of thyrotoxicosis slowly developing through a period of years, with a preponderance of cardiac symptoms and little or no exophthalmos,

usually presents diffuse adenomatosis, or encapsulated multiple adenoma (usually fetal), or regenerations of previously atrophied parenchyma. But such cases are not true exophthalmic goiter.

With the aid of Drs. Mortimer Warren, Baldwin Mann, William B. Clark and William C. White, we have studied the microscopic sections from these thyroids. Colloid has regularly been present in large amount, and epithelial elements in various degree, but in no instance were they sufficiently hyperplastic to resemble the thyroids of exophthalmic goiter. The

proportions of the epithelial elements corresponded in a measure with the severity of the symptoms, but there were many exceptions to this rule. Some of the most severe cases showed very scanty epithelium and abundant colloid in the examined parts.

There are many methods of treating such patients. Rest, without doubt, is very important. Various forms of medication, the Roentgen ray, boiling water injections, and different forms of hygienic procedures are in common use. But an increasing number of patients are seeking relief in surgery. The safety of the operation and the quickness of the result appeal to them strongly.

The main purpose of this paper is to study the results of operation on this group of patients. About two thirds of the enlarged glands were removed at these operations. The posterior capsules and adjacent part of gland tissue were regularly left in position.

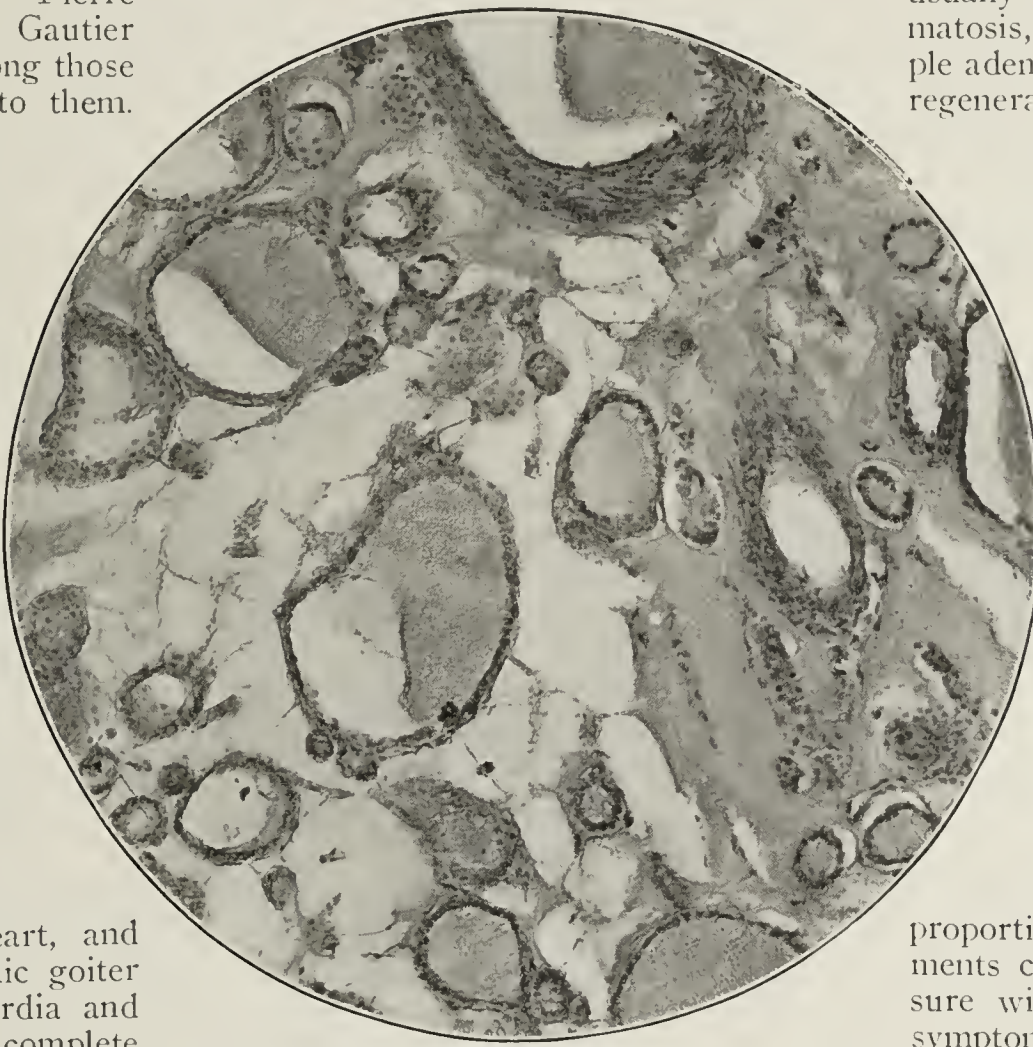


Fig. 1.—Section of thyroid from a girl of 19 whose goiter had been present for three years or more. She had a pulse of from 100 to 120. The patient in this case and in the case illustrated in Figure 2 rested, preliminary to operation, side by side on the same ward balcony and seemed about equally ill.

1. Marie, Pierre, cited by Falta, Wilhelm: *The Ductless Glandular Diseases*, Philadelphia, P. Blakiston's & Co., p. 95.

2. Berry: *Lettsonian Lectures*, Lancet, London, March 1, 1913.

3. Plummer: *Am. Jour. Med. Sc.*, 1913, 146, 793.

4. Wilson, L. B.: *Northwest. Med.*, January, 1913; *Am. Jour. Med. Sc.*, 146, 780.

In one instance, boiling water was injected according to the method of Porter, and with excellent result.

In studying the later histories of this group of patients:

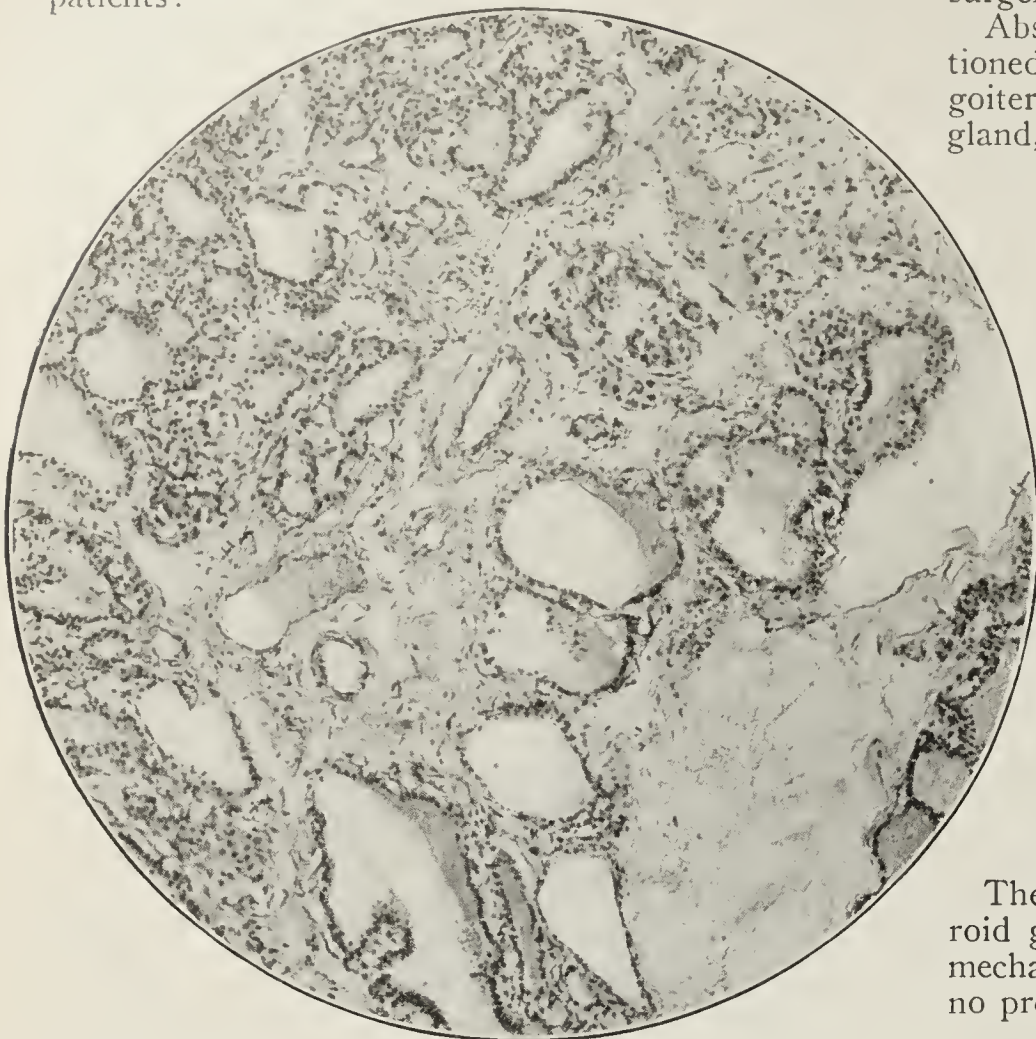


Fig. 2.—Section of thyroid from a girl of 19 whose goiter had been present for three years or more. She had a pulse of from 100 to 120. The patient in this case and in the case illustrated in Figure 1 rested, preliminary to operation, side by side on the same ward balcony, and seemed about equally ill. This patient, however, had a slower convalescence than the other girl.

One has been observed fourteen years; one has been followed into the fifth year; five have been followed into the fourth year; six have been followed into the third year; twelve have been followed into the second year, and seven have been followed into the first year.

All made good recoveries from the operation. Twenty-seven were reported free from symptoms and in excellent health; eight are very greatly improved; two, respectively, eleven and four months after their operations, are still resting, and are far from well. One of these two had very complex symptoms, including attacks of migraine which could not be referred to the thyroid. The symptoms of the other resembled those of exophthalmic goiter, although her goiter was of long standing and was reported colloid. In one or both of these cases something besides the thyroid was influential in producing the symptoms.

The group then shows: 73 per cent. apparent cures; 21.6 per cent. marked improvement, and 5.4 per cent. slight improvement.

There have been some very remarkable patients in the group, patients whose symptoms were really severe. They were fast becoming a burden to their friends and to themselves, but have been so restored to health as to be practically in their former normal condition.

Dr. Charles H. Mayo has called attention to the fact that some of these patients pass into the very worst type of exophthalmic goiter, and I can verify

this by personal observation. If the development can be stopped by a simple operation in the early stages of this change, it is an important achievement for surgery.

Abscess of the thyroid gland should also be mentioned in considering the complications of chronic goiter. The abundant blood supply of the thyroid gland, and its common degenerations, would lead one to expect evidences of blood borne infection. Such evidences, however, do not appear as frequently as in the kidney, or even in the parotid salivary gland, but they do appear occasionally.

Among our thyroid patients there have been four such examples. One was fatal from an overwhelming streptococcus infection; two others had very severe constitutional symptoms, but finally recovered after liberation of the pus; the fourth, who came to the hospital earlier than the other patients, illustrated the development of staphylococcus infection in chronic goiter. After two weeks of increasing tumefaction, fever and discomfort in the neck, the thyroid showed a large intracapsular abscess in each lobe. There was no apparent communication between the abscesses. A large portion of the glandular tissue was destroyed by the suppuration. Prompt recovery followed the opening of the abscesses.

These cases illustrate the vagaries of enlarged thyroid glands. Such growths may prove to be merely mechanical nuisances, pressing where there should be no pressure, and becoming large, unsightly and heavy.

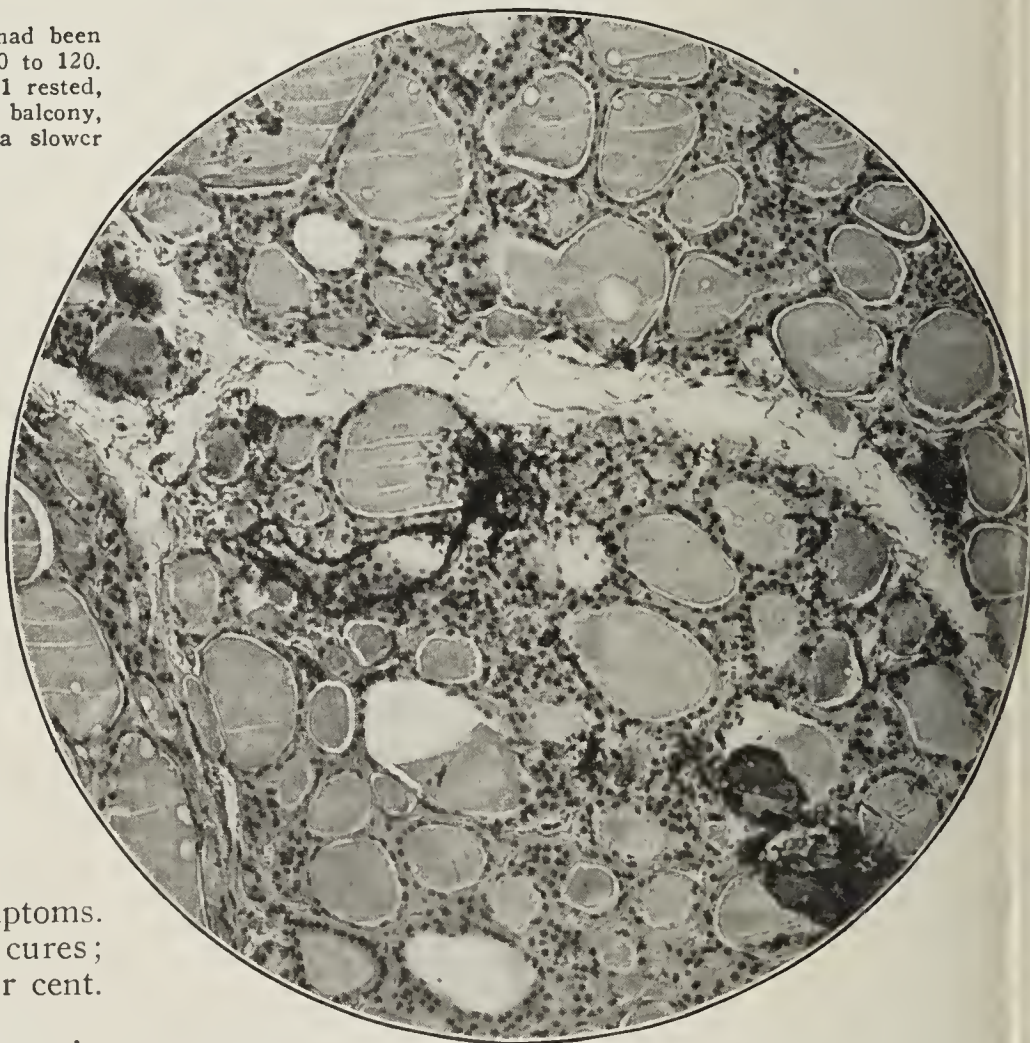


Fig. 3.—Section of thyroid from a woman of 27; five years' enlargement. She had a pulse of 130. There was slight exophthalmos, and decided, but not extreme, loss of strength. There was a marked temporary reaction from partial thyroidectomy. She made a satisfactory recovery. The pulse remains at about 80.

They may be accompanied by various disturbing symptoms, such as discomfort and apprehension, for nervous patients with colloid goiters who have learned the

symptoms of hyperthyroidism may suffer from fear of their developing. Other organic and neurotic disturbances may simulate exophthalmic goiter in these

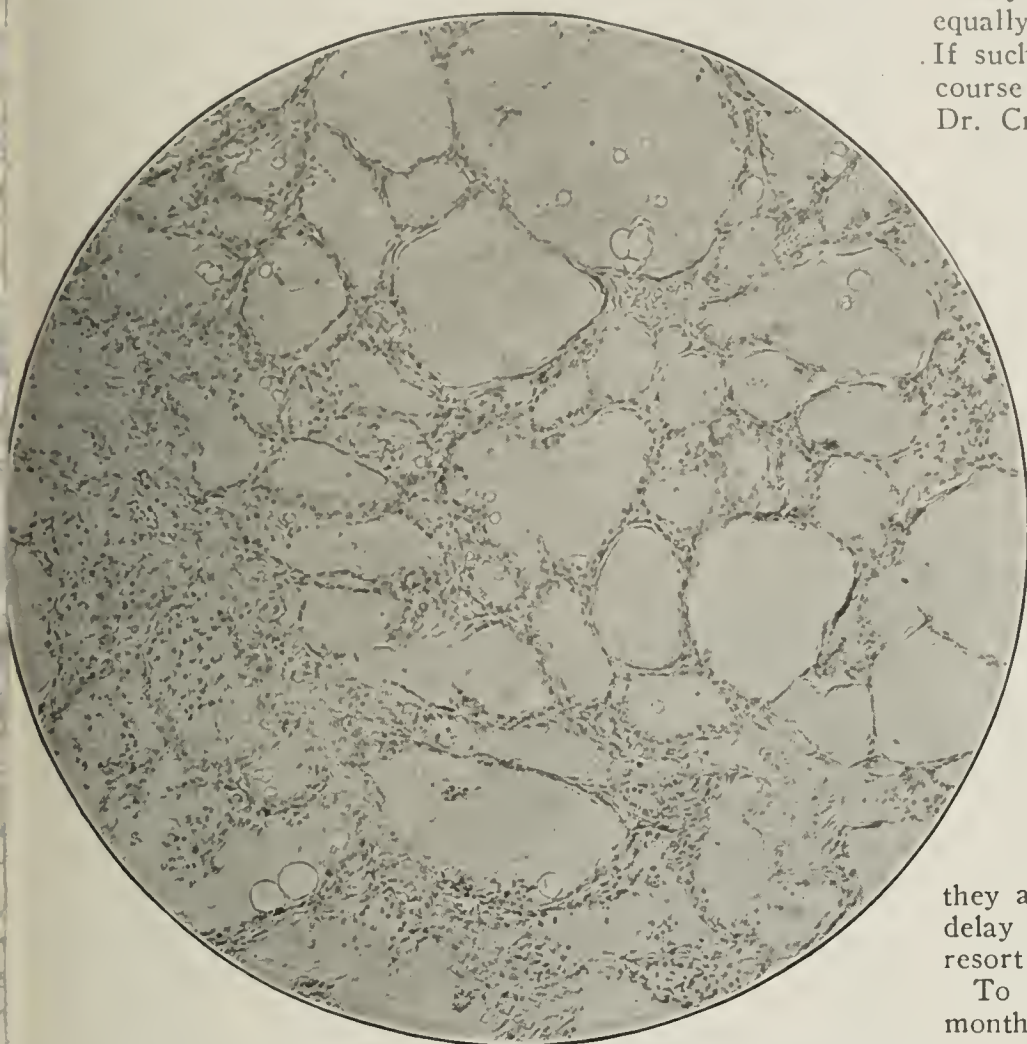


Fig. 4.—Section of goiter of twenty-two years' duration in a woman of 47. There were disturbing constitutional symptoms; the pulse was 116. There was a prompt return to normal health after partial thyroidectomy.

patients and complicate the diagnosis and the treatment. It is to be especially noted that there is a large group of patients in whom thyrotoxic symptoms develop in the course of chronic goiter, apparently dependent on the goiters themselves. These may produce a state of semi-invalidism and may even progress to pronounced invalidism. It is important that they should be recognized while yet within the proper therapeutic limit.

The results of operation on these patients are particularly encouraging. The great majority of them can thus be restored to good health.

The occasional development of abscesses is a complication which might be expected in these large degenerating glands. The seriousness of such a condition is largely due to the strong capsule which surrounds the gland and encloses the septic process.

One must also think of the possibility of cancer in connection with chronic goiter. This condition apparently is a rare coincidence. The few cases of undoubted cancer which I have seen have developed rather acutely.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRs. CRILE, KENDALL AND DOWD

DR. A. J. OCHSNER, Chicago: In 1,200 cases in which I have removed the thyroid gland, I have personally examined the microscopic sections of every gland, and wherever hyperthyroidism was present invariably found portions of the thyroid gland which showed active epithelial cells. What

Dr. Dowd has said regarding the indication for treatment is, of course, very clear and very correct. If you have a patient in whom this condition is permitted to go on you will ultimately have a serious injury to the nervous system and equally serious injuries to the muscular system and the heart. If such a condition can be relieved by a safe operation, of course the operation is distinctly indicated. The facts that Dr. Crile does not increase the hypersecretion due to the

nervous element, that he does not traumatize unnecessarily, that he does not increase the injury to the patient in any way, are of great importance. It seems that the postoperative hypersecretion has something to do with the absorption of material secreted into the stomach during the operation. At any rate, we have found in cases of severe hyperthyroidism in which I have had to operate before the condition had subsided that the postoperative hyperthyroidism could be reduced enormously by making gastric lavage with water at 105 F. immediately after the operation was finished. I never operate in these cases of extreme hyperthyroidism at the top of the wave.

DR. MARTIN B. TINKER, Ithaca, N. Y.: Dr. Dowd has mentioned that these people are frequently treated by rest, Roentgen ray and boiling water, and attention should be called to the fact that a large number, not getting relief from these legitimate medical means, resort to quacks. During the past two years fully 50 per cent. of patients who have come under my care have been treated by osteopaths, chiropractors or other irregulars. Because the condition is not immediately dangerous to life,

they are sometimes encouraged by their medical advisers to delay operation. The reasons why they should be urged to resort to surgery have been clearly brought out by Dr. Dowd.

To add emphasis, I would report my experience for three months this year during which time three patients coming

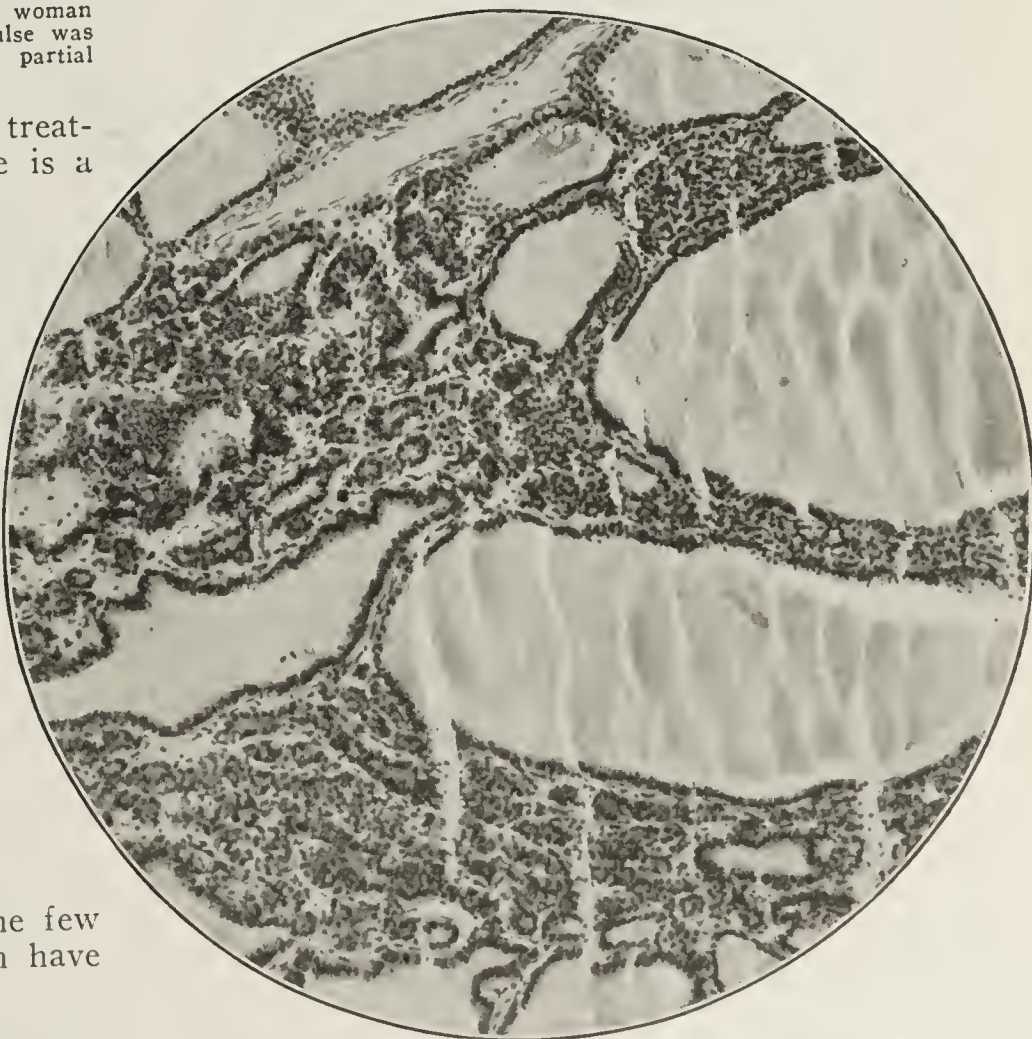


Fig. 5.—Section of goiter of fourteen years' duration from woman of 32. There were moderate constitutional symptoms. She made a satisfactory recovery after partial thyroidectomy.

from various sections of our state, with very toxic goiters, died in their beds without any surgical intervention whatever. Patients overestimate the danger of operation for the relief of goiter; they underestimate the dangers of the dis-

ease. Scarcely a week goes by that a patient does not come into my office for the reason that some member of the family has died from goiter.

My remarks are mostly to emphasize points well brought out by Dr. Dowd, who also called attention to the fact that these growths are transformed by hyperplasia into the worst forms of toxic goiter. He has spoken of the danger of abscess. Any man who has done much goiter surgery must have seen several such cases. He has emphasized the importance of the changes in the circulatory system, which in many patients go on to an incurable condition; they are possibly able to live, but they are not useful members of society as they should be; they are handicapped for life as the result of this disease.

Dr. Dowd has spoken of the frequency of pressure symptoms. Among these are not only distress in breathing, and loss of voice, but, in certain cases, inability to swallow. I had one patient who was unable to swallow solid food for seven years; another for three years. The importance of cancer of the thyroid should also be urged. In one year I saw four of these patients, and there was not one of the four but had carried the goiter from ten to twenty-five years; that is to say, they had had simple goiter, readily curable by operation, and if promptly handled the malignant change would not have occurred.

DR. SOLOMON SOLIS-COHEN, Philadelphia: Contrary to surgical opinion, I continue to believe that goiter in exophthalmic goiter, being only an incident and not the main factor, should not be treated surgically, except in a small proportion of cases—less than 10 per cent. But when the goiter is itself the disease, when the pathologic change in the thyroid gland constitutes the main lesion, then the only right way to deal with it is to get rid of it by excision or ligature, or some other destructive means, as soon as possible. Should toxic symptoms develop in these cases, then the indication becomes still more urgent to remove the goiter, because that is the source of evil.

I was especially interested in the demonstration of the connection of the parathyroid—its inhibitory rôle, so to speak—in this trinity of endocrine disturbances giving rise to certain toxic phenomena. In practice I often observe the secondary disturbances which are here attributed to the suprarenal cortex and a preurca compound coming from the suprarenal cortex.

In the medicinal and hygienic treatment of a case of exophthalmic goiter, the patient recovering under these measures may retain or develop certain symptoms, the type of which may be aptly illustrated by the tremor which is considered one of the cardinal features in the diagnosis, and which may possibly, indeed probably, be attributed to compromising of the parathyroids and production of this highly important compound to which our attention has been called. In such instances, I have found empirically, that the administration of parathyroid substance—and I mean genuine parathyroid substance—is the best means of controlling such symptoms. The treatment was based, of course, on the familiar observations of tetany following removal of the parathyroids and similarly to the rôle of calcium in such cases, it is some-

times found that the association of calcium bromid or other calcium salt with the parathyroid is better than the parathyroid alone in controlling the tremulousness and excitement of these patients. In the course of a persistent treatment of exophthalmic goiter by medicinal means we sometimes find that a patient who is rapidly improving suddenly begins to show high excitement, perhaps fever, to lose weight, to have tachycardia return or increase, and apparently to do very badly. I have had reason to believe that in some such instances the result has been due to too rapid disintegration of the pathologic thyroid gland or at least too rapid flooding of the circulation with thyrotoxic products under some of the measures adopted. Perhaps it is this pre-urea compound which is at work. At all events, the simple withdrawal of medicaments, while keeping the patient at rest and continuing our general hygienic measures, has in so many cases been followed by subsidence of the untoward symptoms that the conclusion has been forced on us that we have here cause and effect and not simply coincidence.

DR. JOHN ROGERS, New York: A little while ago I examined a parathyroid preparation and about one half of it was parotid gland. So if you do not receive any results from feeding parathyroid you can draw the nat-

ural inference. Dr. Kendall of Rochester has described the active principle of the thyroid. I would like to suggest that it be called an active principle. So far as I know, the active principle of an organ should produce immediate and constant demonstrable changes in one or more other organs of the body. I have tested this product of Dr. Kendall's on several occasions and can say that in the stomach it produces an immediate demonstrable response; I think also on the blood pressure. The stomach is very interesting in that it is supplied by the sympathetic

and the vagus. An aqueous extract of the thyroid will produce a vigorous response in the stomach; it increases peristalsis, and increases the quantity and acidity of secretion apparently by stimulation of the vagus. This product of Dr. Kendall's will produce about half the response in the stomach that the

extract of the gland will when given in the same dosage. Some substances derived from the thyroid are inert, some have beneficial effect, and some are toxic.

One of the most noticeable effects in thyroid disturbances is the susceptibility of the patient to fatigue. I do not know of any published experiments which demonstrate the relation of the thyroid to fatigue so well as some I have recently watched and which have not yet been published. It is possible to isolate the rectus abdominis muscle in the cat and then stimulate it and cause it to unite its contractions on a drum. It will fatigue in about four hours, so that the writing on the smoked drum will show a fall in the power of the muscle. If the thyroid gland is excised at the beginning of the experiment the fatigue can usually be induced in twenty minutes to one-half hour. After it has been fatigued, the injection of thyroid extract will immediately cause the effects of the fatigue to disappear. That is the most marked demonstration of the energy production of the thyroid that has been shown.

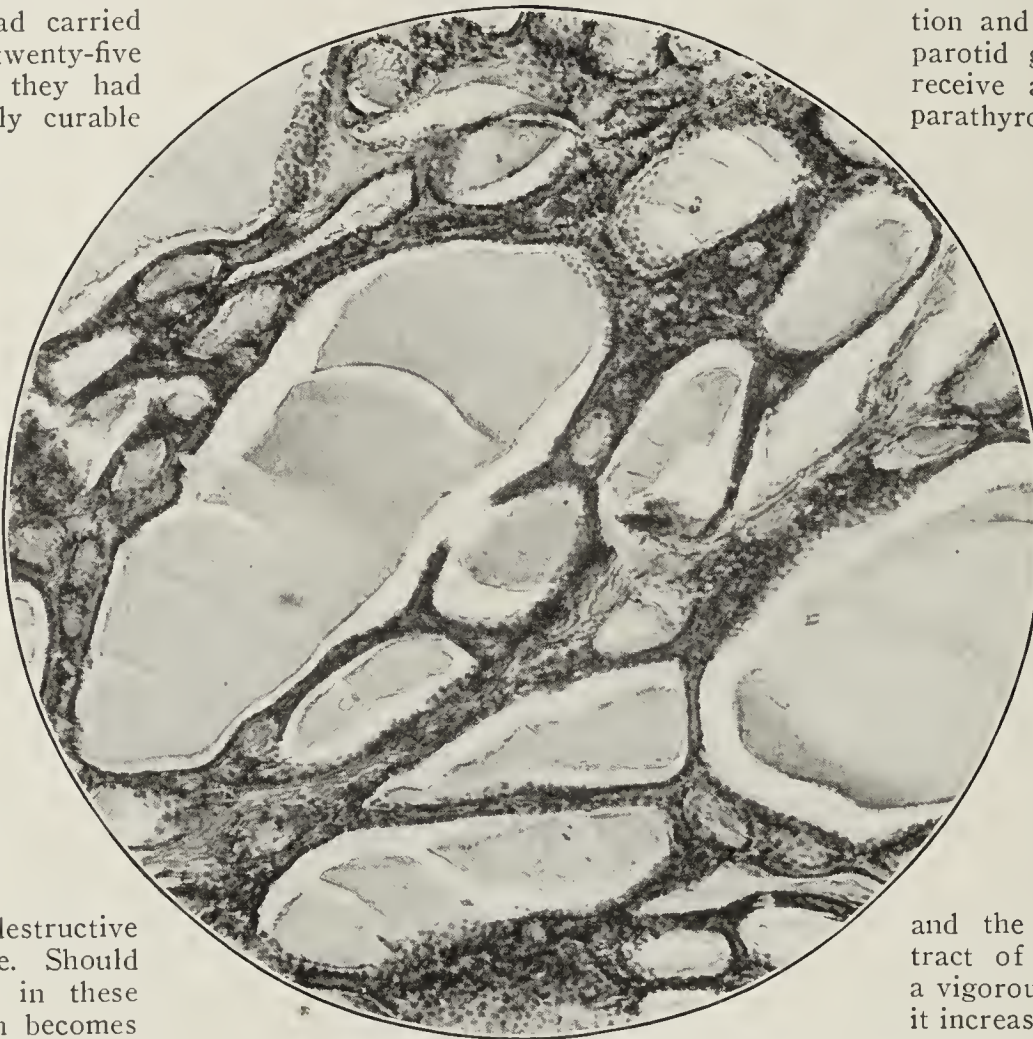


Fig. 6.—Section of large goiter of four years' duration in a woman of 47. There were pronounced constitutional symptoms, which still continue four months after partial thyroidectomy.

DR. E. C. KENDALL, Rochester, Minn.: Dr. Rogers remarks concerning what should be called *an* active constituent and not *the* active constituent will probably not be answered for a number of years. I base my statement that it is the active constituent of the thyroid on the fact that it is the compound that contains iodine, and many workers have already shown that the activity of the gland is in proportion to the iodine content. I should like to point out the fact that the injection of the active constituent of the thyroid in pure crystalline form produces absolutely no apparent effect, immediately. I have never seen in any animal an immediate response; however, if several daily successive injections are given we can produce a most intense reaction. It is this long latent period which is misleading in thyroid investigations. Any result which is obtained immediately on the injection of preparations from the thyroid is not due to the action of the iodine-containing compound. The latent period after administration of the iodine compound has been one of the most puzzling things to clear up in the investigation I have been carrying on, and I think it has been adequately cleared up by showing that it is necessary to bring into response other endocrine glands, one of which is the suprarenal cortex. If the suprarenal cortex is not activated, a totally different chain of results is obtained than when it is activated.

DR. CHARLES N. DOWD, New York: We do not live in a goiter district. In this particular locality I think we do not see the same proportion of exophthalmic goiter among our goiter patients as is seen in some other localities. We are continually struggling with the problem of patients with enlarged thyroid glands and moderate constitutional symptoms. They are semi-invalids, unable to put normal effort into anything which they undertake. This study has been made in the effort to help these people. Those who have discussed the paper have aided materially in this effort.

THE DIAGNOSIS OF TUBERCULOUS LARYNGITIS*

JULIUS DWORETZKY, M.D.
OTISVILLE, N. Y.

The importance of the early diagnosis of pulmonary tuberculosis has been fully established. The early detection of the pulmonary lesion has in the majority of instances enabled us either to cure the lesion or at least check its progress.

The early diagnosis of laryngeal tuberculosis, however, is still being neglected, and too often we meet the advanced laryngeal cases, in which conservative treatment is of no avail, while radical treatment is also useless because of the existing extensive destruction of tissue. Such involvement of the larynx could often be avoided if treatment were instituted in the early infiltrative stage. Thus it could safely be said that, as in pulmonary tuberculosis, the prognosis and the successful treatment of tuberculous laryngitis depends largely on early diagnosis.

In this paper, however, the discussion will not be limited to the diagnosis of the early lesion, but will include all stages and phases of laryngeal tuberculosis.

Since the diagnosis of laryngeal tuberculosis is made by the actual viewing of the larynx, it can readily be seen that the recognition of a lesion in the larynx is much easier than the detection of the pulmonary lesion. This would especially apply to the early cases. The diagnosis will also be helped materially if it is borne in mind that tuberculosis of the larynx is invariably secondary to pulmonary tuberculosis.

Through the cooperation and constant watchfulness on the part of the clinic or family physician, laryngologist and the sanatorium physician, tuberculosis of the larynx can be diagnosed early.

The clinic or family physician with a little practice can diagnose early cases of laryngeal tuberculosis if a routine laryngoscopic examination is made on every patient with pulmonary tuberculosis, even when laryngeal symptoms are entirely lacking. Thirty-five per cent. of the cases of tuberculous laryngitis studied had either no symptoms referable to the larynx or else they were very slight and could easily be attributed to other causes. It is therefore evident that unless a careful examination of the larynx is performed on every patient with pulmonary tuberculosis, a number of cases will escape attention.

The laryngologist may often be misled in the diagnosis of the early lesion because of the absence of a history of tuberculosis, and the excellent general condition of the patient. Such errors can be avoided by having a patient presenting a doubtful lesion in the larynx undergo a thorough chest examination, and by repeatedly examining the sputum. Only after persistently negative examinations may tuberculosis of the larynx be excluded.

The sanatorium physician is in a position to diagnose laryngeal tuberculosis in all stages and phases.

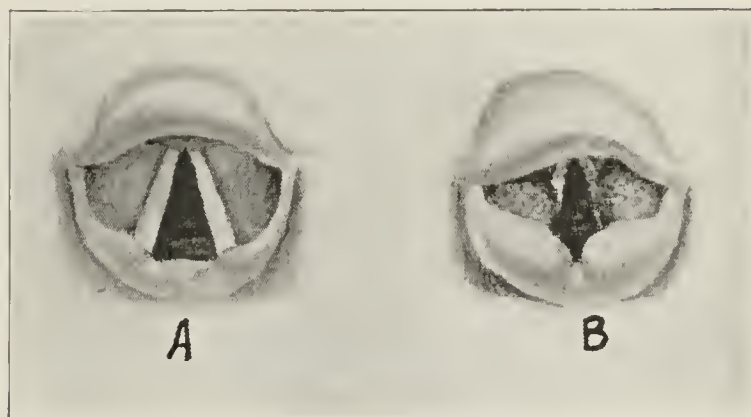


Fig. 1 (Case 1).—A, Acute tuberculous laryngitis; B, condition of the larynx six weeks later.

He has the advantage of having the patient under his constant supervision, and of possessing accurate knowledge of the patient's pulmonary condition. Therefore, if every patient is examined on admission and subsequently at regular intervals, no case of tuberculosis of the larynx should ever escape the observation of the sanatorium physician.

As in most other diseases, these patients present subjective and objective symptoms. The subjective symptoms are those caused by the lesion in the larynx as well as those associated with the pulmonary lesion. The objective symptoms are those of pulmonary tuberculosis and the physical findings on laryngoscopic examination. In this paper laryngeal symptoms and signs only will be considered.

The present study included 150 cases of laryngeal tuberculosis, of which eighty-six were classified as early, and sixty-four as moderately advanced and advanced.

SYMPTOMS

The symptoms of tuberculosis of the larynx can be conveniently divided into two groups: first, those of the early stage, and second, those of the moderately advanced and advanced stages.

The most common symptom among the eighty-six cases of early disease was hoarseness, occurring in

* From the Municipal Sanatorium, Bureau of Hospitals, Department of Health, City of New York.

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

seventy-one, or 82.6 per cent. It often began with slight huskiness of the voice in the morning, gradually disappearing during the course of the day. It varied from a slight change in the voice quality to a low pitched rasping sound. The onset of the hoarseness was, as a rule, insidious in the chronic cases, while it was more sudden in the acute and subacute cases. When the onset was insidious, the patient was often unaware of the development of this symptom, and only by careful questioning could the date of the onset

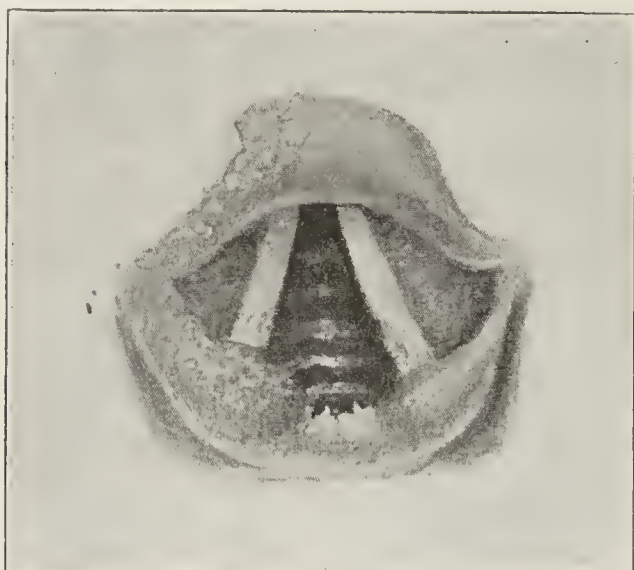


Fig. 2 (Case 2).—Acute tuberculosis of the larynx.

be established. In early cases the hoarseness is most commonly due to infiltration of the posterior commissure or of one or both cords, and often to a combination of both. Cases with marked papillomatous growths in the upper portion of the posterior commissure with no alteration in the quality of the voice were often seen. Thus the hoarseness depends largely on the location of the tumefaction. If it is above or below the cords, the voice may be quite normal.

The next most frequent symptom, or rather combination of symptoms, was the sense of discomfort in

TABLE 1.—SYMPTOMATOLOGY NOTED IN 150 CASES OF TUBERCULOSIS OF THE LARYNX *

Symptoms	Early Cases or Stage 1		Advanced Cases or Stages 2 and 3	
	Number	Per Cent.	Number	Per Cent.
Hoarseness:				
Slight	32	37.2	4	6.3
Moderate	23	26.8	17	26.5
Marked	16	18.6	40	62.5
No hoarseness	15	17.4	3	4.7
Total	86	100.0	64	100.0
Dysphagia	2	2.3	11	17.2
Dysphonia	1	1.2	11	17.2
Aphonia	3	3.5	12	18.8

* Sense of discomfort was present in 51, or 59.3 per cent., of the early cases and in 55, or 86 per cent., of the advanced cases. This was absent in 35, or 40.7 per cent., of the early cases and in 9, or 14 per cent., of the advanced cases.

the larynx. It was present in fifty-one, or 59.3 per cent., of the cases. This sensation was vaguely and variously described as a lump in the throat, desire to clear the throat before talking, consciousness of the throat irritation as if caused by a hair lodging in the throat, dryness, hypersecretion, burning, rawness, sticking pain, etc.

Dysphagia, dysphonia and aphonia are uncommon among early cases of tuberculous laryngitis. Dysphagia was found to exist in only 2.3 per cent. of the early cases; dysphonia in 1.2 per cent., and aphonia in 3.5 per cent.

Of the sixty-four cases with pronounced lesions, fifty-two were of Stage 2 and twelve were of Stage 3.

The symptomatology in this class is more definite and often pathognomonic. Hoarseness was present in sixty-one of the cases, or 95.3 per cent. Sense of discomfort was present in fifty-five, or 86 per cent. Dysphagia and dysphonia in eleven, or 17.2 per cent., and aphonia in twelve, or 18.8 per cent., of the cases.

From the foregoing, it appears that hoarseness is almost always present when the involvement is extensive, and the classic symptoms, such as dysphagia, aphonia and dysphonia, although more common than in the early cases, are far less common than generally supposed.

The physical findings in tuberculous laryngitis will depend, first, on the stage of the disease, whether early or advanced; second, on the type of the lesion, whether acute, subacute or chronic. The early or incipient cases are characterized by infiltrative changes; the advanced cases by extensive infiltration with ulceration. The acute cases are characterized by the presence of macroscopic tubercles, soft edema with rapid destruction of tissue; the subacute cases, by pseudo-edema due to proliferative changes and the formation of granulations; the chronic cases, by hyperplastic changes, marked fibrosis and slow course.

PATHOLOGIC MANIFESTATIONS

Anemia of the Larynx.—This is often spoken of as a sign of tuberculosis. This sign is present in acute cases in which we have formation of tubercles, marked edema and interference with circulation. The acute type of laryngeal tuberculosis, however, is not the most common type. Only thirteen out of 150 patients examined had an acute involvement of the larynx, and therefore anemia is rather an uncommon feature of tuberculosis of the larynx in general. When anemia is present in other than acute cases, it is usually due to a general anemic condition of the patient.

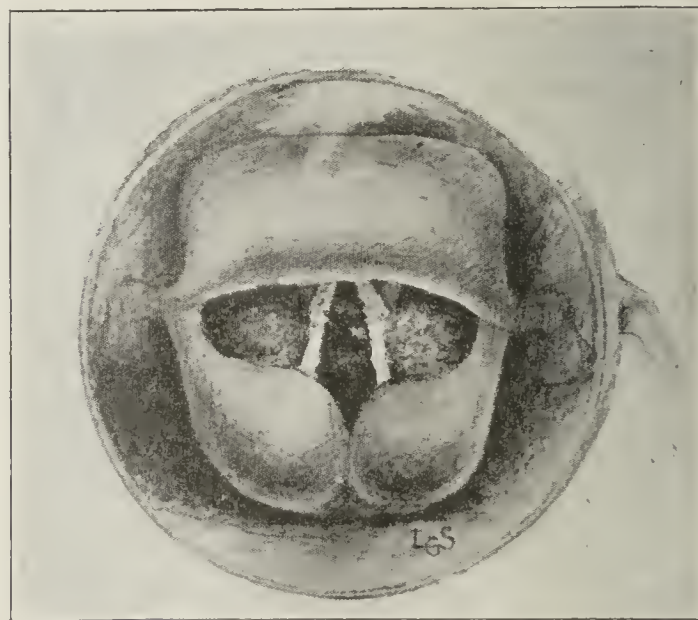


Fig. 3 (Case 3).—Acute tuberculosis of the larynx.

Congestion.—This condition is more common than anemia. It is present in the great majority of the subacute and chronic cases. The congestion may be due to a catarrhal condition preceding the tuberculous lesion, or may be caused by the tuberculous lesion itself.

Infiltration.—By this term is implied inflammatory changes caused primarily by the tubercle bacillus. The part affected is congested and increased in size. The edema may be either of the soft variety, such as seen in the acute case, or of the hard indurative kind,

as seen in the subacute and chronic cases. Soft edema occurring in the arytenoids usually produces the characteristic pear-shaped swelling. When the process is chronic, there is a marked proliferation of connective tissue, and the infiltration becomes hard. Infiltration is most common in the posterior segment of the larynx, but may be seen elsewhere.

Ulceration or Necrosis.—Degeneration of tissue usually occurs after tubercles coalesce and caseate. A typical recent ulcer has a grayish appearance, while a chronic ulcer may be red, due to the formation of granulations. Ulcers are most commonly seen at the posterior portion of the vocal cords, the vocal process, the posterior commissure, and the rim of the epiglottis.



Fig. 4 (Case 4).—Acute tuberculosis of the larynx.

Tumefaction before ulceration is usually due to edema, and is most common in the arytenoids, the ventricular bands, the laryngeal surface of the epiglottis and the aryepiglottidean folds.

Tumefaction.
—This may appear before or after ulceration

TABLE 2.—PHYSICAL SIGNS OBSERVED IN 150 CASES OF TUBERCULOSIS OF THE LARYNX *

	Early Cases or Stage 1		Advanced Cases or Stages 2 and 3	
	Number	Per Cent.	Number	Per Cent.
Interarytenoid Space:				
Affected	78	90.7	63	98.4
Not affected	8	9.3	1	1.6
Total	86	100.0	64	100.0
Vocal Processes:				
Affected	41	47.7	57	89.0
Not affected	45	52.3	7	11.0
Total	86	100.0	64	100.0
Arytenoid cartilages:				
Affected	45	52.3	36	56.3
Not affected	41	47.7	28	43.7
Total	86	100.0	64	100.0
Vocal cords:				
Affected	17	19.8	46	71.9
Not affected	69	80.2	18	28.1
Total	86	100.0	64	100.0
Epiglottis:				
Affected	13	15.1	23	36.0
Not affected	73	84.9	41	64.0
Total	86	100.0	64	100.0
Ventricular bands:				
Affected	16	18.6	20	31.3
Not affected	70	81.4	44	68.7
Total	86	100.0	64	100.0
Aryepiglottidean folds:				
Affected	6	7.0	18	28.1
Not affected	80	93.0	46	71.9
Total	86	100.0	64	100.0

* The cases were grouped into three clinical types: There were 13, or 8.7 per cent., of acute cases, 66, or 44 per cent., subacute, and 71, or 47.3 per cent., chronic cases.

When it follows ulceration, it usually takes the form of granulations, papillomas or tuberculoma. Granulations are most common when ulcerations are present. Papillomas and tuberculoma usually occur at the posterior commissure.

PHYSICAL SIGNS

The frequency with which a part of the larynx was found to be affected was in direct proportion to the amount of trauma that part received as a result of its functional activity and its location.

Interarytenoid Space.—The earliest and most frequent seat of disease was the posterior commissure. This was found to be involved in 141 out of 150 cases examined. Of the eighty-six cases of early disease seventy-eight, or 90.7 per cent., showed involvement of the posterior commissure, while in the sixty-four cases of advanced lesions it was involved in sixty-three, or 98.4 per cent.

The earliest change in the posterior commissure consists of hyperplasia of the mucous membrane. On partial approximation of the cords, this hyperplastic mucous membrane takes on a wrinkled appearance. A streak of mucopus is often seen adhering to the space; but this merely signifies that there is a discharging focus in the lungs. It is often present without any demonstrable tuberculous lesion in the larynx. The usual color of the hyperplastic mucous membrane is gray, although occasionally it is red. As the lesion progresses, a median furrow is formed which is readily perceived on a partial approximation of the cords following a deep inspiration. At this stage a lateral furrow, as described by Casselberry,¹ is also frequently observed. The formation of these furrows is due to the constant creasing of the diseased mucous membrane during all expiratory acts. A little later, if the disease is not arrested, the process will go on to ulceration. Of 141 cases affected, thirty showed ulceration of the posterior commissure. The ulcers were usually shallow and of gray appearance. Often there is an exuberance of granulations with the formation of papillomas or tuberculoma. The papillomas vary in size and shape, but are usually of the broad base type. The amount of discomfort caused by a papilloma in the space depends on its location. If situated right between the true cords, the symptoms, such as hoarseness, aphonia and dysphonia, are marked while if situated above or below the cords, symptoms may be lacking. Patients with papillomatous growths in the space almost always clear the throat before talking. This is usually due to the

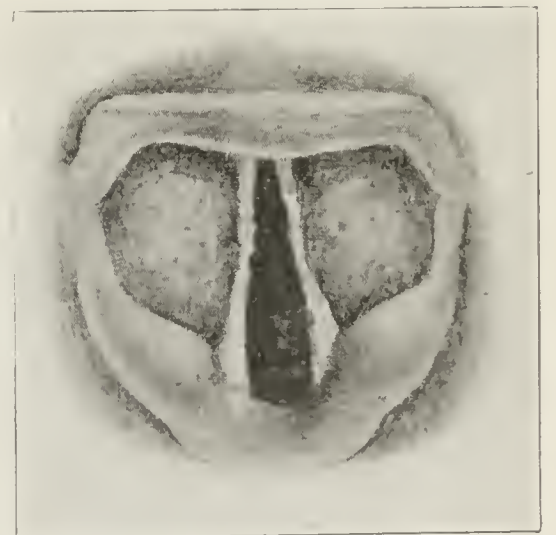


Fig. 5 (Case 5).—Subacute laryngeal tuberculosis.

presence of the growth or to the streaks of mucopus adhering to its rough surface. Conditions such as nasal stenosis, chronic pharyngitis, accessory sinusitis, bronchiectasis, lung abscess, syphilis and asthma will cause a hyperplasia of the posterior commissure simulating tuberculosis. When these conditions, however, are eliminated, interarytenoid hyperplasia with or

1. Casselberry, W. E.: The Recognition of Early Changes in the Larynx in Tuberculosis, THE JOURNAL A. M. A., Nov. 15, 1913, p. 1789.

without ulceration is pathognomonic of tuberculosis of the larynx.

Vocal Processes.—The portion of the larynx next most frequently affected is the vocal process, or the anterior angle of the arytenoid cartilage, which gives attachment to the vocal cords. The vocal process was found frequently affected in early cases, and is there-

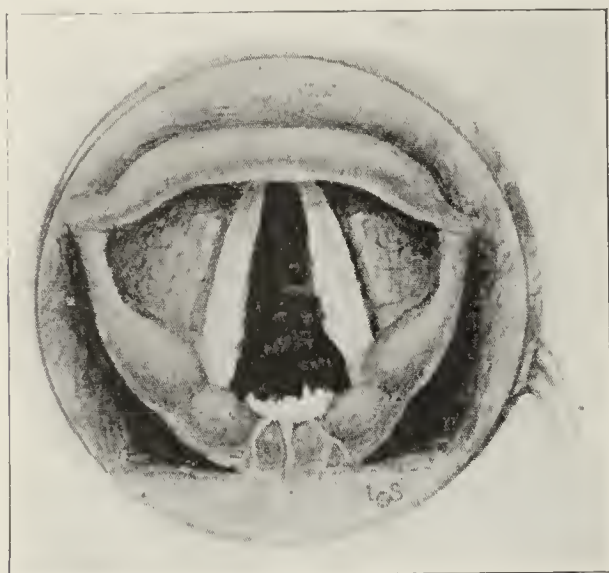


Fig. 6 (Case 6).—Subacute tuberculosis of the larynx.

fore considered separately. Of eighty-six cases in which early involvement occurred, the vocal process was affected in forty-one, or 47.7 per cent., while of sixty-four cases of advanced disease it was affected in fifty-seven, or 89 per cent. The proximity of the vocal processes to the arytenoids, true cords and interarytenoid space, with the consequent liability to trauma, renders them a favorable site for the development of the lesion.

Arytenoid Cartilages.—The arytenoids are next in frequency of involvement. Infiltration of the arytenoids varied from slight swelling, which appeared hard, or semiedematous, to large edematous masses, partially obstructing the opening into the larynx.

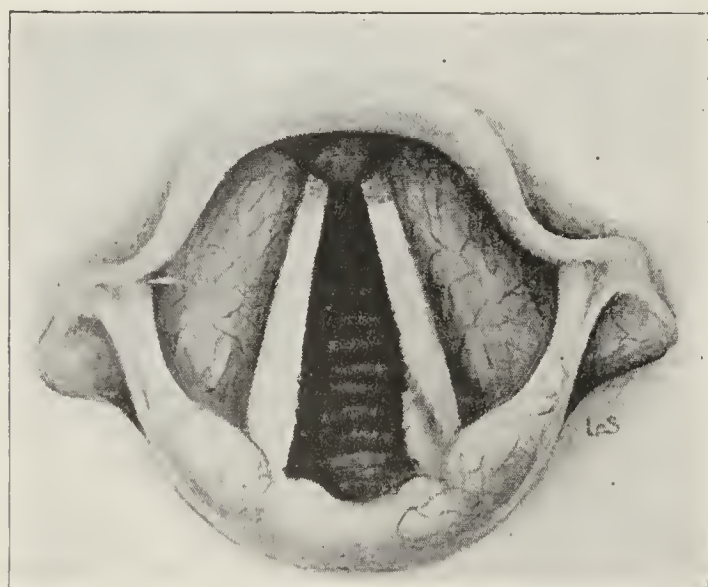


Fig. 7 (Case 7).—Subacute tuberculosis of the larynx.

Marked edema of the arytenoids with extension into the folds gives the characteristic pear-shaped appearance. Out of eighty-six cases of early disease, they were found affected in forty-five, or 52.3 per cent., while they were involved in thirty-six, or 56.3 per cent., of the sixty-four advanced cases. Thus it is seen that eighty-one of the series, or 54 per cent., showed infiltration of one or both arytenoid cartilages.

Vocal Cords.—Out of eighty-six cases of early involvement, the vocal cords were affected in seventeen, or 19.8 per cent., while of the sixty-four cases of advanced involvement, affection of the cords was noted in forty-six, or 71.9 per cent. The usual site of the lesion was at the posterior portion of the cords. The anterior portion was often involved together with the posterior portion, but very rarely was the lesion limited to the anterior portion. Lesions of the cords

TABLE 3.—THE ORDER OF FREQUENCY OF INVOLVEMENT OF THE DIFFERENT PARTS OF THE LARYNX

	Tuberculous		Nontuberculous	
	Number	Per Cent.	Number	Per Cent.
Interarytenoid space.....	141	94.0	9	6.0
Vocal processes	98	65.3	52	34.7
Arytenoid cartilages	81	54.0	69	46.0
Vocal cords	63	42.0	87	58.0
Epiglottis	36	24.0	114	76.0
Ventricular bands	36	24.0	114	76.0
Aryepiglottidean folds	24	16.0	126	84.0

do not differ in their appearance from a lesion located at any other part of the larynx. Descriptive terms, such as "mouse-eaten," "granular" and "cleft-like," are often used in speaking of these lesions. Thus sixty-three out of 150, or 42 per cent., of the cases studied showed involvement of the true cords.

Epiglottis.—The epiglottis was found affected in thirty-six out of 150 cases studied. Of the eighty-six cases of early involvement, the epiglottis was affected in thirteen, or 15.1 per cent., while in sixty-four cases of advanced disease it was affected in twenty-three, or 36 per cent. The epiglottis is the first portion of the larynx that comes into view on laryngoscopic examination, and its lesions are therefore most easily detected. Infiltration is the most common lesion of the epiglottis. The site of the lesion was either at the rim or else at the cushion. All the lesions were bilateral and more or less diffuse. Only one case presented a lesion limited to the right side and the dorsal surface of the epiglottis.

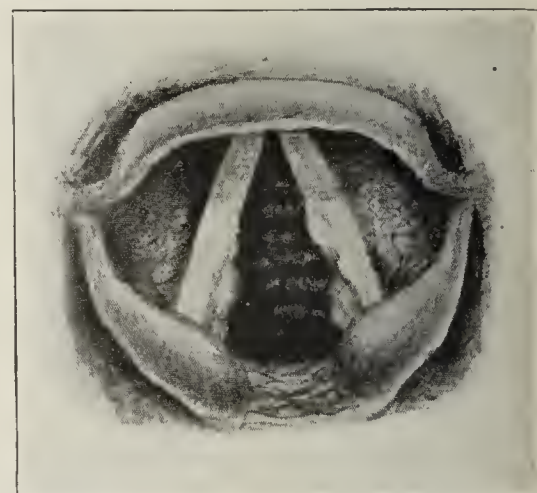


Fig. 8 (Case 8).—Subacute tuberculosis of the larynx.

Ventricular Bands.—The ventricular bands were diseased in thirty-six cases out of 150 examined. Of the eighty-six cases of early involvement, sixteen, or 18.6 per cent., were found affected, while of the sixty-four more advanced cases twenty, or 31.3 per cent., revealed lesions of these bands. The most common lesion of the false cords was infiltration. Only six cases out of the thirty-six showed erosions.

Aryepiglottidean Folds.—Of the 150 cases studied, twenty-four showed involvement of the folds. Of the eighty-six cases of early disease, the folds were affected in six cases, or 7 per cent., while of the sixty-four cases of advanced involvement, they were affected in eighteen, or 28.1 per cent. The usual manifestation of the disease was infiltration. Only two cases out of the twenty-four showed infiltration with erosion.

DIFFERENTIAL DIAGNOSIS

In discussing the differential diagnosis, only those conditions that are not described at length in textbooks will be considered here.

Bronchiectasis and Lung Abscess.—A large majority of patients with bronchiectasis or lung abscess presented an appearance in the larynx typical of tuberculosis. The pulmonary condition of these patients being unknown at the time of the examination, the laryngeal lesion was classified as tuberculous. The diagnosis was changed only when it became established that they were suffering from a nontuberculous pulmonary infection, and the larynx would unlikely be tuberculous.

Accessory Sinusitis.—These cases often present an appearance in the larynx that may lead one to believe it tuberculous. In these patients there is usually a marked thickening at the posterior commissure and often at the posterior ends of both true cords. The thickening is undoubtedly due to the purulent discharge from the posterior nares, and to the improperly modified air breathed in through atrophic nasal chambers, a condition which usually accompanies chronic accessory sinusitis. In such cases, a thorough



Fig. 9 (Case 9).—Chronic tuberculosis of the larynx.

examination of the nasal chambers and sinuses will help in establishing the diagnosis of the laryngeal lesion.

Laryngitis Sicca.—This condition often accompanies accessory sinusitis, atrophic rhinitis and nasal obstruction. The lesion in these cases is diffuse, and here, also, the diagnosis may be determined after a thorough examination of the upper portion of the respiratory tract.

TABLE 4.—THE ORDER OF FREQUENCY OF ULCERATION OF THE DIFFERENT PARTS OF THE LARYNX

	Number of Involvements	Number of Ulcerations	Per Cent.
Arytenoids	81	6	7.4
Aryepiglottidean folds	24	2	8.3
Ventricular bands	36	6	16.7
Epiglottis (rim)	36	7	19.4
Interarytenoid space	141	30	21.3
Vocal processes	98	39	39.8
Vocal cords	63	31	49.2

If, however, in addition to one or more of the three previously described conditions the patient also has a positive sputum, he should be carefully watched, for the resistance of the larynx having been lowered, it is readily subject to infection by the tubercle bacillus, and any signs of progress of the lesion should be regarded as evidence of clinical tuberculosis.

Lupus.—When occurring in the larynx, this disease is characterized by a warty growth, very little ulceration and marked fibrosis. While tuberculosis of the larynx is usually secondary to tuberculosis of the lungs, lupus of the larynx is supposedly secondary to lupus of the skin. In the author's case, however, the lupoid lesion in the larynx was apparently primary.

We must also differentiate tuberculous laryngitis from hypertrophic laryngitis, syphilis and carcinoma, conditions familiar to all.

REPORT OF CASES

CASE 1.—I. T., aged 20, had a moderately advanced type of pulmonary tuberculosis. The larynx showed uniform infiltration of the epiglottis with no ulceration and interarytenoid hyperplasia (Fig. 1 A). Discomfort in the throat was the only subjective symptom present.

The condition in the same patient six weeks later is shown in Figure 1 B. There is acute edema with ulceration of epiglottis, both arytenoids, aryepiglottidean folds and ventricular bands; infiltration and erosion of both cords; negative Wassermann test. There were marked dysphagia and dysphonia and regurgitation of food, especially liquids, through the nose, which latter symptom is caused by the tuberculous involvement of the oropharynx and soft palate, which the patient developed soon after admission. The diagnosis was acute tuberculosis of the larynx with very grave prognosis.

CASE 2.—E. McH., aged 19, was in the moderately advanced pulmonary stage. There was infiltration of the entire epiglottis with erosion of the right half; infiltration and erosion of the right aryepiglottidean fold and arytenoid, and hyperplasia of the posterior commissure. Occasional dysphagia occurred, but no hoarseness. The diagnosis was acute tuberculosis of the larynx.

CASE 3.—J. N., aged 43, in whom pulmonary tuberculosis was moderately advanced, had a marked infiltration of the epiglottis (turban-shaped), pear-shaped arytenoids, and infiltration and erosions of both false and true cords. The Wassermann test was negative. Occasional dysphagia, marked hoarseness and dysphonia occurred. The diagnosis was acute tuberculosis of the larynx.

CASE 4.—P. V., aged 38, had moderately advanced pulmonary tuberculosis. On examination, edema and ulceration of the right ventricular band and the right arytenoid were found, also slight edema of the left arytenoid with infiltration of the vocal process. The Wassermann test was negative. Discomfort in the larynx was the principal subjective symptom. The diagnosis was acute tuberculosis of the larynx.

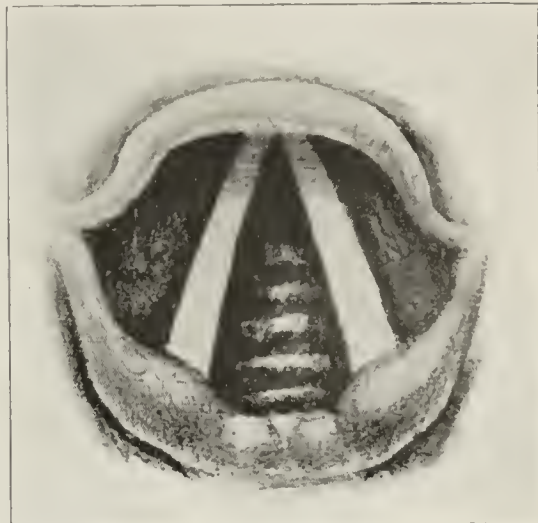


Fig. 10 (Case 10).—Chronic tuberculosis of the larynx.



Fig. 11 (Case 11).—Chronic tuberculosis of the larynx.

CASE 5.—P. S., aged 22, was in an advanced stage of phthisis, and examination of the larynx revealed infiltration with superficial ulceration of both ventricular bands, erosions of both cords and swelling of both arytenoids. One year ago the patient had an acute involvement of the entire larynx with pronounced dysphagia. Amputation of the upper two-thirds of the epiglottis was followed by marked local and general improvement. The diagnosis was subacute tuberculosis of the larynx following the acute type.



Fig. 12 (Case 12).—Chronic tuberculosis of the larynx.

CASE 6.—P. F., aged 21, complained of hoarseness. A broad-based papillomatous growth was found in the posterior commissure of the larynx. It represented the characteristic rugged appearance with adhering streaks of mucopus, and there was infiltration and slight ulceration of the free edges of both true vocal cords. This patient was in an advanced stage of pulmonary tuberculosis. The diagnosis was subacute tuberculosis of the larynx.

CASE 7.—A. P., aged 30, in whom pulmonary tuberculosis was moderately advanced, showed a slight thickening at the posterior commissure of the larynx, with infiltration and ulceration of posterior portion of both true cords especially the left. There was also slight hoarseness. The diagnosis was subacute tuberculosis of the larynx.

CASE 8.—O. B., aged 26, complained of hoarseness and occasional discomfort in his throat. Examination revealed infiltration of the posterior commissure with mammilated appearance of the mucous membrane, and infiltration and erosion of the posterior two thirds of both true cords. The patient had a moderately advanced type of pulmonary tuberculosis. The diagnosis was subacute tuberculosis of the larynx.

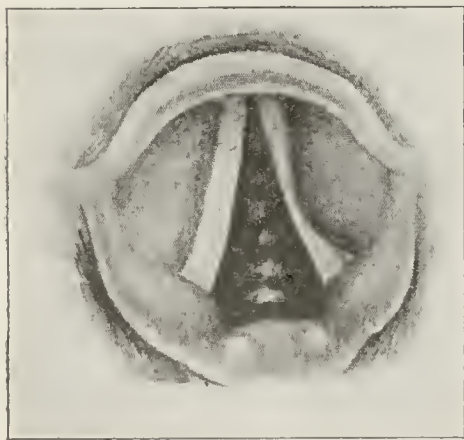


Fig. 13 (Case 13).—Chronic tuberculosis of the larynx.

CASE 10.—O. H., aged 24, was not troubled with any irritation of the throat, but examination of the larynx showed infiltration of the posterior commissure with slight thickening of the arytenoids. These signs are generally the earliest manifestation of laryngeal tuberculosis. Diagnosis was chronic tuberculosis of the larynx.

CASE 11.—F. G., aged 28, had an advanced type of pulmonary tuberculosis. The entire right vocal cord was eroded, with infiltration and erosion of the right ventricular band.

Also partial erosion ("mouse-eaten" appearance) of the left cord and hyperplasia at the posterior commissure with chronic infiltration of both arytenoids. There was marked hoarseness and partial aphonia. The diagnosis was chronic tuberculosis of the larynx.

CASE 12.—M. K., aged 30, complained of slight hoarseness and, on examination of the throat, papillomatous infiltration of the posterior half of the right cord with slight thickening at the interarytenoid space was found. Pulmonary tuberculosis in this patient was far advanced. The diagnosis was chronic tuberculosis of the larynx.

CASE 13.—A. W., aged 24, was in an early stage of pulmonary tuberculosis. Infiltration of left ventricular band was to be seen, also a chronic hyperplasia of the posterior commissure but no subjective symptoms of throat irritation had been noticed. The diagnosis was chronic tuberculosis of the larynx.

CASE 14.—E. C., aged 24, had a warty growth on all parts of the larynx. Physical examination of the lungs was practically negative; sputum examination and the Wassermann test were negative. Hoarseness, dysphonia and discomfort in the larynx were the troublesome subjective symptoms. The diagnosis was lupus of the larynx.

CONCLUSIONS

1. The early diagnosis of laryngeal tuberculosis is of considerable importance.

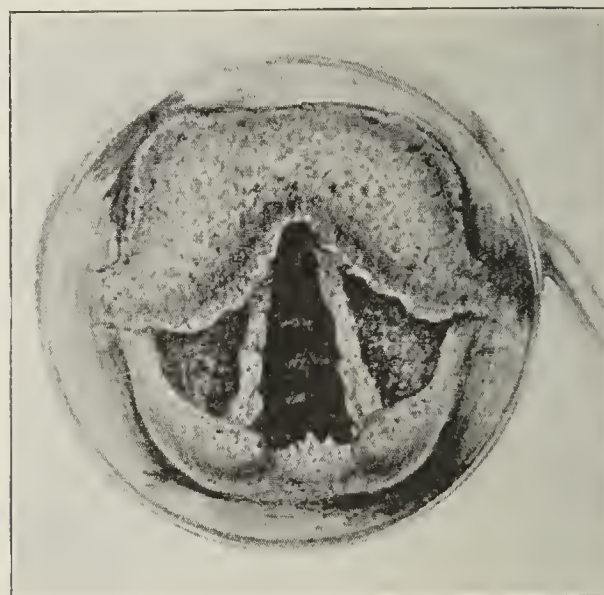


Fig. 14 (Case 14).—Lupus of the larynx.

2. Since tuberculosis of the larynx is almost always secondary to pulmonary tuberculosis, the determination of pulmonary tuberculosis is of value in the diagnosis of laryngeal tuberculosis.

3. Dysphagia, dysphonia and aphonia are rare in early cases, and much less common in late cases than generally supposed.

4. The frequency with which a part of the larynx was found to be affected was in direct proportion to the amount of trauma that part received as a result of its location and functional activity. The parts were affected in the following order of frequency: interarytenoid space, vocal processes, arytenoids, vocal cords, epiglottis, ventricular bands and aryepiglottidean folds.

5. Many cases of bronchiectasis, lung abscess and accessory sinusitis present a laryngeal picture similar to tuberculosis, and to avoid confusion a thorough study of each case is essential.

6. Through the cooperation of the family or clinic physician, the laryngologist and the sanatorium physician, no case of laryngeal tuberculosis should ever escape our attention.

ABSTRACT OF DISCUSSION

DR. WOLFF FREUDENTHAL, New York: Dr. Dworetzky has brought out several points which are not quite in accord with my experience. When, for instance, he says that tuberculosis of the larynx is similar to pulmonary tuberculosis, I cannot quite agree with him. If we have plain laryngitis which does not respond to treatment, we ought to examine the lungs in every case. That anemia of the larynx is rare is contrary to my experience. I have observed a marked anemia beginning at the border of the uvula and going down, which occurs frequently. The congestion which is seen in many instances is often due either to a cough or the previous occupation of the patient, as, for instance, in cigarmakers.

DR. EMIL MAYER, New York: The last picture shown by the speaker is to my mind one of the most interesting things I have seen, in that it shows the condition of what we might call chronic tuberculosis or lupus. If you have never seen a case of lupus, bear that picture in mind; it will save you a great deal of trouble, because if you saw an epiglottis, or even the anterior part of the larynx, in that condition, you would immediately say that is tuberculosis and get into trouble, for the reason that your patient would have very few, if any, of the symptoms. The most important differentiation between a chronic tuberculosis, that is, a lupus of the larynx, and tuberculosis is in the question of prognosis. I know a business man who is doing fine work, whose voice is not affected, and yet he has a ragged epiglottis; he has no cough, but he knows that he has tuberculosis of the larynx. It really is a lupus, and that is the most important differentiating sign, namely, ulceration and destruction without any corresponding symptoms.

A NEW OPERATION FOR MOVABLE KIDNEY*

WILLARD BARTLETT, A.M., M.D.
ST. LOUIS

Garre¹ tells us that movable or floating kidney is mentioned in the literature of early Arabian medicine. Landau² states that the anatomists of an early date knew of the congenital form of this malady but that the acquired variety was first mentioned in 1581 by François Pedemontanus. The first surgical effort in the treatment of the condition was a nephrectomy performed by Martini in 1878. It was not until 1881 that the rational method of restoring the organ to its normal location and fastening it in position was proposed by Hahn.³

Since his time there have been the greatest variety of operative procedures advocated, all of them intended in one way or another to suspend the kidney by sutures either through its substance, through the tunica propria or through the fatty capsule. Some have thrown loops around it of fascia, catgut, nonabsorbable sutures, or gauze, designed to hold it in place for the formation of adhesions, while others have utilized the fibrous capsule by carrying it over a rib or over some other component structure of the abdominal wall. Gauze packs and envelopes have been used in a great variety of ways, both to hold it up temporarily and to induce the formation of adhesions.

Zondek⁴ reminds us that the diagnosis of abnormal kidney position and mobility is by no means easy,

since various students of anatomy who have made special contributions to this subject fail to agree on the amount of kidney structure that is normally uncovered by the ribs as well as on the normal range of motion imparted to it by respiration or by change of position.

It is obvious, then, that no surgical operation is justified by the mere considerations that a kidney is abnormally palpable or movable. The intrinsic symptoms produced by this condition are frequently so elusive and so difficult in some instances to identify when they appear in a highly nervous person that I am not convinced that it is very good surgery to operate, as Mills⁵ says, "for subjective symptoms alone."

It must be admitted that a highly movable kidney is often accompanied by a renal type of pain which is



Fig. 1.—The incision.

instantly relieved by lying down. Then, too, there is Dietl's crisis, which some observers seem to think characteristic of this condition; however, one must be sure of the absence of kidneystone, stricture of the ureter, gallstone disease, etc., before making those symptoms his sole guide to an operation for movable kidney.

It would seem in the light of present knowledge that the one definite and invariable indication for operation must be of an anatomic nature, namely, intermittent hydronephrosis. This is expressed by a roentgenographic demonstration of a dilated kidney pelvis, atrophy of the apexes, and a kink in the ureter.

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Garre and Ehrhardt: *Nierenchirurgie*, Berlin, 1907, S. Karger.

2. Landau: *Movable Kidney in Women*, Selected Monographs, London, New Sydenham Society, 1884.

3. Hahn: *Zentralbl. f. Chir.*, 1881.

4. Zondek: *Die Topographie der Niere und ihre Bedeutung für die Nieren Chirurgie*, Berlin, August Hirschwald, 1903.

5. Mills, G. P.: Discussion on Nephropexy and Its Results, *Tr. Roy. Soc. Med.*, 1913-1914, 7, Part 3.

All of the other movable kidney patients excepting those of the class last mentioned are subjects for medical treatment.

Israel⁶ writes that the fatty capsule may accurately fit the kidney and move with it between the layers of the fascia retrorenal, or, as I have much more frequently noted in operating, the fatty capsule constitutes a more or less thick-walled sack a great deal larger than the kidney, within the limits of which the organ is free to make its excursions up and down.

After this right fatty capsule is stripped out, if the patient lies on the left side and in the Trendelenburg position, the observer will discover that there is left a well defined extraperitoneal cavity extending clear into the true pelvis.

Morris⁷ is authority for the statement that the kidney does not always move up and down behind the peritoneum, but sometimes is covered by so exceedingly loose a peritoneum that it is enabled thus to cross the midline in its excursions. Since I have not had such a case, I do not know the value of this new operation in connection with it, and therefore none of my assertions are to be applied thereto.

Most of the earlier operations designed for the treatment of movable kidney have depended for their efficacy on some form of suspension as opposed to my distinctly supportive procedure. The hanging up of intra-abdominal organs all the way from stomach to uterus seems to have become a discredited principle in surgery, and while its application to the kidney does not involve the risks incident to organs completely covered by peritoneum, still its underlying mechanical deficiencies would seem to remain the same, especially

when compared with a method that aims to prevent prolapse by obviating conditions which make a prolapse possible. In addition, Walkow and Delitzin⁸ make the pertinent observation that any method which sutures the kidney to the abdominal wall causes pathologic adhesions similar to those which result from inflammation; hence they term sutures "artificial, untrustworthy, and not free from danger." It may then be admissible to use this statement as an additional argument for the performance of my operation, which is physiologic so far as it imitates nature's

effort to hold the kidney in place by the deposition of fat in and around it.

Glenard,⁹ and later Walkow and Delitzin,⁸ mentioned sixteen different factors which influence the normal position and mobility of the kidney. As a matter of course, we cannot consider all of them in view of the fact that this paper is devoted to the exposition of one new method of treating the subject. It is sufficient to state that the operative technic now proposed rests in principle on a common clinical observation which has to do with but one of the normal factors mentioned above, namely, that the kidneys tend to become more than usually movable as an individual's body fat disappears, whereas this mobility decreases as weight is regained. The success of this method depends on the now well known principle that

fat can be successfully transposed and even that free transplants of this tissue will remain viable.

The operative technic which I have used in the twenty cases under discussion is divided into the following six steps:

1. With the patient lying on the left side I have employed the incision of my old teacher, von Bergmann, which bisects the angle formed by the last rib and the outer edge of the erector spinae (Fig. 1).

2. As soon as the abdominal cavity is opened, all the fat is removed from the inside of the posterior abdominal wall, leaving the muscles perfectly bare in the kidney fossa, the object being the ultimate formation of broad adhesions between the kidney surface and these denuded muscles (Fig. 2).

3. The fatty capsule of the kidney is divided longitudinally the entire length of the organ and caught with clamps at several points (Fig. 3).

The exposed kidney is lifted out of the abdomen, and at the same time the fatty capsule is inverted over on to the pedicle, being divided to a considerable extent above so that when the kidney lies completely outside the wound edges the inverted fatty capsule occupies a position beneath its lower pole. (In some cases the fibrous capsule will adhere to the kidney very firmly, while in others it will tend to move with the fatty envelop; hence no definite rule can be formulated which will always govern the treatment of this structure. In the majority of cases, it has been left undisturbed.)

4. With a needle and catgut, the cut edges (Fig. 4) of the fatty capsule which were originally grasped by

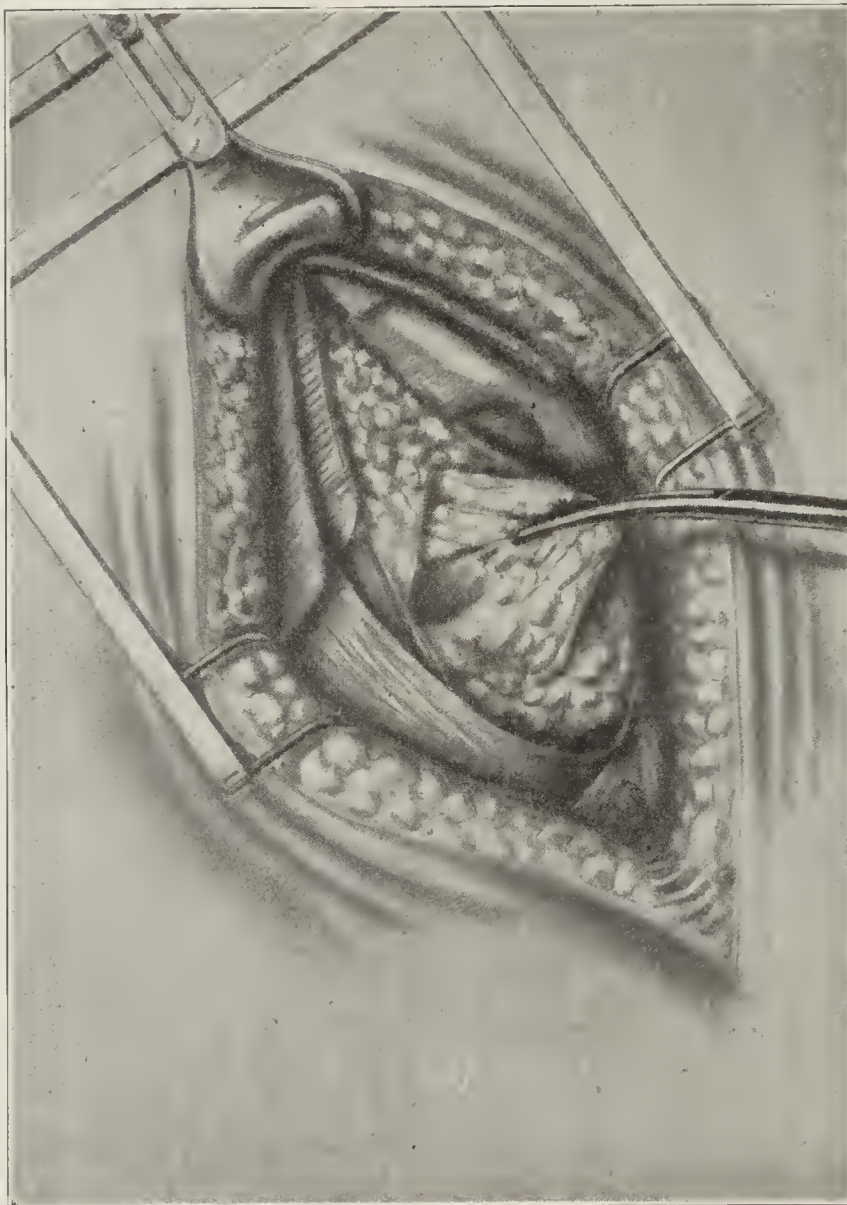


Fig. 2.—The intra-abdominal fat grasped preliminary to stripping it from the lumbar muscles.

6. Israel: Chirurgische Klinik der Nierenkrankheiten, Berlin, August Hirschwald, 1901.

7. Morris: Surgical Diseases of the Kidney and Ureter, Cassell & Co.

8. Walkow and Delitzin: Die Wanderniere, Berlin, August Hirschwald, 1899.

9. Glenard: Les ptoses viscerales, Paris, Felix Alcan, Editor, 1899.

clamps are united, thus transforming this inverted structure into a rather considerable ball of fat, which in most instances is about half the size of the kidney itself.

5. This ball of fat now constitutes a pedunculated flap and is transposed into the defect into which the kidney formerly slid. To insure its remaining in the desired location, it is anchored to the inner aspect of the abdominal wall directly under the lower angle of the wound by a stitch of the catgut which was used to unite its component parts into one spherical mass (Fig. 5).

6. The posterior abdominal wall is completely closed in layers without drainage.

I carried out the steps of the operation through an anterior gallbladder incision on one occasion. However, I do not recommend this method unless it is necessitated by other intra-abdominal work which cannot be equally done by the posterior route.

When this operation has been completed in the way I propose, three objects have been accomplished:

1. The self-lubricating lining of the extraperitoneal cavity has been removed.
2. The cavity itself below the kidney has been filled up.
3. The bared kidney and bared muscles of the posterior abdominal wall are definitely opposed to each other for adhesions to form.

No doubt the ball of fat remains permanently in position, although its real usefulness is probably exerted in the early period during which it holds the kidney up long enough for firm adhesions to take place between this organ and the posterior abdominal wall. Probably a combination of these two factors serves to maintain the kidney in its new position after the patient leaves the hospital.

Of course, the normal position for a kidney varies with the skeletal type of the individual, as has been best explained by Mills¹⁰ of St. Louis. My operative technic may, therefore, have an additional value since it does not definitely fix, at the time of operation, the future position of the organ, but allows it to adjust itself to its environment and become ultimately attached in a location which corresponds to the patient's anatomic type.

The rationale of this operation is perhaps best understood by one who has read Bissell's¹¹ description of the perirenal fascia. He described it as an inverted

bag which completely surrounds the kidney except in front where the two layers are separated for the entrance of the great vessels and below for the passage of the ureter. It is between the two layers below that the kidney prolapses, and it is this defect which I aim to block by transposing the inverted fatty capsule into it.

The Mayos¹² are the only surgeons who have, to my knowledge, made an attempt to treat movable kidney by obliterating the defect into which the organ has slid. They have long accomplished this result by attaching the hepatic flexure of the colon to the lateral abdominal wall. No doubt, Longyear¹³ has accomplished the same thing in utilizing his "nephrocolic" ligament in immobilizing both the kidney and the bowel, although he does not seem to lay very especial stress on this feature of the procedure.

The after-treatment of such patients consists in accentuating the various mechanical influences which normally tend to force the kidney to a higher level and keep it there. We employ a snug binder with a soft elastic pad of common cotton batting over the right anterior abdomen and thus increase the influence of intra-abdominal pressure on the kidney.

The foot of the bed is kept elevated as high as the comfort of the patient will permit, this position having a natural tendency to carry the kidney upward. The patient remains on her back for two weeks, which is considered long enough for fairly firm adhesions to form between the kidney and the muscles on which it lies.

Forced feeding is indulged in, since it must be kept in mind that the newly constructed fat pad will correspond in size to any increase or decrease

of the general body fat. It is a curious coincidence that the method which I propose is directly in line with the mechanical procedure employed by the internist in the treatment of these cases. I use the patient's fat in holding up the kidney as he does and indeed, make use of a pad, but fashion it out of the patient's perirenal fat and apply it directly, in place of the artificial pad which the internist applies to the anterior abdominal wall. Furthermore, this operation, as I brought out in an earlier paper,¹⁴ accomplishes in a few minutes what requires months of patient reconstruction under the care of a competent dietitian.

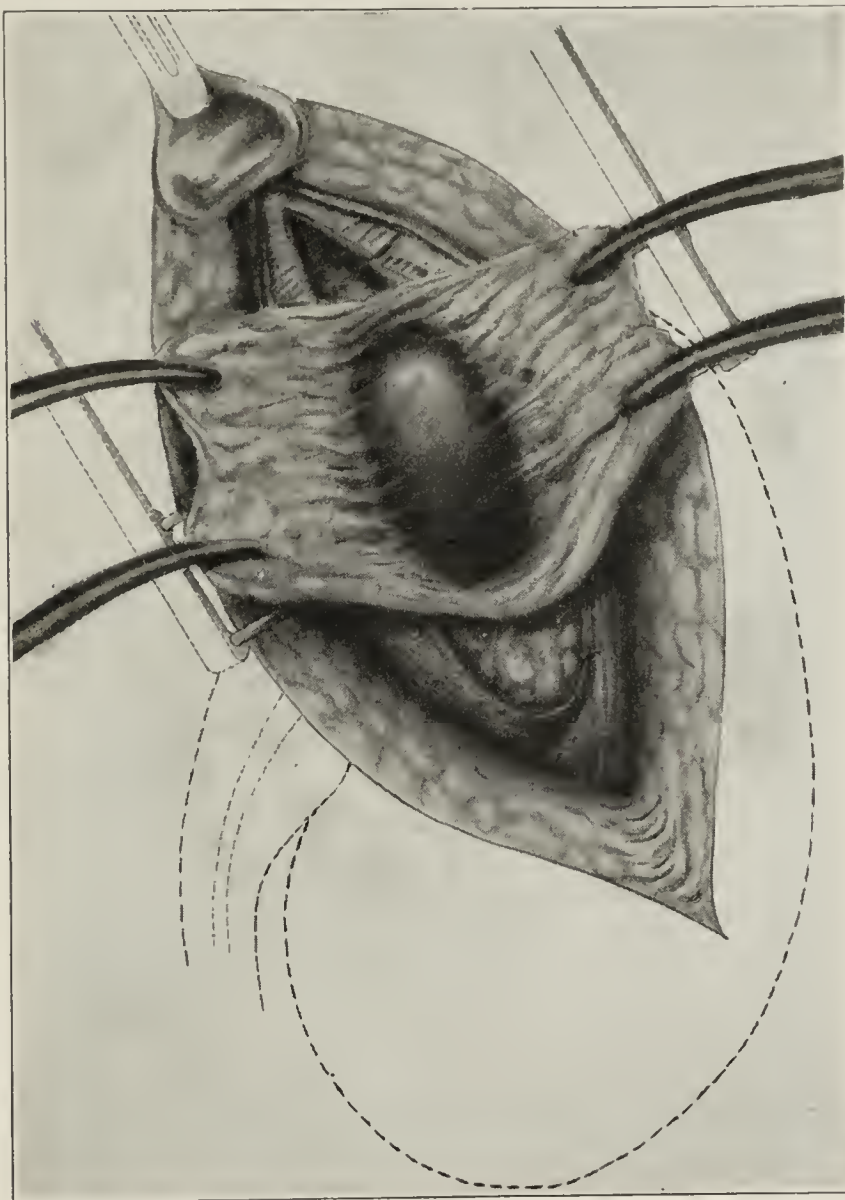


Fig. 3.—The fatty capsule divided along the convexity and grasped at numerous points.

10. Mills, R. W.: *Body Habitus*, Am. Jour. Roentgenol., April, 1917.
11. Bissell: *Surgical Replacement of the Prolapsed Kidney*, Surg., Gynec. and Obst., 1916, 23.

12. Mayo, W. J., and Mayo, C. H.: *Personal demonstration*.

13. Longyear: *Nephrocoloptosis*, St. Louis, Mosby Company, 1910.

14. Bartlett: *A Method of Surgical Treatment for Floating Kidney*, Jour. Missouri Med. Assn., April, 1915.

Ureteral catheterization has proved perfect remote functional ability in only one of these cases for the simple reason that only one patient has had post-operative symptoms urgent enough to induce her to submit to an examination. In this case there was no hydronephrosis, the urine itself was normal, and the functional test gave perfect results alike on both sides four years after the operation had been done. It may be added that in this case the recent symptoms were all pelvic, consisting largely of bladder manifestations pronounced by Dr. John R. Caulk of St. Louis to be caused by chronic metritis and rightsided salpingitis.

In describing the results of twenty of these operations, I am going to confine myself to the use of the patients' own words as far as the subjective side of the question is concerned, since the customary use of the words "cured," "improved" and "unimproved" permits so much latitude on the part of the interpreter that it can hardly be regarded as sufficiently accurate for the purpose in hand. Of still greater importance, perhaps, is the physical examination of such a person at the remote period which has fortunately been possible in a rather large percentage of my cases.

The operation described above has been done on twenty patients, of whom one (Patient 5940) died suddenly in the hospital nine days later. At 3:20 a. m. the nurse carried the bedpan to this woman on her statement that she wished to void. The patient remarked that she had had an unusually good sleep and felt uncommonly well. The pan was used and removed with but slight exertion on her part, but before the nurse could reach the door the patient cried out with violent pain in the region of the heart and clutched at her side with her left hand. She quickly became ashy and pulseless. The intern arrived two or three minutes later, but no heart sound could be heard. At this time the patient was cold, but apparently there was little respiratory difficulty. Death occurred in less than fifteen minutes from the time of the first complaint. No necropsy was obtained.

The remaining nineteen patients have all been heard from at periods after the operation varying as follows:

Four after 5 years; one after 4 years, 6 months; one after 4 years, 3 months; one after 4 years; one after 3 years, 6 months; one after 3 years; one after 1 year, 3 months; two after 11 months; one after 9 months; two after 8 months; one after 4 months; one after 2 months; one after 1½ months.

Fifteen of the nineteen patients who recovered have recently been subjected to physical examination by me

personally, and hence I am in a position to know definitely regarding remote results. All of these nineteen patients were asked to answer specifically the following four questions:

1. Have you had any more (specific symptom asked in each case) which was your leading complaint before the operation?

The answer "no" was given in 68.4 per cent., while "yes" was the reply in 31.5 per cent.

2. Do you consider your general health to be better since the operation?

One patient replied that it was too soon to tell, while 68.4 per cent. answered in the affirmative and 26.3 in the negative.

3. Are there any new symptoms which you think have resulted from the operation?

Ninety-three and one-tenth per cent. answered "no," while one patient insisted on soreness in the region of the wound as a new symptom.

4. Do you think the kidney has stayed in place?

The affirmative reply was given in 100 per cent. of cases.

A. At the time the final physical examination was made on the patients I wrote down that in one patient the kidney was not palpable; in two patients it was of normal size; in two patients it was large; in three patients it was small; in six patients it was of moderate size.

B. The patients were all examined in a lying posture with reference to the position of the kidney, which was noted in three instances high or "normal"; in three others the lower pole was 2 cm. above the level of the umbilicus; in three others it was 1 cm. above this point; in four cases it was at the level of the umbilicus; in one other it reached slightly below this landmark.

C. Movement with respiration in the lying posture was next considered. In 66.6 per cent. of the cases none could be detected, and in 33.3 per cent. movement of 1 cm. or less was appreciable.

D. Movement with change of posture from the lying to the sitting or standing was then considered, with a result that this never exceeded 1 cm., and could be detected in some degrees in only 40 per cent. of those examined, while in 60 per cent. it was not appreciable at all.

These figures by no means do the subject justice, since they fail to express the amount of relief obtained, in many instances from intolerable suffering which rendered patients entirely unfit for any occupation or the enjoyment of life. However, they fulfil their pur-

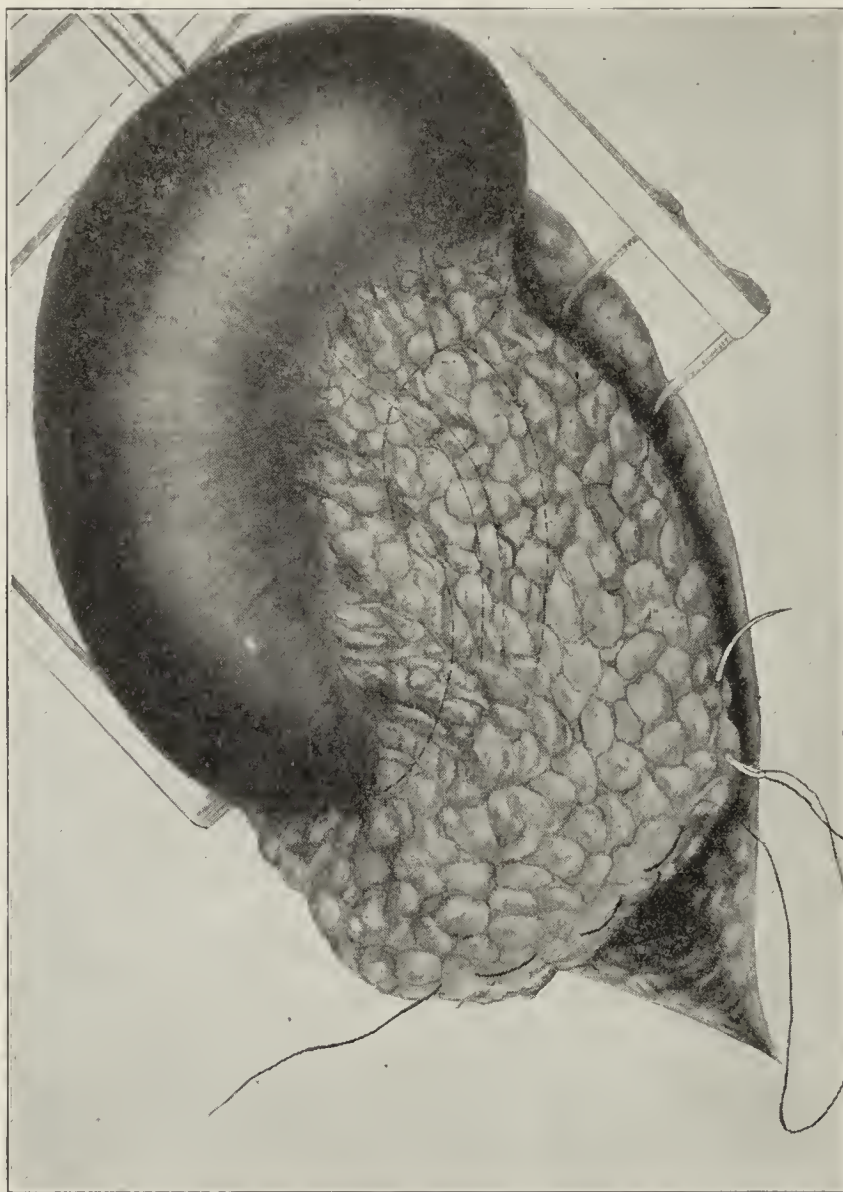


Fig. 4.—The fatty capsule, inverted, is being sutured into a ball by catching the points previously marked by clamps.

pose, since it has been my desire to present the proposed operative procedure to the most searching criticism.

(The underlying scheme of showing the kidney in various positions by dotted lines, employed in our illustrations, was suggested by Broedel's drawings in Kelley and Burnham's¹⁵ excellent textbook. It must be added, for the purpose of clearness, that the method herein proposed has absolutely no point in common with that employed by Dr. Kelley.)

ABSTRACT OF DISCUSSION

DR. HUBERT A. ROYSTER, Raleigh, N. C.: We need to understand, as pointed out by the author, that a mere dropping of the kidney is not an indication for operation, because many times not only are there no symptoms present, but very often the patient herself does not know that she has a floating kidney. And in the words of a great philosopher, "What you don't know won't hurt you." Now these operations have not only failed to relieve symptoms very often, but they have failed to restore the kidney to its normal position, and at times have made conditions worse. Numbers of recurrences, I am sure, are on the list of every operating surgeon. It behooves us to understand just what are the symptoms of a misplaced kidney. I confess that I do not know. As I remarked, there are often no symptoms. At other times if symptoms occur, how do we know that they are due to this condition? So that there are a number of questions which suggest themselves. Is it necessary to show that a hydronephrosis is present before one decides to operate? Is the pain always due to a kink of the ureter? Does not pain sometimes exist from other causes, and are we certain that the nervous phenomena exhibited by the patient are due to a misplaced kidney? The operation proposed by the essayist, I feel inclined to say, has great merit. We might inquire, however, if the ball of fat will permanently hold up the kidney. Does fatty tissue hold up organs always? Will it not yield and will it invariably refrain from absorption? We have been told that the kidney drops very often on account of the absorption of the perirenal fat. If that is the case, do we always have enough fat left here to act as a ball on which we can place the kidney? It seems to me that is an important point to consider. Does the author of this operation find that he has in most cases enough of the perirenal fat left behind to serve his purpose? I am very glad to see that he makes a high incision. In most instances in my experience, when attempts have been made to restore kidneys to their normal position, they have been very far from it. Usually the kidney is placed backward against the pos-

terior abdominal wall and very much lower than its actual anatomic position. Now if the high incision is made, we come nearer to placing it in its proper position than if we make a low incision. It is not my disposition to be too critical of this operation. If the author had given me an opportunity to try the operation before discussing it, I would certainly have done so, because I have numbers of these cases on my waiting list whom I have not dared to interfere with after the usual methods. I have preferred that these patients should wear a good corset and wait a while.

DR. DANIEL N. EISENDRATH, Chicago: If there is any field in modern surgery to which Dr. Bartlett's remarks in his paper this morning are applicable, it is this field of movable kidney. No greater number of sins of commission have been recorded than in these patients, who are operated on simply for the reason that the kidney is a little bit below the umbilicus, and perhaps has a little more mobility than normal.

I was glad that Dr. Bartlett said that his chief indication in these twenty cases was the existence of an intermittent hydronephrosis. I would like to amplify this, that in some of these cases there is not an actual intermittent hydronephrosis, but often repeated occurrence of Dietl's crises. I have had experience of a number of cases in which a pyelitis is favored by a kinking, or at least by a malposition, of the kidney, an abnormality. I believe that is something we should add to the indications. Aside from that, I believe there is no indication for an operation on the movable kidney, for this reason: These patients are the subject of a general visceroptosis, and the immobilization of the kidney is only a portion of our therapeutic procedure, and since we are unable to agree on any standard method of immobilizing all of the abdominal viscera at once, it is unfair to subject these patients to operation. Dr. Royster mentioned the fact that in his experience these patients have very little fat. That has been mine also. Of course Dr. Bartlett's pictures showed a very ample support of perinephritic fat. In my experience there has been so lit-



Fig. 5.—The replaced kidney is held in an elevated position by the ball of fat beneath it.

tle fat that the poles were lower. That is something we cannot reckon with. Another objection is that one is banking everything around the pelvis of the kidney and around the lower pole, chiefly depending on that for support. One is not anchoring any other portion of the kidney. The result may be to have compression of the ureter, because one is unable to gage the amount of pressure on the ureter, and unless it is fixed at the upper pole it is liable to rotate and give rise to symptoms the patient had before. Now there is one method of diagnosis which, as my experience in kidney surgery increases, I have come to regard as the only absolute test of the mobility of a kidney. I don't believe that one can tell by palpation through the abdominal wall whether a kidney is 1 or 2 cm. further down than it ought to be. The only method is by the use of pyelographs. There seems to me also a danger in this operation, namely, that it depends on fixation of the kidney for lower pole support and not denudation, as we think it necessary to fix the

15. Kelley and Burnham: Diseases of the Kidneys, Ureters, and Bladder, New York, D. Appleton & Co., 1914.

rest of the kidney in its new bed. I think the paper is timely.

DR. EMERY MARVEL, Atlantic City, N. J.: Prolapsing kidney causes suffering which is remedied by correcting the cause. Frequently, as stated, movable kidney is only one of a number of misplaced organs. Visceroptosis is not curable by correcting one unit in the chain which causes the symptoms. I would differ with Dr. Eisendrath when he asserts that the symptoms occasioned by the kidney are more pronounced in visceroptosis. I think perhaps the symptoms are more pronounced when the kidney is prolapsing, without general ptosis of the other viscera. I wish to express my appreciation to Dr. Bartlett for again calling attention to a surgical remedy which has grown into disrepute, but which has merits to entitle it to further consideration. I fully agree with Dr. Eisendrath that too frequent and too promiscuous operation is a sin of commission, but it also seems to me that we should be responsible for sins of omission if we declined to recognize the responsibility to correct prolapsing kidney, but, instead, permitted continued suffering which could be relieved. If we operate on the kidney alone which proves but one link in a chain that causes the trouble, we shall have great disappointments in our results. Among other conditions found with prolapsing kidney is that the ascending colon is dropped and by its distention a fecal sac is formed. There is frequently chronic appendicitis. In such cases the appendix certainly should be removed and some means should be employed by which the colon could regain its position and normal caliber. Dr. Bartlett strips back the colon and accentuates the displacement by interposing additional bulk below the kidney. The malposition of the colon is increasingly aggravated to a greater prolapsing position. Dr. Bartlett operates on the hypothesis that a prolapsing kidney is due to the loss of perirenal fat. That has been a theory about which I remain unconvinced. I should like to hear from Dr. Bartlett whether or not he is convinced that there is relatively more fat on the prolapsing than on the nonprolapsing kidney. It would seem that the great cause for prolapsing kidney is an anatomic one. The displacement is present mostly in subjects of straight spine, where there is a reduced shelf for the kidney to lie on.

DR. C. E. CANTRELL, Greenville, Texas: I think the profession has allowed the pendulum to swing too far in cautioning surgeons not to operate on kidneys. I am really sorry that more has not been done to prove or disprove the work of Edebohls. In our work we have found some wonderful results in inflammation of kidneys. I am sorry, also, that these gentlemen who have adversely discussed this paper, in a measure failed to see the very point that the essayist made the most advantage of, holding the kidney where it belongs. The kidney is held where it belongs by intra-abdominal pressure with very little help. One gentleman said he would not put a platform under the child to get it out of the well; he would pull it out with a rope. If he had left that well wide open to the child, would not he be more apt to go into the well? Now the essayist closes up this oily well that the kidney so easily slips down into, and leaves it so that a very little help will cause the intra-abdominal pressure to keep the kidney back on that shelf made by the coming forward of the spine. Let us not just condemn things because the tendency is to condemn. I would not want to operate on a kidney because it had been found by the Roentgen ray out of place. Unless kidneys produce symptoms one had better let them alone. If a woman who does not know she has a floating kidney comes complaining, one had better get a little clinical history and see if the kidney is at fault. Now let us study the field. Most movable kidneys are on the right side. On this side the colon is attached about 4 inches; on the other side 12 inches, which makes the difference. If the kidney gets clear down into the abdomen and makes trouble in the pelvis after it begins pressing on the organs, a clinician ought to be able to know something about it. It seems that they have failed to get the idea that the essayist in stripping the fat off of the muscles of the back clears that field. Perhaps he will get some adhesions there which will fix the kidney; the pad made by the fat and intra-abdominal pressure will hold it in place. If he goes further and slits the capsule, he will get

better fixation, and I am glad now I know how to close the well. Let us hope we will get better results by closing up the well.

DR. MARTIN B. TINKER, Ithaca, N. Y.: I feel inclined to agree that Dr. Bartlett has been pretty severely criticized. There are two sides to this question, and one point that we all recognize: There are cases in which loose kidney is not associated with general visceroptosis, in which operation is indicated; other cases with general visceroptosis in which operation is contraindicated. The cases with hydronephrosis, Dietl's crises and the loose kidneys pressing in the region of the common duct and causing common duct obstruction definitely indicate operation. The number of cases for kidney fixation is small, but all experienced surgeons here must have operated occasionally and seen good, permanent results. It seems hardly necessary to call attention to the fact that the main feature of Dr. Bartlett's operation was also suggested by Nicholas Senn, who advised pushing the fatty capsule of the kidney into the opening below the lower pole. Dr. Robert T. Morris also suggested this method, I believe. Dr. Bartlett's method seems a more perfect utilization of the principle suggested by Drs. Senn and Morris. We should not operate in many cases of loose kidney, but in certain instances it is definitely indicated and gives good results. Furthermore, when we criticize Dr. Bartlett's method we should remember that probably 70 per cent. of us sterilize catgut according to his method and many are using his methods in treating large ventral hernia. The fact is, we know Bartlett's statements will bear careful scrutiny; this operation which he details is probably useful or he would not tell us so.

DR. WILLARD BARTLETT, St. Louis: I must thank the gentlemen who have discussed the paper for giving me an opportunity to bring out things, all of which are discussed in the body of the paper but which are left out because I read only the essence. Dr. Royster wants to know if we do have enough fat in every instance to make a ball to hold the kidney up. That is a very pertinent matter. In some instances we had not as much fat as we desired, but it does not seem to take very much when one considers the other two factors which are favorable. I do not say that the fat did it all, but it was accomplished by removing the large lubricating joint surface, and by skinning the kidney you do favor the formation of adhesions. I have noticed no difference in results when not much fat was in the fatty capsule. Dr. Eisendrath speaks of the possibility of the kidney rotating again because it has nothing under it but a little ball of fat. I must call Dr. Eisendrath's attention again to my very definite statement, that I depend on three factors just mentioned, and that the combination of them does seem to prevent the kidney from rotating on what is really not a very large ball of fat. I had thought of that and I am very glad Dr. Eisendrath brought it out. It does not happen, apparently. Dr. Eisendrath remarked that the only way to tell whether the kidney, after operation, is really movable or not is by making a pyelogram. This is all very well if one can ever in this world get a patient to submit to it twice. I must again call Dr. Eisendrath's attention to the fact that there is much denudation with the idea of getting adhesions. Dr. Marvel spoke of the other factors which hold up the kidney. There are sixteen of them considered in the paper, and I should perhaps have laid more stress on the fact that time did not permit discussing the other fifteen. I cannot answer Dr. Marvel's question in regard to the relative amount of fat around a prolapsed kidney. Dr. Tinker calls my attention—and I appreciate it very much that he does—to the fact that there is nothing at all new in surgery and that Senn packed gauze under the kidney years ago. All of these authorities are carefully written up in the paper and there is a long list of references. They are all given credit for everything they have done. I must thank Dr. Cantrell for having fully understood the thing and saved me a lot of repetition in closing the discussion.

Good Taste.—Good taste is nothing more nor less than a correct estimation of all proportions.—Lorand.

BACTERIAL VACCINE THERAPY*

JAMES P. LEAKE, M.D.

Passed Assistant Surgeon, United States Public Health Service
WASHINGTON, D. C.

"If at the present time ten years of public notoriety have passed over any doctrine professing to be of importance in medical science, and if it has not succeeded in raising up a powerful body of able, learned, and ingenious advocates for its claims, the fault must be in the doctrine and not in the medical profession." This old criterion of Holmes is applicable to bacterial vaccine therapy this year, for though Fraenkel's work dates back a quarter of a century and Wright's fifteen years, in this country it was not until about ten years ago that any great degree of notoriety attached to the subject. The profession generally was about to grant vaccine therapy, at least autogenous vaccines, a more or less definite place when the new mass of data regarding nonspecific reactions began to appear and to cause grave doubts as to what were formerly regarded as fundamental principles.

A clear differentiation must be made between vaccine therapy and prophylaxis. The value of typhoid vaccine in prophylaxis is unquestioned, but the immunity thus obtained, if doses small enough to spare a sick patient from the danger of a reaction are given, may not be rapid enough to be of use in therapeutics. The impression has become more and more dominant that in order to have any definite assurance of improvement from vaccine injection, there must be a reaction. These reactions occur in nonspecific injection therapy. Whether all the improvement in specific bacterial therapy depends on the nonspecific reaction is still questionable. The tendency toward recurrence forms one of the objections to accepting improvement after vaccine therapy as being specific.

Regret over the extension of the meaning of the word vaccine beyond the true Jennerian sense is now useless. Pasteur himself applied the term to his attenuated anthrax injections, and it has been broadened by some to include every substance injected for the purpose of producing an active immunity. A stricter use, and one which I believe should be generally followed, includes under vaccines only suspensions of the bodies of micro-organisms, living or dead. The products of bacterial growth are thus not vaccines, neither are they toxins, though poisonous or toxic, unless they have the property of stimulating the production of demonstrable antitoxins.

As between stock and autogenous vaccines in therapeutics, there is no question that the reports favor the latter. The vote is so strong that the evidence on first thought would be overwhelming for specificity. In fact, one of the great objections to vaccine therapy has been the apparently extremely narrow specificity of some of the reactions, no other vaccine than that made from the patient's own strain proving beneficial; and we are advised that sometimes even strains isolated early in the course of a treatment become useless and a fresh culture from the infected focus must be made for a second and again for a third vaccine. Autogenous vaccines are practically always fresher than stock vaccines, and there is ground for believing that toxicity or the reaction-producing quality decreases on storage. The commercial stock vaccines of the large biologic manufacturing laboratories, on

the other hand, are safer than the usual autogenous vaccine. The vaccines made by laboratories holding federal license, while impossible of accurate control as to potency, are generally more carefully tested as to sterility and content of preservative, and are less likely than other vaccines to contain an excess of toxic protein. If the number of these preparations on the market were an index of their efficacy, one would say that they must be of some value.

NEED FOR CONTROL OBSERVATIONS

The literature abounds with observations on this form of therapy, but the vaccine was administered for the most part without controls. It is obvious that the tendency is to report favorable results, while the series of unsuccessful cases are less likely to be published. Largely on uncontrolled, but remarkably uniform, experience, we have come to think that staphylococcus vaccines are of benefit when proper surgical relief is also given. Why should we demand more scientific checks on observations in the wider field? Because it is high time that bacterial vaccines should either be found definitely useful under clearly outlined conditions or be discarded; in other words, practice has jumped far ahead of knowledge, and knowledge should recover its place. It is hoped that military hospitals in the various countries at war will enable studies to be made on a sufficiently large and complete scale to justify permanent conclusions. The uncertainties due to enthusiasm for any rather new treatment are obvious, but in the case of vaccine therapy our vision is particularly clouded. The seemingly scientific basis for the treatment tends to impress both doctor and patient, and the injection, the reaction and recovery therefrom can hardly help having some psychic effect. Vaccine therapy was formerly considered to be practically devoid of danger, but since benefit is now thought to be proportionate to toxic reaction, and particularly with the intravenous administration, accurate knowledge is essential to replace the present hit-or-miss plan.

My plea, then, is not for utter abandonment of therapeutic inoculation, but for its better control, and for the collation of such reliable data as will more clearly guide our future use of the method. In a laboratory experiment, unless a reaction is quantitatively well established when all the elements are known, there should always be as large a number of control or check tests using the known elements as there are of tests with the unknown element which is under trial. So with the therapeutic test of such substances as bacterial vaccines, since we cannot accurately forecast what will happen in the untreated cases, there should in each series be as large a number of these (or of cases treated nonspecifically) as of vaccine-treated cases, at the same time, under the same conditions, and with the same impartial observation, in order to secure the greatest accuracy from a given number of tests. It would be invidious to indicate examples, but a great part of the unqualifiedly favorable communications on vaccine therapy, reporting uniform benefit without severe reaction, bear internal evidence of lack of careful control, and as a rule the more favorable, the greater is this evidence.

On the other hand, we have some very carefully controlled reports. Last year Captain Whittington¹ of the Royal Army Medical Corps reported 230 cases of

1. Whittington, T. H.: A Report on the Use of Stock Vaccine in Infection by the *Bacillus Typhosus*, *Lancet*, London, 1916, **190**, 759-766.

* From the Hygienic Laboratory.

typhoid fever, selected to conform to rigid standards of diagnosis and classified as to relative severity, and divided them into two lots, so that each vaccine-treated case was accurately checked with a nonvaccine-treated case in the same state of prophylactic vaccination, of the same severity, occurring in the same season, climate and locality, of the same sex, of about the same age and previous health, and receiving the same general treatment as to nursing, dieting, etc. Captain Whittington had the advice of Sir William Leishman on the earlier cases, so that there should be little to criticize as to dosage and time between doses. Such a series, though small, is far more valuable than thousands of cases collated from different observers without proper controls, with the chance favorable results in many instances acting as a spur to publication. Whittington's results are recorded in the accompanying table.

COMPARATIVE RESULTS FROM THE USE OF VACCINES IN TWO HUNDRED AND THIRTY TYPHOID FEVER CASES

	Mortality Per Cent.	Average Days Fever	Relapsed Cases Per Cent.	Cases with Complications or Sequelae Per Cent.
Vaccine-treated cases.	25	29.2	10.4	49.5
Controls	21	26.1	7.8	46

A comparison of these results shows that the controls did a little better than the vaccine-treated cases. Moreover, from the promptness with which some of the hemorrhages followed a vaccine injection, there was a decided suspicion that the vaccine might have induced this complication.

Whittington started with a bias in favor of the vaccine, which his earlier cases tended to confirm. This is one reason for lack of sufficient controls in most published series. Inspired by hope, the workers become so enthusiastic that the majority of the patients are given the "benefit" of the vaccine. To a laboratory worker it would seem that, with our present knowledge, no patient is unjustly treated in having this so-called specific treatment withheld.

The recent intravenous treatment of typhoid fever and some other conditions with various bodies, specific and nonspecific, gives striking results in a proportion of cases; but the dangers in the general use of this method, admitted by practically all who use it, restrict its field at present to the same carefully controlled circumstances as those previously outlined. These dangers are very apparent in intravenous treatment of animals with bacterial suspensions.

One other small but well controlled series was recently reported by a group of workers² under Dr. Park, of the Bureau of Laboratories of the New York City Health Department. These authors also, even up to the time the results were tabulated, believed that the vaccine (pertussis in this case) was of specific benefit. Outpatient material was used, open to the usual objection of uncertain home conditions and questionable information on the part of the parents. Of the more than 1,000 cases, 75 per cent. were rejected because they were not in the proper period of the disease for good comparison, because the diagnosis was somewhat uncertain, because the address was changed, because of unreliability, or for some similar reason. The parents were carefully cross-examined to rule out false reports, and visits were continued at the homes to complete the records. Alternate patients were chosen for

the pertussis vaccine, the others receiving either influenza vaccine, milk solution diluted to resemble vaccine, or merely terpin hydrate by mouth. "In recording the remarks on the charts, the investigators were not biased by a knowledge of the vaccine employed, as they did not know until the study was finished which was which. The secret was safeguarded by the maker of the vaccine." Yet when the data were assembled, no matter what the grouping, whether according to intensity of onset, stage of disease, duration of disease, or intensity of paroxysms, the result was the same. The pertussis vaccine showed no superiority over the non-specific treatments.

The experience of such clinicians as Dr. Billings, who has had the most expert technical assistance and advice, with parallel serologic studies, is more important than the mere numerical summary of the overburdened and much vaunted favorable literature on specific therapy. After years of trial, especially in chronic disorders which should offer the most favorable field, Dr. Billings³ says that a personal and general hygienic management will accomplish quite as much without as with vaccines; and that vaccines without proper attention to a hygienic management are more likely to be harmful than helpful. It has been justly said that autogenous vaccination involves a hunt for latent foci of infection, and that this attention to the patient, with consequent local treatment of such foci as are found, is of itself of great benefit. Properly prepared and tested autogenous vaccines, however, are not within the reach of the great majority of patients. The bulk of vaccine therapy, if it is to become generally available, must be on the stock basis. Autogenous vaccines are often as ludicrously abused as stock vaccines. The differentiation of organisms is largely morphologic; the most easily grown are those found. The securing of a bacterium from the bodily discharges or mucous surfaces, even with a positive serum reaction, cannot be accepted as demonstrating a causative relationship to the disease, or any part of it, unless the bacterium is well known to be a pathogen. As for deeper cultures, those who work with laboratory animals know that normal tissues are by no means found constantly sterile.

The case in general is not proved, and doubt is increasing. Many keen observers believe that specific bacterial therapy is a failure. In some diseases claimed to be within the field of vaccines, such as pertussis, asthma, or bronchitis, a smallpox vaccination, a minor operation, or an intercurrent infection has been observed to precede partial or complete recovery. Why not a hypodermic injection, especially if followed by a systemic reaction? Moreover, there is a difference between changing the course of a disease, and changing it beneficially with any degree of certainty.

Negative results by one set of workers should not discredit the whole method of treatment. Slight but important modification by other workers may give more favorable results; but we should have the details, and above all, proper controls.

Hygienic Laboratory.

3. Billings, Frank: Discussion on Vaccine Therapy, Tr. Cong. Am. Phys. and Surg., 1916, 10, 135-138.

2. Von Sholly, Anna I.; Blum, Julius, and Smith, Luella: Therapeutic Value of Pertussis Vaccine in Whooping Cough, THE JOURNAL A. M. A., May 19, 1917, pp. 1451-1456.

Science.—To the natural philosopher, to whom the whole extent of nature belongs, all the individual branches of science constitute the links of an endless chain, from which not one can be detached without destroying the harmony of the whole.—Schoedler.

ECTOPIC GESTATION

DIAGNOSIS AND TREATMENT *

L. J. LADINSKI, A.B., M.D.

NEW YORK

The signs and symptoms of ectopic gestation are more distinct and characteristic than those associated with other diseases of the pelvic organs, and may be divided into two groups: (1) the unruptured and (2) the ruptured. The following are the diagnostic signs and symptoms of the unruptured group:

1. Amenorrhea, or some irregularity of menstruation, is generally present (excepting when tubal pregnancy occurs during lactation). Menstruation in tubal pregnancy is as exceptional as it is in uterine pregnancy.

2. As a rule the patient feels that she is pregnant, and may have the characteristic subjective signs peculiar to some individuals. She may suspect that the pregnancy differs in some manner from her previous gestations.

3. Pain is a constant symptom of tubal pregnancy, and is due to the small hemorrhages caused by the eroding villi or the distention of the tube by the constantly growing ovum. The pain is sharp, lancinating and paroxysmal in character, and is not only referred to the affected side, but particularly to the ovarian region.

4. Uterine hemorrhage, which is the result of decidual degeneration and separation, is a constant symptom of the disease and usually begins about the sixth or seventh week, and invariably ceases after operation, or destruction of the ovum by rupture or abortion. In rare instances the disintegration of the decidua is retarded and there is comparatively little uterine bleeding, and as a consequence the decidua is eventually expelled in the form of a cast of the uterus. In my series of 280 operations, to date, there were but three decidual uterine casts.

5. The uterus is invariably somewhat enlarged; its consistence, however, is that of the normal nonpregnant uterus. In very exceptional cases, when the decidua remains intact and is subsequently expelled in the form of a cast, the uterus may present an elastic area in the anterior wall.

6. The presence of a distended tube on one side, which offers to the palpating finger the feel of an elastic, tender, fusiform and usually movable tumor, is characteristic. The physical signs of a tube distended by a gravid sac, while not easily distinguished from hydrosalpinx, hematosalpinx, and a thin-walled ovarian or parovarian cyst, can generally be readily differentiated from pyosalpinx, retroverted pregnant uterus, pelvic abscess or exudate, and uterine tumors.

7. Two negative signs of great importance are: the absence of elevation of temperature and the exclusion of uterine pregnancy. There is no rise of temperature in unruptured tubal pregnancy. After rupture has taken place, there may be a rise of temperature due to the infection of the extravasated blood in the peritoneal cavity by the colon bacillus. The leukocyte count and the hemoglobin test are of no value in the unruptured variety. After rupture there may be an increased leukocyte count and reduced hemoglobin percentage.

DIFFERENTIAL DIAGNOSIS OF UTERINE AND
EXTRA-UTERINE PREGNANCY

The most prolific source of error in the diagnosis of tubal pregnancy can be entirely eliminated by a correct differentiation between uterine and extra-uterine pregnancy. An infallible sign of early uterine pregnancy is the peculiar elastic area in the median line of the anterior wall of the body of the uterus, above the junction of body and cervix, to which I called attention some years ago. In one recent textbook on obstetrics, brief mention is made of this sign as "the bulging and softening in the anterior wall of the uterus." Another author describes it in full and attests its value. It is a good beginning, and it is to be hoped that sooner or later this valuable sign will receive the general recognition that it deserves.

In uterine pregnancy, the elastic ova can invariably be felt after the fifth week; in tubal pregnancy, however, while the uterus is enlarged, the elastic area in the anterior wall is never present except in the very rare instances of uterine casts cited above. Thus the presence or absence of the elastic ova will determine the question of uterine or extra-uterine pregnancy.

A correct history, and the elicitation of all the foregoing characteristic signs and symptoms, call for a positive diagnosis. The presence of some of the signs, especially if other pelvic lesions can be eliminated, justifies a presumptive diagnosis. It is a pretty safe rule to think of ectopic gestation in every patient who has had amenorrhea followed by irregular bleeding and pain on one side.

A condition that at times is difficult to differentiate from tubal pregnancy is that of a corpus luteum cyst. The signs and symptoms of the two conditions are occasionally identical, including, also, amenorrhea followed by irregular bleeding.

SYMPTOMS AND DIAGNOSIS IN RUPTURED
TUBAL PREGNANCY

The additional local and constitutional signs of internal hemorrhage attendant on rupture are pathognomonic of the condition. However, in slight ruptures hemorrhage into the peritoneal cavity may be scanty and cause no further symptoms than a sudden severe lancinating pain, followed by general abdominal pains, nausea and vomiting. Likewise, when rupture takes place between the layers of the mesosalpinx, hemorrhage is usually not very profuse and produces very few signs of internal bleeding. Successive ruptures may occur at indefinite intervals and produce such slight symptoms as to escape attention, until the final and tragic rupture calls for immediate surgical interference.

The symptoms caused by rupture will depend for their severity on the extent of the rupture and the displacement of the ovum, and the amount of the internal hemorrhage, and will range and merge from the state of syncope to that of shock, collapse and occasionally unconsciousness. The anemia, the blanching of the mucous membranes, thirst, air hunger, shallow and rapid respiration, feeble pulse and subnormal temperature vary according to the degree of the hemorrhage and resisting power of the patient. Locally, the abdomen may be distended and tender, and palpation will elicit a fluid wave. Bimanual examination will, as a rule, reveal a soft, boggy tumor on one side or the other, which appears to the examining finger to be undefined in contour, and may change its shape under manipulation. When the gravid contents have become

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

entirely detached, and float in the peritoneal cavity, or when perforation has taken place during the early weeks of pregnancy, especially in the isthmian type, no localized pelvic tumor will be palpable, and the only evidences of rupture will be the presence of free fluid in the pelvic and abdominal cavities.

Shock and collapse due to hemorrhage from ruptured tubal pregnancy may simulate lesions of other abdominal viscera; for instance, perforation of the stomach, of the duodenum, of the small intestine or of the appendix; rupture of hydrosalpinx or of pyosalpinx; twisted pedicle of ovarian cyst; torsion of the tube; acute intestinal obstruction and renal and biliary colic. Study of the signs and symptoms presented by such cases will often clear up the diagnosis without any difficulty.

There are instances of intra-abdominal hemorrhage, however, which cannot be differentiated from ruptured tubal pregnancy, a number of which came under my observation. In one case profuse abdominal hemorrhage was due to spontaneous amputation of a twisted pedicle of an ovarian cyst; in another, to torsion of the tube, with cyst of the fimbriated extremity. In a third case, perforation of a graafian follicle, and in several cases rupture of a corpus luteum cyst was followed by severe intra-abdominal hemorrhage.

The pelvic findings in the unruptured varieties are characteristic and distinctive of the disease, while in the ruptured cases the signs of internal hemorrhage will often prove the determining diagnostic factor.

Exploratory vaginal section for diagnostic purposes is absolutely uncalled for in tubal pregnancy, and is an unnecessary and unsatisfactory surgical procedure.

TREATMENT

The only rational treatment is operative. While there is no difference of opinion on that score as regards the unruptured variety, deferred operation is still advocated in the ruptured variety, in cases of extreme shock. It is true that a certain percentage of patients recover spontaneously, especially in cases of tubal abortion, and occasionally early ruptures with the formation of hematoma and hematocele. It is also true that patients die of hemorrhage as a result of ruptured tubal pregnancy or tubal abortion when not operated on.

Moreover, it is undeniably a fact that both the mortality and morbidity of this disease are greatly increased by delayed operation. In my series of 280 operations to date, there were four deaths, three of which were reported in detail in my previous papers on the subject published in 1907 and 1912. In one case, death followed a simple salpingectomy in an unruptured tubal pregnancy, and the other three deaths were undoubtedly due to delayed operation.

Hemorrhage from a ruptured tube must be regarded in the same light as hemorrhage from any other source, and should be checked as quickly as possible, regardless of the severity of the shock. On several occasions I have operated when the patient was unconscious and required no anesthesia, either general or local.

It is my firm belief, justified by the results obtained in the cases of extreme collapse, that, if the operation is performed with ordinary skill and rapidity, the additional shock will be so slight that it cannot possibly be held responsible for a single death, especially if infusion or transfusion be resorted to as soon as the abdomen is opened.

Cases of tubal abortion and rupture present such a multitudinous variety in their course and termination that it is absolutely impossible to say from the signs and symptoms in a given case whether the hemorrhage will cease, or continue and become more profuse.

Moreover, I have noted that the presence of blood in the peritoneal cavity was an important element in the vasomotor paralysis and shock. The longer the patient was allowed to bleed from rupture or abortion, the greater the depression and the more profound was the shock; and this was regardless of the amount of blood lost. Likewise, the recuperative power of the patient after the operation depended more on the duration of the hemorrhage and shock than on their intensity at the time of operation.

Furthermore, the tendency to secondary shock becomes more marked as the interval between rupture and operation is prolonged.

Every patient in profound shock, operated on by me, recovered, and no patient was refused the benefit of operation as long as there was a cardiac beat.

The technic employed in ruptured cases is practically identical today with the method employed by me in my first operations, twenty-one years ago. The abdominal route is invariably employed, with the patient in the prone position. Previous vaginal examination will as a rule determine which side is affected. Through a median incision the hand is introduced into the abdominal cavity, and directed at once toward the affected side; the gravid sac or ruptured tube is enucleated and drawn into the wound. By grasping the outer border of the broad ligament with the hand, or occasionally with a clamp, further hemorrhage is checked.

No attempt is made to wipe away the blood or clots before the gravid tube is delivered at the wound, the steps of the operation having been carried out by touch only. As a precaution in tying off the pedicle, sufficient blood is wiped away with damp pads to expose the pedicle clearly to view. Before closing the abdomen the blood and clots are mopped out with damp gauze pads; drainage is never employed. In case of extreme shock, intravenous saline infusion is given simultaneously with the opening of the abdomen.

I cannot subscribe to the doctrine of deferring operation and trusting to chance, the inevitable result of which is rapidly to diminish the margin of reserve strength of the patient. Nor can I see the wisdom of the rule of watching the patient with the view of waiting with operation when the patient is improving, and operating if she grows worse.

If the patient's condition improves without operation, there can be no question that she would be better off because of the operation; and to wait until the patient grows worse entails an unnecessary loss of very precious moments, that may mean the possible sacrifice of life.

Shock is assuredly no contraindication to the immediate operation for ruptured tubal pregnancy.

1289 Madison Avenue.

ABSTRACT OF DISCUSSION

DR. E. GUSTAV ZINKE, Cincinnati: A woman who has been perfectly well, who misses menstruation once or twice, who believes herself pregnant, and who has cramplike pains in one or both inguinal regions, with a palpable and perhaps pulsating tumor on one or both sides of the uterus, presents

a perfect picture of extra-uterine fetation. Symptoms of ectopic gestation do not arise until either internal or external rupture takes place. The pains experienced prior to rupture are "tubal pains," the result of distention and contraction of the tube; while the pains after rupture are caused by the blood coming in contact with the peritoneum.

Tubal abortion is frequently not recognized and often terminates in spontaneous recovery. If the case is properly diagnosed, a hurried operation is never necessary. Tubal rupture between the broad ligament never places the patient's life in immediate jeopardy, and there is plenty of time to prepare for an operation. Tubal rupture into the peritoneal cavity, however, is always a grave accident. Its symptoms are, usually, marked and characteristic, and the sooner the patient is subjected to an operation, the more prompt the recovery. As a rule, there is sufficient time to prepare for an aseptic operation.

All cases of extra-uterine fetation which result in sub-peritoneal hematoma, peritubal hematocele, or retro-uterine hematocele, should be brought to early operation. Cases of advanced extra-uterine pregnancies are nearly always easy of diagnosis, and the patients should be operated on as soon as they can be made ready for the event. It is possible for a patient to bleed to death from a ruptured gestation sac within an hour or two, though such an occurrence is extremely rare, and is seldom brought to our attention. The histories of carefully recorded cases of rapid, fatal hemorrhage show that the great majority had been bleeding from twelve to twenty-four hours. A patient who bleeds to death within an hour could not be saved even by the man with the "jack-knife and shoestring."

Patients who are bloodless, pulseless, and completely exhausted are not good subjects for an operation. They die during the event or soon thereafter. The operator has done his duty, but where is the satisfaction? Weigh well the evidence in every instance.

DR. J. H. CARSTENS, Detroit: I agree with the author of the paper and I have preached the same doctrine. There are, of course, exceptional cases. I sent a patient home recently who had come to my office a few weeks previously. She was as white as our stenographer's shirtwaist. I could not feel her pulse. She said she had been sick for four or five days. I sent her straight to the hospital. I had operated on this woman a year previously for retroversion of the uterus. She was sterile and wanted to become pregnant. I opened the tubes, sewed them over and made a Gilliam operation. She recovered and menstruated right along and had menstruated twenty-seven days before she came to my office. There was nothing in the culdesac and no swelling on either side of the uterus. On the ninth day I said she was to get up. The next morning she was taken with a terrible pain and was in just as bad condition as the day she came in. I waited a few days until she was stronger and then operated, as she developed fever. I opened the abdomen and found a lot of blood clots in a cavity, well walled in, just above the bladder. I lifted up the little sac, put a clamp on it and removed it. It proved to be a tubal pregnancy not more than two weeks old. So, you see we are sometimes greatly mistaken. If I had operated the first or second day she would have died. There are certain rare cases in which one had better wait a little.

DR. WILLIAM W. GOLDEN, Elkins, W. Va.: Unless I missed some of the statements which the author has made in reference to diagnosis, I am inclined to think that he has not enumerated all the symptoms. I should like to call attention to a symptom or sign which I have observed in a small series of cases. In cases in which bleeding from the uterus is present to a marked degree, there is a strikingly pale appearance of the cervix as compared with the mucous membrane of the vagina. I know that this is contrary to what is stated in the textbooks. I have, however, observed it in a small but appreciable number of successive cases. That no one should refer to this in literature is possibly explained by the fact that an inspection of the vagina is usually not made in cases of ectopic gestation. I ask that you look for this sign in your future cases. In the differential diagnosis the author

asserted that the absence of fever favors the diagnosis of ectopic gestation, admitting, however, that fever is often present after rupture has occurred. But in some cases rupture is a slow process and not evidenced by the typical critical symptoms. In view of this it seems to me that it is not altogether safe to teach the general practitioner to be guided in the differential diagnosis by the presence or the absence of fever. I have frequently seen practitioners mistake ectopic gestation for salpingitis because of the presence of fever.

DR. EDWARD J. McOSCAR, Fort Wayne, Ind.: It is rare that the opportunity offers to study the progress of ectopic pregnancy previous to rupture. In some of these cases the first history which the physician obtains is that the patient has suddenly fainted and he finds her in a state of alarming collapse. He may then learn that she has missed a period or two, with subsequent irregular discharge of blood and clot, attended with cramping attacks. Last year nine patients came into my hands in whom there was rupture, and whom I had no opportunity to see beforehand. Five were in collapse from free hemorrhage. All were operated on without waiting and all recovered. We must remember that hemorrhage is not shock and that shock is not hemorrhage. These patients rarely have shock. Shock results from trauma of sufficient force to do violence to the nerve centers. A little tear of a tube is not a violent thing in itself, nor necessarily dangerous if there be no hemorrhage. It is the hemorrhage that calls for intervention, and if we can operate quickly enough to stop the hemorrhage and get the patient to bed, she will recover.

DR. LOUIS J. LADINSKI, New York: One of the points emphasized in the paper was that absence of temperature aids in the diagnosis of unruptured tubal pregnancy. After rupture has taken place, however, there may be elevation of temperature due to infection of the extravasated blood by the colon bacillus.

The main object in presenting this paper was again to offer a plea for immediate operation in ruptured tubal pregnancy without any regard to the severity of the shock. There is not a single valid reason, based either on theoretical grounds or practical experience, to justify delay in operation in tragic cases. I have never seen a case result fatally in which the patient was operated on in the most profound shock, and I know of a number of patients who died from ruptured tubal pregnancy after operation, not because of the shock, but from complications due to delay. It is generally admitted that patients die of hemorrhage due to ruptured tubal pregnancy when not operated on. I had one experience of that kind. The patient sustained a rupture while being examined in my office, and as this happened some years ago, at the time when the pendulum was swinging toward delay in operating, I was influenced by the fact and kept the patient in the office for more than an hour. As she improved at first under morphin and stimulants, I was beginning to feel a false sense of security in the opinion then gaining ground that these patients never die of hemorrhage; but she suddenly grew worse and I transferred her by ambulance to a hospital within eight blocks of my office. She died as soon as she reached the operating room. Had this patient reached the operating room, as she should have, ten or fifteen minutes earlier, she would have been saved.

Opium and Camphor.—Since the beginning of the war, on account of greatly decreased imports of chemicals and medicines, including opium, the government of Japan has encouraged the production of the latter drug. The output in 1916 was 2,535 pounds, and this year the amount is expected to be increased. In the province of Osaka it is said the increase will be 20 per cent. over last year. The estimated quantity of crude camphor to be produced for export from Formosa for the year ending April 1, 1918, is 7,056,720 pounds, 4,350,000 pounds of which, it is said, will go to the celluloid manufacturers of America. Bad weather may, the Consul General at Yokohama reports (*Commerce Reports*, July 31 and Aug. 2, 1917), reduce this amount considerably.

Military Medicine and Surgery

THE CASUALTY CLEARING STATIONS

THOMAS HERBERT GOODWIN, C.M.G., D.S.O.

Colonel, Army Medical Service, England

WASHINGTON, D. C.

Prior to the present war, this unit was designated a "clearing hospital"; but the nomenclature was altered to "casualty clearing station" soon after the commencement of the present campaign. The unit corresponds, more or less closely, in organization, establishment and function to the "evacuation hospital" of the United States Army.

The following remarks apply to the "casualty clearing station" of the British Army, and may possibly be found of service to officers doing duty with an "evacuation hospital" of the United States Army.

Establishment.—This consists of a lieutenant-colonel, R. A. M. C., in command of the unit; six other medical officers; one quartermaster; eight sergeants; seven corporals, and sixty-two privates.

Attached.—There are three chaplains, one interpreter and six Ambulance Service Corps drivers (mechanical transport).

Transport.—This consists of three 3-ton lorries.

The sergeants are allotted for duties as follows: nursing duties, 2; steward, 1; dispenser, 1; cook, 1; pack storekeeper, 1; clerk, 1, and general duty, 1.

Two of the privates are trained in the use of carpenters' tools.

Nursing Service.—Nursing sisters are appointed, whenever circumstances permit, to a casualty clearing station.

Function.—The casualty clearing station forms a connecting link between the field ambulances and the stationary and general hospitals. It receives patients from the field ambulances by means of the motor ambulance convoy, and it transmits them to the stationary and general hospitals by means of the ambulance trains. It will be readily understood that the functions of a casualty clearing station must necessarily be very elastic; during periods of comparative inactivity it may act more or less as an advanced stationary hospital, transmitting only such patients toward the base as are unlikely to be fit for duty within a reasonable period, while during a period of active battle it acts as a "sieve," winnowing the patients, according to the severity and nature of their injuries, to the base, the "rest station," etc. Again, a casualty clearing station may be allotted special functions; for example, one casualty clearing station may be detailed to deal entirely with cases of abdominal wounds, such patients being brought as rapidly as possible from the front to the special casualty clearing station, and there operated on and retained until fit for transport to the base.

Position.—The position of a casualty clearing station in the area of operations must necessarily vary with the military exigencies of the time being.

The unit will almost invariably be situated close to a railway station and within from 5 to 10 miles of the front line, but may not infrequently be pushed farther forward than this in order to lessen the journey of patients by road as far as possible.

Organization.—In European warfare, buildings will be utilized so far as possible, but very frequently the

accommodation will necessarily be in huts, tents, or a combination of all three.

An important point to remember in the establishment and organization of a casualty clearing station is that it must be capable of rapid and very considerable expansion; ordinarily it is equipped for 200 patients, but it may—at short notice—be required to accommodate a very much larger number.

Consequently it should always be insured that suitable ground is available for the erection of tents, and that any available buildings¹ are prepared for conversion into wards, etc., for patients, should the necessity arise.

It will be found advantageous to organize a casualty clearing station into the following sections or departments; (a) reception; (b) cooking; (c) packstore; (d) nursing, and (e) operating.

(a) *Reception of Patients.*—Arrangements for the reception of patients must be carefully organized in order to prevent any possibility of confusion when large convoys of wounded arrive. There should be a wide and clearly marked entrance for motor ambulances, with an equally clear separate exit to the main road. This is necessary in order that ambulance vehicles may enter, unload their patients at the "reception" hut or building, and depart without being obliged to turn around or to cause any delay or obstruction to the vehicles behind.

A "stretcher party" must always be on duty, night and day, in order to unload patients promptly on arrival. In the "reception" room the patients are seen and rapidly sorted into groups, the lightly wounded being sent to one department, the seriously wounded to another, patients requiring immediate operation to another, etc. Each department is worked by its own staff, and, during active operations, the personnel will be kept extremely busy.

The reception room must be of ample dimensions, as many hundreds of patients may arrive at the same time, and must be rapidly and efficiently dealt with. The admission and discharge books are here filled in by the clerks detailed for the duty.

(b) *Cooking.*—The kitchen arrangements must be complete in every detail, diets for every class of patient being required almost daily. Soups and other hot drinks should be available at any hour for patients on arrival.

(c) *Packstore.*—Here the patients' arms and equipment are taken possession of, tied into bundles and labeled.

(d) *Nursing.*—This comprises the "hospital" section proper of the unit. Wards should be organized and equipped for each class of patient; those for patients that are operated on being in close proximity to the operating theater, while those for patients less seriously wounded may be more distantly situated, possibly in tents. The operating room, Roentgen-ray room, and "serious surgical" wards should be close to each other and conveniently situated.

Lastly, the accommodation, comfort and feeding of the personnel of the unit must not be forgotten. No pains should be spared to insure the comfort and well-being of the medical personnel, every member of which will be extremely hard worked. Nursing sisters

1. As a rough estimate of the number of slightly wounded patients that may be accommodated in a building for one night, it may be reckoned that, in rooms over 15 feet but under 20 feet in width, one man can be accommodated for every yard of length, while in rooms 20 feet and more in width two men can be accommodated for every yard of length.

especially are rather prone, if permitted, to neglect their own well-being, and will cheerfully put up with any discomfort, and possibly neglect their meals, while at the same time working themselves to the point of exhaustion in the interests of their patients. This self-sacrifice is most laudable, but is certain to lead to breakdown if unchecked. It will consequently be necessary for the commanding officer of a casualty clearing station to insure that the nursing sisters have comfortable quarters, that they have a due proportion of rest and sleep, that their meals are well cooked and served, and that there is due insistence that they obtain their meals regularly; otherwise during a period of stress it may be found that sisters and nurses will, if permitted, work for twelve or fifteen hours at a stretch without food or rest.

It must not be inferred from the foregoing that work in a casualty clearing station is in a continuous condition of high pressure. During battle periods the amount of work to be got through is enormous, the operating work especially being extremely onerous, and every member of the personnel is working at very high pressure; but during the comparatively "quiet" intervals, matters are much easier, and it is during these intervals that very much may be done in the way of organization in order to prepare for the busy days and nights in the future.

Office, Surgeon-General of the Army.

MEDICAL IMPRESSIONS IN A BASE HOSPITAL

MILTON MANDEL, M.D.

Major, M. R. C. U. S. Army; Physician, U. S. Army Base Hospital No. 12 (Chicago)

FRANCE

After two months' experience as medical director of U. S. Base Hospital No. 12 (a Chicago organization), stationed "somewhere in France," I have come to the conclusion that the American physician cannot afford to miss the opportunity which presents itself. No other department in the service serves a more important function, and I am firmly convinced that the efficiency of the fighting force depends largely on the efficiency of the medical corps.

Mr. Julius Rosenwald of the Council of National Defense, in discussing the ultimate outcome of the war, tritely stated that it would be the "survival of the best fed." The physician not only passes on the fitness of the volunteer and conscript, and must dispose of him when he is sick or wounded, but is also of necessity the dietitian and the sanitarian.

JUDGMENT AN ASSET

When dealing with thousands of men drawn from all walks of life, and representative of every social stratum, one realizes the necessity of carefully observing the workings of the human mind and of closely studying the individual.

The most difficult task which has confronted us is distinguishing the real from the spurious. By the latter I do not refer to the neurasthenic, who will be touched on later. Every soldier who has seen active service knows the symptoms of the more prevalent diseases, such as trench fever, gas poisoning, and disordered action of the heart. Occasionally he will

recite to you in textbook fashion his symptoms, and will attempt to play on your sympathies, not because he is a slacker—there are none in the Army—but because he is tired physically and sometimes nervously. It is this type of case which taxes one's judgment. Sentiment must be utterly eliminated. The individual must be subordinated to the cause which he serves. A trip to "Blighty" is what he wants, but a few weeks in a nearby convalescent camp again puts him in shape for line duty.

The severe physical and nervous exertion to which the military man is subjected necessarily lights up neurotic tendencies. The more common neuroses encountered are, first, disordered action of the heart (D. A. H.), second, shell shock hysteria, and, third, exhaustion neuroses.

Disordered Action of the Heart.—These patients complain of precordial pains. These rarely simulate angina; more often the distribution and the radiation of the pain depend on the suggestive and leading questions asked. Palpitation is an almost constant concomitant, but dyspnea on exertion is not usually mentioned by the uninitiated, whereas the veteran has learned that shortness of breath is highly suggestive of heart disease. Anasarca of the extremities never occurs. There are no changes in the size and shape of the heart, but occasionally an accidental murmur is audible. The blood pressure is unaffected. Rest, suggestion and graduated exercise usually bring about prompt recovery.

Shell Shock Hysteria.—The hysteria and neurasthenia which develop in uninjured men after a severe engagement manifest themselves in innumerable ways, and almost invariably we are able to elicit a history suggesting a previous neuropathic tendency which antedates the war. Hysteria is more likely to occur after shell shock, but may develop without apparent cause. I have not had opportunity to observe many cases of shell shock, as these patients are sent to special neurologic hospitals. However, it is not common to see cases of pseudomusculospiral paralysis coming on suddenly with wrist-drop and perversions of the sensation, which bear no relationship to the course of the nerve; also paraplegia of the lower extremities, developing while the patient is under observation for some other condition, without any sensory disturbance and, of course, with full retention of bladder and rectal control.

Exhaustion Neuroses.—The neurasthenia is usually the ordinary exhaustion neurosis, and is sent to us labeled "debility." Introspection, fatigue on slight exertion, despite the fact that the muscles are hard and firm, sluggish speech, weak voice and impaired memory are the common evidences.

Functional neurologic pictures are the same as are those met in civil practice; only they are much more frequent, and quite naturally so.

NEED FOR PRACTICAL MEN

I sincerely hope that the members of the medical profession will not wait for conscription. There is plenty of work to be done, and hard working, practical men of ability are needed. The ultrascientific man or the man with a hobby would feel very much out of place in a base hospital such as ours. The work must be done quickly and accurately. The compensation for the work is the satisfaction in knowing that one is "doing one's bit."

A PLEA FOR THE NONCATHETERIZATION OF THE URINARY BLADDER

IN CASES OF GUNSHOT WOUNDS OF THE SPINAL COLUMN

FREDERIC A. BESLEY, M.D.

Major, M. R. C., U. S. Army; Surgeon, U. S. Army Base Hospital No. 12 (Chicago)

FRANCE

Tradition and habit of mind are hard to overcome. From the earliest history of medicine, it has been customary to insert a catheter into the urinary bladder whenever it became distended, without consideration of the underlying pathologic condition.

To propose that a urinary bladder should seldom, if ever, be catheterized is radical, and such a broad statement demands analysis.

I believe that logic and experience teach that in the cases of injury to the spinal cord, the urinary bladder should not be emptied by catheterization, unless there is a pathologic stricture of the urethra which would prevent overflow.

A few years ago I had occasion to go over all the histories of a 1,500 bed general hospital. These histories covered a period of twenty years, and after careful search I failed to find a single case of spontaneous rupture of the urinary bladder. This in itself justifies the conclusion that a spontaneous rupture of the urinary bladder is extremely rare.

In the cases of paralysis of the bladder wall, occurring in injuries to the spinal cord, the bladder may become greatly distended without pain or discomfort to the patient. It has been my experience that it is practically impossible to catheterize a urinary bladder over any considerable period of time without infection, no matter how carefully aseptic the technic is carried out.

Infection of the genito-urinary tract is particularly liable to occur in spinal injury cases in which the tissues suffer nutritional disturbances with accompanying lowered resistance. It is well recognized that one of the most potent and frequent direct causes of death in injuries of the spinal cord is the acute cystitis and purulent pyelitis.

Granting this, every measure should be adopted to prevent this inflammation, which I believe is practically always caused by the catheterization, as I have never seen a single case of cystitis in a patient suffering from a spinal cord injury that had not been catheterized. That isolated cases may occur, I grant.

One recognizes how difficult it is to carry out a proper aseptic technic in the catheterization of patients in the field.

A natural question arises: Are the tissues of the bladder or the kidneys materially damaged by allowing the bladder to become distended until it overflows?

I can only answer that, after practicing the procedure of noncatheterization for a period of ten years in patients suffering from a pathologic condition of the spinal cord, in a considerable number of cases I have not experienced any deleterious effects. In one case of a benign spinal cord tumor, which was finally located and removed, the patient was allowed to go with a bladder distended to the umbilicus for nearly two years. She finally regained complete control of the bladder function. During this time there was no evidence of disturbance of or injury to the kidneys. I never observed any evidence of disturbed kidney

function from this practice of allowing a bladder to become distended and to overflow.

In such cases the urine can be collected in a satisfactory way, so that the bedding is kept relatively dry and the patient comfortable.

To what ultimate end does this noncatheterization of the urinary bladder in these spinal injury cases lead?

In my judgment, it protects the patient almost absolutely from the dangers of an acute, fatal cystitis and pyelitis, and allows for future surgical treatment of the cord if the pathologic condition is such as to permit it. I am here assuming that it is practically impossible in the early hours or even days following the spinal injury to make a positive differential diagnosis of the exact extent of the lesion of the cord; that is, to distinguish between contusion, pressure from bone, blood or exudate, and a complete severance of the structure.

I am not sure that it is ever possible to recognize the exact pathologic condition of the cord without the evidence obtained by surgical exploration, and I am not prepared to say that it would not be better surgical judgment to explore in every case. However, it is not my purpose to discuss this phase of the question at this time. My one thought is to make an urgent plea for the protection of these patients from immediate death caused by inflammation of the genito-urinary tract, which inflammation is, in my judgment, practically always due to catheterization. I can see no justification in suprapubic drainage unless a severe cystitis exists.

One case will suffice to illustrate my point, a case which Colonel Ballance saw in consultation. It is probable that this patient could have survived the injury to the spinal column and cord, had the foreign body been removed and the lamina elevated, provided there had not been the superimposed cystitis and pyelitis.

REPORT OF CASE

History.—J. H. (19483), private, aged 19, wounded, July 7, 1917, entered this hospital sixteen hours later with a gunshot wound of the back nearly in the midline opposite the first or second dorsal vertebra. The wound appeared clean, and the patient's temperature was normal. The findings of a complete transverse lesion of the spinal cord, namely, complete loss of motor and sensory power, absence of deep and superficial reflexes, hyperesthesia above the paralyzed area, and loss of bladder and rectal control were present. The lesion corresponded to an injury of the cord opposite the third and fourth dorsal vertebrae.

July 8, the patient was very tympanitic. Vomiting was marked. Phrenic nerve irritation was evidenced by persistent hiccups. The bladder was distended but the patient was not catheterized while in this hospital, although a catheter had been passed several times at the casualty clearing station. The patient had a marked cough, and both lungs were filled with râles, but no evidence of a penetrating wound of the chest was found. His general condition was very poor and a laminectomy was not advised. His temperature never went above 100.

His condition became rapidly worse, and he died, July 13, six days after his injury.

The clinical diagnosis was gunshot wound of the back with spinal cord injury opposite the third and fourth dorsal vertebrae; pulmonary edema.

Postmortem Findings.—There was a gunshot wound over the second dorsal spine, which was fractured. A foreign body (a piece of metal 1½ inches long) was embedded in the lamina of the fourth dorsal vertebra on the left side. A few strands of clothing had been introduced with it. The metal fragment was projecting into the canal, and some extradural pus was present over an area about 4 inches long in the

region of the wound. The cord itself was not injured. No intradural hemorrhage was present. There was one small patch of pus just below the site of injury, with a slight softening of the cord in this area. There was edema of the lung. The heart was pale and dilated, with no organic lesion; the muscles were softer than normal. The liver, spleen and kidneys showed evidence of infection with an anaerobic gas-producing bacillus; an early pyelitis was present. In the bladder, cystitis was present.

The anatomic diagnosis was fracture of the second dorsal spine with compression of the cord; edema of the lungs; cystitis.

SUMMARY

1. Infection of the genito-urinary tract is the most common and immediate direct cause of death in cases of gunshot wounds of the spinal cord and column, accompanied by paralysis.

2. It is almost impossible to catheterize such a patient, no matter how carefully it is done, without an infection and subsequent inflammation of the genito-urinary tract. Infection rarely, if ever, occurs without catheterization.

3. Distention of the urinary-bladder, allowing it to overflow, is not harmful to the bladder or kidneys.

4. Many patients suffering from an injury to the spinal cord and column may ultimately be saved by surgical operation if they do not succumb to an early cystitis and purulent pyelitis.

MODE OF INFECTION, MEANS OF PREVENTION AND SPECIFIC TREATMENT OF EPIDEMIC MENINGITIS*

SIMON FLEXNER, M.D.

NEW YORK

This article has been prepared because of the appearance of epidemic meningitis among the armed forces of the United States, and for the purpose of bringing the essential facts of our present knowledge of that disease to the immediate attention of the medical officers responsible for the health of the troops and also of the physicians equally responsible for the health of the civil population.

Epidemic meningitis, cerebrospinal fever, or spotted fever, as the disease is variously called, is an old foe of the armed camp, and having ravaged the European armies, has already attacked our own. Moreover, it has prevailed in this country sometimes as epidemics, sometimes sporadically, without complete cessation, since the severe outbreaks of 1904 and 1905. At about the same period, epidemics of the disease appeared in many European countries, and within the next two or three years they penetrated into Africa, South America, Australasia, etc. In other words, a pandemic of epidemic meningitis spread over the world between the years 1904 and 1910, since which time the disease has not again become quiescent in Europe or in this country. In the United States each winter and spring has witnessed, now in one locality and now in another, the appearance of cases or groups of cases of meningococcus meningitis. Thus, from the period of severe epidemics a number of foci in the country have remained over in which the meningococcus still persists.

The meningococcus is unknown in nature aside from the human host. Thus its survival is possible only in human beings; and present knowledge indicates that the persistence in a community is not attributable so much to active cases of epidemic meningitis as to the occurrence there of chronic carriers of the micro-organism, who either reside in the localities in which the disease continues to arise or, because of more peripatetic habits, move about freely from place to place. As these carrying persons are both unsuspected and undetected, they become the malevolent, if innocent, agency through which the infection is kept alive and propagated.

This situation, deplorable enough in ordinary times, becomes at once a serious menace when large numbers of recruits are assembled into camps. The recruits are, in the first instance, of the ages more highly susceptible to the disease. They form a body also which has for the most part escaped exposure either by reason of the immunity of the locality from which they come, or because of the circumstances immediately surrounding their individual mode of life. Once, however, that they are brought together into large aggregations from widely divergent communities, the introduction of the meningococcus carrier among them, considering his distribution in the civil population, is a foregone conclusion. The carrier being present, the close personal association inevitable in camp life prepares the way for the ready communication of the meningococcus to others.

These secondary carriers, as they may be conveniently called, harbor the meningococcus for shorter or longer periods of time. A small part only are converted into chronic carriers of the micro-organism, while another part, of variable dimensions, develops meningitis. Very soon, therefore, a vicious circle is established, since each carrier and each case of meningitis thus produced becomes potentially able to pass the meningococcus on to still other persons. The object of the bacteriologic control of epidemic meningitis is the breaking of this circle, and it is best and may be successfully accomplished by the detection and detention of the meningococcus carrier.

MODE OF INFECTION

The meningococcus enters and leaves the body by way of the secretions of the nasopharyngeal membrane. Since no other avenue of entrance or exit is known, the bacteriologic control of epidemic meningitis centers on those membranes. The meningococcus passes from the mucous membrane to the meninges, in which it multiplies still further and thus sets up an acute inflammation called meningitis. It is not established whether the micro-organism passes directly to the nervous system by way of the lymphatic connections between the nasopharyngeal mucosa and the meninges, which extend along the olfactory nerves, or indirectly by way of the blood. The former route is the one probably taken; but it not infrequently happens that the meningococcus may be cultivated from the general blood early in the course of the infection. Moreover, the occasional occurrence during the meningitis of metastatic meningococcal inflammations, such as arthritis, panophthalmitis and endocarditis, indicates the ability of the micro-organism to survive in and be implanted from the blood. However this may be, there is reason to believe that the meningococcus multiplies in the nasopharyngeal mucosa before

* From the Laboratories of the Rockefeller Institute for Medical Research.

* As the subject matter of this article is of timely importance, the reprints have been prepared in advance of the publication in THE JOURNAL, and can be had by sending a stamped, self-addressed envelope to this office or to the author.

it invades the meninges, and the interval between the two processes may be brief or long, which is equivalent to stating that every case of epidemic meningitis develops out of a carrier.

Two classes of persons harbor the meningococcus in the secretions of the nasopharyngeal mucous membranes: first, persons suffering from epidemic meningitis; second, healthy carriers of the micro-organism. The potential dangers from the two sources are unequal. The ill patient is usually confined in bed; he does not tend to move about and come into contact with many persons. While confined, he is dangerous to the doctor and the sickroom attendants and, if in a hospital ward, to other patients. It is only when convalescent that, if not restrained, he menaces others. The healthy carrier, being usually unsuspected, is unhampered in his movements. He is a menace, therefore, to a wide and indefinite number of persons.

In both instances the mechanism of dissemination is identical, and consists in the ejection of the nasopharyngeal secretions into the surrounding atmosphere. This ejection does not take place during ordinary breathing and little, as a rule, during quiet speaking. But in loud speaking and particularly in coughing, sneezing, hawking and spitting, the secretions may be sprayed and scattered widely.

A more indirect means of communication is by way of the hands soiled with the secretions of the nose and throat, and by insects and particularly by house flies, which, becoming contaminated by feeding on the secretions, may carry them to the nose and mouth of other persons on whom they alight. The meningococcus is, however, a fragile micro-organism, and does not long withstand ordinary air temperatures and the drying of the secretions containing them; once separated from the nasopharynx, it soon succumbs in external nature. Probably the degree of viability of the meningococcus in external nature is not exactly indicated by cultivation tests; it is quite possible that in the more favorable medium of the nasopharyngeal secretions it will multiply when no growth takes place in artificial cultures.

Not only has the connection between the spraying of the contaminated secretions and the occurrence of carriers of the meningococcus been shown, but the greater numerical relationship between violent spraying and carrier-production established. Chronic carriers or patients suffering from meningitis, who suffered at the same time from a severe cough, gave rise to more carriers and contaminated persons over a greater area than has been found otherwise to be the case.

The time relation between carriage of the meningococcus, the occurrence of infection, and the development of the symptoms and lesions of epidemic meningitis has also been noted in a number of instances. Sometimes the fact of the carriage has been discovered several days or weeks before the infection arose; sometimes the interval was so brief as to warrant the assumption that the individuals observed were already in the premeningitic stage of the infection when the bacteriologic examinations were made.

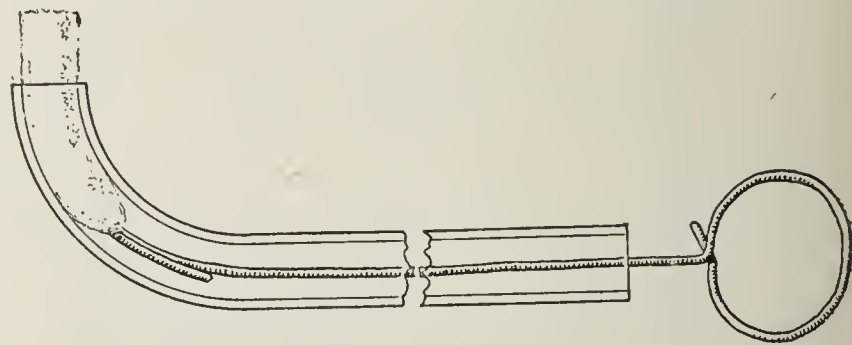
Since the nasopharynx harbors the meningococcus practically always at the onset of the infection which eventuates in meningitis, there have been observed in the course of bacteriologic examinations instances in which the signs of meningitis were still absent, the

cerebrospinal fluid showed few morphologic and chemical changes, and the meningococcus was not detected in the fluid by the microscope or in cultures—and yet the putting together of all the findings, including those of meningococcus in the nasopharynx, led to a diagnosis of epidemic meningitis, which subsequent events confirmed. This possibility of very early diagnosis may be of high importance in view of the far better clinical results obtainable by means of specific therapy when it is promptly applied.¹

The cycle of events which lead to contamination and to infection with the meningococcus is now apparent. A meningococcus carrier is introduced into a group of persons of the more susceptible ages. Of the latter, a certain number become contaminated through aspirating the nasopharyngeal secretions which he ejects; of those thus contaminated, a variable number actually become infected and develop meningitis, while a larger number are converted either into temporary (evanescent) or more enduring (chronic) carriers. The patient during the acute illness and for an indefinite period while convalescent is also a carrier. Hence the number of carriers produced exceeds the number of cases of infection arising, from which it may be concluded that the individual susceptibility to epidemic meningitis is low.

DETECTION OF CARRIERS

A special bacteriologic technic has been devised to discover the meningococcus in the secretions of the nose and throat. The secretions are collected free of



West tube. Actual size. Length about 16.5 cm.

admixture with the saliva and the aerobic bacteria contained in them, and are grown in a medium favorable to the multiplication of the meningococcus.

Swabbing.—The secretions are obtained in a form suitable for cultivation by swabbing the nasopharyngeal mucosa. While in skilled hands the open swab may be successfully employed, the employment of the West² tube can be highly recommended. The instrument consists of a glass tube about 7 mm. inside measurement, about 16.5 cm. in length and bent at one end at nearly a right angle. A copper wire carrying at one end a smoothed cotton swab is inserted inside the tube. The swab is pulled back well within the tube, and both ends are plugged before sterilization. When ready for use, the two plugs are removed.

The tongue is depressed, and during phonation the tube is passed to the posterior pharyngeal wall, raised, and by pushing the copper wire forward the swab is extended about 6 to 7 mm. After touching thoroughly the mucous membrane, which may be accomplished by turning the swab first to one side and then to the

1. Gordon, M. H.: Medical Research Committee, Special Report Series, No. 3, 1917, p. 19. Hereafter this pamphlet will be referred to merely as "English Report."

2. West, C. E.: Proc. Roy. Soc. Med., Otological Section, 1910-11, 4, 43.

other, the cotton plug is pulled back within the tube and the whole withdrawn.

The culture plate being ready, the swab is again pushed forward and the mucus deposited on the center of the medium. This material is further spread over the surface with a bent platinum or nichrome wire. The plates should be incubated at once at 37 C. If this is impracticable, they should be enclosed in a box kept warm with hot water until they can be properly incubated. Cooling of the plates and delay in incubation diminishes the number of successful isolations of the meningococcus from the nasopharyngeal secretion and the cerebrospinal fluid.

Cultivation.—The medium employed for cultivation should contain serum constituents or its equivalents. The serum is preferred in the noncoagulated state. The meningococcus does not develop at all in early generations, and often very little in later generations on ordinary nutrient agar medium. Glucose agar to which blood or blood serum or ascitic fluid has been added yields a suitable medium. The blood of man, rabbit or horse may be used; but bullock's blood is unsatisfactory. The serum obtained from sheep's blood is not only suitable and satisfactory, but because of its availability is to be highly recommended. It is employed in the form of Hiss' serum water.

An eminently satisfactory culture medium is made as follows: Lean beef or, because of cheapness, bob veal, is used for preparing the usual meat infusion. Fairchild's or other suitable peptone is added. The reaction is adjusted to 0.4+ phenolphthalein. Dextrose is added to strength of 1 per cent. Sterilization is accomplished in the autoclave.

The serum is obtained from sheep blood collected at the slaughter house. It is mixed, one part, with distilled water, three parts, and the mixture is sterilized by heating in the Arnold sterilizer on three successive days for thirty minutes, or in the autoclave at 15 pounds' pressure for forty minutes. One c.c. of the serum water is added to each 5 c.c. of the melted agar medium previously cooled to 50 C. The slanted tubes contain approximately 5 c.c. and the Petri plates 10 c.c. of the agar medium. The slanted tubes can be kept on hand, provided care is taken to prevent drying of the surface; the plates are made as required.

Vincent and later Olitsky modified this medium by adding litmus. Olitsky employs 2 c.c. of a sterile 10 per cent. litmus solution in distilled water for each plate (10 to 12 c.c.) of the sheep serum agar medium. As the meningococcus ferments dextrose and *Micrococcus catarrhalis* does not, the colonies of the former assume a pink tint, while those of the latter remain blue. In fact, the medium is not as great an improvement over the colorless agar as might be supposed. The meningococcus, as immediately isolated from human secretions, possesses weak power of fermenting glucose; and certain streptococcus colonies take on a pink hue and confuse the plate. However, the colonies of *Micrococcus flavus* present an opaque yellow and greenish appearance readily distinguished.

Horse serum in the proportion of 2 per cent. may be substituted for the sheep serum water. A medium even more favorable for the growth of the meningococcus than the sheep serum agar is prepared by putting into a Petri plate 0.25 c.c. of defibrinated rabbit blood laked in 0.5 c.c. of sterile water. Ten c.c. of the melted agar cooled to 45 C. are added, and the whole is thoroughly mixed. All the mediums described are transparent, which is an advantage.

The colonies reach a larger size in the hemoglobin medium and certain meningococci grow there when they multiply little or not at all on the serum plates. The original isolation of the colonies from the nasopharyngeal secretions is however assisted by the promoting action of the nasal secretions on the growth of meningococcus in cultures. In practice the greater simplicity of preparation on a large scale of the sheep serum medium is an obvious advantage, especially for subcultures.

The plates inoculated with the secretions should be incubated at 37 C. for from sixteen to twenty hours (over night). They may then be examined immediately or after being set aside for four to six hours, during which time the colonies of *Micrococcus catarrhalis* continue to grow in size. The latter become opaque and show sharply defined borders. The colonies of the meningococcus are smaller and far more delicate; their outlines fade away into the medium. Since form and texture are so important in the detection of the colony of the meningococcus, acquaintance with them should be obtained in advance by the study of pure cultures obtained as recently as may be possible from the cerebrospinal fluid or nasopharyngeal secretions. The colonies of *Micrococcus flavus* in the young state and before pigment has appeared simulate those of the meningococcus, and may lead to temporary confusion.

Microscopic appearance of the organisms is another guide. The form of the meningococcus is more delicate than that of *Micrococcus catarrhalis* or *flavus*. Moreover, full development and subsequent regression or involution are reached earlier. The degenerated meningococci are strikingly irregular in size and variegated in staining properties. Certain individuals stain deeply, many with little intensity. Once the degeneration changes are learned, they give valuable aid in identification.

The meningococcus, like *Micrococcus catarrhalis* and *flavus*, is gram-negative. Two solutions, Sterling's gentian violet and Gram's iodine are employed for staining. They are prepared as follows:

Sterling's Gentian Violet.—Five gm. of gentian violet are ground in a mortar with 10 c.c. of 95 per cent. alcohol. After practical solution, 2 c.c. of aniline are added, and then 88 c.c. of distilled water. The grinding is continued a short time, and after the mixture is permitted to rest a day or two, it is filtered through paper. It has the merit of staining quickly and intensely and of keeping many months.

Gram's Iodine Solution.—One gm. of iodine and 2 gm. of potassium iodide are rubbed together in a mortar and dissolved in 300 c.c. of distilled water. The filtered solution keeps indefinitely.

The film, air dried and passed through the flame, or preferably fixed in methyl alcohol, is stained as follows: The gentian violet is applied for one-half minute and washed or blotted off. The Gram's solution is applied also for one-half minute, and after washing or blotting away the excess, the slide is immersed in a Coplin jar containing 95 per cent. alcohol, for a few seconds. It is advisable to move it up and down. After washing away the alcohol, the counterstain consisting of aqueous safranin, is put on for from one-half to one minute or longer. It does not overstain. (The safranin stain is made by dissolving water soluble safranin in 95 per cent. alcohol to saturation. Ten c.c. of the alcoholic solution are mixed with 90 c.c. of distilled water. The stain keeps.)

The meningococcus, *Micrococcus catarrhalis* and *flavus*, and certain indefinite micrococci appear red; the pyogenic staphylococci, streptococci and pneumococci appear blue under the microscope.

IDENTIFICATION OF MENINGOCOCCUS

Colonies on the Petri plates, suspected of being meningococcus, are inoculated on the slanted sheep serum agar or other medium and incubated at 37 C. for from sixteen to twenty hours. The resulting cultures are subjected to (a) microscopic examination and (b) to agglutination; in addition, but not necessarily, (c) the fermentative effects on sugar may be ascertained. The final test is that of agglutination, but it is well to bear in mind that the meningococcus ferments glucose and maltose with acid production but not saccharose, while the *Micrococcus catarrhalis* exerts no action on glucose, and a number of more indefinite gram-negative micrococci occurring in the nasopharynx from time to time ferment saccharose.

Agglutination.—For the purpose of the rapid identification of the meningococcus, a polyvalent serum prepared in the horse is employed. Such a serum if actively agglutinating is not impaired when preserved with 0.2 per cent tricesol and kept at refrigerator temperature. Hence stock therapeutic serums may be employed. In every instance the stock serum must have been proved by appropriate tests to be agglutinating against established strains of the meningococcus in dilutions of from 1:200 to, say, 1:2,000.

The test is made by the macroscopic method. The culture on the serum agar slant is washed down with from 1.5 to 3 c.c. of 0.8 per cent. sterile saline solution according to the amount of the growth. The serum dilutions consist of 1:50, 1:100, 1:500, 1:1,000 and 1:2,000 strengths. To each 0.8 c.c. of the latter, 0.2 c.c. of the emulsion of the micrococcus is added. After thorough mixing, the tubes are incubated at 55 C. for sixteen hours (over night). Suitable saline controls of the cultures are carried along. The readings of the tubes are made at once, and the usual signs are employed to designate degree of agglutination. Test tubes 9 by 1 cm. in size are preferred for the test.

The meningococcus does not agglutinate spontaneously in salt solution. A true meningococcus is completely agglutinated (++) in a 1:200 dilution of active polyvalent serum, and usually in higher dilutions than this. Other gram-negative micrococci are either not agglutinated at all, or not in dilutions greater than 1:100. *Micrococcus flavus* sometimes agglutinates in normal serum 1:50 and in polyvalent and monovalent meningococcus serums 1:100 or even greater dilution. It is distinguished from meningococcus by its indiscriminate agglutinability and by its cultural properties. When normal serum is available, a control in 1:50 dilution may advantageously be added to the test series. Any culture which fulfils the cultural and microscopic conditions, and which is agglutinated in 1:200 dilution by the polyvalent anti-meningococcic serum, is accepted provisionally as meningococcus, and the person from whose nasopharynx it was obtained is regarded as a carrier.

The number of colonies possessing the characters of the meningococcus, which develop from the nasopharynx of different persons, fluctuates widely. The number may be so large as to yield what is virtually a pure culture on the plates, or it may be so small as to demand skill and much patience for their detection.

The usual condition falls between these extremes. While precise information on this point is lacking, it is to be presumed that the larger the number of meningococci thrown off with the secretions, the greater the danger of contamination of others. The rate at which the carriers clear up or become meningococcus-free is determined also, in part, by the degree of contamination. When few colonies can be cultivated from the nasopharynx, the tendency is for clearing to take place more quickly than when an abundant growth is obtained.

TYPES OF MENINGOCOCCUS

The meningococcus, like several other micro-organisms, and notably the pneumococcus and dysentery bacillus, is not a consistent species, but consists of several closely related varieties of types. The cultural features of the several members are identical; they are distinguished by their immunologic properties. The point is an important one, since on its recognition depends, in large measure, the successful application of the specific serum therapy.

The nomenclature employed to designate the varieties or types varies in different countries. That there is no general agreement is regrettable. This matter is not, however, one that can be adjusted readily, since it follows in part from the occurrence of intermediates between the more stable types.

Until Dopter's³ studies published in 1909, no distinction was made between various cultures of the meningococcus. He was the first to discover that the prevailing type (called normal or regular) of the micro-organism was distinguishable immunologically from a second type called by him para, which existed not infrequently in cases of epidemic meningitis occurring in Paris. These findings have been generally confirmed and have exerted a marked influence on the prophylaxis and specific serum therapy of the disease. An immune serum prepared with the normal cultures contains agglutinin and other antibodies for its own type and little for the other type, and vice versa. It is possible to absorb this common agglutinin for the two types, leaving the quantity of specific agglutinin unaffected.

Still closer analysis has, however, shown that besides the normal and para types, certain intermediates occur approximating one or the other in immunologic properties. English⁴ bacteriologists have, indeed, set up a classification which seeks to range all the cultures into four classes or types, which they designate I, II, III and IV. This differentiation is based on the method of elective absorption of agglutinin just mentioned, and was carried out with cultures derived from the cerebrospinal fluid of cases of epidemic meningitis. The Type I of the English classification appears to correspond to the para, and Type II to the normal or regular meningococcus. Types III and IV appear to conform to the more common intermediates.

The conclusion from the immunologic studies, which have now been carried out abroad and in the United States with painstaking care, is to the effect that two fixed types and certain less fixed ones of the meningococcus exist in nature, and representatives of any of them are capable of infecting the cerebrospinal meninges and of inducing epidemic meningitis; and to combat the disease thus caused, a polyvalent antimeningo-

3. Dopter, C.: Compt. rend. Soc. de Biol., 1909, 67, 74; Wollstein, M.: Jour. Exper. Med., 1914, 20, 201.

4. Ellis, A. W. M.: Brit. Med. Jour., 1915, 2, 881; Gordon, M. H.: English Report, p. 10.

coccic serum in the true sense must be employed. This antiserum must, to be effective, carry adequate antibodies for the fixed types and for as many of the intermediates as may be available as well.

The types of meningococcus which occur in the cerebrospinal fluid must correspond with those existing in the nasopharynx, if the statement already made, that every case of epidemic meningitis arises from a carrier, be true. The recent English studies are conclusive on this point, and establish this relationship. Moreover, certain as yet unpublished studies made in this country point to the same conclusion. Furthermore, in that form of contamination by a carrier which gives rise to many other carriers, the type of meningococcus present tends to be identical in all. The occupation of the mucous membrane by a given variety of meningococcus seems to make the implantation of a second variety infrequent. The English studies, which are the only ones thus far which cover this point, point to this inference.⁵

The identification of the meningococcus by the agglutination test has had the effect of excluding, as meningococcus, certain micrococci present in the nasopharynx which on cultural, microscopic and staining properties, would have been classed with that microorganism. In this way the number of supposed carriers has been reduced about one-third. Even so, the number of carriers proved by the agglutination test still exceeds greatly the cases of meningitis arising, and may be four to five times as numerous as the latter.

PREPARATION OF POLYVALENT AND MONOVALENT ANTIMENINGOCOCCIC SERUM

Polyvalent Serum.—The therapeutic polyvalent serum which can also be used for identifying the meningococcus is prepared in the horse. To produce a true polyvalent serum, representative cultures of the fixed types and available intermediates are used for inoculation. The cultures employed for injection are first tested against monovalent serums to insure that normal and para types are selected. By means of type monovalent serums, intermediates can also be selected; and as the immunization of the horses proceeds, they are added to the material injected until the agglutinins developed adequately represent all the cultures employed. As the immunization extends over many months, while the serum is being collected and used therapeutically, any further deviating cultures which come to hand are added to the stock employed for inoculation, replacing, for the time, normal or para strains for which the agglutinins are already sufficiently developed.

Experience with the specific serum treatment of epidemic meningitis has emphasized the importance of this general method of procedure. Hence to reduce the preparation of the polyvalent serum to routine is to endanger the efficacy of the product. The production of a true polyvalent serum of high titer demands intelligent operation and constant vigilance. Already sad and costly disappointments have followed the employment of commercial products believed to be trustworthy. Any one intelligently engaged in the preparation of the serum must keep in constant touch with the clinicians employing it in practice, in order that he may investigate the causes of failure in certain obstinate cases of epidemic meningitis. This failure may be due to one of several causes, and may be attribu-

table to the infecting meningococcus being unrepresented among the antibodies, as indicated by agglutination, in the serum. When this happens, the particular culture is used in the subsequent injections of meningococcus into the horses in order to develop the antibodies peculiar to it.

This brief sketch should suffice to indicate the far greater care demanded to prepare an efficient antimeningococcic serum than, for example, to produce antidiphtheria or antitetanus serum, which relatively are simple products. There is still another point emphasized by Amoss, namely, that a test bleeding of the horses should precede the regular bleedings, in order that the balance of immune bodies as indicated by the agglutinin content for type cultures may be determined. The titer adopted by us is that of agglutination in 1:1,500 to 1:2,000 dilution for the main normal and para types and for the several intermediate varieties used for inoculation. It is desirable particularly to warn against titration of the serum with one or two cultures of meningococcus which happen to be highly agglutinable.

The commercial standardization of the antimeningococcic serum is highly desirable—indeed, is demanded in the interests of the public welfare. The impression may have been gained that this is not readily accomplished because of the variability of the meningococcus cultures. But what must be kept in mind is that three or four types represent the great preponderance of meningococci causing epidemic meningitis, and it is entirely feasible to standardize the serum with reference to those types. This action would be a great step forward, and would in no wise prevent particular persons or institutions from preparing serum representing the intermediate varieties as well.

The formulation of standard requirements should contain also a definition of the ordinary or gross physical properties of the serum. For example, the serum should be uncolored by hemoglobin or its secondary compounds. This is a matter of first-rate importance. The intraspinal injection of serum carrying considerable quantities of those compounds increases the severity of the reaction and may lead to serious accidents.

Finally, there might even be recommendation as to the chemical preservative to be employed. The experiences of many years now may be drawn on to cover this point. The preservative to be preferred would appear to be tricresol, of which 0.15 to 0.2 per cent. is an adequate amount to prevent bacterial contamination of a serum collected and bottled in a strictly sterile manner. Chloroform has been substituted for tricresol or phenol. It is an efficient antiseptic; but it is objectionable because of the pain, sometimes very severe, which attends the intraspinal injection of the chloroformed serum. Tricresol, on the other hand, exerts something of an analgesic effect.

Monovalent Serum.—Since the polyvalent serum is made on a large scale primarily for therapeutic purposes, more precise details of its preparation are not in place here. The monovalent serums, on the other hand, are prepared for use in the identification of the types and varieties of meningococcus and for the purpose of correlating cultures obtained from the nasopharynx with those present in the cerebrospinal fluid. They are best made in the rabbit, and can be prepared in any bacteriologic laboratory.

Young rabbits are chosen, as they yield serum of higher titer. Male rabbits weighing from 1,500 to 1,800 gm. are to be preferred, but females will suffice,

5. Flack, M.: English Report, p. 60.

and animals somewhat lighter in weight may also be used. There is a choice of method for immunizing the rabbits. The two representative ones will be described.

Amoss proceeds as follows: The meningococcus to be inoculated is transplanted to slanted plain glucose agar. After sixteen hours' incubation, the growth is suspended in 10 c.c. of 0.8 per cent. salt solution. Of the suspension, 0.1 c.c., or one one-hundredth of the culture, is diluted to 2 c.c. with the saline and injected intravenously. The same dose and procedure are repeated with a fresh culture on the second day, and the same procedure with a dose of one eightieth of a culture on the third day. After an interval of five days, one eightieth of a culture, followed the next day by one fiftieth and the third day by one twenty-fifth are injected. Two days later the animal is exsanguinated and the serum collected.

The English method⁶ employed in the army consists in inoculating stock emulsions of meningococcus killed by heat and preserved with phenol. The emulsions are said to bear storage for several months, and besides yielding satisfactory agglutinating serums, to be adapted to agglutination and absorption tests.

The emulsion is prepared from growths of the meningococcus on Petri plates which have been incubated for twenty-four hours at 37 C. About six plates are used for a batch. Over each plate a few cubic centimeters of 0.8 per cent. sterile salt solution are poured, and the growth is detached from the surface and distributed in the saline. The emulsions are examined microscopically to insure purity, and then mixed and heated to 65 C. for half an hour to prevent autolysis. After the heating, which appears to help the meningococcus to emulsify, the emulsion is standardized: 0.1 c.c. is placed in a special tube kept for the purpose, and clear tap water is then added from a 5 c.c. pipet graduated in 0.1 c.c. divisions, until the contents of the tube are just perceptibly turbid to the naked eye as compared with a control of pure tap water. The "end-point" is taken to represent a content approximately 100 million of the meningococcus per cubic centimeter. The amount of dilution needed to reduce 0.1 c.c. of the emulsion to the end-point having been determined and the bulk of the emulsion being known, it is quite simple to so dilute the emulsion with saline that it contains 2,000 million meningococci per cubic centimeter. Five-tenths per cent. phenol is added as a preservative. The emulsion so prepared and standardized suffices to inject rabbits and to perform agglutination and absorption tests. For the last, an emulsion of double the strength is preferred. The emulsion keeps for several months at refrigerator temperature.

For preparing agglutinating serums, the procedure is as follows: The rabbits receive intravenously 1,000 of the killed and emulsified meningococci, and an hour later a second injection of 500 million. On the sixth day afterward, 3,000 million are injected. A test bleeding is made two days later. If the agglutination titer is sufficiently high (from 1:400 to 1:800 by the macroscopic method), the animal is bled to death on the ninth day. The clear serum is separated and stored in the cold, preferably without preservative.

Whatever the method employed, some of the rabbits will not survive the immunization period. Hence it is necessary to carry out the inoculation in series of, say, two or three animals for each culture type or variety injected.

NUMBER, DURATION AND TREATMENT OF CARRIERS

Number.—Meningococcus carriers are distinguished according as they have arisen from a known previous carrier or from a case of epidemic meningitis or insidiously without such known association. The one is termed "contact" and the other "noncontact" carriage. The distinction is not entirely academic. For instance, if a bacteriologic examination be made of the nasopharynx of a general population without reference to particular cases of meningitis or carriers of meningococcus which may have arisen, the percentage of contaminated persons detected will be smaller than among the immediate persons in contact with the known cases or carriers.

The older figures from various sources indicate that during the prevalence in some degree of epidemic meningitis, about 2 per cent. of carriers exist among groups of persons representing the general community. In arriving at this result, cultural properties, not agglutination reaction, were employed to identify the meningococcus, and yet the figures have been essentially confirmed by the later and more precise observations.

The recent English studies extend our knowledge in important ways. Flack,⁷ for example, found among 275 noncontacts, who were swabbed, 2.18 per cent. of carriers; among 832 men from an epidemic area, 4.39 per cent. of carriers, and among 1,629 actual contacts, 8.53 per cent. of carriers. All these were confirmed by agglutination. The larger number of actual contacts was made up of the following groups: regimental, who gave 10.98 per cent.; hospital, who gave 7.18 per cent., and outside commands (hospital and other contacts), with 5.53 per cent. of carriers. These figures illustrate the determining factor of close association.

The question will arise whether, for example, it is feasible to examine bacteriologically large numbers, thousands say, of exposed persons in a military camp without excessive disturbance of the usual routine. Theoretically, the task is one not at all beyond relatively a simple laboratory organization. With sufficient stocks of culture mediums and trained technical help, three or four bacteriologists, skilled in the detection of meningococcus, could complete such an undertaking in a comparatively short time and without serious disorganization of camp life. An instance of the swabbing of 10,000 men is recorded in the English report.⁸ This large number included not only immediate contacts, but also a large garrison which, so far as ascertained, had not been in direct contact with actual cases of meningitis. The number of persons carrying micro-organisms resembling meningococcus was 410, but subsequent agglutination tests eliminated about one third of these, who were immediately set free.

Duration.—The persistence of the carrier state has been especially studied by Flack, whose figures are based on 185 examples, of which 124 had and sixty-one had not been in known contact with a case of meningitis or another carrier. The average duration among the former was 4.65, among the latter, 3.68 weeks. Within the first two week period, the percentage becoming clear was 20, within the first four week period 52, while about 5 per cent. endured beyond the twelve week period. The weather conditions seem to play a part. It was noted that following

6. Hine, T. G. M.: English Report, p. 99.

7. Flack, M.: English Report, p. 52 et seq.

8. Tulloch, W. J.: English Report, p. 70.

a week of sunshine, with little rain, the clearing up process was accelerated.

In rare instances, the duration continued for long periods. Examples of carriage for six, twelve and fifteen months with, however, eventual disappearance of the meningococcus are recorded. In the great majority of carriers, the nasopharyngeal mucosa is normal. When inflammatory conditions of the mucosa and tonsils exist, they would appear to be accidental. On the other hand, carriers who suffer from tonsillitis and catarrhal inflammations of the nasopharynx tend to lose the meningococcus more slowly than normal persons.

(To be continued)

Therapeutics

ACUTE DIARRHEA IN INFANTS

It is not our purpose to discuss this subject elaborately, but merely to recall a few therapeutic suggestions.

1. With beginning abdominal disturbance we must consider, in infants, typhoid fever, dysentery, appendicitis, and infection of the kidneys, to say nothing of more serious conditions, as obstruction. During a diarrhea we must watch for symptoms of acidemia, and for meningeal complications.

2. Eruptions that may be present may be due to food poisoning, other protein poisoning, or to drugs.

3. We should seek for sources of focal infection, perhaps in the tonsils or in the ear, or perhaps a serious bronchitis or other lung condition. It should be recognized that streptococcic focal infections may cause diarrhea.

4. The child should always be kept in the fresh air, and outdoors, in the shade, if the weather is hot. If possible, a speedy removal to the seashore or to the country is advisable. This therapeutic measure should not wait until the child is hopelessly ill.

5. Castor oil should be given.

6. Food should be withheld.

7. Plenty of water should be given. If the child cannot retain water in the stomach, after a colon wash, it may be retained in the colon. If water is continually lost by the body, and cannot be retained in the stomach or colon, hypodermoclysis is advisable. Many a diarrheal patient dies from lack of water.

8. In twenty-four hours (sooner if the patient is very weak) lactose, in from 3 to 5 per cent. solution, in water, should be given.

9. If the patient is acidemic, starch water and sodium bicarbonate should be given in small, frequent doses. Thin oatmeal gruel may be given.

10. If there are frequent small stools, with considerable tenesmus and pain, the lower bowel should be washed out with 0.7 per cent. sodium chlorid solution once or twice daily. This should be done very gently. If it causes prostration, it should be stopped.

11. While these treatments are going on, the stools should be examined for bacteria, to ascertain what pathogenic germs we must combat. If the gas bacillus is found, Bulgaria bacilli tablets may be crushed and administered in sugar and water, or in whatever nutrient is being given.

12. If the stools are fetid, and especially if there is a tendency toward incomplete evacuation of the bowels, small doses of yeast may be given, in water, as one twentieth of an ordinary yeast cake, once a day.

13. Phenyl salicylate, in 0.03 gm. doses for a child 1 year old, may be given every three hours for a day or two, and then every six hours. Older children should receive a larger dose.

14. If there is much irritation of the stomach or upper intestine, milk of bismuth may be given. It should not be given too long, and is of no value given by the mouth in colitis.

15. If the child is hot, it should be sponged with tepid water and kept cool. If it is cold, it should be kept warm with dry heat. So-called antipyretics should not be given. A good working rule is to keep the abdomen warm, and the rest of the body cool.

16. If stimulation is required, very small doses of atropin, or very small doses of strychnin, or both, may be given.

17. If the child becomes constipated; and the bowel condition is troublesome, another dose of castor oil may be given.

18. The mouth should be kept clean, but all measures should be gentle. The usual antiseptic precautions should be used for all nose and mouth secretions, for the diapers, and for cleansing the clothing and bed linen.

19. It is well to keep petrolatum spread over the anus and buttocks. This prevents irritation from the excretions, and is not conducive to germ growth.

20. As soon as advisable, the food should be increased by giving malted foods or malted gruels, and later by pasteurized milk, but the diet should be kept low until the abnormal temperature ceases and the stools are less frequent and contain no blood.

21. A gradual return should be made to the regular milk or mixed diet of the child.

22. Occasionally, when all measures seem to fail, if the child is a bottle-fed infant, a wetnurse may be a life saver. If the child is a nursing child, the mother's milk may be at fault, and all other possible sources of infection should be sought.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, SECRETARY.

GASTRON.—A solution of the gastric tissue juice obtained by direct extraction from the mucosa of the fresh stomach of the pig and containing the activated principles of the gastric cells, the enzymes and the associated organic and inorganic constituents in an acid, aromatized menstruum containing 25 per cent. glycerin by weight. It has an acidity corresponding approximately to 0.25 per cent. absolute hydrochloric acid, and 1 Cc. dissolves 200 Gm. coagulated egg albumin under standard conditions.

Actions and Uses.—Gastron is claimed to exhibit the characteristic enzymic properties of gastric secretion. It is designed to present in a stable form a complete gastric gland extract for use in disorders of gastric functions.

Dosage.—From 4 to 8 Cc. (1 to 2 fluidrachms) diluted with a little cold water or with acidulated water. It may be administered before, in divided doses during, or after meals.

Manufactured by Fairchild Bros. and Foster, New York. No U. S. patent, U. S. trademark No. 65,397.

Gastron is a viscid, slightly opaque, straw-colored fluid. Heat and strong alcohol cause coagulation of gastron.

One Cc. of gastron in water acidulated to 0.3 per cent. hydrochloric acid is capable of dissolving 200 Gm. coagulated fresh egg albumin when treated according to the method for the valuation of pepsin of the U. S. P. IX.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address "Medic, Chicago"

Subscription price Five dollars per annum in advance

*Contributors, subscribers and readers will find important information
on the second advertising page following the reading matter*

SATURDAY, AUGUST 25, 1917

THE CITY MILK PROBLEM

The enormous improvement effected in the quality of the milk supply in the last two decades has been highly satisfactory from the sanitary point of view, but certain developments associated with this improvement have been more or less disquieting. The principal cause of complaint is the great increase in the cost of milk to the consumer. Part of this increase is perhaps justified by the expense of throwing sanitary safeguards around the supply, but there is question whether the rise in price can be altogether explained in this way. The truth seems to be that the milk business in many cities has become practically a monopoly, that the concentration of distribution in the hands of a few large companies has been of marked disadvantage to the producers and in some respects to the consumers, and that the price paid for distribution has become disproportionately high. The consumer in many cities pays double or more than double the amount per quart received by the producer from 20 to 50 miles away. It cannot be gainsaid that any unnecessary increase in the cost of milk to the city dweller entails grave hygienic as well as economic disadvantages.

In point of fact, it is impossible to separate sanitary from economic interests. The delivery of wholesome milk as cheaply as possible is manifestly what the community has a right to demand. The entire milk supply should be guarded at its source and throughout the process of distribution. Pasteurization should be extensively employed. While unnecessary elaboration of detail should be avoided, legitimate, carefully thought out measures for protecting the quality of the supply will be cheerfully supported by the majority of intelligent citizens. But objection is growing to any addition to the cost of milk based on advertising and other wasteful competitive methods, on duplication of milk routes, on high profits obtained by distribution companies, and on all methods of collection and transportation not expressly justified on sanitary grounds.

The community has taken over without material opposition the task of sanitary inspection and super-

vision of the milk business. There are many who believe it should also assume the work of prompt transportation, of uniform and centralized pasteurization, and of economically efficient delivery. No one cognizant of the facts can doubt that, in the present system of bringing milk from the producer to the consumer, the cost of milk to the latter has been increased beyond what is fair and reasonable. Privately owned and managed plants for distributing water in modern cities have almost disappeared; milk supply is today perhaps second only to water supply in its importance for the public health. There are obvious difficulties in the way of the complete municipal control of the milk distributing business, but in some respects they are not so great as those encountered in the waterworks management.

It may be taken for granted that the usual objections will be raised against the assumption by the public of functions heretofore mainly in the hands of private individuals; but doctrinaire objections are not especially daunting to the much exploited city dweller. If the public control is more satisfactory to consumers, all things considered, than private control, there is little else to be said about it. It would be of great service if an experiment in municipal milk handling should be made by several favorably situated communities. Whether this proved a success or a failure, we should at least obtain some data on which to base opinions and perhaps further action. Certainly the present situation with respect to the cost of milk distribution to the consumer is not without further study to be accepted as the best in the best of possible worlds.

THE NEWER CONCEPTION OF ACIDOSIS

Those who have become acquainted with the word "acidosis" since its introduction into scientific medical literature can scarcely help experiencing some confusion of ideas when they attempt to interpret the meaning of this now widely current term. Naunyn first employed the word to denote that perversion of metabolism in which betahydroxybutyric acid is formed. Subsequently "acidosis" was the name given to other conditions in which acids of any type tend to upset the acid-base equilibrium of the body. The production of betahydroxybutyric acid is an incident in the disordered metabolic changes that lead to an output of ketone substances by the organism. This abnormality is now known to have a significance of its own, namely, in the indication that fatty acids derived either from fats or from amino-acids are being incompletely oxidized; and since this may exist without any conspicuous acid intoxication, it seems advisable to reserve a specific designation for this perverted metabolism of fatty acids. It has thus repeatedly been proposed to indicate the excretion of ketone bodies as "ketonuria," while Allen¹ has sug-

1. Allen, F. M.: Am. Jour. Med. Sc., 1917, 153, 313.

gested for the metabolic condition which gives rise to them the concise and specific term "ketosis."

What, then, is the expression "acidosis" to be understood to mean if it shall no longer be applied specifically to the condition in which acetone or ketone bodies are formed? It has been applied somewhat vaguely to "acid intoxication"; and more recently with the advent of the newer physicochemical conceptions of acidity, acidosis has been identified with an actual increase in the hydrogen ion concentration of the blood. As a matter of fact, however, it has been clearly established that, owing to the remarkable regulatory devices of the organism, the reaction of the blood not only is constant under normal conditions but may even be kept so under pathologic stress involving great lowering of the alkali reserve. But whether the cause of the phenomenon described as acidosis is the production of acid, or the ingestion of acid, or the lack of alkali in the food; whether it is due to a failure to eliminate acid or to a failure to produce and eliminate the neutralizing ammonia—in any event it must always involve a depletion of the body's alkali reserves. Van Slyke² and his collaborators at the Hospital of the Rockefeller Institute, New York, have clearly pointed out that free carbon dioxide is present in the body fluids in such concentration that it automatically converts into bicarbonates all bases not bound by other acids. The bicarbonate therefore represents the excess of base which is left after all the nonvolatile acids have been neutralized and is available for the immediate neutralization of further acids. In this sense, says Van Slyke, it constitutes the alkaline reserve of the body. The bicarbonate concentration of the blood is representative of that of the body fluids in general, and is normally maintained at a definite level. Entrance of free acids reduces it to an extent proportional to the amount of the invading acid.

L. J. Henderson of Harvard University has been preeminently responsible for the acceptance of the blood bicarbonate as a criterion of the acid-base balance of the body. He has lately remarked in the Samuel D. Gross lecture³ for 1916 that "we come nearest to certainty if we say that acidosis must involve a depletion of the body's alkali reserves, and specifically a depletion of the bicarbonate of the blood. So long as this has not taken place, he adds, the pathologic condition cannot amount to much, so far as the acid-base equilibrium is concerned; when this defect is established, the whole chain of causation, involving breathing, oxidation, nitrogen metabolism, renal activity, etc., has been set in motion. As a practical

maxim Henderson therefore describes acidosis as a state of diminished bicarbonate of the blood.

Van Slyke and Cullen² have insisted that since the normal concentration of the blood bicarbonate is so definite as to constitute a physiologic constant, the limits of variations being similar in magnitude to those of the pulse rate, we can reduce the term "acidosis" to as definite a meaning as "fever" or "tachycardia." Heretofore acidosis has been detected or measured in a variety of ways. The blood plasma has been titrated directly; the carbon dioxide content or capacity of the blood has been determined; the hydrogen ion concentration has been ascertained; the carbon dioxide content of the alveolar air has been measured; the urine has been examined for evidences of acid excretion. Fortunately, Van Slyke and Cullen² have devised a simple technic by means of which the capacity of the plasma to combine with carbonic acid (formed by carbon dioxide) under definite tension is determined as a measure of the alkali in excess of acids other than carbonic. It seems likely that this will find application as a clinical procedure, since it involves merely the withdrawal of a sample of blood so far as the patient is concerned, and it is free from psychic and other factors that affect the now widely tested estimation of alveolar carbon dioxide tension as an indication of the severity or progress of an acidosis. It is stated that the results obtained with a given plasma are reproducible to within 1 per cent. of carbon dioxide, 65 volume per cent. being the average normal value for man. In acidosis the carbon dioxide capacity of the plasma falls so far below the normal that the method is a most sensitive indicator of this condition and its severity.

There is, however, another simple though crude physiologic test of acidosis which involves little skill in its execution. It consists in ascertaining the amount of soda, administered by the mouth, that is required to make the urine alkaline. For normal persons, the addition of 5 or 10 gm. to the food will suffice; but an organism whose store has been depleted will retain alkali, so that if more than 10 gm. of soda are required, experience justifies the conclusion that a state of acidosis exists. If, as Henderson thinks, acidosis is probably more common than fever, the test for it should always be made. The alkali can be administered for therapeutic ends too. The use of soda does not remove the cause of the acidosis, but it does protect the alkali reserve, pending the discovery of the etiologic defects. Accordingly, Henderson has offered the following precept: The duty of the physician is to discover whether the quantity of sodium bicarbonate in the blood is diminished, to restore that quantity to normal, and to hold it there. But while restoring it, he must never increase the quantity above normal. Thus founding practice on exact knowledge, on theory fully confirmed, and on an understanding, however imperfect, of the organization of all the mani-

2. Van Slyke, D. D., and Cullen, G. E.: Studies of Acidosis, I, The Bicarbonate Concentration of the Blood Plasma, Its Significance, and Its Determination as a Measure of Acidosis, *Jour. Biol. Chem.*, 1917, **30**, 289.

3. Henderson, L. J.: Acidosis, *Science*, July 27, 1917, p. 73. This is a singularly illuminating discussion of the problems here under consideration. See also the Studies of acidosis by Van Slyke, D.D., et al., in the *Journal of Biological Chemistry*, 1917, **30**, 289 ff., from which many of the features discussed above are taken.

fold processes of metabolism, he may hope sometimes to block a cycle of changes leading to final disintegration, and perhaps more often to alleviate discomfort and pain.

CREATIN AND CREATININ IN BLOOD

In health the urine of human adults rarely contains any noteworthy amount of creatin despite the constant presence of the closely related substance creatinin. In fasting and certain diseases, particularly such as are attended with more or less inanition, creatin may make its appearance in the secretion from the kidney. It is found in the urine of women after postpartum resolution of the uterus; and children commonly excrete creatin along with creatinin until the middle years of childhood.

Underhill¹ has lately pointed out, in an experimental study on certain species, that a marked condition of acidosis, as measured by the hydrogen ion concentration of the urine, is always associated with the appearance of creatin in the rabbit. This may be brought about by feeding acid-forming foods. On the other hand, if a base-producing food, such as carrots, is fed to rabbits with creatinuria, this symptom rapidly disappears as the urine becomes alkaline. Lack of carbohydrate in the diet has been believed to lead to an output of creatin in the urine. Underhill has concluded, however, that it may appear even when adequate carbohydrate is supplied. He believes that creatinuria is not necessarily related to carbohydrate deficiency in the body. It would appear to be associated with a condition of acidosis which usually accompanies those states of metabolism in which carbohydrate deficiency is especially noticeable. If this interrelationship is established, creatin in the urine may prove to be an index of a condition of acidosis in the organism.

Wilson and Plass² of the Johns Hopkins Hospital have carried the analysis a step farther back in the metabolism by reinvestigating the relationship between creatin and creatinin in the blood plasma and in the urine. They have found little or no creatin in adult human plasma. This observation offers an explanation for the fact that creatin is seldom found in the urine of normal men, and in small and variable amounts in the urine of normal women. On the other hand, infants, who are known to eliminate relatively large quantities of creatin, have in their plasma practically as much creatin as creatinin.

It has further been observed that the plasmas of other species, such as the pig and the hen, which commonly excrete creatin in the urine, contain larger quantities of this nitrogenous compound. This harmonizes well with the view that a characteristic

relationship appears to exist between the concentration of creatin in the plasma and its elimination in the urine. Wilson and Plass point out that the older observations led to the anomalous conclusion that creatin is present in considerable quantities in the blood of man, while little if any normally escapes into the urine; but that under certain slightly abnormal conditions, it may be eliminated in considerable quantities. Moreover, the variations in the concentration of creatin in the bloods of different animals showed no relationship to the relative amounts of creatin excreted. The new hypothesis makes the output of creatin and creatinin dependent, as are certain other urinary constituents, on their presence and concentration in the plasma. The concentrations of creatin in the plasma and corpuscles of man appear to be different and must henceforth be studied independently.

In this connection it appears worth while, in view of the increasing attention now being devoted to the chemical analysis of human blood, to call attention to the conflicting views regarding its content of creatinin. The normal values have usually been put from 1 to 2 mg., while Gettler, of the Department of Pathology at Bellevue Hospital, New York, contends that these figures are much too high. A critical study of the current methods of analysis leads him to adopt a range of from 0.1 to 0.5 mg. in 100 c.c. of blood as normal values. Such differences reported by prominent investigators bring the quantitative aspects of the blood-creatinin question into prominence anew.

VACCINE TREATMENT AGAIN

In these columns we have called attention repeatedly to the *post hoc ergo propter hoc* fallacy in claims advanced in favor of the treatment of various infectious conditions with bacterial vaccines. The majority of the acute and subacute conditions are curable spontaneously without any such specific means as vaccines have been thought to be, and especially when the general condition of the patient receives good attention and when, as in the case of strictly local infections, the proper conditions favorable for healing are secured by surgical measures. In any event, the more chronic infectious processes subjected to vaccine treatment almost without exception present variations in their course; periods of improvement succeed periods of exacerbation.

On account of these facts it obviously is utterly impossible to judge of the effects of any given treatment of such diseases as we now have in mind without the most careful comparative observations in treated and untreated cases of such nature and under such conditions that the results obtained in the two groups are comparable. As pointed out by Leake¹ in his article on bacterial vaccine therapy, whenever this

1. Underhill, F. P.: Studies in Creatine Metabolism, I, Possible Interrelations Between Acidosis and Creatine Elimination, Jour. Biol. Chem., 1916, **27**, 127.

2. Wilson, D. W., and Plass, E. D.: Creatine and Creatinine in Whole Blood and Plasma, Jour. Biol. Chem., 1917, **29**, 413.

1. Leake, J. P.: Bacterial Vaccine Therapy, THE JOURNAL A. M. A., this issue, p. 631.

kind of study has been made so far, the results appear to be about the same in the two groups, the test groups and the control group. This is true not only of whooping cough and typhoid fever, but also of that intractable infection, gonorrheal vulvovaginitis in young girls, and, we believe, in pyorrhea alveolaris, too. As for the strikingly favorable results in individual instances reported by vaccine enthusiasts, and repeated over and over again in advertisements, they are all matched, every one of them, by equally brilliant results in cases not treated with vaccine and of frequent occurrence everywhere. In other words, the present situation as to vaccine treatment illustrates again that uncontrolled clinical reports have no value as evidence as to the curative value of a treatment in spontaneously variable and self-curable diseases, and as Leake says, the case in general for bacterial vaccine therapy is not proved.

The history of commercial vaccines is not creditable to many medical and scientific journals. At present the *Journal of Bacteriology*, the official organ of the Society of American Bacteriologists, managed and edited by a committee of distinguished bacteriologists (distinguished, however, not for high standards as to ethical advertising in scientific fields), carries a full page display advertisement which reads:

HAY-FEVER
SUCCESSFULLY TREATED WITH
BACTERIAL VACCINES

Pollen irritation and breathing of the hot dust-laden atmosphere favor the development of pyogenic bacteria in the respiratory tract which then become a factor of the disease.

Experience shows that the immunizing influence of an appropriate bacterin will either cure the disease or so modify it that it causes but little distress. Use ———'s No. 40. Write for literature.

Where is the evidence of the cure? Of the modification of the disease? As no conscientious person wishes to be the means of spreading what is false, let us take to heart and profit by what Bacon says: "If false facts in nature be once set on foot, what through neglect of examination, the countenance of antiquity, and the use made of them in discourse, they are scarce ever retracted."

Menthol from Japan.—Since the beginning of the war the United States has become the largest purchaser of menthol from Japan. In 1916 the total export amounted to 515,277 pounds, valued at \$1,201,698. The duty on menthol in the United States is 50 cents a pound. The price has varied from \$2 to \$2.50 a pound during the past five years. Recent improvements in the process of manufacture have kept the price at a reasonable figure even during the war. It is said that 85 per cent. of the peppermint from which the menthol is made is grown in the Hokkaido district (*Commerce Reports*, Aug. 7, 1917), where the preliminary steps in its manufacture are carried out by the peppermint farmers themselves with stills of simple design. The crude product is sent to Kobe and Yokohama factories where the menthol is produced and the residual oil further purified to the standard requirements for peppermint oil.

Current Comment

MEDICAL STUDENTS AND THE DRAFT

We are publishing, for the third time, facts collected from medical students in regard to their relationship to the draft, and restate how the facts were obtained. In order to secure the information, a double postal card was sent to every medical student whose address we had. These addresses were available as part of the data obtained each year by the Council on Medical Education. We had 8,600 such addresses. The postal card called for the name, age, college and class in which the student was enrolled, his red serial number, and the numerical order of call. It also called for information as to whether or not the individual was in the first call; whether he considered himself exempt; and if so, for what reason? To those schools whose students' addresses we did not have, post cards were sent in packages with a letter urging the college to place them in the hands of the students to be mailed to us at the earliest opportunity. As replies were received, the cards were divided into seven groups, according to whether the students were in the first, second or later call; were below or above the draft age; were exempt on account of being aliens, or had previously enlisted. The cards in each group were kept in alphabetical order, so that all duplications were avoided. At present replies have been received from 6,777 students. Of these, 108 have already enlisted; 42 are aliens; 659 are under and 146 over the draft age, a total of 955, leaving 5,822 (85.9 per cent.) otherwise eligible for the draft. There are 1,666 (28.4 per cent) in the first call; 1,157 (19.7 per cent.) in the second call, and 2,999 (51.9 per cent.)

Class	Total Re- plies	Total to be Drafted		First Call		Second Call		Later Calls		Age Ex- empt		Aliens	En- listed
		No.	%	No.	%	No.	%	No.	%	Under	Over		
Freshmen...	2,265	1,785	78.8	467	26.2	325	18.2	993	55.8	387	33	17	43
Sophomores	2,165	1,900	87.8	498	26.2	397	20.9	1,005	52.9	176	49	14	26
Juniors.....	1,689	1,568	92.8	477	30.2	323	20.6	768	48.9	44	44	9	24
Seniors.....	242	227	93.7	84	37.0	56	24.7	87	38.3	5	7	2	1
Not stated..	416	342	82.2	140	40.9	56	16.4	146	42.7	47	13	..	14
Totals.....	6,777	5,822		1,666		1,157		2,999		659	146	42	108
Perecentages	100	85.9		28.4		19.7		51.9		9.7	2.2	0.6	1.6

in the third and later calls. Of the 1,666 who are in the first call, 1,052 stated positively that they were so included, while 614 did not know, but were so included through estimation from the key list giving the numerical order of the call. All the numbers coming below 2,250 were estimated as being in the first call; those between 2,250 and 4,500 in the second call and those above 4,500 in the third and later calls. These numbers were arbitrarily selected and it now appears that 2,250 was not sufficiently high to cover all in the first call. As stated previously, there were 13,764 medical students enrolled in our medical colleges during the session of 1916-17. Of these, 3,379 were recently graduated, leaving 10,385 to be regarded as medical students. Of these, 4,107 were freshmen; 3,117 sophomores; 2,866 juniors and 295 seniors who were not graduated. On the basis of the replies already received, 8,983 students, or 86.5 per cent. of all,

including aliens, have registered and 1,402 have not registered, either because of previous enlistment or because they were under or over the draft age. Continuing our calculation on the basis of the actual returns, we estimate that 2,551 (28.4 per cent.) will be included in the first call; 1,770 (19.7 per cent.) in the second call, and 4,662 (51.9 per cent.) in the third or later calls. Aside from those mentioned in the table exempted because of alien citizenship, no reference is made to exemptions.

MEDICAL STUDENTS AND CONSCRIPTION— OUR FIGURES QUESTIONED

Two weeks ago we published the analysis of the data obtained from medical students regarding their relation to the draft: age, total number registered, number to be called on each call, etc. The figures published were based on information received directly from the students themselves. The Provost-Marshal, General Crowder, both in letters and in the public press, has stated that these figures "are erroneous and are on their face impossible to be true." General Crowder is also quoted as saying:

"Out of 10,000,000 persons of draftable age, the present call extends only to 700,000, or one fourteenth of the total number registered. Therefore, it is only one fourteenth, or about that fraction, of medical students that can be taken on the present draft."

It may be true that one fourteenth of the total number of all persons registered will be drafted and placed in the National Army on this first call. But how many of the total number registered will it be necessary to examine to secure this one fourteenth—the 700,000 for the first call? General Crowder says that 60 per cent. of those called will be exempted. If this is true, then it will require 1,750,000 of those registered to supply the 700,000; that is, it will take 18 per cent. or nearly one fifth of the total number registered to supply the first call, using General Crowder's figures.¹ Let us apply these facts to the medical student problem. Our estimate was that 85.5 per cent. of medical students (8,879) were subject to draft; that is, were within the draft age. Eighteen per cent. of the total number of medical students registered is 1,598; this number would be subject to the first call. General Crowder, however, would have us deduct 60 per cent. of this number for exemption. But the 60 per cent. exemptions is based on the total registration; it applies to and includes all classes of the male population between 21 and 31 years of age: the lame, the halt, the blind, prisoners, insane, those who are engaged in occupations necessary to the conduct of the war—every male person in the United States between 21 and 31 years of age. Is it not fallacious to apply this percentage of exemptions to medical students? It certainly and emphatically is. According to the selective draft law, persons registered may be exempted because they are: (1) supporting dependents; (2) ministers or theological students; (3) holding gov-

ernment positions, employed in munitions work, in agriculture, etc.; (4) physically defective, or (5) of alien birth. It is extremely rare that a medical student is a married man; extremely few are supporting dependents. Obviously those who are, have independent incomes, or they would not be in the medical schools. The second and third causes for exemption are excluded. As to physical defects, there is probably no group of men who, as a class, are physically better qualified than medical students. As to aliens: our investigation shows that the number of aliens is a minor quantity; one half of one per cent. of those replying reported themselves as aliens. We unhesitatingly assert that instead of there being 60 per cent. of exemptions among medical students, there will be less than 10 per cent. And from such evidence as we have before us, we still believe that the figures we have given in the past and that appear in another part of this issue are much more nearly correct than those that are here discussed based almost wholly on percentage calculations.

THE PROVOST-MARSHAL'S CONCEPTION OF MEDICAL EDUCATION

The following is from a memorandum from the Provost-Marshal, General Crowder, to the Secretary of War, under date of June 30:

"I think that any medical student drafted can continue his studies to the very best advantage in the Medical Corps of the United States Army and gain a practical experience which he could not gain at any other time than war. It would be very well, it seems to me, if all the medical students could be furloughed from the colleges into the Army for the purpose of taking this practical training, rather than furloughing them from the Army back to the medical schools to complete a technical course."

This, it must be remembered, comes from a man in a responsible position, and apparently endorsed by the Secretary of War. Is it possible that these officials imagine that medical science and medical education have made no progress since our Civil War?

THE PROPOSED COMPENSATION AND INSURANCE LAW

A most important piece of legislation, one which is destined to affect the entire social organization of our country, is the family allowance, compensation and insurance bill recently introduced in Congress and abstracted in this issue.¹ It is a war measure which immediately affects the welfare and the morale of our troops at the front. The soldier who knows that in case of death or disability his family will be permanently provided for is a better soldier than one whose morale, if not health, is weakened by anxiety regarding loved ones at home. The commander of the American troops in France—General Pershing—believes that it is not only unnecessary but also undesirable that the American soldier have for spending money each month the sum of \$33 or more. The allotment of a portion of his pay to his family and the voluntary disposal of a certain sum per month toward the purchase of insurance will still leave him more

1. We are using the numbers given by General Crowder. As a matter of fact, the official figures quoted from the Official Bulletin are 9,659,382 men registered, not 10,000,000; the first call is for 687,000 men, not 700,000.

1. See The War Insurance and Compensation Bill, Medical Mobilization and the War, this issue, p. 652.

money than is received by most of the troops of our allies. The bill is not a bill to make the soldier dependent on the government after the war, but to encourage him to rehabilitate himself, to take up new work to make him better able to take care of himself and of his family. The law does not provide for pensions, but for compensation. It compensates the military workman of the government, just as many state governments compel employers to compensate their employees. The justice of the measure, especially for the men in the ranks and their dependents, will be fully appreciated by physicians. It will benefit the whole country in the way of maintaining the health and welfare of the mass of the population involved. As the Secretary of War has said, "When we draft the wage-earner, we call not only him but the entire family to the flag; the sacrifice entailed is not divisible."

NASOPHARYNGEAL DISINFECTION BY HYPOCHLORITES

When properly used, hypochlorite solutions may render infected wounds practically sterile so that they may be sutured with success, as illustrated by the results of Carrel's method. Naturally the question arises whether or not such solutions will be of value in disinfection of the nose and throat, especially in the case of diphtheria and meningococcus carriers. The general situation in the case of such carriers is, of course, by no means the same as in an infected wound. Infected wounds may be subjected to practically constant flushing with disinfectant solutions, the surfaces are either fresh or granulating, and the tissues are abundantly vascularized and infiltrated with leukocytes, so that they are in good condition for healing when foreign bodies and micro-organisms are removed. In the throat and nose, disinfectant solutions cannot be used constantly; there are many places which can be reached by disinfectants only with great difficulty and frequently not at all, such as deep crypts in the tonsils and in adenoids, abnormal conditions in the nose, etc., and the surfaces are covered with mucous membrane in which no active inflammatory or antibacterial processes are usually going on. And yet it surely does seem as if it might be possible so to apply disinfectants in the nose and throat that they would destroy rapidly bacteria like the diphtheria bacillus and the meningococcus, at least in persons with practically normal anatomic conditions. Many substances have been used for this purpose, but it has not been established that it is possible by means of disinfectants to hasten the removal of the offending bacteria in carriers. Recently encouraging results have been reported from the use of hypochlorite preparations.¹ Dunham and Dakin state that a marked diminution in the number of colonies obtained from the nasopharynx follows intensive spraying with dichloramin-T in oily solution. Conclusive evidence can be obtained only from the accurate study, properly controlled, of a large number of carriers. For this

purpose, chronic diphtheria and meningococcus carriers should be used especially, because in them there is less likelihood of the spontaneous disappearance of the bacteria. Studies of this nature should be pursued with persistence and vigor, because no more important steps can be taken in the prevention of cerebrospinal fever and diphtheria than the discovery of a means whereby carriers can be promptly freed from meningococci and diphtheria bacilli in the nasopharynx.

MENINGOCOCCAL SKIN LESIONS

Several observers have noted the presence of meningococci in spots in the skin after death from cerebrospinal fever, and recently Netter and others¹ have demonstrated meningococci in purpuric and petechial eruptions during life, not only in cases with the usual meningeal symptoms and signs, but also in cases of meningococcus infection without meningitis or before meningitis had developed. It will be recalled that the development of petechial eruptions in cerebrospinal fever is an indication of grave prognostic significance; that such eruptions appear to have been more frequently present formerly than recently, and that the disease at one time was called "black death" because of the many deaths in cases with cutaneous eruptions. Netter and his associates find typical meningococci in the contents of little vesicles that may form on the surface of purpuric and petechial spots and also in the fluid that exudes after scarification of such spots. So far their cases have occurred in infants, and, as indicated, grave meningococcus infection has been diagnosed by this demonstration of meningococci in patients in whom typical meningitis had not developed, thus making it imperative to inject antimeningitis serum at a much earlier period than otherwise would have been the case, and even when it otherwise would not have been used at all. This finding of meningococci in skin lesions is quite analogous to the finding of typhoid bacilli in the rose spots of typhoid fever; in both cases it signifies that the organisms have been present in the blood. Besides being of great value in the early diagnosis and prompt serotherapy of meningococcus infection, the demonstration of the cocci in skin lesions may be of great value also from the point of view of prevention, because thereby cases of cerebrospinal fever may be detected that otherwise might escape observation, isolation, quarantine of contacts, etc. In all cases of obscure fever with peculiar skin eruption, the fluid in the tissues of the affected skin should be examined bacteriologically for micro-organisms, particularly meningococci; let it be remembered, however, that in this instance as well as in so many others, the negative result cannot be assigned any such value as may be assigned to the positive result.

1. Netter and others: *Brit. Jour. Child. Dis.*, 1917, **14**, pp. 101 and 104.

The Autumn Purge.—Purges are good in autumn from the eighth kalends of October to the eighth kalends of December, for since in summer and winter the body produces phlegm and black bile or melancholy, as we call it, in autumn it should be purged of these.—Ancient Medicine.

1. Gordon: *Brit. Med. Jour.*, 1916, **2**, 8. Gordon and Flack: *Ibid.*, 1916, **2**, 673 (nebularized chloramin solutions). Beattie, Lewis and Cee: *Ibid.*, 1917, **1**, 256. Dunham and Dakin: *Ibid.*, 1917, **1**, 682.

Medical Mobilization and the War

The Surgeon-General and Drafted Students

We are asked to announce that the Surgeon-General's Office desires the names, addresses and ages of men in each class of every reputable medical school who have been drawn and accepted for military service under the provisions of the selective draft, these names to be vouched for by the deans of the respective medical colleges.

Modification of Physical Requirements for the National Army

The Surgeon-General has amended the regulations governing physical examinations for the National Army so as to authorize acceptance of men 61 inches in height, weighing not less than 110 pounds; 62 inches, same weight; 63 inches, not less than 112 pounds. He also authorizes acceptance of men 64 inches in height and over of less than standard weight, provided the underweight is due to temporary causes and can be reasonably explained.

Standard of Height and Weight for Medical Reserve Officers

To comply with the qualifications for the new National Army physicians will be accepted for the Medical Reserve Corps who are not under 61 inches in height or 118 pounds minimum weight, a variation of 8 pounds being allowed—110 pounds minimum—in case the applicant is otherwise physically fit. These physical requirements for the Medical Reserve Corps which were height, 64 inches; weight, 120 pounds minimum. Physicians who have been rejected on previous application for membership in the Medical Reserve Corps because of disability in minimum height and weight may apply again for commission to the board before which they first appeared.

Reserve Officers on Active Duty

There are at present approximately 8,000 medical reserve officers on active duty. This number includes those in training camps for Medical Reserve Officers, those mobilizing the National Guard, those in foreign service, and also a considerable number who have been sent to the Philippine Islands, to Hawaii, and to other American dependencies to relieve the regular medical corps men from those stations. On August 25, between 1,000 and 1,100 medical reserve officers will go to the various cantonments for the National Army to prepare for the advent of the first 200,000 men of the National Army who have been ordered to report at the cantonments on September 5.

The Conscription of Interns

Last week we referred to the fact that the hospitals of the country which employ interns were to be deprived of a certain proportion of interns by the draft. We have obtained figures from five general hospitals in Chicago. Of 117 interns in these five hospitals, forty-three have been accepted by draft boards and ordered to be prepared to report for military service. In addition, twenty-eight have been drafted from the eligible list of sixty from which the Cook County Hospital was prepared to draw to fill its shortage. Thus, of a total of 177 interns, seventy-one, or 40 per cent., have been drafted.

Physicians Recommended for Commission in the Medical Reserve Corps

During the week ending August 18, 834 physicians were recommended for commission in the Medical Reserve Corps, the proportion being six majors, seventy-one captains and 757 lieutenants.

Physicians in the Training Camps

On August 18, there were in the various training camps for Medical Reserve Officers approximately the following number of physicians: Fort Oglethorpe, 1,100; Fort Benjamin Harrison, 1,200; Fort Riley, 1,000; Allentown, Pa., 125; Fort Des Moines, Iowa, 72 (colored); total, 3,497.

Advice on Food

The Surgeon-General of the Army authorizes the following: Dr. Alonzo E. Taylor, member of the advisory board of food division of the Surgeon-General's Office, will visit the several medical officers' training camps and deliver a series of lectures on food values, food needs, and preparation and conservation of food.

The Disposal of Drafted Medical Students, Pharmacists and Physicians

There is considerable anxiety on the part of many of our readers concerning the drafting of persons in whom they are interested. Two physicians write concerning pharmacists; several have written as to what will be done with medical students, provided they are not to complete their medical education; and a large number have written as to disposal of physicians who have been conscripted. The reply to all these inquiries is that each man will be assigned to that particular work for which he is best fitted. So far as pharmacy is concerned, there is quite a large demand for pharmacists in connection with the Medical Department of the Army. So far as medical students are concerned, it is already announced unofficially that these will be assigned to the Medical Department and become a part of the enlisted Hospital Corps. Physicians, of course, will be assigned to the same department.

Hospital Interns and Medical Students and the Selective Service Act

Thirty-two of the leading hospitals of New York were represented at a meeting of the mayor's committee on Hospital and Medical Facilities in New York, August 15. A resolution was adopted calling the attention of the Secretary of War to the serious consequences to the civilian population of the country and to the maintenance and operation of the hospitals if medical students and hospital interns are not for the present withdrawn from the operation of the selective service act. The resolution provides that the views of the committee be laid before the proper officials of the government and the district boards of the state of New York, and requests that proper steps be taken for the temporary exemption of medical students and interns so that there may be a constant supply of medical men to the Army throughout the war, and to prevent the embarrassment of the hospitals and the consequent serious results to the people of the United States. At present, it is understood, no provision has been made by the government for such exemption.

The War Insurance and Compensation Bill

The war insurance and compensation bill pending in Congress is intended to apply to the tremendous hazards of war conditions for the benefit of our soldiers, sailors and their dependents, the protective principle of the industrial compensation laws and the additional privilege of individual insurance at a nominal cost; compensation rather than pensions in amounts fixed definitely in advance in the place of the chance of mere gratuities after the war; death insurance at such low rates that even the private may insure for the maximum sum allowed. The bill involves the economic welfare, and therefore the body welfare, of a large mass of our people. Physicians, especially, as well as all other citizens, will be vitally interested in it, and for their information the main features of the bill are given here.

The bill, with the approval of the President and strongly recommended by the Secretary of the Treasury, was introduced into both houses of Congress, August 10, as an amendment to the act establishing the Bureau of War Risk Insurance in the Treasury Department. The bill applies to all enlisted men of the Army and Navy as well as to the women of the nursing service of both branches, and sets forth in exact terms what will be done for every person in any relation to the soldier, sailor or nurse who is dependent on him or her for support, and also for the soldier himself in case of injury or disease in the way of free hospital treatment, appliances for mutilated men and provisions (which may be compulsory) for vocational training and reeducation. It provides for insurance against death at extremely low rates in any sum up to \$10,000. As expressed by the Secretary of the Treasury, the main purpose of the bill "is to grant a reasonable government indemnity against the losses and risks incurred in the discharge of a patriotic duty and in the performance of extraordinarily hazardous service to which the

government has called and forced the citizens. It provides not only for the man, but for his family."

The provision for dependents, however, is not all to come from government funds; it is to a certain extent mutual. By a compulsory feature of the bill, unless waived or exempted, an allotment from the soldier's pay will be made to a wife and children up to the age of 18 of a minimum of \$15 per month or not more than half the pay, and to other dependents such sums as the soldier may voluntarily agree to pay. In the case of the wife and children the allotment of government funds shall be from \$5 to \$50 per month, according to the size of the family, and in the case of other dependents the amount of their actual needs and the amount usually contributed by the soldier to their support; but no allowance will be made in the case of the latter by the government unless a voluntary allowance has been made by the soldier. A schedule of family allowances under the bill is as follows: In the case of a man to his wife (including a former wife divorced) and to his child or children: if there be a wife but no children, \$15; if there be a wife with one child, \$25; a wife and two children, with \$5 additional per month for each child, \$32.50; if there be no wife but one child, \$5; if there be no wife, but two children, \$12.50; if there be no wife, but three children, \$20; if there be no wife, but four children, with \$5 per month additional for each additional child, \$30. The bill explicitly defines the status of wife and children, parents and others who may be entitled to compensation, and is liberal in its interpretation in this respect, for instance, including illegitimate children acknowledged by the father, or whom he has been judicially ordered to support.

In case death results from injury the percentages of the Army pay allowed to dependents shall be as follows: For a widow alone, 25 per cent., but not less than \$30; for a widow and one child, 35 per cent., but not less than \$40; for a widow and two children, 40 per cent., but not less than \$50, with 5 per cent. additional, but not less than \$5 for each additional child up to two; if there be no widow, then for one child, 20 per cent., but not less than \$15; for two children, 30 per cent., but not less than \$25; for three children, 40 per cent., but not less than \$35, with 5 per cent. additional, but not less than \$10, for each additional child up to two; for a widowed mother, 20 per cent., but not less than \$25; the maximum monthly compensation for death shall be \$200. Compensation for death is to continue until the children are 18 years of age and until two years after the remarriage of the widow, and the amount to be granted is to be determined by the status of the family at the time of each monthly payment.

Total disability from injury "so as to make it impracticable for the injured person to pursue any gainful occupation" is provided for in the following percentages of the pay: If the person has neither wife nor child living, 40 per cent., but not less than \$40; if he has a wife, but no child living, 50 per cent., but not less than \$55; if he has a wife and one child living, 55 per cent., but not less than \$65; if he has a wife and two or more children living, 60 per cent., but not less than \$75; if he has no wife, but one child living, 50 per cent., but not less than \$50, with 5 per cent. additional, but not less than \$10, for each additional child up to two; if he has a widowed mother substantially dependent on him for support, then, in addition to the above, 10 per cent., but not less than \$10; \$20 additional for a helpless person in constant need of nurse or attendant; the maximum monthly compensation to be \$200.

The government, through this bill, does not intend to prevent the soldier from applying his income to the establishment of a business or to the purchase of a farm. The soldier is allowed to commute his compensation, but the government will protect him from his own folly because it permits him to commute only one half of his personal compensation and does not permit him to commute that portion which is for the use of his family nor the remaining half of his personal compensation. He will thus be independent of communal assistance even though he loses the sum which he has invested.

On certification within one year after resignation or discharge compensation may be claimed by the soldier or on his account for disability or death resulting from injury suffered or disease contracted while in the service. A man must avail himself of opportunities provided by the government under penalty of loss of compensation during any period of unreasonable refusal, but he retains the right to disability compensation regardless of economic recuperation.

An important and remarkable feature of this bill is the provision for government insurance covering total disability and death, to officers, men and Army nurses while in active

service as part of the military or naval forces, enabling them to purchase insurance at a premium for the war period of from \$7 to \$8 per \$1,000 for any sum up to \$10,000. This feature was framed after thorough study by Judge Mack, the author of the bill, in cooperation with the actuary of the War Department and a number of other government department heads and other experts, and the low cost of the insurance to the men is based on the principle that the excess cost due to increased mortality and disability risk should under the circumstances be borne by the government, as should also the expense of administering the insurance bureau; contributory also to the possibility of low rates is the avoidance of the large expense of private companies in the way of agents' commissions, advertising, medical examination, profits, etc. The premiums are to be payable in installments; the insurance is to be nonassignable and free from the claims of creditors either of the insured or the beneficiary. It is limited to the wife and children and to other relatives who are specified, and must be applied for within 120 days after the act is in force or after enlistment and entrance into the service. It is even provided that those who are disabled or die within the prescribed period of 120 days, before they have had opportunity to apply for the insurance, shall be considered to have applied for and will be allowed insurance in the sum of \$5,000. After the war the insurance, it is said, may be converted into other forms with earlier maturity, but with the premium based on the same mortality tables of peace times. The liberal provisions of the bill will be apparent when they are contrasted with those of the present pension laws, which allow from \$12 to \$30 for a man, \$8 for a widow and \$2 for a child.

The estimated cost of this insurance for the first year has been placed at about \$176,000,000, and for the second year, about \$380,000,000. Objection has been raised to the bill on account of this apparently vast expense. The Secretary of the Treasury, however, calls attention to the fact that this will amount to only about 6 per cent. of the sums proposed to be expended for the other purposes of the war, and considering that it is for the benefit of the widows and orphans, the dependent and the injured, who make the real and the greatest sacrifices for the safety and honor of the country, objection on account of expense is not worthy of consideration. Nor indeed would the country escape possibly greater expenditures ultimately through the pension system, which this bill on its passage would replace.

A Petition for the Drafting of Physicians

The New York State Committee for National Defense some time ago passed resolutions to the effect that measures be instituted to secure the necessary federal legislation authorizing a selective draft of physicians based on a classification of physicians similar to that which was recently made of the physicians of New York state. In order to bring the matter before the attention of those interested, a committee was appointed to draw up a petition to the Congress of the United States to be circulated for signatures and then presented to Congress. Letters have been drafted for the medical boards of various hospitals, the county medical societies, the deans of various medical colleges, and the Council of National Defense, presenting the petition and urging that it be signed and presented to Congress. The petition follows:

A PETITION TO THE CONGRESS OF THE UNITED STATES FROM THE MEDICAL PROFESSION OF THE STATE OF NEW YORK

WHEREAS, A critical analysis, based upon a classification of physicians by the recent New York State Special Medical Census, when applied to the personnel resident in this State of the Medical Officers' Reserve Corps of the Army, has clearly demonstrated that the volunteer system of recruiting this personnel, now and hitherto in effect, has failed to secure an adequate number of physicians available and desirable for active army medical service; and

WHEREAS, Such analysis has likewise clearly demonstrated that the volunteer system has failed to exclude from this personnel physicians unfit for active military duty, by reason of age, physical disability, family obligations or many dependents; and

WHEREAS, The volunteer system has also failed to exclude from this personnel physicians whose services at home are essential to the public welfare in health departments, hospitals, medical colleges and isolated communities; and

WHEREAS, It has further failed to adjust equitably, in age or geographic or population distribution, the burden of military service upon the medical profession of the United States; and

WHEREAS, It has by these failures caused injury to the individual, to the community, to the medical profession and to the public; and

WHEREAS, The volunteer system puts an undesirable and embarrassing burden of decision upon those physicians whose services are most needed at home; and

WHEREAS, There exists no provision in the present draft law for drafting physicians as medical officers, but only as private soldiers; and

WHEREAS, The existing general draft law affects only those physicians who are of an age of maximum efficiency as soldiers and fails to affect many of those who are of an age most suitable for medical officers; and

WHEREAS, The justice, wisdom and effectiveness of the selective draft principle have been recognized by Congress in raising a strong army from our civilian population; and

WHEREAS, We are firmly convinced that a selective draft of physicians for military purposes, based upon a classification similar to that of the New York State Medical Census and designed specifically to exempt those unfit by reason of age, physical disability or many dependents, as well as those necessary for the maintenance of public health, hospital and community service and medical education, will be alike just to the individual, to the community and to the Nation, and that it will secure to the medical service of the National defense those best fitted for its uses while it retains at home those most needed in the community; and

WHEREAS, We, the undersigned physicians, graduates of standard medical colleges and duly licensed to practice medicine in the State of New York, mindful of our duty to our communities and State as well as to the Nation, are in favor of a selective draft of physicians between the ages of 21 and 45 years, for medical officers, in numbers sufficient for the Nation's military needs, based upon a classification by census, which shall exempt those unfit for military purposes and those necessary for the community at home; and

WHEREAS, We justly claim that such a selective draft of physicians when and if instituted shall and of right ought to exempt graduate physicians, students of medicine and pre-medical students in the General Draft Law age group from further liability to the provisions of the existing General Draft Law so long as they retain medical status; now therefore

WE, the undersigned physicians as aforesaid, do hereby petition the Congress of the United States for legislation enabling the President to direct the institution of such a classification and to proclaim and order such a selective draft.

Program of Social Hygiene for Soldiers, to Safeguard Their Morals and Health, Outlined by Surgeon-General's Office

The Surgeon-General's Office has authorized the following statement on the social hygiene program of the War Department in relation to other agencies:

In its popular interpretation, social hygiene has been used as a phrase to refer inclusively to all efforts for protection of the population from prostitution and venereal disease. Prostitution in its various forms affords the chief opportunity for disseminating the venereal diseases and promoting sexual promiscuity. Neither the military nor the civil authorities have been able effectively to combat this medical social evil alone. The assembling of troops in the vicinity of civil communities has always introduced a difficult social problem on the one hand and on the other has attracted the promoters of organized vice, who have established the commercialized activities known to increase the supply and demand for prostitution. The civil authorities within whose jurisdiction these practices were carried on were inexperienced in dealing with the situation, and the military authorities had no legal power under which to take action.

During the present war there is for the first time the opportunity to secure full cooperation between military and civil forces in applying the medical, social, moral, and economic knowledge which has been demonstrated to have a bearing on the repression of prostitution and the reduction of the prevalence of venereal diseases. Public opinion will now support a sound program, and sufficient authority has been secured through legislative and administrative action to promise important results.

MEASURES PROPOSED

The paramount national issue is the winning of the war, and every resource, both military and civil, must be applied toward this end. The social hygiene program has, therefore, been centered administratively on the protection of the military, naval, and other governmental forces. The success attained, however, is equally to the advantage of the civil population. So far as these administrative measures relate to the United States Army they may be grouped under five headings:

1. *Army Medical Department.*—Military measures for combating venereal diseases.

2. *United States Public Health Service.*—Epidemiological measures for the control of venereal diseases in the civil sanitary districts.

3. *War Department Commission on Training Camp Activities.*—(a) Law enforcement measures in the department zones. (b) Recreation measures in the department zones.

4. *Civil Authorities.*—Law enforcement, recreation, facilities for treatment of venereal diseases and protection and control of women and girls.

5. *Nonofficial Agencies.*—Social hygiene activities of volunteer organizations recognized for special services.

Each of these groups includes a variety of activities carried out by widely different agencies that have been available at the moment of necessity, and having proved useful have continued to function.

THE ARMY MEDICAL DEPARTMENT

The Medical Department of the Army is limited in its strictly official capacity to measures for the prevention and treatment of venereal diseases inside the military encampments. Unofficially the Surgeon-General and his staff are in full accord and cooperation with the agencies to which reference has been made. A section has been organized to devote its attention to this problem, with an officer in charge of the laboratory investigations, one in charge of medical work, and one in charge of educational and environmental measures and sociological studies. These officers will have the cooperation of the officer who is in charge of sanitary inspection, and the officer who directs the division of training camps. While the creation of a special section is new it should be stated that the work has been carried on by the Army for many years. The activities of the section may be summarized under the following headings:

1. Educational work adapted so far as practicable to the individual needs and responsibilities of the men and officers, and conducted through personal interviews, group talks, illustrated lectures, exhibits, pamphlets, and library reference books.

2. Prophylactic stations for minimizing the number of infections developing after exposure, and for personal advice and warning directed toward lessening the number of future exposures.

3. Diagnosis and treatment facilities for cases of syphilis and gonococcus infections which develop in spite of efforts to prevent them.

4. Enforcement of penalties against those who ignore advice and instruction to avoid sexual intercourse and venereal disease.

5. Epidemiological studies of the venereal diseases to discover any new measures which may be applied.

PUBLIC HEALTH SERVICE

The United States Public Health Service has been charged with the responsibility for health conditions in civil sanitary districts surrounding military establishments. The work will be done in cooperation with the State and local authorities and with the American Red Cross through an advisory board. The venereal diseases, as dangerous communicable diseases, are included in the program. The following are the principal lines of activity to be undertaken in relation to these diseases:

1. Promotion of public opinion in support of the social hygiene program agreed upon.

2. Survey and standardization of dispensary and hospital facilities for venereal diseases.

3. Cooperation with private practitioners in minimizing the dissemination of infections.

4. Extension of laboratory, clinical, and advisory service for venereal diseases in communities under civil auspices.

Efforts along each of these lines will simplify and render more effective the Army measures.

COMMISSION ON TRAINING CAMP ACTIVITIES

In order to deal effectively with social hygiene in all its phases the Secretary of War has created the commission on training camp activities to carry out the law enforcement regulations promulgated by him under the authority of Congress and the President. This commission has also been charged with important activities in furnishing recreation for the troops. Under these two divisions the commission's work as it indirectly bears on the control of venereal diseases may be summarized as follows:

A. Law enforcement measures.

1. Elimination of commercialized prostitution in the cantonment zones.

2. Repression of clandestine prostitution.

3. Control of alcohol and other aids to prostitution.

4. Combating of gambling, use of drugs, and other harmful practices.

B. Recreation measures.

5. Social and educational activities of recreation huts in the cantonments, and of recognized agencies in the cantonment zones.

6. Theatrical and other entertainment programs.

7. Athletic contests, tournaments, and games.

8. Reception tents for visitors.

9. Libraries of popular books and other facilities provided under the direction of the commission.

CIVIL AUTHORITIES

It is recognized that neither the measures within the military establishments nor the supplementary measures in specified zones can achieve the largest success without full cooperation of civil authorities in enforcing equivalent measures in all communities accessible to the personnel of the military forces. The carrying out of the following program, which

has been inaugurated in many cities and towns, is of great importance to the Army and to national efficiency:

1. Enforcement of laws and ordinances against prostitution and alcohol.
2. Establishment of proper facilities for advice and treatment of persons infected with venereal diseases.
3. Provision of attractive recreation and entertainment for the leisure hours of the population.
4. Moral protection and education of women and girls.

NONOFFICIAL AGENCIES

The complicated interlocking of military and civil interests in the protection of soldiers and civilians from vice and disease affords an opportunity for many useful activities of volunteer agencies. This is particularly true in the field of social hygiene. In the interest of efficiency and avoidance of confusion and duplication of effort a small number of such agencies have been recognized as clearing houses for military-civil work of a very large number of organizations in their respective fields.

American Women's Hospitals

"The War Service Committee of the Medical Women's National Association," according to a note from Dr. Ethel D. Brown, secretary, "has organized the American Women's Hospitals for work at home and abroad. The Surgeon-General of the Army and the General-Director of the Department of Military Relief of the American Red Cross have approved the provision made for service to the Army and to the civil population. The work will be officially part of the medical and surgical service of the American Red Cross. The scope of the plan is a broad one. It includes units for maternity service and village practice in the devastated parts of the Allies' countries and hospitals run by women for service there as well as for the United States Army in Europe. In this country acute and convalescent cases will be treated in hospitals equipped for the purpose; soldiers' dependents will be cared for, interned alien enemies will be given medical aid and substitutes will be provided to look after the hospital service and the private practice of physicians who have gone to the front. The first units hope to go to France and to Serbia in the early fall. Headquarters have been established at 637 Madison Avenue, New York. Dr. Rosalie Slaughter Morton is chairman of the War Service Committee."

Orders to Officers of the Medical Reserve Corps

ALABAMA

To Baltimore, Phipps Clinic, for a six weeks' course of training, Major Eugene D. Bonduant, Mobile, and Lieut. Wilbur L. Heard, Mt. Vernon.
To Brownville, Texas, for duty with Base Hospital No. 3, Lieut. Duncan P. Dixon, Talladega.

To Fort Des Moines, for duty, Lieut. Thomas L. Zuber, Carrollton.
To Fort Oglethorpe, for instruction, Lieuts. Albert S. Zimmerman, Larkinsville; Cecil H. Ross, Mobile; Robert Goldthwaite, Montgomery; Jesse McC. Reed, Ray Minette; and Charles D. Mason, Scottsboro.

ARKANSAS

To Fort Riley, for instruction, Lieut. Kenneth B. Huffman, Bentonville.

CALIFORNIA

To Army Service School, Washington, for duty, Lieut. Jean R. Oliver, San Francisco.

To Fort McDowell, Calif., for duty, Lieut. Mark A. Williamson, Lone Pine.

To Presidio of San Francisco, Letterman Hospital, for duty, Lieut. Kenneth J. Staniford, Fresno.

To Report in Person to Commanding General, Western Department, for duty, Major Herbert C. Moffitt, Capt. Gustav J. Bergener, William R. P. Clark, San Francisco; Lieuts. Michel H. Etcheverry, Herman Verplank Hoffman, and George R. Hubbell, San Francisco.

To Sparta, Wis., for duty with 17th Field Art., Lieut. William A. Sampson, San Francisco.

COLORADO

To Fort Douglas, Utah, for making examinations in his specialty, Lieut. Phillip Work, Pueblo.

To Fort Snelling, Minn., for duty with 41st Infantry as surgeon, Lieut. William J. McDonald, Fowler.

CONNECTICUT

To Rantoul, Ill., for duty as post surgeon, Capt. Richard Blackmore, Farmington.

DISTRICT OF COLUMBIA

To Army Medical School, Washington, for the purpose of taking sick calls at the Coast Artillery Camp, East Potomac Park, Capt. James W. Hart, Washington.

To Fort Des Moines, for duty, Lieut. Silas S. Thompson, Washington.
To Walter Reed General Hospital, Takoma Park, Lieuts. Daniel L. Borden, and Adam Kemble, Washington.

Honorably discharged, Lieut. Harry Cockerville Blair, Washington.

FLORIDA

To Fort Des Moines, for duty, Lieut. James M. Ponder, Ocala.
To Fort Oglethorpe for instruction, Major Raymond C. Turck, Jacksonville, and Lieut. Stanley Erwin, Jacksonville.

To Philadelphia, for course of instruction in military roentgenology, Lieut. Harry B. McEuen, Quincy.

GEORGIA

To Allentown, Pa., for duty, Lieuts. James E. Pitman, Decatur; and Heber J. Morton, Waynesboro.

To Fort Oglethorpe for instruction, Lieuts. James A. McAllister, Atlanta; Thomas E. Oden, Blackshear; and Richard Binion, Sparta.

IDAHO

To report by telegraph to commanding general, Western Department, for duty, Capt. Edward E. Maxey, Boise.

ILLINOIS

To Chicago, enlisting personnel of American Red Cross Ambulance Co., No. 3, Capt. Elbert Clark, Danville.

To Fort Benjamin Harrison, for instruction, Capt. Charles A. Stevens, Lieuts. Thomas P. Foley, Robert H. Lowry, Jr., Chicago; and Ralph R. Trueblood, Lawrenceville.

To Fort Leavenworth for duty as surgeon with 7th Engineers, Lieut. Lawrence H. Roblee, Chicago.

To Fort Riley, for instruction, Lieut. Robert G. Bond, Harrisburg.

To Fort Sheridan, for duty, Capt. Robert C. Fullenweider, La Salle.

To Sparta, Wis., for duty with 17th Field Art., Capt. Walter F. Von Zelinski, Chicago; with 16th Field Art. as assistant to the surgeon, Lieut. Frank C. Murrah, Herrin.

To report to Surgeon General of Army, for duty in his office, Major William H. G. Logan, Chicago.

INDIANA

To Fort Douglas, Utah, Lieut. Albert G. Grubb, Mongo.

To Fort Sheridan, Ill., for duty Capt. William H. Lane, Angola.

Resignation of Lieut. Charles C. Moore, Owensburg, is accepted.

IOWA

To Army Service School, Washington, for duty, Lieut. Daniel J. Glomset, Des Moines.

To Fort Riley for instruction, Lieut. Thomas V. Golden, Afton.

To Sparta, Wis., for duty with 16th Field Art. as assistant to the surgeon, Lieut. Edward S. Parker, Idagrove.

KANSAS

To Allentown, Pa., for duty, Capt. Jirah M. Downs, Ellsworth.

To Fort Riley, for instruction, Lieuts. Harrison W. Wright, Enterprise; Andrew Engberg, McPherson.

To Fredonia, Kan., enlisting personnel of Red Cross Ambulance Co. No. 16, Lieut. Walter P. Guy, Winfield.

To Gettysburg, Pa., for duty with 1st Hospital and Ambulance Co., Lieut. Robert L. Hoffman, Wichita.

Resignation of Lieut. Edwin R. Tenney, Kansas City, is accepted.

KENTUCKY

To Fort Oglethorpe, for instruction, Lieut. Louis W. Frank, Louisville.

To Gettysburg, Pa., for duty with 1st Hospital and Ambulance Co., Lieut. William S. Ehrich, Louisville.

To Sparta, Wis., for duty with 17th Field Art., Lieut. Carroll P. Price, Harrodsburg.

LOUISIANA

To Fort Des Moines, for duty, Lieut. Oliver W. Landry, New Orleans, La.

To Fort Riley, Kans., for making examinations in his specialty, Lieut. Ralph C. P. Truitt, Jackson.

To Fort D. A. Russell, Wyo., for making examinations in his specialty, Lieut. Louis V. J. Lopez, New Orleans.

MARYLAND

To Camp Kelly, South San Antonio, for duty with 31st Aero Squadron, Lieut. Fred P. Weltner, Baltimore.

To Fort Benjamin Harrison for instruction, Capt. Herbert B. Montgomery, Lanham; and Lieut. Herbert W. Rogers, Baltimore.

To Fort Oglethorpe for instruction, Capt. George E. Lewis, Rockville, and Lieut. Lewis H. Howard, Baltimore.

MASSACHUSETTS

To Fort Benjamin Harrison, for duty with the 48th Infantry as surgeon, Capt. Miles D. Chisholm, Westfield.

To Fort Sill, Okla., for making examinations in his specialty, Lieut. John J. Stack, Boston.

To Gettysburg, Pa., for duty with 1st Hospital and Ambulance Co., Lieut. Albert Pfeiffer, Lexington.

To Quonset Point, R. I., as assistant camp surgeon, Lieut. Frank Piper, Boston.

MICHIGAN

To Detroit, Mich., enlisting personnel of Red Cross Ambulance Co., No. 8, Lieut. Clarence L. Candler, Detroit.

To Fort Riley, for instruction, Lieut. Walter N. Sallisbury, Ann Arbor.

To Grand Rapids, Mich., enlisting personnel of American Red Cross Ambulance Co., No. 15, Capt. Thomas D. Gordon, Grand Rapids.

MINNESOTA

To Fort Riley for instruction, Lieut. James Farrage, Breckenridge.

To Sparta, Wis., for duty with 16th Field Art. as assistant to the surgeon, Lieut. Charles F. McClusker, Minneapolis.

MISSISSIPPI

To Fort Oglethorpe for instruction, Lieut. Canning Tom Bell, De Kalb.

To report by telegraph to commanding general, Southern Department, for duty, Lieut. Clyde M. Speck, Blue Springs.

MISSOURI

To Fort Oglethorpe, for instruction, Capt. Douglas Haggard, Nevada.

To Fort Riley, for instruction, Lieut. Otto N. Schudde, Sullivan.

So much of Par. 32, S. O. 180, Aug. 4, 1917, War D., as relates to Capt. Douglas Haggard, Nevada, is revoked.

MONTANA

To Fort Riley, for instruction, Lieut. Serge Androp, Richey.

NEBRASKA

To Fort Riley, for instruction, Lieut. Abel B. George, Beatrice.

To Sparta, Wis., for duty with 17th Field Art., Lieut. Frederick A. Van Buren.

Honorably discharged, Capt. Carl F. Roh, Seward.

NEVADA

To Fort Leavenworth, for duty with 7th Engineers, Lieut. Delos A. Turner, Goldfield.

NEW JERSEY

To Fort Des Moines, for duty, Lieut. James R. Stroud, Jersey City.

To Fort Ontario, N. Y., for duty, Lieut. Widmer E. Doremus, Arlington.

Relieved from further active duty, Lieut. Edward F. Fitzpatrick, Newark.

NEW YORK

To Allentown, Pa., for duty, Lieut. Vernon C. Heddens, Bronxville.

To Army Service School, Washington, for duty, Lieuts. Russell LaFayette Cecil, Henry E. Meleney, and Malcolm McBurney, New York, N. Y.

To Fort Benjamin Harrison, for instruction, Capts. Joseph B. Cooke, Cooperstown; for duty with the 45th Infantry as surgeon, Junius H. McHenry, New York, N. Y.; for duty, Lieut. Benjamin E. Helprin, Brooklyn.

To Fort Delaware, Del., for duty, Lieut. Rowland P. Stanley, New York, N. Y.

To Fort Leavenworth, for duty, Lieut. David M. Kaplan, New York, N. Y.

To Fort Snelling, for duty with 41st Infantry, Lieut. Joseph H. Beattie, Dobbs Ferry.

To General Hospital No. 1, New York, N. Y., for duty, Lieut. Edward G. Cary, New York, N. Y.

To Gettysburg, Pa., for duty with 1st Hospital and Ambulance Co.; Lieuts. Louis R. Steibel, and John W. Warner, New York, N. Y.

To Rantoul, Ill., Lieut. Conrad Berens, Jr., New York, N. Y.

To report by telegraph to commanding general, Eastern Department, for assignment to duty, Lieut. John B. Byrne, Jr., Brooklyn.

To Syracuse, N. Y., Lieut. Brewster C. Doust, Syracuse.

To Washington Barracks, D. C., for making examinations in his specialty, Lieut. Edward L. Hanes, Rochester.

So much of Par. 109, S. O. 181, Aug. 6, 1917, War D., as relates to Lieut. Edward G. Cary, New York, N. Y., is revoked.

So much of Par. 159, S. O. 165, July 18, 1917, War D., relating to Capt. Joseph E. Donnelly, New York, N. Y., is revoked.

Honorably discharged, Lieut. L. Grant Baldwin, Brooklyn.

NORTH CAROLINA

To Fort Oglethorpe for instruction, Lieut. Nathan H. Andrews, Rowland.

To Hot Springs, Ark., for duty, Lieut. Thomas B. Henderson, Henderson.

To report by telegraph to commanding general, Southern Department, for duty, Lieut. Edward M. McCoy, Huntersville.

To Newport News, Va., for duty, Capt. James E. Stokes, Salisbury.

Honorably discharged, Capt. Montgomery H. Biggs, Rutherfordton.

NORTH DAKOTA

To Sparta, Wis., for duty with 16th Field Art. as surgeon, Lieut. Philip G. Reedy, Regan.

OHIO

To Columbus Barracks, Ohio, for duty, Lieut. Harold V. Postle, Columbus.

OKLAHOMA

To Fort Riley for instruction, Lieut. Clarence R. McDonald, Broken Bow.

To report by telegraph to commanding general, Southern Department, for duty, Lieuts. Jackson Brashear, Lawton; and Howard A. Wagner, Shawnee.

OREGON

To Fort Leavenworth, for duty with 7th Engineers, Lieut. Philip J. Keizer, North Bend.

To Presidio of San Francisco, Calif., Letterman Hospital, for duty in the department laboratory, Capt. David N. Roberg, Portland.

To report by telegraph to commanding general, Western Department, for duty, Capts. Herbert M. Greene, John J. Sellwood, Portland; and Harry E. Clay, Salem.

Resignation of Lieut. Marion J. Jones, Portland, is accepted.

PENNSYLVANIA

To Allentown, Pa., for duty, Lieut. Dwight E. Long, Freeberg.

To Army Service School, Washington, for duty, Lieut. Russell Richardson, Newton.

To Baltimore, Phipps Clinic, for a six weeks' course of training, Lieut. Victor J. P. Jourdan, Philadelphia.

To Fort Oglethorpe for instruction, Capts. William D. Hunter, Monessen; David S. Bergey, Philadelphia; Lieuts. Edward L. Artman, Jr., and Benjamin F. Buzby, Philadelphia.

To Fort Snelling, Minn., for duty with 40th Infantry as surgeon, Capt. George C. Kieffer, with 41st Infantry Lieut. Cheney M. Stimson, Philadelphia.

To Gettysburg, Pa., for duty with 1st Hospital and Ambulance Co., Lieuts. John D. Elliott, Philadelphia; Samuel Hamilton, Jr., Pittsburgh; Ira A. Rowson, Plattsburg; Benjamin J. Longwell, Seminole; with reorganization camp, William C. Stiff, Plymouth.

To Lock Haven, Pa., enlisting personnel of Red Cross Ambulance Co., No. 41, Lieut. Lee McC. Goodman, Jersey Shore.

So much of Par. 46, S. O. 174, War D., July 28, 1917, as relates to Lieut. John D. Jungmann, Philadelphia, is revoked.

Honorably discharged, Lieut. Robert A. Schless, Philadelphia.

PHILIPPINE ISLANDS

To Regan Barracks, Albany, for duty, Lieut. Thomas C. Walker, Manila.

SOUTH CAROLINA

To Fort Oglethorpe for instruction, Lieut. Jeff N. Webb, Townville.

To Greenville, S. C., Lieuts. Charles W. Gentry, James L. Orr, Greenville.

SOUTH DAKOTA

To Fort Oglethorpe for instruction, Lieut. Archie McCallister, Crow Creek.

TENNESSEE

To Allentown, Pa., for instruction, Lieut. H. R. Townsend, Nashville.

To Fort Des Moines, Iowa, for duty, Lieut. Lucius H. Gilmore, Columbia.

TEXAS

To Camp Kelly, South Antonio, for duty with 30th Aero Squadron, Lieut. Joseph H. Graves, Waco.

To Fort Clark, for duty and assignment to Ambulance Co. No. 29, to be organized, Lieut. James G. Ellis, Dennison.

To Fort Sam Houston for duty, Capts. Edgar W. Loomis, Dallas; and William H. Hargis, San Antonio.

To report to commanding general, Southern Department, for duty, Lieut. Wesley J. C. Wiemers, Galveston.

To report by telegraph to commanding general Southern Department, for duty, Lieuts. Thomas N. Roach, Medicine Mound; and Paul R. E. Sheppard, Terrell.

VIRGINIA

To Fort Benjamin Harrison for duty, Capt. Wyndham B. Blanton, Richmond.

To Fort Oglethorpe for instruction, Lieut. Claude N. Rucker, Clifton Forge.

To Newport News, Va., for duty, Capt. George A. Renn, Norfolk.

WASHINGTON

To report by telegraph to commanding general, Western Department, for duty, Capt. Herbert C. Lieser, Vancouver.

WEST VIRGINIA

To Fort Des Moines, Iowa, for duty, Lieut. James M. Whittico, Williamson.

WISCONSIN

To Allentown, Pa., for duty, Lieut. Charles A. Squires, Sheboygan.

Orders to Officers of the Medical Corps

Major Joseph F. Siler, M.C., Detachment Laboratory, Fort Sam Houston, to New York City for duty as C. O., Base Hospital No. 8, New York Post-Graduate Hospital, New York City.

Major Llewellyn P. Williamson, M. C., to Fort Sill, Okla., and report August 18 to inaugurate a system of instruction in gas defense.

Capt. William H. Smith and Charles C. Demmer, M. C., will report at Camp Travis, Fort Sam Houston, for duty as C. O. of base hospitals to be established at that camp.

Capt. William L. Sheep, M. C., to Camp Greene, Charlotte, N. C., for duty.

So much of Par. 80, S. O. 175, July 30, 1917, War D., as relates to Capt. Omar H. Quade, M. C., is revoked.

Capt. Lloyd A. Kefauver, M. C., to Annapolis Junction, M.D., Camp Meade, for commanding base hospital to be organized there.

Capt. Ernest R. Gentry, M. C., to Washington for duty.

Capt. Raymond W. Bliss, M. C., to duty at Camp Wheeler, Macon, Ga.

Officers of M. C. now on duty as camp sanitary officer at the camp specified will report in person to C. O. of that camp for commanding the base hospital to be established there: Capt. W. Cole Davis, Camp Dix, Wrightstown, N. J.; Capt. James F. Johnston, Camp Jackson, Columbia, S. C.; Capt. Glenn I. Jones, Camp Devens, Ayer, Mass.; Capt. Kerwin W. Kinard, Camp Sherman, Chillicothe, Ohio; Capt. Henry C. Michie, Jr., Camp Grant, Rockford, Ill.; Capt. Eugene G. Northington, Camp Lewis, American Lake, Wash.; Capt. Neal N. Wood, Camp Custer, Battle Creek, Mich.

Orders to Officers of Sanitary Corps

Capt. George J. Gabriel, Sanitary Corps, to duty at St. Louis.

Capt. Richmond Mayo-Smith, Sanitary Corps, to New York Sanitary Corps, medical supply depot, for duty.

Capt. John W. Hicks, Sanitary Corps, to duty at Chicago.

First Lieut. Shelby G. Fell, Sanitary Corps, to duty at Newport News, Va.

The following officers of Sanitary Corps to report in person to the Surgeon-General for assignment to duty in his office:

Capt. John B. Copping, Patrick P. Vane and Richard A. Wood.

Officers of Sanitary Corps to duty at camps specified as supply officers: Capt. William C. Livingston, Camp Lewis, American Lake, Wash.; First Lieuts. James Sweeney, Camp Pike, Little Rock, Ark.; John Baigent, Camp Dodge, Des Moines, Iowa, and Herman J. Weber, Rockford, Ill.

First Lieut. Harold J. Feistel, Sanitary Corps, to duty at medical supply depot, New York, N. Y.

First Lieut. George W. Ramaker, Sanitary Corps, to duty at San Antonio, Texas.

First Lieut. Max Weinberg, Sanitary Corps, to duty at Ayer, Mass.

Orders to Contract Surgeons

Contract Surgs. A. F. Beifeld and J. C. Friedman, Chicago, assigned to active duty, central department.

Orders of July 24 to Contract Surg. R. S. Dorsett, Philadelphia, amended. He is assigned to active duty for the purpose indicated in said order.

The following assigned active duty, Kansas City, Mo., in connection with the examination of the troops of the national guard for tuberculosis: W. W. Drake, Samuel Ayres and H. D. Hamilton.

Contract Surg. L. A. Klein, Brooklyn, will inspect the remount depots.

The following contract surgeons assigned active duty with national guard: J. J. Singer, H. B. Grensfelder, and E. W. Taylor, St. Louis; C. G. Dewey, J. B. Ayer, H. R. Stedman, F. C. Richardson, L. V. Briggs, D. A. Thom and I. H. Coriat, Boston, and Abraham Myerson, Taunton, Mass.

The following assigned active duty, examining the troops in the vicinity of Albany for tuberculosis: William Kirk, E. R. Stillman and H. W. Carey.

Contract Surg. J. A. O'Connell assigned active duty, Philadelphia, examining for tuberculosis.

First Lieut. R. L. Patterson assigned active duty, report to Dr. Van Manning, director of bureau of gas warfare investigation, Washington.

Capt. Clark L. Brown assigned active duty, Washington.

Capt. Oscar Burkard assigned active duty, Camp Upton, as property and supply officer.

Contract Surg. R. C. Kirkwood, Coneter, Iowa, assigned active duty.

Contract Surg. F. J. O'Connor assigned active duty at Toronto, Canada, to examine applicants for aviation section.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

District Health Officers Appointed.—At the meeting of the state board of health, the following district health officers were appointed: Northern Coast District, Dr. Allen S. Gillihan, Berkeley; Middle Coast District, Dr. George B. Hoitt, Manchester, N. H.; Central District, Ralph Nauss, Berkeley; Southern District, E. A. Ingham, Boston; Northern District, Harold F. Gray, San José, and Southern District, Dr. Edwin D. Ward, Los Angeles.—Dr. F. H. Kellogg, Berkeley, has been appointed director of the department of communicable diseases, succeeding Dr. J. C. Cummings, resigned to enter the federal service.—Dr. Ida May Stevens has been appointed bacteriologist in the branch laboratory of communicable diseases, Los Angeles.

Annual Registration Fee.—Among the amendments passed by the 1917 legislature in California was one providing for a \$2 registration fee payable to the Board of Medical Examiners by all holders of any form of certificates issued by the present or any previous licensing board of that state. The fee is due January 1 of each year. Failure to pay the fee within sixty days automatically revokes the certificate, and must be paid in order to restore it. Thirty days prior to January 1 of each year the board will forward a notice to each certificate holder, and it is essential that licentiates notify the board of each change of address. The board expects to publish each year a directory of the licensed practitioners of the state, physicians as well as osteopaths, and drugless healers, and will send a copy to each licentiate who has paid his annual fee.

Personal.—Dr. Anna E. Rude, San Francisco, has been appointed a member of the staff of the Federal Children's Bureau, Washington, D. C.—Dr. Emmet L. Wemple, a member of the staff of St. Luke's Hospital, San Francisco, was attacked, August 6, in the lobby of a hotel where he had gone to make a special call, and is under treatment at the Central Emergency Hospital.—Dr. T. Percival Geroen, Los Angeles, was operated on in the Good Samaritan Hospital, Los Angeles, August 1, on account of an injured knee.—Dr. Elizabeth Follansbee, Los Angeles, who has been ill in a hospital, is convalescent and has returned home.—Dr. Herman S. Senftner, formerly a member of the California State Sanitary Board, has been appointed state sanitary supervisor for that district of New York which includes Erie, Niagara, Orleans and Tennessee counties, with headquarters in Buffalo.—Dr. Ernest B. Hoag, Pasadena, medical psychologist to the Los Angeles Judiciary Court, has been appointed lecturer

in criminology in the school of jurisprudence of the University of California, Berkeley.

ILLINOIS

Clinic at State Hospital.—A clinic on nervous and mental diseases was held at the Watertown State Hospital, August 23, under the auspices of the Iowa and Illinois Central District Society. Cases of special interest were selected and presented by Drs. Julius Grinker, Chicago; Charles F. Reed, superintendent of the hospital, and Edward A. Foley, first assistant.

Health Zones Created.—The state board of health has announced the creation of four special health districts, each embracing a zone adjacent to a military or naval camp site. These districts are as follows:

1. Camp Grant district, including the city of Rockford: Medical officer, Dr. Charles E. West, Springfield; sanitary health officer, P. H. Cooney, Chicago.

2. Great Lakes—Fort Sheridan district: Health officer, Dr. John Kappelman, Mt. Vernon; sanitary officer, Dr. Jerome Smejkal, Chicago.

3. Lincoln-Lowden District, including the city of Springfield: Medical health officer, Dr. John J. McShane; sanitary officer, Edward Cowles.

4. Camp Chanute Aviation District, including Rantoul: Medical and sanitary officer, Dr. John J. McShane, Springfield.

The executive officer of each of these districts will be the medical health officer, and will report directly to the secretary of the state board of health.

Chicago

Field Hospital Commander Transferred.—Major Gustavus M. Blech, commanding Illinois Field Hospital No. 2, has been appointed assistant to the chief surgeon of the Thirty-Third Division, Camp Logan, Houston, Texas, and left for his new post of duty, August 21.

Graduate Lecture.—Dr. G. Carl Huber, professor of anatomy in the University of Michigan, Ann Arbor, recently delivered an address on "Early Stages in Mammalian Development," before the faculty of students of the graduate summer quarter in medicine of the University of Illinois.

Fine for Medical Fraud.—Amante Rongetti was found guilty of having sold a false medical diploma recently, and was fined \$2,000 in Judge Fitch's court. Rongetti was indicted April 24, 1916, following action taken by the Illinois State Board of Health. Dr. Gaetano Ronga, a codefendant, was acquitted.

Appropriation Asked for Contagious Diseases.—Health Commissioner Robertson has asked for an appropriation of about \$35,000 to fight the epidemic of contagious diseases due to the recent influx of colored labor in Chicago. He recommends a house-to-house canvass, and vaccination in the localities where smallpox has been found.

Personal.—Dr. James M. Neff has returned to Chicago after an absence of more than two years at the British Base Hospital, Etaples, France. Dr. Neff has been commended in general orders for superlative service.—Dr. Harry R. Hoffman, chief alienist of the Bridewell, has been ordered to report to Ann Arbor for military service as a member of the psychiatric unit.

Ambulance Company Starts East.—The University of Chicago Ambulance Company No. 3, under command of Capt. Elbert Clark, has been called into actual service and entrained for Allentown, Pa., August 20. The company has a personnel of 180, and takes with it six ambulances, four of which were donated by the friends of the institution and two by the American Red Cross. It also has a motor laboratory donated by the students of the university, and five kitchens on wheels.

INDIANA

Smallpox in Soldiers' Home.—Two cases of smallpox have been discovered in the Soldiers' Home, Lafayette, and all the inmates have been vaccinated.

Tuberculosis Cottage Donated.—Mr. and Mrs. R. Bockhoff, Richmond, have donated the first cottage to be built as a part of the Wayne County Tuberculosis Sanatorium.

New Hospital.—The Jeffersonville Tribe of the Improved Order of Red Men has purchased the former home of Marshall Hospital, which it proposes to remodel and open as a general hospital for the city.

City Health Board Must Borrow.—The City Health Board of Indianapolis has asked for a temporary loan of \$45,000 to defray the expenses of the department until funds are available from the fall instalment of taxes.

Sanatorium will Open Next Month.—Sunnyside Sanatorium, Oaklandon, the Tuberculosis Institution of Marion County,

will be opened in September, with a capacity of seventy patients, which will be increased later. An outpatient department will be conducted in connection with the institution. Dr. Harold S. Hatch has been appointed superintendent, and has already assumed charge of the institution.

Personal.—Dr. John C. McClelland, formerly health officer of Lafayette, has been commissioned captain, and assigned to duty with the Fourth Indiana Infantry.—Dr. Arett C. Arnett has been commissioned captain, and assigned to the First Indiana Artillery.—Dr. C. E. Cekul, La Otto, was caught under his overturned automobile near Sheldon, August 7, fracturing several ribs. He is under treatment in a hospital in Fort Wayne.—Dr. William M. Reser has been appointed secretary of the Lafayette Board of Health.—Col. Larue D. Carter, Indianapolis, has been appointed chief surgeon of the state.

IOWA

Hospital Items.—Shenandoah is to have a new hospital, to cost about \$45,000.—The LeMars hospital has been purchased from Drs. G. Henry Mammen and Roy F. Bellaire, and is now under the charge of the Sisters of St. Francis of Dubuque. The hospital has been enlarged and remodeled, and a Sister's home will be built on the property.

National Guard Changes.—Lieut. Larned Allen, Davenport, has been assigned to the staff of the chief surgeon.—Lieuts. Peter H. Schroeder and John C. Murphy, Davenport, have been assigned to the First Field Artillery.—Major David S. Fairchild, Jr., Clinton, and Pierre McDermid, Fontanelle, have been assigned to headquarters staff.—Lieuts. Willis H. McClain and Redfield C. Mills have been attached to the field hospital.

Work of State Laboratories.—By the annual report of Dr. Henry Albert, Iowa City, of the state university, director of the state board of health laboratories, 23,272 examinations and preventive treatments have been given during the past year. Of these, 8,994 were for diphtheria, 3,429 for tuberculosis, 1,965 for typhoid fever, 493 for meningitis, three for malaria and 163 miscellaneous. All these were made at the central laboratory of the state university, Iowa City. During the year twelve persons received the pasteur treatment for rabies, 165 were inoculated against typhoid fever, and seventy-six received smallpox vaccination, and 1,971 water analyses were made.

Personal.—Drs. Henry Matthey and Walter Matthey, Davenport, who have been indicted for conspiracy against the government, have been released on a \$2,000 bond.—Dr. Frederick H. Lamb, Davenport, pathologist to the Marshalltown Hospital, was the guest of honor at a banquet given by thirty physicians of the city, August 8, and at the conclusion Dr. Kuno H. Struck, Davenport, on behalf of the physicians, presented Dr. Lamb with a revolver.—Dr. David J. Chinn, Bettendorf, is convalescent after more than two months' illness with septicemia.—Dr. J. R. Martin, Iowa City, has resigned as assistant surgeon of the Marshalltown Soldiers' Home, and has been succeeded by Dr. George A. Mershon, Mobile, Ala., formerly of Liscomb, Iowa.

KANSAS

Hospital News.—The Arkansas City Hospital has closed its doors for the present on account of the absence of Dr. R. Claude Young at the training camp, Fort Riley.

State Board Election.—Dr. George M. Gray, Kansas City, has been reelected president of the State Board of Medical Examiners, and Dr. Henry A. Dykes, Lebanon, has been reelected secretary for a fourth term.

New Ambulance Company.—Red Cross Ambulance Company No. 44, Topeka, has been organized at Washburn University, and its personnel is composed chiefly of students of this institution. Dr. Charles H. Lerrigo is in command of the company.

Typhoid in Leavenworth.—During the first six months of this year, Leavenworth had more than half the total number of cases of typhoid fever reported in all cities of first class in the state, and July 30, there were twenty-five cases of the disease in the city. Dr. William Prebble and Sanitary Engineer J. S. Stredor, U. S. P. H. S., arrived in Leavenworth, August 5, to assist city physicians, Charles J. McGee and Jacob L. Everhardy, in tracing the source of the typhoid fever. During the week ending July 28, seventeen new cases were reported.

Personal.—The Topeka Chapter of the American Red Cross has offered, through Dr. William F. Bowen, a base hospital

unit.—Dr. Oliver D. Walker has been reelected president of the Salina board of education.—Dr. John F. Coffman, Jr., Marion, has been commissioned first lieutenant, M. C., Kan. N. G., and assigned to duty with the Third Infantry.—Dr. William S. Yates has been elected president of the board of education of Junction City.—Dr. Alexander J. Jeffrey, Topeka, has returned after six months' service in an English base hospital near London.—Dr. Henry A. Nave, Kansas City, has been judged insane, and committed to the State Hospital, Topeka.

MARYLAND

Infantile Paralysis.—Three new cases of infantile paralysis have been reported to the state board of health from Cumberland.

Eastern Shore Election.—The recently organized Eastern Shore Medical Society has elected Dr. J. McFadden Dick, Salisbury, president, and Dr. Eldrige E. Wolff, Cambridge, secretary-treasurer.

Dr. Dunton's Plan for Maimed Soldiers.—In a talk before the Rotary Club during a luncheon at the Hotel Rennert, August 14, Dr. William Rush Dunton, Jr., Towson, showed how maimed soldiers can be made useful citizens on their return from France. His subject was "Occupational Therapy" or the work cure, which is recognized as the best single treatment for mental and functional disorders, particularly those resulting from shell shock. Conversion of the physically or mentally crippled soldier, invalided back home from the front, into an economic asset, instead of allowing him to become a very definite liability, was the problem under discussion. Part of the problem is enlistment of the interest and cooperation of employers of men for engaging cripples and "part-time" workers in jobs for which they can be adequately fitted. Among Dr. Dunton's suggestions were the employment of two "part-time" workers in the factories or plants for half a day each in cases in which one would break down under the strain of an all-day job; the employment by the city of one-armed men, physically sound otherwise, as traffic cops, the employment by dentists of deaf, one-armed, one-eyed, one-legged men—in extreme cases—for the job of cleaning patients' teeth preliminary to examination by the dentist, and giving home work to legless men, or perhaps teaching them stenography and typewriting for office work. A staff of consulting physicians is already being gathered tentatively for the purpose of determining what work certain cripples could do best by testing out their mental and physical abilities. Teachers in technical schools will be asked to aid in instruction of crippled soldiers mentally capable of being educated for technical positions, and the possibility was pointed out that a man too crippled to dig ditches or handle a saw could be taught to become construction boss.

NEW YORK

New York City

Personal.—Dr. Aristine P. Munn-Recht has been appointed the first dean of women at New York University.—Rear Admiral Charles F. Stokes, N. S. Navy, retired, has resigned the position of director of the Warwick Farm for Drug Addicts.

Memorial Hospital for Brooklyn.—Plans have been prepared and application has been made to the state board of charities for a hospital to be built as a memorial to Carson C. Peck, formerly vice president of the F. W. Woolworth Company, and owner of the Brooklyn Times. The hospital is to occupy a site bounded by Albany and Troy avenues, and Crown and Montgomery streets, Brooklyn. It is aimed to make it like a comfortable hotel, with the hospital features kept as far in the background as possible.

Venereal Clinics for Queens.—The department of health, pursuant to its policy of extending its campaign against venereal diseases, has established venereal advisory clinics in each of the four health centers of Queens. The medical advisor will consult only with those applicants who are not under the care of a physician, and who come to the health department seeking advice. Under no circumstances will patients be interviewed who are sent by physicians or private institutions for the Wassermann and complement fixation tests, unless requests for advice by the physicians or institutions sending the patients. All applicants are given a circular of information regarding venereal diseases, and a card of instructions regarding syphilis and gonorrhea.

New Law Relating to Medical Advertisements.—The Public Health Education Bureau of the department of health calls

special attention to the new law relating to certain medical advertisements which was enacted at the last session of the legislature. The passage of the law was prompted by the fact that misrepresentation practiced by quacks and unscrupulous nostrum manufacturers constituted one of the chief obstacles encountered by health authorities in dealing with venereal diseases. Much of this misrepresentation appears in the advertisements still carried by certain newspapers and periodicals published in this city. The new law designed to reach these offenders goes into effect September 1, and applies to both the advertiser ("who causes to be published") and to the publisher of this class of advertisements.

Rockefeller War Hospital Formally Opened.—July 12, the heads of the medical departments of the United States government and their staffs, and a large number of Army and Medical Reserve officers, inspected the new Rockefeller Demonstration Hospital, and the occasion was made the formal opening of the hospital. Dr. Simon Flexner described the work that the hospital expected to do, and Dr. Alexis Carrel and others made brief addresses and gave demonstrations. It was stated that the serum for gangrene announced some time ago had reached a stage of development where it could be used on human beings. The visitors also inspected the Columbia University War Hospital, which differs from the Rockefeller Hospital in that the former is primarily for the treatment of the wounded, while the latter is for demonstration work for physicians.

NORTH CAROLINA

Ophthalmia Prevention.—The state board of health is distributing to all physicians and midwives ampules of a 1 per cent. silver nitrate solution to be used in the prevention of blindness, in compliance with a recent statute enacted by the legislature.

Reporting of Communicable Diseases.—Since August 1, the state board of health, with a competent epidemiologist devoting his whole time to this department, has been enforcing the new statute providing stringent regulations and the reporting of whooping cough, measles, scarlet fever, typhoid fever, bubonic plague, smallpox, typhus fever, yellow fever, diphtheria, infantile paralysis, Asiatic cholera and cerebrospinal meningitis. The board fully realizes the necessity of cordial cooperation of the physicians in securing the beneficent effects of the new law, and their friendly aid has been invited in a special letter to each practitioner.

OKLAHOMA

Personal.—Dr. James J. Williams, Clinton, has been elected president of the state medical board.—Dr. Frederick R. Sutton, Bartlesville, is reported to be critically ill.

License Revoked.—Word was received from Oklahoma City, July 18, that the State Board of Medical Examiners has revoked the license of Dr. Thomas E. Shepherd, Tulsa, charged with having performed a criminal operation on Miss Loyce Smith, in May, which resulted in her death.

Laboratory to Be in State Hospital.—The governor has decided against placing the state health laboratory in the suite of rooms occupied by the health department in the capitol. The laboratory therefore will probably remain in Guthrie until the new state hospital is ready for occupancy.

National Corps Appointments.—The following medical officers have passed the examination of the military board: Major Hugh Scott and Lieut. Ralph Mavity, Field Hospital, Oklahoma City; Capt. Hector G. La Reau and Lieut. J. M. Ferguson, Ambulance Corps, Tulsa; Lieuts. D. S. Graham, W. P. Fite and John Kay, Regimental Infirmary, Fort Sill.

OREGON

New Medical Unit.—Under the auspices of the University of Oregon Medical Department, a new unit is being recruited for a base hospital under the regulations of the American Red Cross.

Personal.—Dr. Robert Pilkington, Astoria, has been confined to the house for a week on account of septicemia due to a wound of the thumb.—Dr. Ernest A. Sommer, Portland, who was thrown from a horse at Lumme Island, August 1, fracturing his clavicle, is reported to be doing well.—Dr. Claude P. Fryer, Independence, has been appointed bacteriologist in charge of the Tampa laboratory of the Florida State Board of Health.—Dr. Ralph C. Matson, Portland, is convalescent after an operation for appendicitis.

PENNSYLVANIA

Philadelphia

Methodist Hospital Unit Nearly Complete.—With the exception of three reserve nurses, the naval hospital unit of the Methodist Hospital is complete.

Personal.—Dr. Charles R. Turner has been appointed dean of the Thomas W. Evans Dental Institute of the University of Pennsylvania, to succeed Dr. Edward C. Kirk, who resigned last June.

Three Ambulances for Red Cross.—The students of the Friends' Central School have raised sufficient funds to purchase three ambulances, which recently were presented to the Red Cross. The chassis were purchased from the Ford Automobile Company. The J. G. Brill Company, Philadelphia, built the bodies in accordance with specified regulation trench ambulances now being used in France.

City to Treat Teeth of Rejected Men.—The city has thrown open its Dental Dispensary City Hall for the free treatment of the teeth of men who have been drafted or have volunteered for the Army, and have been rejected because of defective teeth. Dr. Edwin S. Mereshon, chief of the dispensary, has asked Dr. Krusen, director of health and charities, to increase the staff of dental surgeons and to keep the dispensary open until late in the evening, if necessary. He also made arrangements with the Dental Preparedness League, whereby each member agrees to treat one soldier free.

VIRGINIA

State Admitted to Birth Registration Area.—August 8, Virginia was admitted as the first southern state to the birth registration area of the United States, which includes only those states in which public health work in general, and vital statistics in particular, have reached the grade of proficiency that make the figures compiled reasonably accurate. This decision was made after a searching investigation of the vital statistic records of the state by special agents of the Census Bureau.

Hospital News.—The Riverside Hospital, Newport News, has purchased a nurses' home in order that the third floor of the hospital may be used wholly for hospital purposes. The home, with the changes and improvements required, will cost \$10,000.—The Medical College of Virginia Memorial Hospital, Richmond, has been authorized to proceed with the erection of a three-story brick hospital building which is to be a part of the new group of the Memorial Hospital. This building will be the contagious pavilion, and will cost about \$40,000. It has been donated to the institution by Major James H. Dooley.

WASHINGTON

Medical Corps Assignment.—Lieuts. Robert N. Hamblen and Max R. Charlton, Spokane, have been assigned to duty with Field Hospital No. 30.—Lieut. Arvid Anderson has been transferred from the Eighteenth Infantry to Field Hospital No. 30.

Returns from Russian Mission.—Dr. Eugene D. Hurd, Seattle, who accompanied the American Mission to Russia, returned, August 3. Dr. Hurd holds the commission of colonel in the medical corps of the Russian army, and has had two years of service in the Galician and Carpathian campaigns.

Tuberculosis Foes Meet.—At the annual meeting of the Washington Association for the Prevention and Relief of Tuberculosis, held in Tacoma, July 27, the following officers were elected: president, Dr. Christen Quevli (reelected); vice presidents, Drs. Clarence A. Smith, Seattle, and Mrs. R. C. McCredie, Sunnyside; executive secretary, Mrs. Beth B. Buchanan, Seattle (reelected), and executive treasurer, J. A. B. Smith, Seattle (reelected). The proceedings of the meeting concluded with the dedication of the Children's Pavilion at the Mountain View Sanatorium. The building will be ready for occupancy this month, and will have accommodation for thirty patients.

WEST VIRGINIA

Sanatorium Opened.—The View Point Sanatorium of the Ohio County Anti-Tuberculosis Society was formally reopened, August 6. The institution will be able to care for about thirty patients.

Personal.—Dr. William C. Etzler has resigned as health commissioner of Wheeling, and has been succeeded by Dr. Mayes B. Williams.—Dr. Martin R. Casey, Weston, has

been appointed a member of the medical staff of the Weston State Hospital.

Sanatorium Board Named.—The governor has named the following commission of colored practitioners to locate the proposed State Tuberculosis Sanatorium for Colored People: Drs. Augustus L. Critchlow, Charleston; Roscoe C. Harrison, Kimball, and Henry F. Clay, Louisville.

New Board Members.—Governor Cornwell of West Virginia has appointed Drs. Vincent T. Churchman, Charleston; H. Luther Clark, Kyle, and Hubert E. Gaynor, Parkersburg, as members of the public health council in place of Drs. W. William Golden, Elkins; William J. Davidson, Parkersburg, and Joseph E. Robins, Charleston, whose terms had expired. The public health council has in charge the licensing of physicians in West Virginia.

WISCONSIN

Trachoma Should Be Reported.—Health Commissioner Ruhland of Milwaukee is making a strenuous effort to induce state authorities to include trachoma among the reportable communicable diseases. This has already been done in New York, Ohio, Massachusetts, Pennsylvania, Kansas and Louisiana.

Personal.—Dr. William H. Schnell, Superior, has been appointed junior local surgeon for the Minneapolis, St. Paul and Sault Ste. Marie Railway at Superior.—Dr. Isaac G. Babcock, Cumberland, who has been seriously ill with diphtheria, is reported to be improving.—Dr. Charles H. Van Hise, Madison, has been elected the university member of the state board of education, succeeding Lieut.-Col. Gilbert E. Seaman, Milwaukee, chief surgeon of Wisconsin.

GENERAL

Diploma Stolen.—Dr. Wilbur Kenneth Brown, at present employed at Barnes Hospital, St. Louis, reports that his diploma, issued by the Washington University Medical School, June 14, 1917, has mysteriously disappeared. He believes it has been stolen. Licensing boards should, therefore, be on the lookout for it.

Change of Meeting Place.—The annual meeting of the American Public Health Association, which was to have been held in New Orleans in December, will be held in Washington by direction of the executive committee. The reason for this change is said to be because war hygiene will be the central theme of discussion, and Washington is the city of all others where information regarding the sanitary problems of armies is being concentrated.

Antituberculosis Work Grows.—In summarizing the work of the state legislatures during their last session, the National Association for the Study and Prevention of Tuberculosis finds that thirty-eight legislatures enacted antituberculosis laws, and fourteen passed laws relating to county tuberculosis hospitals. The legislatures of Alaska, Arizona, New Mexico, Porto Rico, Utah, Hawaii and Nevada failed to take action in this direction.

Guard Germs with Care.—Hospitals, medical colleges and laboratories throughout the country have been requested by Surg.-Gen. Rupert Blue, U. S. P. H. S., to inform him at once if they maintain cultures of anthrax, tetanus, diphtheria, bubonic plague, Asiatic cholera, tuberculosis, typhoid fever, paratyphoid fever, and related organisms, and stating that none of these cultures should be given out, excepting to physicians who can be personally vouched for.

Bequests and Donations.—The following bequests and donations have recently been announced:

Johns Hopkins Hospital, Baltimore, \$300,000, and New York Hospital, residuary legatee of the estate of James Buchanan Brady.

St. Agnes' Hospital, Philadelphia, \$500; St. Joseph's Hospital, Philadelphia, and two other Catholic charities, one-fourth of the remainder of the estate of Ellen McCabe on the death of her sister.

St. Vincent's Home and Maternity Hospital, Philadelphia, \$5,000, by the will of Ella L. Lane, and \$500 by the will of Rose McClinchey.

Mount Sinai Hospital and Montefiore Home and Hospital, New York, and Zion Home, Buffalo, each \$1,000, by the will of Norbert Gunsburger.

Death of Roumanian Ophthalmologist in This Country.—G. Stanculeanu, professor of ophthalmology at the University of Bucharest until the German invasion, who has been lecturing in this country in the interest of the Roumanian government, died recently at a sanatorium at Stamford, Conn., of pneumonia. Dr. Stanculeanu arrived in New York two or three months ago, and suffered a nervous breakdown. When the Germans invaded Roumania he and his wife fled,

leaving behind all their property except what they could carry in a handbag. Later they were sent to America on a mission by the Roumanian government.

FOREIGN

Meningitis in London.—The *British Medical Journal* states that in London, from January 1 to June 16, there have been 307 cases reported of cerebrospinal meningitis, including ten military cases, with 164 deaths. The corresponding figure for last year was 295 cases.

Deaths in the Profession Abroad.—Lieut.-Col. A. W. D. Leaky, retired, London.—Lieut. A. Atkinson, London, aged 57.—J. P. Steele of Rome and Florence, retired, the Italian correspondent of the *Lancet*, aged 81.—Capt. I. Macfarlane, before the war for several years a medical missionary in Palestine, of late in charge of a typhus isolation camp in Egypt, died of typhus in July.—C. Bourdillon, Marseilles.—Major L. Augier, Evaux-les-Bains.—F. Le Corre, Angers. From recent casualty lists: British: E. S. Calthrop; Lieut.-Col. F. J. C. Heffernan; Major J. Aitken; Lieut. J. S. Munro; Lieut. S. C. Ellison; Major R. C. Tweedy; Capt. F. A. Deravin, Australian A. M. C. French: J. Lecerf; Capt. F. Belmont; M. Bergoend.

Santos Fernandez' Seventieth Birthday.—The scientific societies of Cuba recently joined to present a gold souvenir medal and parchment to Dr. Juan Santos Fernandez of Havana on the occasion of his seventieth birthday. The Academia de Ciencias, of which he is president, devoted a special meeting to the ceremony of presentation. Santos Fernandez has always taken a prominent part in promoting the progress of medicine and of the profession in Cuba, and especially the progress of his specialty, ophthalmology. He has never occupied an official position, but his numerous works on ophthalmologic and public health subjects have carried his name far. It is said that he has presented more than a thousand communications at meetings of different scientific organizations.

PARIS LETTER

PARIS, July 26, 1917.

The War

TREATMENT OF PENETRATING ABDOMINAL WOUNDS IN THE HOSPITALS AT THE FRONT

Dr. Quénu, professor of the surgical clinic at the Faculté de médecine de Paris, in reference to several communications on penetrating abdominal wounds which have been addressed to him by surgeons operating with the advance formations at the front, affirms that at the present time the cause of laparotomy in the treatment of abdominal war wounds appears to be definitely won. A number of questions connected with it remain to be decided: (1) the indications for operation; (2) the operative technic, and (3) the transport of the wounded.

1. The indications for operation are based on the probability of an abdominal penetration, but this probability cannot always be established by a study of the symptoms, since, for the first few hours, these may be effaced. Even the sign of the contracture, though localized, may be lacking. One must not be deceived by the fact that the clinical picture is temporarily benign, and it is important to verify the penetration or the nonpenetration by a direct examination of the wound, if this is, in any way, possible. It should also be remembered that wounds some distance away from the abdomen may be the ports of entry for abdominal lesions. While the probability of a penetration should point toward an operation, the general condition of the patient must always be considered. Dr. Rouvillois, in 116 cases of penetrating visceral wounds, abstained from an operation because the general condition was so precarious that any intervention would have been unpardonable. In this connection, one must attribute great importance to a pulse that is so weak as to be scarcely perceptible, and also to any considerable lowering of the blood pressure.

2. The operative technic seems to have made great progress. The systematic examination of all the organs in the path of the projectile must be scrupulously performed, but the mode of procedure is not so evident. Depage practices total evisceration *en bloc*, following this up with copious irrigations of warm serum. Other surgeons, most of them, in fact, proceed differently. They make an incision in the abdomen, noting that the wounded loops of intestine have a tendency to present themselves first in the wound. The wounded coils are first taken up and repaired, which does not prevent proceeding to a complete evisceration, provided the condition

of the intestine requires it. The latter technic appears preferable to Depage's, since it seems to expose the patient less to the danger of shock, and would appear to be just as certain in its results. What attitude should be taken toward lavage of the intestine and of the abdominal cavity? That one should irrigate copiously the coils touched and infected by the traumatism; that one should even perform a lavage of the abdominal cavity with warm serum when the whole abdominal cavity is infected and there appears to be no other way of cleansing it, is all very well; but, when the infection is localized, the lavage appears to be fraught with danger, and to tend to diffuse infection.

3. The question as to the conditions under which the wounded can be best transported is a very important one. So much is certain, namely, that the ideal condition would be, not to have to transport the wounded at all, but to operate on them a few hundred yards from the point where they fall. It is incontestable that the best statistical results have been obtained by the surgeons who, by reason of the peculiar circumstances under which they were working, have been able to approach these conditions. Here arises the great controversial question of the forward first-aid stations. Quénu regards the advance first-aid station as an excellent creation in a war in which a high degree of stabilization is possible; also under certain conditions of natural protection offered by the peculiar topography of the country. The organization of the advance first-aid stations requires a great deal of time and labor, and the returns are hardly adequate. In this branch of the medical service the conditions of evacuation are often uncertain. It is, in short, a very peculiar part of the service. In a campaign in which the movements of the contending forces cover a large territory, safety for the first-aid corps can be found only in a chance protection, which is sometimes afforded by the physical features of the country, sometimes by a building erected by the hand of man; or, what is much more common, by remaining at a distance from the firing line. In view of these facts, the motor hospital ambulances with their perfect technical equipment and their details of expert surgeons were called in to strengthen the service. In actual practice, however, these ambulances, which were created especially in order to meet the need of first aid and to treat particularly abdominal wounds, have been located sometimes 7 miles, sometimes from 15 to 20 miles, distant. When they have been placed only 7 miles away, they have been able to do good abdominal surgery; but when much farther removed they have been handicapped, and on one tour of inspection Quénu observed that some of these units did not receive any wounds of the small intestines, while others received them only after they had become inoperable. Perhaps it would be advisable to return to automobile units less unwieldy than the present ones—that would be able to operate at a distance of 6 or 7 miles from the firing line. A better method of transporting the wounded from the firing line to the ambulance should be devised so that the jolting and shaking which affects so seriously men suffering from abdominal wounds, might be reduced to a minimum. Any improvement brought about in the method of transportation, the modes of suspension, etc., would be of advantage also to the wounded of other classes, even though the improvement has not for them the same essential importance.

ANESTHESIA AND ANESTHETICS IN WAR SURGERY

Dr. Bilhaut, surgeon of the Hôpital International de Paris, has addressed a communication to the Société de pathologie comparée on the subject of general and local anesthesia in war surgery. He accords the preference to chloroform. He finds chloroform easier to administer than ether and less likely than ether to cause a chilling of the respiratory tract, such as may produce pneumonia or pulmonary congestions. In 812 important operations performed by Bilhaut there were no unhappy results from the use of chloroform. The reaction on the liver has been found negligible. In case an operation may require some time, the surgeon should have recourse to general anesthesia. During the course of an operation it is deplorable to have to substitute narcosis for local anesthesia. Therefore, from the very outset, the surgeon should make a definite choice, and in case of doubt he should decide in favor of general anesthesia. In skeletal lesions, which are so frequent, general anesthesia is indispensable. Long bone resections and the removal of bone splinters should be undertaken with scrupulous care, even down to the minutest details, in order to preserve the periosteum, as the significant experiments of Professor Ollier have proved. Without general anesthesia, one cannot bring to a satisfactory conclusion this extremely delicate work, which is indispensable in order to secure anything like complete restorations. It is only by pro-

ceeding thus that Bilhaut has obtained in his war surgery the complete reparation, without shortening (real or apparent), of extensive losses of substance in the long bones. Local anesthesia (cocain, stovain, novocain, freezing) should be confined strictly to minor operations of short duration.

Dr. Fiessinger has called attention to the fact that the results obtained by Bilhaut seem to prove that the operations performed on soldiers under war conditions give better results than in times of peace. It seems as if the new conditions created by the war have brought about an increase in the potency of organic defense. Under ordinary conditions it seems that ether might possibly be superior as an anesthetic to chloroform, since it does not cause alterations of the hepatic cells; however, it would appear from the communication of Bilhaut that, under the existing conditions, chloroform has lost part of its injurious properties.

THE MORE REMOTE FUNCTIONAL RESULTS FROM THE RESECTION OF THE KNEE IN TREATING WAR WOUNDS

At one of the recent meetings of the Société de chirurgie de Paris, Dr. Bégouin of Bordeaux presented a communication on this subject. He has had an opportunity of examining about one hundred resections of the knee, and has preserved notes on seventy-seven of these. In these operations he affirms that, generally speaking, the functional results were excellent, leaving the leg perfectly utilizable for walking and standing, which constitute its essential function. Only in fifteen cases were the results distinctly bad. In order to obtain in resection of the knee such results as shall justify its being considered an excellent operation, two conditions are required: (1) an exact operative technic, at least as regards the ablation of a thin slice of bone which removes at the same time the cartilage from the end of the tibia and the femur, a bony ankylosis being the object desired from the resection of the knee, which cannot be brought about if a cartilaginous covering is left on either of the two bones; (2) a prolonged postoperative surveillance in order to maintain an immobilization of the member in extension, with the bony surfaces in close contact until the bony ankylosis is complete. These are the two essential conditions of success, but it is well to make this emphatic, for the neglect of these points is the cause of the failures observed by Bégouin: incomplete resection; lack of care in maintaining the bony surfaces in juxtaposition, allowing one bone to slip past the other with the consequent deviation of the lower leg, and the poor support of the foot.

Marriages

LIEUT. ELIAS CECIL FISCHBEIN, M. R. C., U. S. Army, to Miss Florence Givens Smith, both of Sonyea, N. Y., at Rochester, N. Y., August 8.

JOSEPH EMIL ARTIGUES, M.D., San Francisco, to Mrs. Noelle Morcel of Constantinople, Turkey, at San Francisco, July 30.

LIEUT. SAMUEL JAFFE, M. R. C., U. S. Army, Norristown, Pa., to Miss Lily Bailey of Alliance, N. J., in New York, July 7.

CHESTER D. SEWALL, M.D., San Francisco, to Miss Vernie L. Gregory of Redding, Calif., at Castle Rock, Calif., August 4.

CAPT. JULIAN MAST WOLFSOHN, M. R. C., U. S. Army, San Francisco, to Miss Ethel Liebes of London, England, July 25.

LIEUT. ROBERT PARVIN WILLIAMS, M. C., U. S. Army, to Miss Barbara Rebecca Murray, at Douglas, Ariz., July 21.

LIEUT. JAMES STEINBERG, M. R. C., U. S. Army, Los Angeles, to Miss Helen Marie Jonas of Hollywood, Calif., July 29.

ASST. SURG. HUGH JOHN DUFFY, U. S. Navy, Chicago, to Miss Jessie Sullivan of Denver, at Chicago, August 9.

EDMUND MCCOLLAM CONNELLY, M.D., to Miss Frances Rocker Bisland, both of New York, July 21.

AARON SAMUEL TORRENS, M.D., to Miss Myrtle Myra McClarkin, both of Portland, Ore., June 27.

LIEUT. CLARENCE STILES MCKEE, M. R. C., U. S. Army, to Miss Edna Stiles of New York, August 4.

PHILIP JOHN TRENTZSCH, M.D., Rives, Tenn., to Miss Velma O. Schmitt of Dodgeville, Wis., July 31.

ISADORE EMIL COHN, M.D., to Miss Dolly Newman, both of Chicago, recently.

Deaths

Walter Hawthorne Rowan, M.D., Jackson, Miss.; Memphis (Tenn.) Hospital Medical College, 1902; aged 42; formerly a Fellow of the American Medical Association; state sanitary inspector for Mississippi from 1912 to 1914, later appointed by the International Sanitary Commission as director of sanitation work in Guatemala, and since that time and until recently superintendent of the Mississippi Tuberculosis Sanatorium, Magee; one of the leading sanitarians and hygienists of the South; died, August 7, at a hospital in Jackson.

Frederick Walter Smith, M.D., Syracuse, N. Y.; New York University, New York, 1881; aged 58; a Fellow of the American Medical Association; a member of the American Public Health Association; health commissioner of Syracuse from 1891 to 1897, and health officer of the city since 1902; a member of the state board of health from 1895 to 1901; coroner of Onondaga County for several years; obstetrician to St. Joseph's Hospital; died at his home, July 31, from cerebral hemorrhage.

Charles Boyd Kelsey, M.D., New York, College of Physicians and Surgeons in the City of New York, 1873; aged 66; formerly a member of the Medical Society of the State of New York; assistant demonstrator of anatomy in his alma mater, from 1874 to 1879; professor of diseases of the rectum in the University of Vermont, Burlington, in 1889 and 1890, and since 1890 occupying the same chair in the New York Post-Graduate School; a specialist in proctology and author of several works on that subject; died at his home, August 4.

Major Charles Clarence Billingslea, M. C., U. S. Army; University of Maryland, Baltimore, 1900; aged 39; a Fellow of the American Medical Association, who entered the Medical Corps, June 2, 1902, was made captain five years later, and was promoted to major in May, 1915; in charge of the sanitation work at Camp Meade, Annapolis Junction, Md.; was found dead in his tent at the cantonment camp, August 16, from the effects of an accidental gunshot wound of the head.

Walter D. Greene, M.D., Buffalo; University of Buffalo, N. Y., 1876; aged 64; a Fellow of the American Medical Association, and a member of the American Public Health Association; formerly president of the Medical Society of the State of New York; clinical professor of genito-urinary diseases in his alma mater; surgeon to the Erie County and Buffalo hospitals; for five years health commissioner of the city; died at the home of his brother at West Falls, August 3, from heart disease.

Ira Irving Nicol, M.D., Mason City, Iowa; College of Physicians and Surgeons, Keokuk, Iowa, 1895; aged 66; formerly a member of the Iowa State Medical Society; for thirteen years surgeon for the Milwaukee System at North English, Iowa, and editor of the *North English Record*; for two years surgeon for the Northwestern System at Mason City; died at his home, August 4, from cerebral hemorrhage.

David Ben Bentley, M.D., Sarnia, Ont.; Trinity Medical College, Toronto, 1890; aged 52; an officer of the Canadian Army Corps and a member of the first unit to go abroad; died in Ramsgate, England, April 5, after two and one-half years of service in France and England, from pneumonia complicating nephritis.

William A. Keegan, M.D., Rochester, N. Y.; Chicago Homeopathic Medical College, 1888; aged 55; for many years visiting surgeon to the Homeopathic Hospital, Rochester, and at one time president of the staff; a member of the Medical Society of the State of New York; died at his home, August 8, from angina pectoris.

Dwight Gordon Smith, M.D., Washington, D. C.; George Washington University, Washington, D. C., 1903; aged 44; a Fellow of the American Medical Association; for twelve years a member of the staff of the Emergency and Children's hospitals, Washington; died in the Emergency Hospital, July 31.

Harvin C. Moore, M.D., Houston, Texas; Tulane University, New Orleans, 1898; aged 42; a member of the State Medical Association of Texas, and once president of the Harris County Medical Society; died in a sanatorium in Houston, August 7, ten days after an operation for appendicitis.

John Hamilton Potter Hodgson, M.D., New York; University of Virginia, Charlottesville, 1888; College of Physicians and Surgeons in the City of New York, 1889; a member of

the Medical Society of the State of New York; died at his summer home, on Muskoka Lake, Ont., August 4, from heart disease.

Floyd B. Olney, M.D., Fort Dodge, Iowa; Hahnemann Medical College, Chicago, 1881; aged 66; a member of the Iowa State Medical Society; was instantly killed, August 8, when his automobile was struck by an Illinois Central passenger train on a grade crossing near Pomeroy, Iowa.

Homer H. Warner, M.D., New York; University of Vermont, Burlington, 1869; aged 79; formerly medical officer of the New York Fire Patrol; surgeon of the First Massachusetts Volunteer Cavalry during the Civil War; died at his home, August 12, from nephritis.

David M. Taylor, M.D., Garrison, Tex.; Memphis (Tenn.) Hospital Medical College, 1902; aged 40; formerly a member of the State Medical Association of Texas; died in the Whiteside Sanatorium, Timpson, Texas, August 2, after an operation for appendicitis.

John Hobson Womack, M.D., Catham, Va.; University College of Richmond, 1901; aged 48; formerly a Fellow of the American Medical Association; a member of the Medical Society of Virginia; died in the Danville (Va.) Hospital, May 5, from nephritis.

Marx Stecher Wiesen, M.D., Philadelphia; Medico-Chirurgical College of Philadelphia, 1914; aged 26; died in St. Agnes' Hospital, Philadelphia, July 31, from the effects of a gunshot wound of the chest, received in a fight with a burglar, July 12.

Frances Tudor Weed, M.D., Los Angeles; University of Michigan, Ann Arbor, 1895; aged 58; formerly deputy health officer of Grand Rapids, Mich.; while crossing a street in Los Angeles, August 3, was crushed between street cars and instantly killed.

Stephen T. Lea, M.D., Holly Hill, S. C.; Medical College of the State of South Carolina, Charleston, 1877; aged 61; formerly a member of the South Carolina Medical Association; died suddenly at his home, August 2, from acute gastritis.

Warren Lawton Whitmore, M.D., New Haven, N. Y.; Syracuse (N. Y.) University, 1895; aged 47; formerly a member of the Medical Society of the State of New York; died at his home, June 12, from cerebral hemorrhage.

Ernest M. Sellards, M.D., Ashland, Ky.; Kentucky School of Medicine, Louisville, 1893; aged 45; a member of the Kentucky State Medical Association; died at his home, August 4, from meningitis following an attack of rheumatism.

Marion D. Snyder, M.D., Dunmore, Pa.; Jefferson Medical College, 1896; aged 46; formerly a member of the Medical Society of the State of Pennsylvania; died at his home, May 27, from pernicious anemia.

Frederica R. Baker, M.D., Chicago; Hahnemann Medical College, Chicago, 1895; aged 52; formerly a member of the Illinois State Medical Society; died at her summer home, near Peacock, Mich., August 7.

Charles Sumner Hitchcock, M.D., Toledo, Ohio; Physio-Medical College of Indiana, Indianapolis, 1890; aged 51; a Fellow of the American Medical Association; died at his home, August 7, from neuritis.

Eugene Francois Marguerat, M.D., Chicago; Rush Medical College, 1895; aged 47; a member of the Illinois State Medical Society; died at his home in Chicago, August 9, from chronic gastro-enteritis.

Hubbard L. Gillette, M.D., Washington, D. C.; Baltimore Medical College, 1889; aged 68; a member of the Medical Society of the District of Columbia; died at his home, May 12, from uremia.

Jacob J. Frankel, M.D., Philadelphia; Medico-Chirurgical College of Philadelphia, 1899; aged 46; a Fellow of the American Medical Association; died in his office, recently, from heat prostration.

James Arthur Ross, M.D., Barrie, Ont., University of Toronto, Ont., 1889; L.R.C.P., L.R.C.S. (Edin.); L.R.S.P.&S. (Glas.), 1892; aged 50; died at his home, May 1, from pernicious anemia.

Frederick Theodore Harpel, M.D., Shamokin, Pa.; Hahnemann Medical College, Philadelphia, 1900; aged 41; died in the Coshocton (Ohio) Sanitarium, about August 1, from heart disease.

Andrew Barclay Mercer, M.D., Alexandria, Ind.; University of Michigan, Ann Arbor, 1884; aged 63; died at his country home near Alexandria, August 7, from cerebral hemorrhage.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

SOME MISCELLANEOUS NOSTRUMS

S. S. S.—"Swift's Sure Specific," according to the manufacturer, is "made from purely vegetable ingredients." The only real information that the manufacturer gives regarding its composition is that which the government compels, namely, the alcohol-content—15 per cent. The dose recommended is from one to two tablespoonfuls four times a day. The Swift Specific Company claims that this "imparts just the slight exhilaration that nearly all women find beneficial." As the alcohol-content of S. S. S. is nearly one-third of that of raw whisky, a woman taking eight tablespoonfuls (4 ounces) of this preparation daily, would be getting the alcohol equivalent of more than one bottle of beer every day.

S. S. S. is sold under the claim, either direct or inferential, that it will cure syphilis ("blood poison"). In a booklet issued some time ago the Swift Specific Company, discussing secondary syphilis, said:

"Until the discovery of S. S. S., no remedy was known that could completely wipe out the disease and restore the sufferer to health . . . but S. S. S. clears out the whole thing, root and branch, and leaves the physical organism of the patient unimpaired."

S. S. S. is not only a certain cure for Syphilis but is the one absolutely safe remedy. It contains no strong minerals to damage the system, but is made entirely of roots, herbs and barks of healing, cleansing nature.

We offer \$1,000 for proof that S.S.S. contains a particle of mineral in any form.

**• THE SWIFT SPECIFIC CO.,
ATLANTA, GA.**

A page from one of the older booklets sent out by the Swift Specific Company. At that time the concern made no secret of the claim that S. S. S. was offered as "the one absolutely safe" and "certain cure for syphilis."

In the same booklet, under tertiary syphilis, it was said:

"In tertiary Syphilis . . . S. S. S. acts with amazing effect and rarely ever fails to produce a complete cure . . . many cases, the most malignant, the most virulent, the most hopeless have been cured by S. S. S."

In a personal letter written some time ago to a victim of syphilis the "medical advisor" of the Swift Specific Company wrote, in part:

"We regret to know that you are suffering from Syphilis. Syphilis is a blood disease and the only way to cure it permanently is to cleanse the blood from all impurities and there is nothing that will purify your blood more thoroughly and quicker than S. S. S. We advise you to continue taking S. S. S. regularly. . . . It is decidedly the best thing you can take. . . . It will cure you in less time than any other remedy and the cure will be permanent. In S. S. S. we have the only vegetable antidote to syphilis that has ever been discovered. . . ."

In another letter the company said:

"For more than forty years S. S. S. has been recognized as the one remedy for Syphilis. Thousands upon thousands have been cured through its use. . . ."

In a booklet accompanying the previous letter the statement was printed in large, black-faced type:

"S. S. S. is not only a certain cure for syphilis but is the one absolutely safe remedy."

Because the better class of newspapers are recognizing that there is no possible justification for the sale of an alleged remedy for the self-treatment of so serious a disease as syphilis—a menace alike to the individual and community—the newspaper advertisements of S. S. S. no longer feature the alleged curative values of the preparation in syphilis. It is now "rheumatism" and "impure blood." The purchaser of S. S. S., however, is urged to write for the "Special Book on the Blood" which "covers all forms of blood impurities" and "goes deeply into the subject of mercury, iodid of potash, arsenic and other mineral drugs." The booklet purports to "enable one to properly treat syphilis under the use of S. S. S. together with such medical advice as we give gratis by correspondence." It further states that the treatment of syphilis "is a simple matter."

To sell such a mixture as S. S. S. as a cure for a disease like syphilis is much on a par with selling a simple gargle as a "cure" for diphtheria.

Kaufmann's Sulphur Bitters.—This preparation was marketed by A. P. Ordway & Co. of New York, which was the trade name of Aaron P. Ordway. According to the label, the product has the following formula:

"Sublimed Sulphur (trituated), 2 gr. Gentianae Radix 31 gr. Prunes Virginiana 31 gr. Aloe Socotrina 19 gr. Eupatorium 16 gr. Tanacetum 6 gr. Balmony 16 gr. Podophyllum 140 gr. Senna Indica 140 gr. Calamus 31 gr. Aqua Pura Q. S. 10½ oz. Alcohol Absolutum 22.30 per cent."

It was sold under the claim that it was an effective remedy for scrofula, catarrh, salt rheum, rheumatism, fever and ague, ulcerations, as well as effective in the treatment of diabetes and for curing and preventing the return of syphilis. It was also said to be a cure for leprosy. These claims the government declared were false and fraudulent, made knowingly and in reckless and wanton disregard of their truth or falsity. The government further charged that the claims that the preparation consisted of an appreciable amount of sulphur in solution with liquids, combined by means of a process discovered by Dr. Kaufmann, were false and misleading in that they were not true. Ordway pleaded guilty and was fined \$100.—[Notice of Judgment No. 4370].

Correspondence

ABSORBABLE METAL CLIPS AS SUBSTITUTES FOR LIGATURES AND DEEP SUTURES IN WOUND CLOSURE

To the Editor:—Referring to Dr. Andrews' article on this subject (THE JOURNAL, July 28, 1917, p. 278), I think it might be interesting to your readers to learn that I went over much of the same ground fully twenty years ago, and also to hear of the disappointing results of my experiments.

Catgut sutures were not then as satisfactory as now. To obviate the danger of infection from them, and at the same time to facilitate vessel ligation, I devised a small "horseshoe-shaped metal clip" and a specially constructed instrument by which to attach and compress it. This instrument, a cut of which then appeared in the catalog of a leading instrument firm in New York City, was so constructed as to catch up the bleeding point with a sliding tenaculum and draw it within its forceps jaws that held the tiny staple, and also compress the artery as it was brought together. The metal which I utilized for this horseshoe clip was not silver, as was that later employed by Dr. Harvey Cushing in his brain work, but aluminum. I demonstrated the principle and method of employment of my clip to the late Dr. Morton of Philadelphia, and asked his opinion of it. He contemptuously replied that he could tie vessels with catgut much faster than I could clamp them, and that it would be silly to fill a wound with irritating and permanent foreign material. (I had laid no claims to the absorptive properties of aluminum.) I was not discouraged, and for several years employed my aluminum clips. Finally I was forced to discard them for the following

reasons: They unfortunately did *not* absorb, becoming encysted in shotlike beads of fibrous tissue, making the part wherein they had been placed feel like the hide of a hunting dog that has been frequently fired at with bird shot; or if placed near the surface or where the part was subjected to constant motion or friction, they finally produced sufficient irritation to be extruded, and in several instances (one an amputation stump and another a hernia repair case) obliged me to cut down on and remove them. There was also danger in protracted operations, or when for any reason much manipulation and sponging was resorted to, of their being detached with opening up of fresh hemorrhage, before the procedure was completed. Finally, the psychic impression produced on many sensitive patients by the knowledge of the presence of the foreign bodies kept them constantly complaining of real or imaginary pain produced thereby.

Let me emphasize that these aluminum clips *did not corrode or absorb away in the tissues* in any of the many cases that remained under my observation.

EVAN O'NEILL KANE, M.D., Kane, Pa.

DISGRACING THE MEDICAL PROFESSION

To the Editor:—According to prevailing reports, it is proposed to draft physicians to bring the number of medical officers up to the requisite 21,000. If this measure is passed by Congress, the laity will consider that the members of the medical profession of the United States have disgraced themselves, by not volunteering, to make such a measure necessary.

Does the average physician who has not volunteered his services to his country consider himself a disgrace? Absolutely not. The psychology of a physician's practice is vastly different from that of any other profession, business, trade or occupation. A customer buys his goods of a certain wholesale or retail house because the firm has always done a square business. A railroad switchman, when he changes location, presents his credentials from the last road he worked for. Not so the physician. His practice is held by his personality, and when he goes to war, his practice goes elsewhere.

The plan suggested, that when a physician goes into the military service, his competitor shall divide the receipts with the absent one, is impracticable and absurd. Does any one imagine that the average doctor feels that the pittance he receives for his night's services is so out of proportion to the services rendered that he must needs hurry to find some one to divide with?

One of the principal reasons why the army is so short of medical officers is that physicians realize that their work of five, ten or fifteen years, in building up a practice, will be lost when they return, and that they, men of middle age, will have to start at the bottom again, in competition with younger men.

Before Congress places this stamp of shame on the medical profession of the United States, by drafting them into the Army, let Congress hold out some promise for the future for these men, who must needs sacrifice all they have accumulated. Let Congress raise the age limit of the regular Medical Corps of the Army to 40 or 45 years, so that the men will be assured an honorable living after the war, and it will never be necessary to draft physicians.

If the war continues until a time when there will be too great a proportion of doctors in the regular army, through the raising of the maximum age limit, then let the practice of medicine and surgery be placed on a federal basis, like that at present contemplated in England.

The very fact that medical men are the only class of men represented by a branch of the military service that it has become necessary to consider drafting should indicate to our legislators that there must be two sides to the problem.

No more patriotic class of men exists in our country today than the medical profession, and to draft them because they do not volunteer under the present unequal terms is a gross injustice to the profession.

If the retirement of a man entering the service at 40 years of age is considered an injustice to the man entering at 30 years of age, then let retirement be adjusted on a sliding scale according to the number of years' service.

E. W. McBRATNEY, M.D., St. Louis.

THE STAMMERER AND ARMY SERVICE

To the Editor.—Apropos of Sir William Osler's warning concerning the acceptance of neurasthenics into the army, and of Dr. William Dewey's similar warning concerning the high grade feeble-minded, it is well to consider also the stammerer in the same connection. In the creation of the new American Army, probably several thousand young men who stammer will present themselves for compulsory examination.

Apparently uncertainty and difference of view exist in the Army itself as to the importance of this disorder to the soldier. One stammerer who has been under my observation was accepted into the local militia of a neighboring state, and later was sent to the Mexican border as a corporal; but, finding that he was very unreliable in his ability to speak the names of his men at roll call, he voluntarily resigned from the service. Another was accepted into the Marine Corps as a commissioned officer, but later was informed by the authorities that he could continue in the service only as a private. He resigned from the Marine Corps, and has since been doing a commissioned officer's training and similar duty for the army. Under treatment he has gained such control over his speech that he would not now at most times be suspected to be a stammerer, and yet at this time he is far from cured. Lately he has been accepted into an infantry officers' training camp. Another, a very marked stammerer, served in the Regular Army of the United States as a private for three years, but not in time of war. Still another was prevented by a wise father from presenting himself for enlistment in the Aviation Corps, because the father believed, probably rightly, that under the stress of this particularly nerve-racking service, his son "would go all to pieces."

Aside from the instances of stammering created by "shell shock" or other forms of war excitement, one reads of the intensification of existing stammering by service in the war, and of the return of stammering that had previously been cured under treatment. Instances of improvement or cure in the war are not yet, and probably will not be, reported.

If one eliminates the occasional stammerer of the genuinely neurasthenic type who falls with increased emphasis in Dr. Osler's category of the militarily unfit, and also eliminates the occasional highly nervous, though not neurasthenic, stammerer, he has left the great body of the stammerers. These are in social relationships highly sensitive and highly emotional; they are usually of good mentality, and excepting for their stammering are not different from other individuals of the same type. Let it be recalled that the stammering phenomenon varies in degree from the lightest hesitation to a most serious spasmodic interference with speech movements. The very light stammerer might be accepted for any military service, at any rate until it became evident that the nervous stress of the military life did not increase his stammering.

With respect to the more profound stammerer, two characteristic facts are to be borne in mind. One is, that stammering is dependent on the particular emotional phenomena happening at any moment to be present in the stammerer's mind, and, therefore, that its manifestations may be wholly absent for hours at a time, but very severe at other times. This irregularity and variableness in the manifestations of the phenomenon may cause entire misapprehension as to its seriousness in the individual case. At the time of the examination for admission to service, the stammering may be largely or even wholly in abeyance, and this is likely to lead to misunderstanding. The second characteristic is that the stammerer of severe type is liable at any moment to become wholly or partly unable to express himself. Since in war the instant giving of a command or the instant making of a report might be attended with great consequence, it is not difficult to understand the unfitness of the serious stammerer for commanding positions on the fighting line. Why might

not the service of the serious stammerer best be rendered in a form of military service in which the lives of others were not immediately jeopardized by his inability to express himself, for example, in the commissary, or hospital, or similar service?

ELMER L. KENYON, M.D., Chicago.

COMMON SENSE AND THE SYNTHETICS

To the Editor:—While the Therapeutic Research Congress is legislating out enemy patents, while the National Research Council is engaged in facilitating the manufacture of synthetic drugs, pharmacologists and clinicians should begin an intensive unprejudiced investigation into the merits of the synthetics. I believe that our gullibility has been capitalized, and that we have been systematically imposed on by commercial scientists. Our sincere appreciation and gratitude toward foreign medical exponents has led us to take their recommendations unchallenged.

If aspirin were common property and cheap, and sodium salicylate patented and expensive, perhaps no one would think of using aspirin. Is not the cheaper drug more efficacious, more prompt and more certain in its action? Let clinicians state their views on this point.

We know the impotence of alkaloids in pneumonia. We know the dictum, when the heart is invaded by a toxin, nothing is of avail. Quinin in all doses has been tried in pneumonia, and I feel that in the end ethyl-hydrocuprein, which is closely related to quinin, will not be found more efficacious even when given under the patent name "Optochin."

With all respect to the great Unna, I suspect that he would not have seen such cures by ichthyol if it were not an exclusively Tyrol fossil. An ointment of sulphur and oil of cade, such as the Compound Sulphur Ointment, N. F., has served me equally well.

Some time ago methylene blue was used with alleged wonderful results in gonorrhea, cancer, indolent ulcers, etc. Now scarlet red is in vogue. The war has brought forward other methods of securing healing. Soon they will all yield the palm to a patented "crimson red." This is not a sarcasm. It is a prediction logically deduced from a mass of known facts and experiences.

The labors of the National Research Council, no matter how successful, will be of little avail. It will produce synthetic drugs. But as soon as the war ends, foreign pharmaceutical houses will deluge us with essentially the same substances. They will be newly named, patented, expensive, and bearing loud testimonials. Our old established drugs, which nobody cares to advertise, will soon lose ground and then become obsolete.

Fortunately for us Americans, we do not need this war to rid us of "divine rights." Let us use it to rid ourselves of sophistry and blind faith. Let common sense come to its own.

JACOB LANSKI, M.D., Chicago.

AN APPEAL FOR AID FOR BELGIAN AND FRENCH PHYSICIANS

To the Editor:—I fear that many of your readers, owing to the activities of the war and the absences of the summer, may not have seen my recent letter appealing for help for our Belgian or French confrères. On the conclusion of peace these physicians will return to devastated homes and looted offices, with nothing but their hearts, their heads and their hands to serve them in diagnosis and treatment. The committee in Paris is endorsed by our colleague, Dr. Joseph A. Blake.

I trust that a generous response to this appeal for help to refit their offices may be forthcoming. I well know the unending appeals for money. But suppose that we were the victims! That will decide in favor of sending aid to them, I am sure.

I will acknowledge all gifts through THE JOURNAL.

W. W. KEEN, M.D., Philadelphia.

"RED CROSS" BASE HOSPITALS

To the Editor:—It has occurred to me that a hospital located near the firing line or where there is danger from air men dropping bombs might have its various units arranged in the shape of a Geneva Cross with the roofs painted bright red. An aviator would have to be very high up in the air not to be able to recognize the group of buildings as a red cross. Base hospitals now paint a large red cross on their roofs, but this plan surely would be much better.

JOSEPH B. DE LEE, Chicago.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

- ALASKA: Juneau, Sept. 4. Sec., Dr. S. P. Dawes, Juneau.
ARIZONA: Phoenix, Oct. 2-3. Sec., Dr. John Wix Thomas, 306 Goodrich Bldg., Phoenix.
COLORADO: Denver, Oct. 2. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.
HAWAII: Honolulu, Sept. 10-13. Chairman, Dr. Grover A. Batten, 1142 Alakea St., Honolulu.
IDAHO: Pocatello, Oct. 2. Sec., Dr. Charles A. Dettman, Burke.
MASSACHUSETTS: Boston, Sept. 11-13. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.
MINNESOTA: Minneapolis, Oct. 2-5. Sec., Dr. Thomas S. McDavitt, Lowry Bldg., St. Paul.
MONTANA: Helena, Oct. 2. Sec., Dr. William C. Riddell, Power Bldg., Helena.
NEW YORK: Albany, Buffalo, New York City and Syracuse, Oct. 2-5. Chief, Examinations Division, Harlan S. Horner, State Education Bldg., Albany.
PORTO RICO: San Juan, Oct. 2. Sec., Dr. M. Quevedo Bacz, San Juan.
RHODE ISLAND: Providence, Oct. 4-5. Sec., Dr. Byron O. Richards, State House, Providence.
UTAH: Salt Lake City, Oct. 1-2. Sec., Dr. G. F. Harding, Templeton Bldg., Salt Lake City.

Candidates' Deficiencies at the Alabama Examination

A letter from the chairman of the Alabama State Board of Health states that at the recent examination conducted by that board the applicants displayed a surprising deficiency in hygiene and medical jurisprudence, indicating that sufficient attention was not being given to these branches in the medical schools. A majority of the candidates were said also to be deficient in physical diagnosis and in diseases of the eye, ear, nose and throat. These statements should be of special interest to teachers in medical schools.

Alabama's Reciprocal Relations

A communication from Dr. S. W. Welch, health officer of Alabama, states that a plan has been adopted by which reciprocal relations are being established with other states. Already such relations have been established with Iowa, Kentucky, Louisiana, Maryland, and Pennsylvania, and similar relations are pending with Arkansas, California, Colorado, Illinois, Indiana, Michigan, New Jersey, New Mexico, North Carolina, Ohio, Tennessee and West Virginia.

Louisiana's Reciprocal Relations

A letter just received from Dr. E. W. Mahler, secretary pro tem. of the Louisiana State Board of Medical Examiners, states that Louisiana now has reciprocal relations with the thirty-three following states: Alabama, Arkansas, California, Colorado, Delaware, District of Columbia, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, North Carolina, North Dakota, Ohio, Pennsylvania, Utah, Vermont, Virginia, West Virginia, Wisconsin and Wyoming.

Endowing Motherhood.—The war is familiarizing the whole civilized world with the notion of endowing motherhood in one form or another, and more is likely to be heard from it.—*Lancet*, London.

Book Notices

DR. LYMAN SPALDING. *The Originator of the United States Pharmacopoeia, Co-Laborer with Dr. Nathan Smith in the Founding of the Dartmouth Medical School, and Its First Chemical Lecturer; President and Professor of Anatomy and Surgery of the College of Physicians and Surgeons of the Western District, at Fairfield, N. Y.* By His Grandson, Dr. James Alfred Spalding. Cloth. Price, \$3.50 postpaid. Pp. 380, with illustrations. Boston: W. M. Leonard, 1916.

This interesting biography is based on the papers that Lyman Spalding left behind him, which fortunately fell into the hands of a grandson who fully appreciated their unusual value. The book consists largely of letters from physicians to Dr. Spalding, only a few copies of his own letters having been found. Interwoven with these letters are accurate accounts and interesting anecdotes of their writers and many of the chief persons mentioned in the letters, so that mention is made of a large number of the leading physicians in this country in the time of Dr. Spalding. The reader follows with growing interest the career of a distinguished but hitherto little known man in medicine. For in addition to the important work indicated in the title of the book, Lyman Spalding was really the first to test publicly the efficacy of vaccination as a preventive of smallpox, which he did in the smallpox hospital at Portsmouth Harbor in 1801, where four recently vaccinated persons and Dr. Spalding lived on intimate terms with two smallpox patients and were inoculated with the actual smallpox virus, all coming off scot-free of the smallpox; in 1800 he began to tabulate all deaths in Portsmouth, and these bills of mortality attracted much attention, Benjamin Rush writing that they were "an ingenious improvement of that species of publication and calculated to add to the certainty of our knowledge upon several medical subjects." Anatomic preparations, especially of the lymphatics, which are said to be unique, made Dr. Spalding's name well known to American anatomists. Beginning in 1812, Dr. Spalding lectured each winter for six years at the Fairfield school, then the only medical school outside of Boston, New York and Philadelphia, and was president of the college part of the time. He died from injury at the early age of 46, but in his short life he accomplished much for American medicine, in the history of which his name will live as the originator of the United States Pharmacopoeia. By reason of the importance of his career and of the manner in which it is presented, his biography is a most valuable addition to our medicohistorical literature.

BUILDING HUMAN INTELLIGENCE. By Dr. Arnold Lorand, Physician to the Baths, Carlsbad. Translated from the German by Philipp Fischelis, M.D., Acting Associate Professor of Histology and Embryology, University of Pennsylvania. Cloth. Price, \$3 net. Pp. 541. Philadelphia: F. A. Davis Company, 1917.

This volume is based on hygienic and physiologic considerations. The book is made interesting and readable, because of numerous anecdotes taken from personal experience and historical record. The book is not a scientific work, but is rather the expressions of the practical psychology of a physician. The author, realizing that the subject is somewhat beyond the usual character, says: "A severe critic may have ample opportunity to ruffle my feathers. If he will admit, however, in his just criticism that there is at least a single good thought in this work which may further the common welfare, I shall consider the goal for which I have been striving in the preparation of this work as having been attained." As there are many good thoughts in the work, the reviewer must grant that the author has attained his goal.

STANDARD METHODS FOR THE EXAMINATION OF WATER AND SEWAGE. Revised by Committees of the American Public Health Association, American Chemical Society, and Referees of the Association of Official Agricultural Chemists. Third Edition. Cloth. Price, \$1.25. Pp. 115. Boston: American Public Health Association, 1917.

This is the culmination of the work of various committees under the supervision of the American Public Health Association in compiling up-to-date analytic methods for public health laboratory workers. The first part of the book is devoted to a detailed description for the chemical examina-

tions of water and sewage. The completeness of the technical operations is a distinct advantage; the observations of various chemists will lend themselves to more critical and reliable comparisons. It is regrettable that the reasons for certain procedures are not more fully developed. The bacteriologic section is treated in much the same manner as the chemical. To all who are interested in the active investigation of water and sanitation, this book is commended as a "standard."

Social Medicine, Medical Economics and Miscellany

PSYCHIATRIC PROBLEMS AT LARGE*

AARON J. ROSANOFF, M.D.
KINGS PARK, N. Y.

July 1, 1916, an enumeration of cases of mental disorder, both in and out of institutions, was undertaken in Nassau County, N. Y. A method was applied which was calculated to bring to light more especially cases of sociological significance. These cases were, however, also studied from the medical point of view, so that eventually the material that had been gathered came to be classified in a twofold manner, according to a medical and a sociological classification.

The investigation was conducted essentially in two stages. The first stage consisted in securing leads to cases of probable mental abnormality, and the second in efforts to secure data concerning these cases sufficient to establish the abnormality, if it indeed was there, and to determine at least roughly its nature.

The main sources of leads were as follows: (1) lists furnished by the State Department of Charities, Eugenics Record Office, and Nassau County Association and other charitable organizations in the county; (2) the records of the overseers of the poor; (3) the records of the justices of the peace, police justices, and the district attorney; (4) the records in the county clerk's office of divorce and separation proceedings; (5) lists furnished by neighborhood workers, district nurses, truant officers, clergymen, old residents and other persons; (6) lists furnished by practicing physicians; (7) cases examined in state hospitals, public and private charitable institutions and in penal and correctional institutions, and (8) cases found in the elementary public schools.

The near relatives of all "abnormal" persons living in the county were also investigated, and among them were found many whom we classified as mentally abnormal and to whom no leads were available from any of the sources mentioned. A total of 1,592 "abnormal" persons was thus discovered in the county (exclusive of the cases found in the schools).

The total population being 115,827, the percentage of mentally abnormal persons in the county is found, by calculation, to be 1.37.

Clinically the "abnormal" cases may be divided into four main groups:

Insane	394
Epileptic	72
Feeble-minded	634
Constitutionally inferior (inebriates, criminals, prostitutes, chronic dependents, etc.)	492

Not all these cases would require institutional treatment, but, according to the judgment of the medical officers of the survey, only 59.4 per cent. Moreover, for many of the cases institutional treatment is already available; this is true especially of the insane and, to some extent, of the epileptic and the feeble-minded.

The survey has shown clearly that for the bulk of cases presenting psychiatric problems, the benefit of psychiatric study, judgment and treatment is not available.

The fact is that the psychiatric basis of many cases of retardation in school, criminal tendency, inebriety, drug habits

* Read before the American Medico-Psychological Association, May 29, 1917; also before the National Conference of Charities and Corrections, June 12, 1917.

and pauperism, is hardly recognized even by medical practitioners. It is, I think, owing to this circumstance that mental clinics, especially in rural or semirural places, have heretofore failed to realize their full possibilities for service.

The usual practice has been merely to organize a clinic and to open its doors to those who would, of their own accord, seek psychiatric advice or who would be sent or brought to the clinic for that purpose by their relatives or physicians. At some of the clinics, attendance has seemingly depended on advertisement, falling off rapidly when advertisement was not kept up.

The great problem evidently is to bring to the clinic cases which are of a psychiatric nature, but not necessarily recognized as such by general practitioners, by laymen, or by the patients themselves.

Perhaps the best plan would be to organize a system of cooperation between the mental clinic and public authorities who have to deal with problems of social maladjustment, such as often arise on a psychiatric basis: (1) school principals having to deal with retardation, truancy and unruliness; (2) justices of the peace, police justices, district attorneys, and county judges having to deal with crime, inebriety, vagrancy, prostitution, etc.; (3) overseers of the poor, county superintendents of the poor, and charitable organizations having to deal with dependency.

In large urban centers it is perhaps not so important—though none the less desirable and advantageous—for an outpatient mental clinic to establish such connections; the functions of the mental clinic are vicariously performed for the police, the courts, the schools and charitable organizations by neurologic clinics, by "clearing houses" for mental defectives, or by psychiatrists especially employed for such purposes. In rural or semirural places no such assistance is, as a rule, available, and, when made available through the establishment of a mental clinic, is not apt to be made use of to any great extent in a spontaneous way, as the communities have not yet been educated to the point of discerning a psychiatric problem, as such, when it exists.

The experience of the Nassau County survey has shown in a most striking way that large opportunities for psychiatric service would develop if the medical staffs of the mental clinics would undertake regular inspections of schools, almshouses, charitable homes, jails, penitentiaries, prisons, etc.

It has been customary heretofore to hold outpatient mental clinics at stated regular times, either fortnightly, or weekly, or perhaps somewhat more often. This does not afford an opportunity for psychiatric consultations which may be sought in the intervals. In order to provide such an opportunity, each state hospital conducting an outpatient mental clinic should arrange for the psychiatric examinations of persons brought to it for that purpose at any time; and the law should permit the detention of such persons for observation for a period of ten days on an order of a magistrate.

As it is not always convenient or even possible to bring patients either to the outpatient clinic or to the state hospital, some provision would seem necessary whereby a state hospital would be ready at any time to send a member of its medical staff to any part of the hospital district for psychiatric consultation on the request of a proper authority.

It is not to be assumed that even such an organization of outpatient mental clinics as is here advocated would provide fully such psychiatric service as the communities need; it would merely place the state hospital in closer touch with psychiatric problems arising at large in its district, and make unrestricted psychiatric consultation and advice available for the community. In order to make it possible for the state hospitals to render remedial service in full measure, as needed, they must somehow be empowered, in the first place, to furnish, through social service, relief from unfavorable environmental conditions, financial difficulties, unemployment, etc., which often appear as the direct causes of the social maladjustment; and, in the second place, to provide early institutional treatment for the cases in which it seems necessary.

The first of these requirements will perhaps be fulfilled through such cooperation on the part of the poor law officials and charitable organizations as previously described.

The second could be met only by increase of institutional capacity. Today, even in the most highly organized states, the crying need, in the sphere of mental hygiene, is for increase of institutional capacity. The state of New York, for instance—one of the foremost in the Union in this respect—had, in 1910, 396.3 persons in institutions for the insane, epileptic, feeble-minded, etc., per hundred thousand of its general population. The material brought to light in the course of the Nassau County survey shows that, by a most conservative judgment, the state could double its institutional provision without the slightest danger of such increased provision proving to be in excess of actual needs.

I wish to refer to a valuable by-product that would develop in the course of the growth of the outpatient clinic if organized according to the plan here advocated; namely, a register of cases of mental disorder, if not complete, at least including all those cases which are of sufficient sociological import to have become the concern of public authorities. The records accumulated by the clinic would gradually develop into such a register.

Judging from the results of the Nassau County survey, it may be anticipated that after several years' development such a register would show that the bulk of all crime, vice, dependency and other social maladjustments in a given community is attributable to a comparatively small fraction of its population. It stands to reason that problems presented by such evils could be much more successfully attacked with the aid of material that would be available in such a register than without it.

Dispensary Control of Tuberculosis

The ninth annual report of the association of tuberculosis clinics of the city of New York says that the work has suffered somewhat during the year covered by the report on account of the diversion of some of the effort of the field nursing service, originally designed for tuberculosis work alone, to include the sanitary supervision of various other infectious diseases. Results inimical to the standards set for tuberculosis work have followed. Enthusiasm for it has been dissipated, it is said, as new problems, more interesting because of their newness, have been taken up. In some instances the use of the tuberculosis machinery has been diverted to meet these needs. It is said, furthermore, that qualitative ideals also have succumbed to quantitative demands, with the inevitable lessening in the efficiency of the tuberculosis follow-up work. There was a decrease in clinic activity during the year covered by the report, but this is construed to indicate that the ten-year campaign against tuberculosis has begun to show definite results, and the actual need for clinic service has grown less. The vital statistics for 1916 show that the tuberculosis death rate has been reduced from 1.61 per cent. to 1.50 per cent., while the drop in the general death rate has been from 13.93 to 13.89 per cent., showing the reduction in the tuberculosis death rate to be 0.7 per cent. greater than the general rate. There were 419 fewer deaths from pulmonary tuberculosis, and the new cases reported during the year were 2,844 less than during the preceding year.

It is said that hospitals for the tuberculous reported that there were a number of vacant beds, and that preventoriums were complaining of difficulty in getting children. On the other side of the picture, however, it is found that while the death rate has declined since 1906, the number of new cases reported has continued to overbalance the number of deaths plus the cases removed from the active register for various reasons, such as "arrested" or "apparently cured," permanently left the city, or "not found" for two years, so that since 1913 there has been an increase of approximately 6,000 registered tuberculosis cases.

It is said that it will take anywhere from ten to twenty years before curves may be plotted that will show results from preventive work for tuberculosis comparable with those so clearly and easily shown in connection with the preventive and supervisory work done for various acute infectious diseases or in infant welfare work.

Medicolegal

Physician Acting in Professional Capacity

(*Cincinnati, H. & D. R. Co. vs. Gross (Ind.)*, 114 N. E. R. 962)

The Supreme Court of Indiana, in affirming a judgment in favor of plaintiff Gross for damages for personal injuries sustained by him while in the employ of the defendant railroad company, says that a surgeon in the employ of the company attended the plaintiff after he was taken to a hospital after the accident. On the first or second evening after the accident the surgeon made an arrangement with two representatives of the company to visit and interview the plaintiff in the waiting room of the hospital. The plaintiff was wheeled into the waiting room and there questioned by the two representatives concerning the wreck. The plaintiff was not previously advised as to the purpose of taking him to the waiting room. The foregoing, among other things, appeared from evidence introduced on behalf of the plaintiff. The surgeon testified that on the occasion of the interview he did not attend the plaintiff as a physician, but went to the hospital for two reasons, one to make sure that the two representatives were allowed to see the plaintiff, and the other to see that he was given proper treatment in his removal to and from the waiting room; that the witness did not participate in the conversation with the two representatives of the company. The surgeon was asked to state what the plaintiff said, but this was objected to and the objection was sustained. It was contended that this ruling was erroneous on the ground that at the time of the interview in question the surgeon was not acting in his professional capacity; but the supreme court holds that the offered evidence was properly excluded. While it was true that in his preliminary examination the witness stated that he was not acting in his professional capacity, it was within the province of the court to determine, from the entire examination of the witness and from other relevant evidence, whether the relation of physician and patient existed at the time, and its decision on the question was, in this case, fairly supported by the evidence. Moreover, the witness, both immediately before and after the interview, at least, represented each of the parties whose interests here conflicted. Under such circumstances it was peculiarly within the province of the trial court, in passing on the admissibility of evidence, to determine what weight should be given to preliminary statements of the witness. The Indiana statute provides that physicians shall not be competent witnesses "as to matter communicated to them, as such, by patients, in the course of their professional business, or advice given in such cases." This enactment has consistently been construed by this court as covering a broader field than is indicated by the literal meaning of the words employed, and, so construed, it renders the physician incompetent to disclose information acquired by him while attending a patient in a professional capacity. This includes all that he sees or observes, while so acting, as to matters communicated by the patient. The rule, which is a beneficent one, is not to be lightly broken down.

Operating on Child at Request of Others Than Parents

(*Rishworth vs. Moss et al. (Tex.)*, 191 S. W. R. 843)

The Court of Civil Appeals of Texas, on the second appearance before it of this case, reverses the second judgment rendered in favor of the defendants, remands the cause, and overrules a motion for a rehearing. The court says that the plaintiff was suing the defendants for damages alleged to have been sustained on account of the death of his daughter, aged 11, which occurred within a few minutes after an operation had been performed on her for the removal of adenoids and tonsils. The plaintiff contended that the operation was performed without the request or the consent, express or implied, of himself and his wife. The child had been taken by two adult sisters for a week or ten days' visit with them in a city about 60 miles from home, in which city they had been in training at a hospital with a view to becoming professional nurses. These sisters took the child to Dr. Moss' office to have the operation performed. This court on the

first appeal held that a physician is liable for operating on a person unless he obtains the consent of such person, if competent to give consent, and, if not, of some one who, under the circumstances, would be legally authorized to give the consent; and that, in the case of a child of tender years, consent must be obtained from the parent or guardian. In this case, Dr. Moss relied altogether, as was shown by his own testimony, on permission given him by an agent or agents. At the time the daughters came to him he did not know whether they were even legally in possession of the child; all he knew was that they led him to believe they were legally in possession of her, and that they had authority to have the operation performed. They did not say that they had such authority, but they used language from which such meaning would naturally be deduced. In order, however, to determine whether agency existed, the court must look, not to the acts and declarations of the persons assuming to be an agent, but to the transactions between such person and the persons sought to be charged as principals. The only evidence concerning such matters was furnished by the parents. They testified that the child was permitted to accompany her sisters to the city to pay them a visit for a week or ten days, and with this purpose in view, and no other, she was placed in the custody of her sisters. They were constituted the agents of the parents, but their authority was very limited. It cannot be contended that such an agency would carry with it the implied authority to take the child to a surgeon and have an operation performed on her, there being no emergency. Such an agency would carry the implied authority to employ a physician to attend the child if it should become ill and require medical aid, and if an emergency arose which required that an immediate operation be performed in order to save the life of the child, the agent would undoubtedly have authority to employ a surgeon to perform the operation. Where there has been no change in the child's health after its custody was confided to its sisters for a week, it appears to the court that the sisters would not have any authority to employ physicians to treat the child and endeavor to improve its health, much less to employ a surgeon to perform such an operation as is involved in the removal of the tonsils and adenoids, and requires the use of a general anesthetic. There was nothing in the relation created by giving the custody of the child to its sisters for a short visit which would imply the authority exercised by them. The fact that parents are not present when an operation is to be performed on a little child is a circumstance sufficient to arouse inquiry as to whether they know the operation is to be performed. All of the testimony of expert witnesses with regard to the advisability of performing the operation at the time it was done should have been excluded, there being no evidence of any express or implied or apparent authority. The condition of the child's health, and the advisability of removing tonsils and adenoids could not justify want of authority, no emergency being alleged and proved. Had the child survived the anesthetic and operation, it would have had a cause of action.

Law Making No Provision for Systems Not Taught in Any School—"Neuzopath"—Membership of State Board of Health

(*State vs. Heffernan (R. I.)*, 100 Atl. R. 55)

The Supreme Court of Rhode Island, to which this case was certified for the determination of constitutional questions raised by the defendant, holds that none of the objections properly presented by him to the validity of Chapter 193 of the General Laws, and especially Section 3 thereof, with reference to the practice of medicine in that state, were well founded. The defendant was charged, among other things, with holding himself out to the public as a practitioner of medicine by appending to his name the title of "Neuzopathic Physician," also by appending to his name the title of "Neuzopath," and with practicing medicine and surgery for compensation, without being legally authorized so to do. The court does not find that the provision of Section 3 of Chapter 193, which requires "satisfactory evidence of graduation from a medical school in good standing" before a candidate can be examined or be permitted to practice medicine, is in con-

flict with either the state or the federal constitution. Nor, the court holds, is the law invalid because it makes no provision for persons who desire to practice a system of medicine which is not taught in any school.

The court says that while undoubtedly in stages of its history the practice of medicine has been to some extent empiric, it is safe to say as a matter of common knowledge that a vast amount of accurate information has now been accumulated as to the structure of the human body, as to the functions of its various parts, as to the diseases to which it is subject or exposed, and as to the discovery and use of remedies for the prevention and cure of disease, and that this information is included in the subjects of study in medical schools. It is also a matter of common knowledge that by increased facilities for research and experiment in laboratories by men scientifically trained, within the last few years great advances have been made in a more intelligent and successful practice of medicine and surgery. It is of these and kindred subjects that the person seeking to practice medicine is required by the law to have knowledge. While doubtless there is a difference in the different schools of medicine as to the remedial measures to be employed in the treatment of disease, nevertheless an accurate knowledge of the human body, of the functions of its organs and parts, and of the diseases to which it is subject, must furnish the foundation of medical practice in all schools of medicine. The defendant did not seek an examination in these matters, but said he had originated a system of medicine or therapeutics not taught in any school of medicine; in other words, that he had originated a new method for the discovery, prevention and treatment of disease. It might perhaps be inferred that he was the only practitioner under the system thus originated, and that there was no one qualified to examine him in it. There was no suggestion that the defendant's system of medicine had ever been explained or submitted for examination to any one or had ever been committed to print so that it might be examined or studied by others. A system thus unexplained with apparently no followers is scarcely worthy to be dignified by calling it a school of medicine. In these circumstances, while recognizing that progress in the discovery of the causes of disease and of its prevention is probably now being made, the court thinks it is outside of all reasonable probability that the defendant has discovered such a large field of medical knowledge, hitherto unexplored by any student, investigator or practitioner of medicine, as to permit him to originate a new system of medicine or therapeutics. In the court's judgment it is so utterly improbable, that a legislative provision excluding one from practicing such a system on his fellow men must be held to be in the interest of the general welfare and a reasonable and proper exercise of legislative power.

The court also holds constitutional the requirement of Chapter 115 that a majority of the state board of health must be physicians who are members of some medical society incorporated by the state.

Society Proceedings

COMING MEETINGS

- Am. Assn. Obstetricians and Gynecologists, Newark, N. J., Sept. 17-19.
- American Association of Railway Surgeons, Chicago, Oct. 17-19.
- American Electro-Therapeutic Association, Atlantic City, Sept. 11-13.
- American Roentgen Ray Society, Pittsburgh, Sept. 19-22.
- Delaware State Medical Society, Middletown, Oct. 8-9.
- Colorado State Medical Society, Colorado Springs, Sept. 25-27.
- Indiana State Medical Association, Evansville, Sept. 26-28.
- Kentucky State Medical Association, Louisville, Oct. 16-18.
- Medical Association of the Southwest, Kansas City, Oct. 15-17.
- Michigan State Medical Society, Battle Creek, Sept. 4-6.
- Minnesota State Medical Association, St. Paul, Oct. 10-20.
- Mississippi Valley Medical Association, Toledo, O., Oct. 9-11.
- Missouri Valley Medical Society, Lincoln, Neb., Sept. 20-21.
- Nevada State Medical Association, Reno, Oct. 18-19.
- New Mexico Medical Society, Las Cruces, Oct. 4-6.
- Pennsylvania State Medical Society, Pittsburgh, Sept. 24-27.
- Utah State Medical Association, Salt Lake City, Sept. 12-13.
- Vermont State Medical Society, Barre, Oct. 11-12.
- Virginia State Medical Society, Roanoke, Oct. 23-26.
- West Virginia State Medical Association, Fairmont, Oct. 2-4.
- Wisconsin State Medical Society, Milwaukee, Oct. 3-5.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Obstetrics and Diseases of Women and Children

August, LXXVI, No. 2

- 1 *Value of Avoidance of Shock and Trauma in Treatment of Eclampsia. E. B. Cragin, New York City.—p. 211.
- 2 *Uteroscopy Versus Transperitoneal Hysterotomy. A. Heineberg, Philadelphia.—p. 216.
- 3 Infectious Abortion of Cattle as Complication of Pregnancy of Women; Report of Cases. H. P. De Forest, New York City.—p. 221.
- 4 Elizabeth Steel Magee Hospital of Pittsburgh, C. E. Ziegler, Pittsburgh.—p. 255.
- 5 *Roentgen Therapy Successful in Uterine Fibroid Without Affecting Ovaries; Report of Case. G. E. Pfahler and J. A. McGlinn, Philadelphia.—p. 262.
- 6 Inversion of Uterus. Operation by Spinelli Method. Recovery of Patient. G. E. Shoemaker, Philadelphia.—p. 268.
- 7 Hysterectomy—Operation of Choice to Terminate Pregnancy, when Subsequent Pregnancy is to Be Avoided. E. Marvel, Atlantic City, N. J.—p. 271.
- 8 True Value of Certain Pelvic Measurements. J. L. Huntington, Boston.—p. 277.
- 9 Cervical Repair Following Confinement. T. Coffey, Los Angeles.—p. 282.
- 10 Pregnancy and Labor Following Operative Procedures on Genital Tract. J. Ronsheim, Brooklyn.—p. 289.
- 11 Pyelitis During Pregnancy. F. E. Leavitt, St. Paul.—p. 297.
- 12 *New Method of Treating Pernicious Vomiting of Pregnancy by Blood Transfusion. A. Y. P. Garnett, Washington, D. C.—p. 303.

1. Abstracted in THE JOURNAL, July 14, 1917, p. 144.

2. **Uteroscopy vs. Transperitoneal Hysterotomy.**—The advantages of uteroscopy over transperitoneal hysterotomy are stated by Heineberg as follows: 1. It affords a perfect view of the interior of the uterus without subjecting the patient to the dangers attendant on invasion of the peritoneal cavity. 2. It may be performed quickly under nitrous oxid oxygen anesthesia. 3. The patient experiences no more pain or discomfort than after an ordinary dilatation and curettage. 4. It affords a clear view of the cervical canal as well as of the uterine cavity. 5. The dilated cervical canal insures good postoperative drainage from the cavity of the uterus. 6. It will demonstrate that a very large proportion of cases of obscure intra-uterine disease are nonmalignant and may be efficiently treated by the curet or placental forceps and thus avoid a maximum of cure for a minimum of disease.

5. **Roentgen Therapy in Uterine Fibroid.**—The authors report what they believe to be the first case in which a gynecologist and roentgenologist have definitely planned, and successfully carried out, Roentgen treatment for the reduction or dissipation of a fibroid of the uterus, with the protection of the ovaries, and proof of their success by subsequent pregnancy. They conclude that the results in this case would strongly suggest that, in dealing with a patient otherwise healthy in the childbearing period, in which the uterus is involved by fibroid, the gynecologist is not justified in the removal of the uterus without first making the attempt at treatment with the Roentgen rays by directing the rays against the fibroid and shielding the ovaries. The success of the treatment in a case like this demands, first, a careful and thorough investigation by the gynecologist as to size and position of the fibroid. Second, he should report, so far as possible, on the condition and position of the ovaries, and third, the roentgenologist should be most careful in his technic as to the direction of rays and as to the protection of the skin of the patient, and in shielding the ovarian region, for, if operation is needed later, or if the roentgentherapy is not successful in removing the fibroid, the skin must not become damaged.

12. **Blood Transfusion in Pernicious Vomiting of Pregnancy.**—In two cases reported by Garnett a donor about ten days postpartum was selected as it was thought advantageous to have a donor who had recently passed through pregnancy, but in whom all uterine contractions had then ceased, in the hope that her blood might contain an antibody, antiferment or whatever it may be that would neutralize the toxic agent

in the recipient, this neutralizing substance having been produced in the donor during her pregnancy at which time the toxic substance or substances had apparently been overcome or neutralized by her.

American Journal of Orthopedic Surgery, Boston

August, XV, No. 8

- 13 *Localization of Growing Point in Epiphyseal Cartilage Plate of Bones. S. L. Haas, San Francisco.—p. 563.
- 14 *Bone and Joint Infections Treated by Carrel Technic. G. W. Hawley, Bridgeport, Conn.—p. 586.
- 15 *New Supra-Articular Subperiosteal Approach to Hip Joint. M. N. Smith-Petersen, Boston.—p. 592.
- 16 Artificial Limbs for Sailors and Soldiers. E. M. Little, London.—p. 596.
- 17 Case of Paralytic Calcaneo-Cavus with Extreme Deformity Treated by Jones' Method of Tarsectomy in Two Stages. A. P. C. Ashhurst, Philadelphia.—p. 602.

13. **Localization of Growing Point in Epiphyseal Cartilage Plate of Bones.**—The experiments reported by Haas show that an incision through a growing bone at the junction of the metaphysis with the epiphysis always causes a disturbance in growth. A separation in the natural line of cleavage between the epiphysis and metaphysis, after incising the periosteum, causes some loss in length growth. It is possible in exceptional cases, in which a minimal amount of injury is produced, that there will be no hindrance to growth. The excision of the metaphysis causes a very slight disturbance in growth. The excision of the epiphyseal cartilage plate causes practically a complete cessation of active longitudinal growth. The most active and important elements necessary for longitudinal growths are located in the columns of cartilage of the epiphyseal cartilage plate. A limited property of producing length growth is possessed by the cartilage adjacent to the columns of cartilage.

14. **Bone and Joint Infections Treated by Carrel Technic.**—Forty cases of acute and chronic osteomyelitis, compound fractures and joint tuberculosis have been treated by Hawley by this method, and all have responded remarkably well, with the exception of two cases of tuberculosis. In these the early progress was excellent, but the disease process extended and the treatment was abandoned. Hawley says that this is the first time in his experience that it has been possible definitely to sterilize suppurating infections of the bones and joints and see them heal without any evidence of pus and without sinus formation. This has occurred, not in one instance only, but in all the cases not still under treatment. At the same time two very interesting phenomena have been observed which are entirely new—the growth of granulation tissue from the bone itself and a peculiar form sequestration.

15. **New Supra-Articular Subperiosteal Approach to Hip Joint.**—Petersen advises that the usual anterior incision be extended backward from the anterior superior spine along the crest of the ilium, and the flap thus formed reflected downward by subperiosteal dissection, giving an excellent exposure of the superior portion of the capsule and of the acetabulum.

Bulletin Johns Hopkins Hospital, Baltimore

August, XXVIII, No. 318

- 18 *Hemolytic Substances in Heated Milk and in Milk Cultures of *Bacterium Welchii*. W. W. Ford and J. H. Lawrence, Baltimore.—p. 245.
- 19 Venous Congestion in Its Relation to Necroses of Liver. H. Oertel, Montreal.—p. 249.
- 20 *Degeneration of Leukocytes in Urine as Diagnostic Aid in Tuberculosis of Urinary Tract in Women. H. M. N. Wynne, Baltimore.—p. 251.
- 21 Ethics of Practice of Medicine from Jewish Point of View. H. Friedenwald.—p. 256.
- 22 Paleopathology. A. C. Klebs, Washington, D. C.—p. 261.

18. **Hemolytic Substances in Heated Milk and in Milk Cultures of *Bacterium Welchii*.**—It is shown by Ford and Lawrence that market milk heated to 85 C. for fifteen to twenty minutes and allowed to decompose by incubation at 22 C. or 37 C. for twenty-four to forty-eight hours contains a hemolysin of moderate strength. This hemolysin is independent of the acids in the milk, occurring in neutralized specimens, is thermolabile, being destroyed at temperatures between 55 C. and 60 C., is precipitable by ethyl alcohol and can be digested by pepsin and pancreatin. It is to be classed

with the bacterial hemolysin and is in all probability to be attributed to the presence of *Bacterium welchii* in the market milk. Pure milk cultures of *B. welchii* contain a similar hemolysin which is, however, usually slightly more powerful. This also is independent of the acids in the milk, is thermolabile, being destroyed at temperatures between 55 C. and 60 C., is precipitable by ethyl alcohol and can be digested by pepsin and pancreatin. On the basis of the work thus far completed they believe that this hemolysin is a true bacterial hemolysin. It is especially to be differentiated from the hemolysin of both lactic acid and butyric acid, which are thermostabile. The rôle which these acids play in the hemolysis seen in cultures of *B. welchii* is, the authors believe, secondary to that of the true bacterial hemolysin secreted by the organism.

20. **Degeneration of Leukocytes in Urine Diagnostic Aid in Tuberculosis of Urinary Tract.**—In eleven cases of renal tuberculosis cited by Wynne, the tubercle bacillus was demonstrated in ten. The tables contained in the article include eleven cases of renal tuberculosis, for which nephrectomy was performed, fifteen cases of nontuberculous pyuria in which the possibility of tuberculosis was definitely eliminated by operation or necropsy, and twenty cases in which there was no operation but the clinical picture and results of treatment rule out tuberculosis. Wynne concludes that degenerated leukocytes in the urine are not pathognomonic of tuberculosis of the urinary tract, but a marked degeneration is strongly suggestive of this disease. The absence of degeneration of leukocytes does not eliminate tuberculosis. The cytologic study of the urine cannot replace the demonstration of tubercle bacilli or animal inoculation as a means of diagnosis; at best it offers presumptive evidence.

California State Journal of Medicine, San Francisco

August, XV, No. 8

- 23 Some Heart Problems Suggesting Necessity for Closer Alliance Between Physiologist, Biochemist and Clinician. W. W. Kerr, San Francisco.—p. 283.
- 24 Syphilitic Arthritis. L. W. Ely, San Francisco.—p. 288.
- 25 Tonsils as Focus of Infection. J. M. Brown, Los Angeles.—p. 290.
- 26 Focal Infection Intestinal Involvement. F. F. Gundrum, Sacramento.—p. 293.
- 27 High Calory Feeding in Typhoid in Children. H. H. Yerington, San Francisco.—p. 294.
- 28 Clinical Observations of One Hundred Cases of Artificial Pneumothorax. R. C. Matson, Portland, Ore.—p. 297.
- 29 Tuberculosis in Childhood with Unusual Manifestations. L. Porter, San Francisco.—p. 303.
- 30 Differential Diagnosis of Abdominal Tuberculosis. G. E. Ebricht, San Francisco.—p. 306.
- 31 Toxic Gastric Hemorrhage. E. L. Crispin, Rochester, Minn.—p. 308.
- 32 Hypophyseal Symptomatology; Review. C. W. Rand, Los Angeles.—p. 312.
- 33 Vaccine in Typhoid. H. R. Parker, Dunsmuir, Cal.—p. 316.
- 34 General Practitioner and Tuberculous Patient. R. A. Peers, Colfax.—p. 318.
- 35 Medical Inspection of Prisoners at San Quentin; Report of Case of Tinea Versicolor. L. L. Stanley, San Quentin.—p. 323.
- 36 Case of Hemoglobinuria. N. E. Williamson, San Francisco.—p. 324.

Journal of Bacteriology, Baltimore

July, II, No. 4

- 37 *Importance of Uniform Culture Media in Bacteriologic Examination of Disinfectants. J. H. Wright, New York.—p. 315.
- 38 Nomenclature and Classification of Bacteria. R. E. Buchanan, Ames, Iowa.—p. 347.
- 39 Effect of Hydrogen Ion Concentration on Production of Precipitates in Solution of Peptone and Its Relation to Nutritive Value of Media. I. J. Kligler, New York.—p. 351.
- 40 *Types of Organisms Isolated from Water After Treatment with Calcium Hypochlorite. M. A. Smeeton, New York.—p. 355.
- 41 *Morphology of Strain of *B. Diphtheriae*. P. G. Heinemann, Chicago.—p. 361.
- 42 Preparation of Hyphomycetes for Microscopical Examination.—p. 365.
- 43 Blastocystis Hominis: Its Characteristics and Its Prevalence in Intestinal Content and Feces in South Carolina. K. M. Lynch, Charleston.—p. 369.
- 44 Characteristics of Coli-Like Microorganisms from Soil. B. R. Johnson and M. Levine, Ames, Iowa.—p. 379.
- 45 Effect of Sterilization on Sugars in Culture Media. C. S. Mudge, Providence, R. I.—p. 403.
- 46 Presence of *B. Coli* and *B. Welchii* Groups in Intestinal Tract of Fish (*Stenopus Chrysops*). W. W. Browne, Woods Hole, Mass.—p. 417.

- 47 Nitrogen-Assimilating Organisms in Manure. H. L. Fulmer and E. B. Fred, Madison, Wis.—p. 423.
48 New Differential Plating Methods for *B. Bifidus* (Tissier) and *B. Acidophilus* (Moro). J. C. Torrey. New York.—p. 435.
49 Trichomoniasis of Chicks: New and Highly Fatal Disease. J. Weinzirl.—p. 441.
50 *Study of Diphtheroid Group of Organisms with Special Reference to Its Relation to Streptococci. R. E. Bellon, Boston.—p. 447.

37. Importance of Uniform Culture Media in Bacteriologic Examination of Disinfectants.—The essential points brought out by Wright may be summed up as follows: Variations in culture mediums are the cause of the majority of the discrepancies obtained in the bacteriologic examination of disinfectants. There is no indication that these variations in culture mediums are in any way due to lack of uniformity in Witte's peptone. Liebig's Extract of Meat, however, should be regarded with suspicion.

40. Organisms Isolated from Water Treated with Calcium Hypochlorite.—The organisms found by Smeeton were apparently of the common saprophytic type usually found in air and water. No intestinal forms appeared to survive the treatment in the amount examined. It would appear, therefore, that available chlorin in the proportion of 1 part to 2,000,000 is sufficient to purify surface water obtained under conditions similar to that of the Croton supply.

41. Morphology of Strain of *B. Diphtheriae*.—Heinemann's observations indicate the existence of a close morphologic relationship between the members of the *B. diphtheriae* group. An exhaustive study of this relationship might lead to important scientific results and might be of practical value for the detection of diphtheria carriers, inasmuch as abnormal forms which at present lead to negative diagnoses might, when properly interpreted, show the presence of virulent diphtheria bacilli in unsuspected cases.

50. Relation of Diphtheroid Organisms to Streptococci.—It would appear from Mellon's work that the sum total of evidence shows that the diphtheroid group is one of great diversity and lability, and that it is more or less related to several other groups of organisms. Prominent among these is the acid-fast group, represented by *B. tuberculosis*; the streptococcus group, represented by some of its nonhemolytic types; *B. proteus* and the enterococcus.

Kentucky Medical Journal, Bowling Green

August, XV, No. 8

- 51 Accessory Sinus Disease. G. C. Hall, Louisville.—p. 363.
52 Genuine Physician. H. C. Clark, Falmouth.—p. 366.
53 Vulvovaginitis. A. L. Beckett, Butler.—p. 367.
54 Menorrhagia and Metrorrhagia; Etiology and Pathology. T. A. Pease, Kirbyton.—p. 368.
55 Diabetes Mellitus. W. L. Mosby, Bardwell.—p. 369.
56 Empyema in Childhood: Its Diagnosis and Treatment. P. C. Layne, Ashland.—p. 370.
57 Some Conditions of Liver, Requiring Surgical Intervention. P. H. Stewart, Paducah.—p. 373.
58 Few Practical Points on Diagnosis of Renal Lesions. E. W. Jackson, Paducah.—p. 375.
59 Tuberculosis of Bones and Joints with Treatment, Including Use of Tuberculin. V. Blythe, Paducah.—p. 378.
60 General Practitioner, His Patients, and Specialist. W. J. Shacklette, Glendale.—p. 380.
61 One Hundred and Thirty-One Cases of Measles. M. A. Moore, McVeigh.—p. 381.
62 Eclampsia. Z. A. Thompson, Pikeville.—p. 383.
63 Rural Physician and Diagnostic Laboratory. C. K. Beck, Louisville.—p. 384.
64 Fractures. A. C. Henthorn, Garrison.—p. 386.
65 Infectious Meningitis; Study of Twenty-Seven Cases in 586 Necropsies. S. Graves, Louisville.—p. 387.
66 Some Important Facts About Malaria. C. C. Bass, New Orleans.—p. 393.
67 Colles' Fracture. S. Lambert, Owensboro.—p. 396.
68 Enterocolitis; Sporadic Dysentery. R. T. Hocker, Arlington.—p. 398.

Medical Record, New York

August 4, XCII, No. 5

- 69 Diagnosis and Treatment of Abortion. H. N. Vineberg, New York.—p. 177.
70 Infant Feeding. M. S. Reuben, New York.—p. 181.
71 Significance of Abdominal Pain. M. Behrend, Philadelphia.—p. 188.
72 Bronchial Asthma. M. F. Morris, Jr., Chelsea, Mass.—p. 190.
73 Course, Symptoms and Treatment of Proctitis. A. A. Landsman, New York.—p. 193.

Modern Hospital, St. Louis

August, IX, No. 2

- 74 Rockefeller Institute War Demonstration Hospital. C. Butler, New York.—p. 73.
75 What State of Illinois is Doing for Its Blind. C. E. Comstock, Chicago.—p. 80.
76 Conversion of Yachts into Ambulance Boats. W. E. Eaton.—p. 81.
77 Emergency Hospital Construction for U. S. Navy. W. C. Braisted.—p. 87.
78 Hospital Organization under War Department. J. A. Hornsby.—p. 88.
79 Scarcity of Surgical Instruments and Hospital Equipment. V. Mueller, Chicago.—p. 90.
80 Artist's Work in War Orthopedics. F. B. Lester, Chicago.—p. 92.
81 Grape Juice, Lime Juice and Loganberry Juice. J. P. Street, New Haven, Conn.—p. 96.
82 Sanatorium Blanket Problem. H. L. Rockwood, Warrensville, O.—p. 98.
83 Maryland State Hospital Train. D. Z. Dunott, Baltimore.—p. 101.
84 Standardization of Hospitals—University or Teaching Hospital. J. A. Hornsby, Chicago, and others.—p. 103.
85 Columbia War Hospital. F. C. Wood, New York.—p. 112.

New York Medical Journal

August 4, CVI, No. 5

- 86 Primitive Medicine Man's Virtues. J. Wright, Pleasantville.—p. 197.
87 Bariumized Test Meal with Combined Fluoroscopic and Chemical Study as Means of Rapid Preliminary Stomach Diagnosis. G. W. McCaskey, Fort Wayne, Ind.—p. 202.
88 Study of Drug Action. T. J. Mays, Philadelphia.—p. 204.
89 Campaign for Pure Food. H. W. Wiley, Washington, D. C.—p. 208.
90 Control of Nose and Throat Hemorrhage. L. A. Coffin, New York.—p. 211.
91 Ambulatory Treatment of Peptic Ulcers. H. A. Rafsky, New York.—p. 212.
92 Serum Therapy as Applied to Pneumococcal Infections of Eye. L. Lehrfeld, Philadelphia.—p. 214.
93 Femina Adomestica. D. Waterson, El Paso, Tex.—p. 215.
94 Treatment of Excessive Menstruation in Unmarried. S. Axilbund, Philadelphia.—p. 217.
95 Lobar Pneumonia Problem in Army. H. J. Nichols, El Paso, Tex.—p. 219.
96 Use of Inexpensive Drugs in Practice. L. T. de M. Sajous, Philadelphia.—p. 232.

Oklahoma State Medical Association Journal, Muskogee

August, X, No. 8

- 97 Intravenous Medication. W. F. Dutton, Tulsa.—p. 315.
98 Prevention of Malaria. J. W. Duke, Guthrie.—p. 321.
99 Injuries of Head. J. W. Riley, Oklahoma City.—p. 328.
100 Accidental Brain Injuries. A. D. Young, Oklahoma City.—p. 333.
101 Fractures of Base of Skull. C. von Wedel, Jr., Oklahoma City.—p. 335.
102 Application of Principle of Bone-Graft to Unretainable Recent Fractures. M. E. Stout, Oklahoma City.—p. 337.

Ophthalmic Record, Chicago

August, XXVI, No. 8

- 103 Present Status of Corneal Transplantation and Some Experimental Data. S. Walker, Jr., Chicago.—p. 383.
104 Stereoscopic Campimeter Slate. R. I. Lloyd, Brooklyn.—p. 391.
105 Vernal Conjunctivitis. F. Allport, Chicago.—p. 395.

Southwestern Medicine, El Paso, Texas

July, I, No. 7

- 106 Intestinal Obstruction; Report of Cases. R. L. Ramey, El Paso.—p. 9.
107 Discussion of Diagnosis and Treatment of Infantile La Grippe. W. W. Dill, Albuquerque, N. M.—p. 12.
108 *Nonpassive Expiration Theory of Bronchial Asthma. O. H. Brown, Phoenix, Ariz.—p. 14.
109 Immunity in Tuberculosis. D. C. Twichell, Albuquerque, N. M.—p. 17.
110 Clague Electrolytic Treatment of Lead Poisoning. L. G. Witherpoon, El Paso, Tex.—p. 20.
111 Idiopathic Epilepsy. E. B. Shaw, Las Vegas, N. M.—p. 23.
112 Herpes Zoster Ophthalmicus; Report of Case. A. D. Wilson, Prescott, Ariz.—p. 31.

108. Nonpassive Expiration Theory of Bronchial Asthma.—Brown likens a bronchiole with its respiratory bronchioles, atria, infundibula and alveoli, constituting the lobule, to a sort of complicated Maxim silencer or muffler construction, for air to wander about in on its way from the remote air cells to the bronchi, trachea and outside atmosphere. Inspiration takes place with muscular effort under all conditions; expiration is a passive process in normal breathing. When expiration is made an active process by bringing the strong abdominal muscles into use to expel the air from the lungs,

the momentum of the air will be greatly decreased and the air tension within the alveoli will be much heightened. This increased pressure is applied to all structures within the chest and will affect all thin structures. This, then, is Brown's theory: The high tension tends to cause the thin walled bronchioles to collapse, and thus further hinders the exhalation. It strikes the pulmonary capillaries, dams the blood from them to the right heart, larger veins, and thence to the tributaries which have an external pressure of but one atmosphere. The redness of the face and the swelling of the neck veins during coughing paroxysms is evidence of this. The bronchial venules and capillaries being under approximately one atmosphere pressure even during the time of forceful expirations get their share of the dammed back blood. Since the pulmonary capillaries anastomose direct with the bronchial capillaries, blood is forced to the bronchial mucosa. The high alveolar pressure is applied also to the exterior of the bronchial vein and hence facilitates the damming of the blood of the bronchial vein and thence to the bronchial venules and capillaries. The pressure is also applied to the bronchial lymph duct, and the lymph is forced into the lymph spaces of the bronchial mucosa. The pressure applied to the pulmonary capillaries as well as damming the blood to the right heart forces it onward to the left heart and aorta and causes a rise of arterial blood pressure during expiration, and the higher the arterial pressure becomes the more blood will be pumped through the bronchial vein to the mucosa. Forceful expirations without assistance from inflammatory or anaphylactic swelling within the bronchi might produce sufficient passive congestion of the bronchial mucosa greatly to narrow the lumen of the bronchi. The common cause of forceful expirations is inflammation and irritation of some part of the respiratory tract. Any inflammatory or anaphylactic swelling or other narrowing of the bronchial mucosa, coupled with coughing, sneezing, dyspnea, or hard breathing of any sort or source may result in such markedly narrowed lumen of the bronchi as to produce expiratory dyspnea, loud piping râles and wheezes, an accumulation of mucus with pellets, shreds and bronchial casts, and emphysema. This, Brown says, is asthma.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Annals of Tropical Medicine and Parasitology, Liverpool

June, XI, No. 1

- 1 *Malaria in the Gold Coast Colony, West Africa. J. W. S. Macfie and A. Ingram.—p. 1.
- 2 Protozoologic Investigation of Cases of Dysentery Conducted at Liverpool School of Tropical Medicine. H. F. Carter, D. L. Mackinnon, J. R. Matthews and A. M. Smith.—p. 27.
- 3 Occurrence of *Ankylostoma Ceylanicum* in West African Dogs. W. Yorke and B. Blacklock.—p. 69.
- 4 Occurrence of *Spirocheta Eurygyrata* in Europeans in England, with Note on Second Species of *Spirocheta* from Human Intestine. J. W. S. Macfie and H. F. Carter.—p. 75.
- 5 Relapsing Fever *Spirochetes*. J. W. S. Macfie and W. Yorke.—p. 81.
- 6 *Persons Who Have Never Been Out of Great Britain as Carriers of *Entameba histolytica*. W. Yorke, H. F. Carter, D. L. Mackinnon, J. R. Matthews and A. M. Smith.—p. 87.
- 7 *Studies in Treatment of Malaria. J. W. W. Stephens, W. Yorke, B. Blacklock, J. W. S. Macfie and C. Forster Cooper.—p. 91.
- 8 *Id. Intramuscular Injections of Quinin Bihydrochlorid in Simple Tertian Malaria. J. W. W. Stephens, W. Yorke, B. Blacklock, J. W. S. Macfie and C. Forster Cooper.—p. 113.

1. Malaria in Gold Coast Colony, West Africa.—Many of the most serious diseases of other tropical countries are either unknown or are but rarely encountered in West Africa. Cholera, for example, has never yet broken out on the Gold Coast, and plague, although it has visited the colony, is not an established disease; kala-azar and other *Leishmania* infections, undulant fever, and tick fever are very rarely seen; typhoid fever is uncommon, and the trypanosomiasis that does occur is of the relatively mild type due to infections with *T. gambiense*. Dysentery is prevalent, but it is mainly amebic, and yellow fever and cerebrospinal meningitis periodically occur in fatal outbreaks. Malaria, however, is exceedingly common, and is mostly of the subtertian variety. In the majority of the blood films neither schizonts nor

gametocytes are present to aid in the diagnosis. The identification of the parasites has therefore to be made in the great majority of cases from the characters of the trophozoites. The points which Macfie and Ingram have found of greatest assistance in recognizing the subtertian parasites have been the small size of the organisms, the absence of enlargement of the enveloping erythrocytes, the characteristic coarse stippling which can usually be brought out by suitable staining, and especially the precocious division of the chromatin.

6. Persons Never Out of Great Britain Carriers of *Entameba histolytica*.—An examination of 344 persons who had never been out of Great Britain showed that at least ten (2.9 per cent.) harbored in their feces cysts morphologically indistinguishable from those of *E. histolytica*. By feeding experiments on kittens the cysts in one of these cases were proved to be pathogenic.

7. Studies in Treatment of Malaria.—Twenty-two cases of malaria were treated by intravenous injection of tartar emetic. The solution used for injection was 2 per cent. tartar emetic in water containing 0.5 per cent. phenol. All these patients had parasites (trophozoites and gametes) in their blood on the day treatment commenced. The individual injections varied from 5 to 15 cg., and the total amounts from 15 to 67.5 cg. The initial dose was 5 cg. in seven cases, 7.5 cg. in one, and 10 cg. in two; in subsequent injections the dose was increased to 10 cg. or 15 cg. Thus in eight of the ten cases a larger amount was given than that (32 cg.) employed by Rogers, and both the initial and the maximum doses were also larger. Not only did the course of the treatment fail to clear the parasites (trophozoites or gametes) from the cutaneous blood, but in six patients the rigors continued and the condition became so serious that the authors were compelled to resort to the administration of quinin. In striking contrast to the failure of antimony either to control the fever or eradicate the parasites from the peripheral blood in these six cases, was the action of quinin, after the administration of which, in every instance, the febrile paroxysms ceased abruptly, and parasites, both trophozoites and gametes, disappeared from the cutaneous blood. In none of eight cases of malignant tertian malaria in which gametes were present on the day treatment began did the injections cause them to disappear from the peripheral blood. In one of two cases in which they were not present on the first day of treatment they made their appearance two days later, while in the other they appeared on the fifth day after treatment ceased.

8. Intramuscular Injections of Quinin Bihydrochlorid in Simple Tertian Malaria.—The authors found that in cases of simple tertian malaria an intramuscular injection of quinin bihydrochlorid, 15 grains in 2 c.c. of water, on each of two consecutive days causes the cessation of febrile paroxysms of simple tertian malaria and effects the disappearance of all stages of the parasite from the cutaneous blood. The action, however, is only temporary, a relapse occurring within two or three weeks.

Archives of Radiology and Electrotherapy, London

July, XXII, No. 2

- 9 Case of Traumatic Dislocation of Right Half of Pelvis. C. H. S. Webb.—p. 33.
- 10 *Skin Ink. N. S. Finzi.—p. 38.
- 11 Simple Method of Localization of Foreign Bodies. J. S. Young.—p. 40.
- 12 Roentgen Observations on Duodenum, with Special Reference to Lesions Beyond First Portion. J. T. Case.—p. 41. (Continued)

10. Skin Ink.—The following formula is given by Finzi: acid pyrogallol, 1 gm.; acetone, 10 c.c.; liquor ferri perchlor. fortior, 2 c.c.; spiritus vini meth. ad, 20 c.c. The solution is best kept in a bottle with a camel's hair brush attached to the cork. The mark is a brownish-gray at first, but after a few hours turns a brilliant black. It is unaffected by iodine, acetone, ether soap, etc. It can be scrubbed with a nail brush and ether soap two days after it is made without being completely removed.

British Journal of Tuberculosis, London

July, XI, No. 3

- 13 Shakespeare's References to Consumption, Climate and Fresh Air. St. C. Thomson.—p. 95.

- 14 Tuberculous Soldier. G. S. Woodhead and P. C. Varric-Jones.—p. 99.
15 *Delayed or "Latent" Tuberculous Infection. S. Delcpine.—p. 107.
16 *Value of Arneth's Leukocyte Count in Pulmonary Tuberculosis. F. E. Taylor and H. Wilson.—p. 112.
17 Sanatorium Market Garden Colony. N. D. Bardswell.—p. 119.
18 Observations of Tuberculous Patient. H. H. Barnes.—p. 124.

15. **Delayed or "Latent" Tuberculous Infection.**—In the experiments referred to by Delepine, the period of latency did not exceed three or four weeks, but it was sufficiently long to reveal an aspect of infection processes which must be of great importance, more especially in relation to latent infections. The fact that tubercle bacilli were still living and capable of a modified pathogenic action after being kept for nearly 500 days in a natural tuberculous product (milk), supports the view that under certain circumstances tubercle bacilli are still infective after remaining dormant for a considerable period of time.

16. **Value of Arneth's Leukocyte Count in Pulmonary Tuberculosis.**—The following practical conclusions may be drawn from Taylor and Wilson's observations: Where there is much leucodeviation no great permanent benefit may be anticipated from treatment beyond a prolongation of life. Should leucodeviation be absent, even with an extensive lesion, the probability is that the disease will progress to chronicity. There are cases where an active process with leucodeviation may develop into a smoldering fibrosis with improvement in the leukocyte count, and this process seems to be favored by the administration of tuberculin. An investigation of the nuclear condition of the leukocytes by Arneth's method can render valuable aid in prognosis.

British Medical Journal, London

July 21, II, No. 2951

- 19 Clinical Organization of Medical Profession. C. O. Hawthorne.—p. 69.
20 *Antiseptic Properties of Acriflavine, Proflavine, and Brilliant Green. C. H. Browning, R. Gulbransen and L. H. D. Thornton.—p. 70.
21 Medical and Surgical Notes from Mesopotamia. G. G. Turner.—p. 75.
22 Case of Aeholurie Jaundice. W. H. McKinstry.—p. 79.

20. **Antiseptic Properties of Acriflavine, Proflavine and Brilliant Green.**—These compounds were investigated by the authors and they found that flavine compounds and brilliant green are antiseptics which exert a slowly progressive bactericidal action. Concentrations of these substances which at first inhibit and finally kill bacteria, are without harmful effect on phagocytosis or on the tissues locally or generally; hence, they are specially suited for therapeutic purposes in infected wounds. Flavine compounds may be applied to the peritoneum with safety. Flavine compounds (acriflavine and proflavine) are enhanced in their bactericidal potency by the presence of serum; brilliant green, in common with most other antiseptics, is reduced in its activity by serum. When the antiseptic is inactivated by serum, frequent renewal of the water solution is indicated; this, of course, is only permissible provided that the substance is not in itself toxic. Brilliant green satisfies the requirements for application by repeated irrigation, as a powerfully bactericidal solution (1:2,000) in water is practically innocuous to the tissues. On the other hand, since flavine compounds are most bactericidal in serum, the indication is to arrange the wound dressing so that these antiseptics may act in a serum medium; also, since these bodies are not rapidly thrown out of action by serum accumulative deposit should be prevented by avoiding too frequent additions of considerable quantities of the antiseptic solution. Clinical experiences have substantiated these conclusions, and the evidence at disposal points to the application of flavine bodies by means of gauze packing or some appropriate modification of this procedure as likely to yield the best results. Thus there is evidence that, by taking full advantage of the properties of flavine bodies, a relatively simple technic may be followed. The application of the flavine compounds especially for the purpose of preventing the onset of septic manifestations in early wounds is emphasized; also their use for preventing exacerbations after operating in areas already infected.

Dublin Journal of Medical Science

March, CXLIII, No. 543

- 23 Fractures and Fraeture Dislocations. J. S. M'Ardle.—p. 153 (Continued).
24 Theory of Body Temperature. J. M. O'Connor.—p. 160.
25 Continuous Surgical Laparotomy Sponges. W. J. Smyly.—p. 165.
27 Case of Abscess of Tongue. D. Hennessy.—p. 192.
28 Recollections of Centro-Continental Holiday. J. Knott.—p. 193.

April, CXLIII, No. 544

- 29 Nephritis. W. Boxwell.—p. 225.
30 Bone Grafting for Pott's Caries. W. I. de Wheeler.—p. 232.
31 *Case of Enteric Fever with Hyperpyrexia. H. C. Drury.—p. 237.
32 Place of Curare in Treatment of Tetanus. J. S. M'Ardle.—p. 239.
33 Acute Aleoholie Pancreatitis. W. St. C. Symmers.—p. 244.
34 Shell Shock. C. P. Smyly.—p. 247.
35 Operative Treatment of Fixed Backward Displacement of Uterus. A. Smith.—p. 257.

May, CXLIII, No. 545

- 36 High Explosives. T. N. T.: Its Toxic Action in Munition Workers. Detection of T. N. T. in Urine, with Experiments. W. G. Smith.—p. 289.
37 Tetanus. J. S. M'Ardle.—p. 298. (To be continued.)
38 Limitations of Vaccine Treatment. R. J. Rowlette.—p. 306.
39 Burns and Sealds as Cause of Child Disablement and Death. J. Moore.—p. 313.

June, CXLIII, No. 546

- 40 Case of Intrathoracic Lymphosarcoma. G. E. Nesbitt.—p. 353.
41 Tetanus. J. S. McArdle.—p. 355. (Concluded.)
42 Influence of Environment on Morphology of Acne Bacillus. W. M. Crofton.—p. 364.
43 Typhoid Fever, with Special Reference to Its Early Diagnosis. W. F. Wicht.—p. 366.
44 Nephritis After Burns. J. Moore.—p. 375.

July, CXLIV, No. 547

- 45 Fevers Among Troops in Egypt. T. G. Moorhead.—p. 1.
46 Fractures and Fraeture Dislocations. J. S. McArdle.—p. 21. (Concluded.)
47 *Tuberculosis on Virgin Soil. H. T. Marrable.—p. 25.

31. **Case of Enteric Fever with Hyperpyrexia.**—This case is of special interest in several points: (1) The acute onset with continuous high temperature—103 to 104 F. from the evening of admission, which was apparently the sixth day of disease, till it terminated; with a fatal exacerbation on the tenth day to 107.6 F.; (2) The diagnosis of enteric positively supported by the atropin test without delay and with great ease; (3) the appearance of "delirium ferox," which appears to be a very fatal symptom in this disease; (4) the confirmation of the diagnosis by postmortem examination, where the intestinal lesions were seen in an unusually early stage.

47. **Tuberculosis on Virgin Soil.**—Up to 1900, pulmonary tuberculosis was unknown in Central Persia, a plateau varying from 4,000 to 6,000 feet. About the year 1900 it appeared among the Armenians of Julfa, a village two miles from Ispahan, being introduced into that community by an Armenian merchant who had lived in India. Two years later it appeared among the Mohammedans in the town of Ispahan. Between the years 1900 and 1908 over 100 cases were seen and treated in Ispahan. Two facts stand out with regard to these cases: first, the rapidity of the disease; rarely did it last more than six months; never more than one year; secondly, the mortality: all died. In 1908 treatment with tuberculin was commenced. Up to the end of 1914 close on 500 patients had been treated by this method. The average time occupied by the treatment was six months. The preparations used were tuberculin bouillon filtrate bovine (P. T. O.), old tuberculin bovine (P. T.) and old tuberculin human (T.). The first dose administered was rarely larger than 0.0001 c.c., P. T. O., and this was increased until the patient was able to tolerate 1 c.c. T. The treatment was then stopped; test injections of 0.5 c.c. and 1 c.c. T. being given once every three months for the first year, and once every six months for the next two years. If at the end of three years no reaction had taken place, the case was considered cured; if reactions occurred, a second and sometimes a third shortened course of treatment was given. Forty per cent. were alive and well three years after the last reaction to a large dose of tuberculin. In 20 per cent. of the cases the treatment was found unsuitable, and discontinued; the remainder of cases were lost sight of. Previous methods of treatment had proved a complete failure, and in consequence tuberculin was tried in cases which could not be considered favorable, such as mixed infection; hence, the results are encouraging.

Glasgow Medical Journal

July, LXXXVIII, No. 1

- 48 Two Cases of Subdural Hemorrhage Due to Injury Without Fracture of Skull. J. H. Teacher.—p. 1.
49 Acute Cystitis. A. G. Faulds.—p. 7. (Concluded.)

Indian Medical Gazette, Calcutta

June, LII, No. 6

- 50 Tour of Instruction. G. G. Giffard.—p. 185. (Continued.)
51 Quarantine Station of Tor. N. Davis.—p. 197.
52 New War Splint for Fractured Femur. J. A. Shorten.—p. 201.
53 Accidental Suffocation: Important from a Medicolegal Point of View. M. N. Ghelani.—p. 204.

Sei-I-Kwai Medical Journal, Tokyo

July, XXXVI, No. 7

- 54 Third Report on Action of Urea on Tetanus Toxin. H. Sewaki and Y. Tagami.—p. 53.
55 Case of Cerebrospinal Meningitis Caused by Fränkel's Pneumococcus. T. Nomura.—p. 65.

Journal of Tropical Medicine and Hygiene, London

July 16, XX, No. 14

- 56 Tropical Diseases Met with in Balcanic and Adriatic Zones. A. Castellani.—p. 157. (To be continued.)

Lancet, London

July 21, II, No. 4899

- 57 *Treatment of Amebic Dysentery with Emetin Bismuth Iodid. W. Waddell, C. Banks, H. Watson and W. O. Redman King.—p. 73.
58 *Effect of Trinitrotoluene on Blood. P. N. Panton.—p. 77.
59 War Surgery in Serbia: Penetrating Wounds of Abdomen. F. Armstrong.—p. 82.
60 Trench Fever. E. R. Grieverson.—p. 84.
61 *Premeningitic Rash of Cerebrospinal Fever. C. P. Symonds.—p. 86.
62 Purpuric and Cerebral Symptoms Occurring in Defervescence of English Measles: Two Fatal Cases. T. Goodard Nicholson.—p. 87.
63 Case of Recovery After Thrombosis of Superior Vena Cava. M. I. Hounsfeld.—p. 87.

57. Treatment of 102 Carriers of Amebic Dysentery with Emetin Bismuth Iodid.—Waddell and his associates found that emetin bismuth iodid is much more effective than emetin hydrochlorid in the treatment of carriers of *Endameba histolytica*, but about 20 to 25 per cent. of failures may occur. The intensely irritating properties of the drug in many cases are a drawback in its general application. It is advisable to keep cases under observation for not less than fourteen days after treatment, and to examine them not less than four times during that period if relapses are to be detected. The drug is without appreciable effect on the intestinal flagellates, but has an effect, usually temporary, on *Endameba coli*.

58. Effect of Trinitrotoluene on Blood.—Panton's experimental work is not yet concluded, but his results are for the most part negative. Large doses, up to a gram, of T. N. T. dissolved in toluol can be given to rabbits without any serious effect. Injections of dinitrobenzol were similarly harmless. Nitrous oxid gas given to rabbits and white rats gave rise to cyanosis, drowsiness, and a yellow staining of the fur, but to no other ill effects. If the percentage of nitrous oxid gas in the fume chamber was allowed to rise too high respiratory distress resulted, and in one or two instances dyspnea remained for several days, but in no case was sufficient of the gas given to produce a fatal pulmonary complication. The animals, even with small quantities of the gas, showed cyanosis and gave a positive Haldane test in the blood. Neither jaundice nor anemia was induced in any instance.

61. Premeningitic Rash of Cerebrospinal Fever.—In three cases of cerebrospinal fever Symonds observed this erythematous rash; it was in each instance observed very early after the onset, and before there were any symptoms of meningitis to suggest the diagnosis. In one case where the patient was under observation from the onset, there was a profuse rash to be seen six hours later, which had disappeared four hours after it had first been observed. In the second case the erythematous rash was present twelve hours after the onset and had almost disappeared six hours later. In the third case the probability is that there was primarily a local meningococcal infection of the throat and nasopharynx, and that this became a general infection after the patient's admission to hospital. Probably, therefore, in all three cases the rash had made its appearance and faded away within twenty-

four hours of the onset of the general infection, and it was a striking feature of each case before meningeal symptoms suggested the diagnosis.

Annales de Médecine, Paris

May-June, IV, No. 3, pp. 229-376

- 64 *Localization of Nerve Centers by Effects of Skull Wounds. (Topographie cranio-cérébrale.) P. Marie, C. Foix and I. Bertrand.—p. 229.
65 Graphic and Radioscopic Study of Congenital Disease of the Heart; Five Cases. (Les syndromes infundibulaires.) E. Lenoble.—p. 250. (See title 74 below.)
66 *Vegetating and Suppurating Dermatitis. H. Gougerot and Clara.—p. 279.
67 Histologic Injury of the Spinal Cord from Concussions. (Com-motion de la moelle épinière.) J. Lhermitte.—p. 295.
68 Typhoid and Paratyphoid in the Vaccinated and Nonvaccinated. P. Pagniez and P. V. Radot.—p. 308.
69 *Graphic Record of Reflexes. (La myographie clinique.) A. Strohl.—p. 315.
70 *The Intra-Ocular Arterial Pressure. P. Baillart.—p. 329.
71 Fasting in Treatment of Diabetes Mellitus. N. B. Potter (New York).—p. 341.

64. Localization of Brain Centers in Men with Skull Wounds.—Marie, Foix and Bertrand here amplify their previous communications on the uniformity of the symptoms that accompany injury of certain parts of the skull. In their total 400 cases of skull wounds they found only two skulls so steeple-shaped that their outline chart did not apply. They give illustrations showing the regions of the skull where any moderate wound of the skull caused a certain set of symptoms, uniform in all. The findings confirmed with precision the already known data, and have added much that was new to the list. A severe and deep lesion is necessary to induce hemiplegia. Monoplegia may develop as paralysis of both legs or of one arm, or as a paretic state of the face, the motor centers for these ranging downward from the top of the ascending frontal convolution. The center for the legs is on the median line of the skull, at right angles to it, touching a vertical line from the posterior margin of the mastoid. The lesion thus straddling the median line explains why the crural monoplegia affects both legs as a rule. With monoplegia of leg or arm, the tendon reflexes were inclined to be exaggerated, the automatic weakened, which seemed to be a favorable omen. The lower portion of the ascending frontal convolution did not seem to preside over any motor phenomena; and nothing short of deep destructive lesions in the anterior frontal region entailed serious disturbance. In two cases of this type there was an abscess in this region and the mind worked torpidly, the memory was impaired, and the speech very slow and scanning, with stammering or rather repetition of syllables in one case.

66. Parasitic Vegetating Dermatoses.—Gougerot and Clara describe what seems to them a new form of a vegetating, suppurating skin affection. It involved nearly the whole body of the previously healthy man of 45. He worked in a foundry in France, and in a few months the affection had spread practically over the entire body, the maximum on the head and legs. The affection developed in four waves, and it was conquered by local treatment with petrolatum containing 5 per cent. camphorated naphthol. On account of the resemblance to American mycosis the man was given potassium iodid, and arsenic on account of the resemblance to Brazilian leishmaniosis. No germ unmistakably of causal import could be isolated, but the parasitic nature of the trouble was manifest. It seems, they say, to be a new type in the great group of parasitic verrucous and vegetating dermatoses.

69. Graphic Registration of Tendon Reflexes.—Strohl has been applying in the clinic the delicate electric instrument devised to record the reflex movement in the knee-jerk, ankle clonus, etc., in experimental physiology. He gives an illustrated description of it and reproduces tracings to show the ease, simplicity and reliability of the procedure while in examining large numbers of men or the same patient at different times, this clinical myography introduces unprecedented precision into the data obtained.

70. Intra-Ocular Arterial Pressure.—Baillart has been examining the retinal artery in fifty persons between 25 and 47, increasing the natural pulsation by light pressure on the eyeball through the eyelid. He comments on the remarkable

fact that the resulting transient total loss of vision has not been regarded as of particular moment in the research done in this line with the oculocardiac reflex, etc. A black curtain, starting from the nose, spreads out over the visual field for ten or fifteen seconds. The interval before the blindness becomes total varies in different persons; possibly the rapidity of the blood flow may influence it. The practical side of the research reported is the suggestion that possibly the pressure in the retinal arteries may prove illuminating as to the pressure in the cerebral arteries so close at hand, rather than by estimating the pressure from the distant radial artery. In any event, he says, it is a new application of sphygmomanometry.

Bulletin de l'Académie de Médecine, Paris

July 10, LXXVIII, No. 28, pp. 13-24

- 72 *Treatment of Suppuration in the Pleura. T. Tuffier.—p. 16.
73 Dry Hypochlorite and Boric Acid Treatment of Chronic Otitis Media. A. Pognat (Geneva).—p. 19.
74 Frequency of Changes in the Infundibulum of the Pulmonary Artery with Congenital Heart Disease. E. Lenoble.—p. 19.
75 Advantage of Farm Labor Camps for Soldiers Temporarily Disabled by Malaria. E. Jeanselme.—p. 21.

72. **Treatment of Intrapleural Suppuration.**—Tuffier has now a record of twenty-two old chronic cases and twenty-two quite recent cases of intrapleural suppuration, all confirming the benefit from clearing out the focus and closing it as soon as possible, watching over the microbes in the lesion, and sterilizing with neutral solution of chlorinated soda or its equivalent, closing the opening as soon as the pleural cavity is clinically sterile, thus transforming a pyothorax into a pneumothorax which heals spontaneously. In his later series of recent cases, there were ten of medical purulent pleurisy and two of suppurating hemothorax. One was a girl of 14 with purulent pleurisy after six weeks of ordinary pleurisy. Five days after pus was found, he resected a rib and evacuated over a liter of pus from the pleura. No adhesions were evident. The pleura was sterilized by the Carrel method, and the pneumococcus curve and the temperature curve kept parallel. The operative wound was sutured the tenth day, and by the twenty-fifth day recovery was complete, the lung functioning normally, as is evident on radiology. In another, a streptococcus case, over a liter of pus was evacuated and, soon after, a second liter after resection of the seventh rib. Under Carrel treatment the opening was closed in a month and the lung soon recuperated entirely. Fourteen cases of suppurating wounds of the pleura have run the same uneventful course to recovery under these measures in another ambulance. It is evident that the penetration of the air into the pleura is the great obstacle to the expansion of the lung, and hence to complete recuperation. But the air cannot be kept out safely until the cavity has been rendered sterile. In short, he concludes, with these simple means we have it in our power to prevent purulent pleurisy from becoming chronic. By healing it before serious damage has been done, the lung behaves like a normal lung thereafter.

Lyon Chirurgical

May-June, XIV, No. 3, pp. 413-624

- 76 Extraction of Foreign Bodies in the Mediastinum; Ten Cases; Recovery. Patel and Papillon.—p. 413.
77 *Anatomic Localization of Projectiles by Orthoradiology. J. Coste.—p. 441.
78 *Probe with Resonator Attachment. J. Stefani.—p. 476.
79 Spinal Anesthesia in Two Hundred Cases. G. Leclerc.—p. 479.
80 Postoperative Treatment of Wounds. J. Cocci.—p. 489.
81 *Muscular Osteomas. A. Policard and B. Desplas.—p. 497.
82 *Restoration of Severed Nerves. E. Duroux and E. Couvreur.—p. 515.
83 *Gas Gangrene. E. Vincent.—p. 539; G. Leclerc.—p. 578.
84 Tetanus Restricted to Region of Wound. S. Colombino.—p. 586.
85 Amputation of the Thigh; Forty-Six Cases. A. Chalier.—p. 591.
86 *Prostheses Among the Ancients. H. Branchu.—p. 608.
87 War Wound of the Ankle, with Recovery of Function. J. Kocher.—p. 623.

77. **Orthoradiology for Locating Projectiles.**—Coste expatiates on the instructive findings in locating a foreign body by the principle of displacing the tube at regular intervals and taking parallel views from front to rear and from side to side. The vertical rays alone are utilized in orthoradiology, the diverging rays being shut off by a very narrow diaphragm.

He gives eighteen diagrams or views thus obtained. No special instruments are required.

78. **The Stylophone Vibrator.**—This is the name given by Stefani to his combination of a metal probe and vibrating resonator. The touch of the probe against the particle of metal can be both felt and heard by this means.

81. **Osteomas in Muscles after War Wounds.**—In the two cases of which an illustrated description is given, the circumscribed ossification proceeded rapidly in the connective tissue, the muscles being invaded only secondarily. The osteomas displayed some tendency to retrogress later.

82. **Section and Suture of Nerves.**—The eight experimental sections of the sciatic and external popliteal nerves on dogs that are described were followed by repair, and the motor functioning was very little impaired. Similar injury in man induces pronounced paralysis. The experimental and clinical experiences related emphasize the importance of early suture after a nerve is severed. In the five clinical cases the ends were coaptated as an electrician splices a cable. This restores the nerve to a certain extent and trophic disturbances are materially improved by it, but this is probably merely the result of the freeing of the ends of the stumps from cicatricial and edematous tissue. The axis cylinder does not regenerate for a long time, progressing only about 1 mm. a day. In one of the cases the distance from the injury to the tip of the fingers was about 620 mm., and it took 630 days for complete return of functioning.

83. **Gas Gangrene.**—Vincent reports forty cases of gas gangrene developing after the men had been sent back from the front, their war wounds apparently well on the road to healing. Over 28 per cent. of the men died. They had been wounded at different parts of the war zone, the majority from Lorraine. In twenty-two of the cases an extensive operation or amputation was done, but thirteen died and three of the others treated with minor surgical measures. He laments that the fatalities were unmistakably traceable to the delay before the men got the proper surgical treatment, owing to lack of men with surgical training or lack of advanced operating posts. Vaccine therapy seems to have a future in these cases; he is confident that the recovery of one of the men was materially promoted by antistreptococcus serum. Weinberg insists that the vaccine must be autogenous and total, and be administered immediately. He makes the vaccine with the centrifuge sediment from the serous fluid aspirated from the recesses of the wound. Lumière found staphylococci, septic vibrios, the perfringens and the Nicolaier bacillus on projectiles by the seventh to the eightieth days when they had entirely and apparently harmlessly healed in the tissues. This confirms the danger of rousing slumbering tetanus and gas gangrene germs in a secondary operation. It also confirms the advantage of immediately removing the foreign body always as a routine measure.

86. **Prostheses Among the Ancients.**—Branchu gives twenty-three illustrations of various devices to correct deformity, from Hippocrates' day down through the sixteenth century. The earliest are sets of ivory teeth that were fastened to sound teeth with gold wires. Another early device is an artificial eye made to fit in place by cupping suction, with a flexible metal support hidden in the hair. Masks with minute openings opposite each eye were used to correct squint. Other illustrations show artificial ears, noses and plugs for cleft palate. The latter were combinations of sponge and metal plate. The sponge was introduced dry; as it swelled it sustained the metal plate against the roof of the mouth. Another device worn in the mouth after loss of the tongue permitted some attempt at speech.

Paris Médical

July 7, VII, No. 27, pp. 1-44

- 88 *Difference Between the Results of Injury of Nerve Centers in Peace and in Wartime. J. Camus.—p. 1.
89 *Treatment of Wounds of Nerve with Much Loss of Substance. P. Mauclair.—p. 6.
90 *Spinal Cord Trouble from Concussion of the Spine from a Distanc. H. Claude and J. Lhermitte.—p. 11.
91 Psychology of Simulation. Laignel-Lavastine and P. Courbon. p. 14.

- 92 Visual Hallucinations and Jacksonian Attacks After Injury of the Occipital Lobe. P. Lereboullet and J. Mouzon.—p. 19.
 93 The Psychic Disturbances After Shell Shock. (Les commotionnés.) R. Charon and G. Halberstadt.—p. 23.
 94 Defective Restoration of Motor Nerve Fibers. André-Thomas.—p. 33.
 95 Isolation and Reeducation of the "Functionally Wounded." Massacré.—p. 38.

88. **The Neurology of Peace and War.**—This issue of the *Paris Médical* is devoted to various neurologic questions clamoring for solution. Camus relates that time has demonstrated that in many cases of supposed irreparable paralysis and other nervous affections from war wounds, great improvement has been gradually realized. But for those with paraplegia, eschars and sphincter trouble, or hemiplegia or contracture with frequent epileptic seizures, special provision must be made. He discusses this in detail, and the functional and professional reeducation of these *grands infirmes du système nerveux*. He reiterates that they do not belong in the surgical services, and they cannot be sent home, as without specialized care complications would soon develop, but they should be near their families, and their quarters should be made as homelike and attractive as possible. Their future depends on the care and encouragement they receive now, and astonishing cures may be possible.

89. **Treatment of Nerves with Much Loss of Substance.**—Mauclaire has used the trachea from chickens and geese as a tubular sheath slipped over the stumps of the nerve to serve as a guide for their regenerating fibers. He here gives an illustrated description of this and other means for bridging a long gap as practiced by himself and others. Unfortunately the variety of the technics is not paralleled by the excellence of the results. This is due to the fibrous neuritis which accompanies war wounds and often is tantamount to a section of the nerve. The first step, therefore, with any technic is to clear away all fibrous tissue from the ends of the nerve.

90. **Spinal Cord Lesions from Indirect Injury.**—Claude and Lhermitte show that besides the injury of the spinal cord from a shell explosion near by, without local traumatism, and those from direct concussion of the spine, similar injury may be induced by a projectile striking soft parts at a distance, the chest walls or the muscles near the spine.

Presse Médicale, Paris

July 9, XXV, No. 38, pp. 385-400

- 96 *Association of Reflex Nervous Disturbances with Hysteria in the Wounded. (Troubles physiopathiques d'ordre réflexe.) J. Babinski and J. Froment.—p. 385.
 97 *Extraction of Projectiles in the Pelvis Through Posterior Wall. Auvray.—p. 386.
 98 *Rebuilding the Face. (Autoplastie de la face suivant la méthode Moure.) P. Piétri.—p. 388.
 99 *Gas Gangrene. A. Chalié.—p. 390.
 100 *Emetin Bismuth Iodid in Treatment of Amebic Dysentery. A. Leboeuf.—p. 391.
 101 *Resection of Auriculotemporal Nerve in Treatment of Parotid Fistulas. L. Dieulafoy.—p. 392.
 102 Intraspinal Anesthesia. V. Pauchet.—p. 394.

96. **Reflex and Hysterical Nervous Disturbance in the Wounded.**—Babinski and Froment admit a reflex element in certain motor nervous disturbances in the wounded, but say that this does not last. Its place may be taken, however, by a hysterical contracture, so that treatment for hysteria may ultimately cure when at first it had no effect on the nervous trouble.

97. **Access to the Pelvis from the Rear.**—In the three cases described, Auvray removed a scrap of shell in the posterior wall of the rectum or close to the sacrum or the bladder, through an opening made in the sacrum. The gluteus muscle was divided lengthwise of its fibers and then they were cut across. There has been no disturbance in the gait or functioning of the muscles since. This mode of access has several advantages in such cases.

98. **Reconstructing the Face.**—The photographs "before and after" show the excellent result of the application of Moure's method of autoplastics. He utilizes the subjacent adipose tissue to pack the depressions, turning it over by the Indian technic. The actual loss of the soft parts is generally small, even when the deformity is considerable, and it is usually possible to reconstruct the face satisfactorily from what is

left after the wound has entirely healed. A course of hot air and massage are given first to loosen up the tissues.

99. **Gas Gangrene.**—In Chalié's 108 cases of true gas gangrene, it developed within twenty-four hours in 16 per cent., not until the third or sixth days in 18 per cent., but in all before the week was out. The wounds were all on the limbs, generally the legs, and always with great laceration of muscles. In 74 cases conservative measures were applied and proved successful in over 55 per cent. of the 52 cases which did not compel amputation later. This group included 27.3 per cent. of 22 of the diffuse form. The conservative measures were deep and extensive electric cauterization (*pointes de feu*), and interstitial injection of hydrogen dioxide after extensive excision of all affected tissues.

100. **Emetin Bismuth Iodid in the Treatment of Amebiasis.**—Leboeuf has been giving a trial to emetin and bismuth iodid in treatment of amebic dysentery, and thinks that this compound is more regularly effectual than emetin alone. The latter is liable to be eliminated before it has had a chance to do all its work. In the ten cases reported the men took 0.18 gm. of the iodid daily for twelve days, and the ameba and cysts disappeared completely from the stools.

101. **Nerve Resection in Treatment of Salivary Fistula.**—Dieulafoy has resected the auriculotemporal nerve in treatment of rebellious fistulas in the parotid gland in five cases. In two the operation had to be done in the midst of cicatricial changes. This arrested the secretion of saliva, and the fistula healed as the irritation from the saliva ceased. In two cases the healing was hastened by cauterizing which previously had had no effect.

Correspondenz-Blatt für Schweizer Aerzte, Basel

July 7, XLVII, No. 27, pp. 849-880

- 103 *The Movements of the Eyes Induced by Tests Applied to the Ears. J. Stähli.—p. 849.
 104 The Origin and Nature of the Roentgen Rays. M. Steiger.—p. 860.
 105 *Vacuum Bottles as Receptacles for Milk. von Bergen.—p. 870.
 106 *Suicides from Poison. J. R. Spinner.—p. 872.

103. **Labyrinthine Ophthalmostatics.**—Stähli remarks that in a few years the centennial of the discoveries by Flourens in the field of vestibular physiology can be celebrated. But only comparatively recently has medicine sought to utilize the data thus presented so long ago by the physiologists. Bárány the otologist and Bartels the ophthalmologist have contributed much in this line, and all within the last ten years. The ear-eye movements are observed almost throughout the whole animal kingdom, Stähli recalls, even in invertebrates. There is quite a literature on the ear-eye movements in crabs. He describes the physiologic mechanism and the various features of vestibular nystagmus, the caloric reactions, etc. With rotation nystagmus there are always two phases, a slow and then a rapid phase. The latter does not appear in the unconscious, the prematurely born and in others with defective brain action. This seems to indicate that the ear is responsible for the first phase alone; the second phase is the work of the brain. The nystagmus can be induced by only slight rotation, not more than for a few degrees. These ear-eye movements have proved most instructive in otology to date, the caloric and rotation tests demonstrating whether or not the vestibular apparatus is intact. Neurology also depends on these tests for diagnosis of intracranial tumors, ocular paralysis, etc. Certain features of miners' nystagmus indicate that influences from the ear are important if not the exclusive factors. The nystagmus of the blind is entirely involuntary, and ear influences are probably at work here also. In Stähli's practice at Zurich he has encountered many cases of tremor of the eyes or pronounced nystagmus in apparently entirely healthy persons. The nystagmus was horizontal in some, rotary in others, and vertical in a few. This nystagmus used to be ascribed to difficulty in fixation during early childhood, with more or less defective vision, but now we regard the ear as responsible for it. This is the more probable as examination shows normal conditions in the eyes as the rule. Recent research has indicated further that for certain forms of squint the ear must be incriminated. In short, these "labyrinthine ophthalmostatics" offer a new and interesting

field for further study by physicians as well as by eye and ear specialists.

105. **Vacuum Bottles for Keeping Milk Warm.**—Bergen warns that milk kept warm in a vacuum bottle is an excellent culture medium for germs, all the conditions favoring proliferation of germs in the milk. If a vacuum bottle is used, the milk should be poured in boiling hot; this will help to keep it properly.

106. **Suicides with Poisons.**—Spinner cites statistics in Switzerland which show that suicides from poison are more numerous among male than among women suicides. Of the total 474 poison suicide cases in Switzerland during the last ten years, 56.1 per cent. were men and only 43.9 per cent. women and girls. He urges compilation of data as to the kind of poison and other features of the cases as a basis for prophylaxis. He cites as typical of what can be accomplished, the complete disappearance of phosphorus poisonings of all kinds since phosphorus matches are no longer used.

Gazzetta degli Ospedali e delle Cliniche, Milan

June 3, XXXVIII, No. 44, pp. 649-663

107 *Special Features of Typhoid in the Italian Troops. F. Durant. p. 651.

June 7, No. 45, pp. 665-672

108 *Meningococci in the Blood. G. Raffaelli.—p. 665.

109 Hemiplegia from Cerebral Embolism Following Bullet Wound of Internal Carotid. C. Frugoni.—p. 667.

107. **Typhoid in the Troops.**—Durant describes the special features which distinguish typhoid in the camp environment, as modified by vaccination, etc., in 215 cases. He regards the diarrhea as a defensive process, and reenforces it by giving daily 20 gm. glycerin by the mouth, in a liter of water. This has nourishing value, he says, besides that it facilitates the absorption of food and has a direct disinfecting action on the bacterial flora, and an indirect action, by means of the bile, on the biologic properties of the germs present in the intestines. Its cholagogue action is the most important, perhaps. The results of this treatment have been good in his experience; he has also had excellent results with vaccine therapy in addition.

108. **Meningococci in the Blood.**—Raffaelli declares that epidemic meningitis must be considered a meningococcus sepsis. The meninges are merely the most common seat of the metastases. In twenty-two cases described in detail they were found in the blood in all but two and in these cases only a single examination was made. He thinks that the negative findings others have reported must be ascribed to the slight resisting power of these cocci; they die off before they get a chance to proliferate unless the culture is made directly from a vein. He urges that during epidemics the blood, rather than the nasopharyngeal secretions should be examined. This would disclose carriers much more reliably than with the usual measures, especially in case of children with fever from gastro-intestinal, visceral or joint trouble, purpura, etc. This might reveal hitherto overlooked links in the chain.

Policlinico, Rome

July 8, XXIV, No. 28, pp. 873-900

110 *Epidemic of Infectious Purpura among the Troops. F. Vannutelli.—p. 873.

111 Hemorrhagic Nephritis among the Troops. C. Bartolotti.—p. 879.

112 Operative Treatment and Cure in Case of Destructive Noma. L. Moncalvi.—p. 884.

113 *Improved Technic for Ligation of Popliteal Artery. S. Marinacci.—p. 888.

114 *Electrovibrator in Treatment of Digestive Tract. V. Maragliano.—p. 888.

110-111. **Purpura and Nephritis in Soldiers.**—Vannutelli says that when this hemorrhagic disease developed in epidemic form among the troops at the front, many regarded it at first as of factitious origin as the hemorrhagic manifestations were restricted almost entirely to the legs. After a prodromal period of eight or ten days, the symptoms resembling Werlhof's disease developed and recovery was not complete for from one to three months. The pulse was slow and pressure low, the spleen enlarged, but no blood or albumin in the urine as a rule. Treatment was with salicylates and epinephrin; the latter proved very effectual. He usually gave the

epinephrin by the mouth up to 90 or 100 drops daily of a 1:1,000 solution, and injected two 0.25 c.c. ampules of the same. The effect was most favorable when the epinephrin was given systematically for a long time, and especially by the subcutaneous route. He insists that it has a triple action, checking the tendency to hemorrhage, counteracting the intoxication by stimulating diuresis, while at the same time it exalts the organic defensive processes. The only men affected were those who had been long in the trenches. The early fall was the season of the epidemic, scarcely any cases being encountered after November 1.

Bartolotti has observed a number of somewhat similar cases only that the kidneys were affected more regularly. He incriminates the excess of proteins in the diet as this seems to be far beyond what is suitable for men unable to get exercise in the trenches.

113. **Improved Technic for Ligation of Popliteal Artery.**—Marinacci obtains access to the artery where it leaves the adductor to enter the lozenge-shaped popliteal space, reaching it through a vertical incision along the internal posterior margin of the tendon of the adductor longus, the knee semi-flexed. The artery is reached closer to the surface here and is more readily separated from the vein, than by the usual technic.

114. **The Electrovibrator in Gastro-Intestinal Differentiation.**—Maragliano has the subject ingest some magnetic iron and then he applies the electrovibrator to the outside. The palpating hand can readily locate the outlines of the organ containing the iron as the vibrations occur under the influence of the electric apparatus. The findings are most pronounced with the stomach, but even in the cecum it is possible to follow the iron in this way after ingestion of about 30 gm., and control the findings with roentgenography. It is possible that the vibration induced inside the organ by this means might have a direct curative action, a kind of internal massage.

Riforma Medica, Naples

June 30, XXXIII, No. 26, pp. 669-688

115 Treatment of War Wounds of Joints. S. Salinari.—p. 669. Continuation.

116 War Nephritis; Two Cases. L. Eustachio.—p. 674. To be continued.

117 *Spontaneous Muscle Sign of Tabes. A. Cominelli.—p. 677.

117. **Tendon-Muscle Twitching as Symptom of Tabes.**—Cominelli called attention nearly eight years ago to what he called muscle-tendon subsultus, a spasmodic jerking of the muscles as the patient stands erect, most marked in the region of the ankle. There does not seem to be any regularity or rhythm to the twitching, but it corresponds to the course of the tendons and is evidently a sign of spinal ataxia. He here reiterates its differential and pathogenic value, quoting from the literature on the subject of ataxia in general. A tracing is given of the subsultus taken with the eyes open and another with the eyes closed. The difference between them is pathognomonic of ataxic parakinesis. He has never found this sign absent in tabes, and says that it may even precede the motor symptoms.

Brazil Medico, Rio de Janeiro

June 9, XXXI, No. 23, pp. 193-200

118 Present Status of Diphtheria. R. D. de Sanson.—p. 193. Commenced in No. 22, p. 185.

June 16, No. 24, pp. 201-208

119 Intestinal Trichomonosis. R. da Silva.—p. 201.

120 *Puncture of Corpus Callosum. (Uma operação de Bramann.) C. Wallau.—p. 203. Commenced in No. 20, p. 168.

120. **Puncture of Corpus Callosum.**—Wallau reports the first operation by Bramann's technic done in Brazil. The patient was a girl of 14 who had lost the sight of one eye and the other was fast going—choked disk being already apparent—from some intracranial lesion. The corpus callosum was found at a depth of about 6 cm. The brain showed no sign of pulsation when the skull was opened, owing to the extreme compression to which it had been subjected, but after the corpus callosum had been punctured and about 10 gm. of a bloody fluid withdrawn, the pulse in the brain seemed to return to normal. The operation lasted not quite an hour

and the patient bore it well. Vision since has much improved. He reviews the literature on the subject, and compares the simple Bramann technic with the complicated measures otherwise necessary in certain cases of dangerous pressure on the brain. He declares it is a less serious intervention than lumbar puncture; no fatalities with it have been known, and he says there are no absolute contraindications. The operation has been done to date in seventeen cases of hydrocephalus; five of pituitary tumors; twenty-three of tumors or cysts in or near the ventricles; in two of nonpurulent meningitis, one of steeple skull and seventeen of epilepsy, besides numerous cases in which it was merely a preliminary to an operation.

Revista Clinica, Medellin, Colombia

June, II, No. 5, pp. 200-246

- 121 *Cancer in Colombia. J. B. Montoya.—p. 200.
- 122 *Reflex Therapy. B. Mejia.—p. 209.
- 123 Genital Prolapse. A. Castro.—p. 210.
- 124 Extra-Uterine Pregnancy. G. J. Gil.—p. 222.

121. **Cancer in Colombia.**—Montoya reports 168 cases of cancer in which he has operated in the last eleven years. The uterus was the seat of the malignant disease in 25 per cent., the stomach in 7.6 per cent.; the breast in 15 per cent. the upper jaw in 10 per cent. and the liver and penis in 2 and 3 per cent. Neoplasms have formed about 21 per cent. of all the 1,921 operations done in his service during the eleven years. Sarcoma in the legs is comparatively frequent, and grows very large, with early recurrence even after extensive resection. The parotid gland is frequently the site of huge mixed tumors, but they can be successfully removed without recurrence. He regards the electro-coagulation technic as the greatest progress of late in the treatment of accessible cancer, and reports a few cases to illustrate the fine results attainable even with inoperable malignant disease. In conclusion he lists the indications with different types of cancer, warning particularly that with large sarcomas mishaps from the anesthetic and shock from hemorrhage are very frequent. The patients with these large sarcomas are generally obese women with heart and kidney lesions. They should be given preliminary treatment or no operation should be attempted.

122. **Reflex Therapy.**—Mejia includes epidural injections and dilatation of the urethra among the weapons of reflex therapy. He here relates the successful application of epidural injections of sodium chlorid in the case of a man of 62 with a tendency to neurasthenia and slight enlargement of the prostate. He consulted the physician on account of impotency for the last few months. The epidural injections were painful and he refused further treatment after the second. A few days later, however, he returned for more, saying they had certainly improved him. Under six further injections entirely satisfactory results were obtained, and they have persisted during the three months to date. In two cases of irritable bladder and sudden retention of urine in women with a tendency to hysteria, dilatation of the urethra, under chloroform, put an end to all the disturbances.

Semana Medica, Buenos Aires

XXIV, No. 9, pp. 247-274

- 125 Typhoid in Northern Brazilian City (Rosario). J. B. Valdes.—p. 247.
- 126 Milk in Infant Feeding. E. Fynn.—p. 255.
- 127 *The Campaign against Alcoholism. E. R. Coni.—p. 259.
- 128 Lymphocytosis in Syphilitics. C. P. Mayer and A. C. Gourdy.—p. 269. Continuation.

127. **Progress of Hygiene in Argentina.**—This is one of the chapters of Coni's autobiography which is being published in serial form as a contribution to the history of public and social hygiene in the Argentine Republic. Coni has always taken a leading part in all such matters. His book is to be entitled "The Memoirs of a Medical Hygienist." His first address was on alcoholism. It was read before the Sixth International Medical Congress at Amsterdam, 1879; he was the delegate from Buenos Aires. He urged the necessity for treating habitual drunkards and extolled the institutions for the purpose in the United States, the only country said to have them at that time.

Siglo Medico, Madrid

June 30, LXIV, No. 3316, pp. 465-484

- 129 *Chronic Cystitis with Retention Treated with Iodin Fumes. P. Cifuentes.—p. 466.
- 130 *Treatment of Furuncles. E. Oyarzabal.—p. 468.
- 131 *Diathermy for Gonococcus Orchitis and Epididymitis. B. N. Canovas.—p. 469.
- 132 *Peptic Ulcer in Jejunum after Gastro-Enterostomy. L. Urrutia.—p. 470.
- 133 Present Status of Our Knowledge of Diabetes. N. Santos.—p. 479.

129. **Iodin Fumes in Treatment of Chronic Cystitis.**—Cifuentes gives the details of a typical case of chronic bladder trouble dating from gonococcus infection twenty-three years before. The present status included pain in perineum and hypogastrium with micturition frequent and painful but no hematuria or gravel. The prostate was somewhat enlarged, the urethra constricted, the capacity of the bladder 190 c.c. As all other treatment had failed to induce a permanent cure, Cifuentes applied the iodine fumes technic. The iodoform is placed in a spindle-shaped glass receptacle with an opening at the top and the open ends drawn out to permit a rubber tube to be slipped over each. As the iodoform is heated over an alcohol flame the fumes of iodine are pumped through a catheter into the bladder. (The method was described with an illustration in THE JOURNAL, 1912, 59, 488.) He made eight applications, using 0.05 gm. iodoform each time. By the third, marked improvement was evident. All the symptoms subsided and there has been no further trouble during the two months since. Tuberculous cystitis seems to be the special field for this method of local iodine fumigation, but it is valuable in all forms of cystitis, particularly old chronic cases. Cifuentes has had very gratifying results with it also in the rebellious cystitis accompanying an enlarged prostate. The only caution is to keep the amount of air injected within the capacity of the bladder, previously determined. The applications seem to be borne better in the nontuberculous cases.

130. **Treatment of Furuncles.**—Oyarzabal applies a mercurial salve at the first sign of a furuncle, and tries to abort it by touching the center with phenol or the actual cautery. He cuts the hairs in the region and cleanses with benzoin, and then applies a small piece of mercurial plaster and over this another of zinc oxid. He changes these once or twice a day, cleansing with benzoin. The whole region should be washed daily with hot water and a medicated soap. When the furuncle is once established and painful, he applies fomentations with a 2 or 3 per cent. hot solution of resorcin with 20 or 30 per cent. alcohol. As soon as the center shows pus or sloughing, he applies phenol on cotton wound on a toothpick, or heat. A Bier vacuum glass facilitates the cure; aspiration is applied for five minutes at a time, with pause for two or three minutes, keeping this up for three quarters of an hour or until blood comes without pain. If the skin is not much macerated it can be painted from time to time with iodine. When the region shows a tendency to develop furuncles it should be kept covered with a sulphur salve with ichthyol or cinnabar, and the region around be painted with iodine. In rebellious furunculosis an autovaccine sometimes has a surprisingly favorable action. Very large carbuncles require surgical measures.

131. **Diathermy for Gonococcus Orchitis.**—Canovas published over two years ago an account of the excellent results he had obtained with diathermy in treatment of gonorrheal arthritis. Since then he has applied it in seventy-three cases of orchitis and epididymitis of similar origin, and declares that diathermy surpasses all other known methods of treating such affections. For orchitis-epididymitis, he says it is the ideal treatment. Whether acute, subacute or chronic, it relieves the pain at once and cures it completely by the third or fourth application, and the patient does not have to stay in bed. The deep application of heat not only reduces the inflammation but kills the gonococci in the depths of the tissues. The technic is simple and cleanly, and as the cure is so rapid and complete the patient's genital functions are not permanently impaired.

132. **Peptic Ulcers.**—Urrutia reviews the literature on jejunal ulcer following gastro-enterostomy, and reports six cases from his own experience. In one an anterior gastro-enterostomy for duodenal ulcer put an end to the symptoms for ten days, but then others flared up, and in a month a tumor could be palpated in the epigastrium. With peptic ulcer after posterior gastro-enterostomy palpation is seldom possible. There was a tumor the size of a mandarin orange in one of his cases, but it could not be felt through the abdomen wall. In two of his cases the jejunum perforated into the colon. The diagnosis was unmistakable when this occurred. Polya in 1912 had compiled nineteen cases of this type. In one of Urrutia's cases the hyperacidity persisted almost unmodified after the gastro-enterostomy, and notwithstanding extreme care and most careful dieting a peptic ulcer developed in the jejunum. In his last three cases, one patient died in spite of a prompt secondary operation.

Grèce Médicale, Athens

XIX, No. 3, pp. 5-8

- 134 *Postoperative Eventration; Two Cases. G. dré Kolias.—p. 5. Commenced in No. 1, p. 1.
135 Treatment of Psoriasis. Queyrat. Commenced in No. 1, p. 3.

134. **Postoperative Eventration.**—In the first of the two cases described—in a woman of 45—the eventration had followed removal of a cystic ovary and the skin had ulcerated. The protruding intestines slid back into place as the woman reclined, but finally they burst through the skin and were in contact with the clothing for fifty-two hours. The rectus muscles had been so stretched that they could be drawn up to close the gap. He thinks that the eventrated bowel should be replaced if it has not become infected and is not covered with false membranes. In both cases he did this, and the wound healed by primary intention. The abdominal fluid lubricates and protects against infection as the saliva protects erosions in the mouth. A narrow corset, leaving the diaphragm free, is an excellent means of protecting against eventration in those with large paunches. The latter are prevalent in the near East as starchy foods are used a great deal, and much fluid ingested.

Kitasato Archives of Experimental Medicine, Tokio

April, I, No. 1, pp. 1-156

- 136 *On the Life Cycle of the Mite Carrier of Tsutsugamushi, Japanese River Fever. M. Miyajima and T. Okumura.—p. 1. In English.
137 Investigation of Therapy of Tuberculosis. K. Shiga.—p. 17. In English.
138 *Spirochetosis with Hemorrhagic Jaundice. R. Inada, Y. Ito and others.—p. 55. In German.
139 *Stain for Protozoa and Blood Corpuscles. T. Watabiki.—p. 153. In French.

The "Kitasato Archives."—This new publication issues from the Institute for Infectious Diseases founded by Kitasato in 1892 on his return from his work with Koch. It was founded as a private undertaking, but was transferred to the government for a time, 1899 to 1914, and is now again a private institution. The *Archives* are to be issued twice a year in English, French and German, aiming to bring Japanese medicine to the attention of the world.

136. **Mite Carrier of Tsutsugamushi Disease.**—"River fever" occurs endemically in certain parts of Japan and resembles somewhat Rocky Mountain fever and also typhus, but the transmitting agent seems to be a minute, yellowish red mite. This communication with its colored plates describes the life cycle of this hairy arthropod. It is said that the proper name for it should be *Leptus akamushi*.

138. **Icterohemorrhagic Spirochetosis.**—This article was reviewed when published elsewhere. See THE JOURNAL, Sept. 9, 1916, p. 842.

139. **Polychrome Stain for Protozoa and Blood Corpuscles.**—Watabiki relates that he has been studying for years to find the best formula for differential staining purposes, and describes here the technic which he has found most satisfactory. The tints are no deeper than with the Giemsa but the different parts of the cell show up more plainly. The nucleus, the spirochetes, flagella, and the chromatin of the malaria germ show up a reddish violet, while the bodies of trypanosomes, malaria germs and the protoplasm of the leuko-

cytes and other cells are blue; the granules of eosinophils and pseudo-eosinophils are red; the neutrophil granules pale bluish red; the basophil granules dark violet, almost black. Bacteria stain blue or black, the nucleus of the nucleated red corpuscles a bluish black. The formula for the first solution is 1 part pure methylene blue; 10 parts absolute alcohol; 1 part sodium carbonate and 90 parts distilled water. Dissolve the blue in the alcohol and the carbonate in the water and then mix and set aside at a temperature of 37 C. for two days. The second reagent is a solution of 1 part eosin in 200 parts distilled water (soluble *eosin jaunatre*). Reagent No. 1, after filtering, is slowly added to Reagent No. 2 and the mixture is incubated at 37 C. for twenty-four hours, to give it time to dry out. The resulting powder is ground in a mortar and methyl alcohol added in small amounts. The solution of the powder in the methyl alcohol is then filtered and glycerin added. It keeps a long time in a cool dark place. It is applied in ten parts distilled water, leaving it in contact with the specimen for from ten to thirty minutes.

Russkiy Vrach, Petrograd

XVI, No. 10, pp. 217-240

- 140 Organization of the Medical Societies of Petrograd District with Enlarged Aims. K. P. Sulima.—p. 217.
141 *Retrograde Catheterization in Treatment of War Wounds Involving the Urinary Passages. T. K. Veber.—p. 219.
142 Paralysis of the Arm after Application of Esmarch Band. V. N. Parin.—p. 222.
143 A Year's Experience with War Wounds of the Skull. S. I. Liukomovitch.—p. 224. Concluded in No. 11.
144 Bactericidal Efficacy of Ehrlich's Salvarsan and Hata's Arsaminol. M. P. Izabolinsky and L. B. Malkina.—p. 227.
145 *Chemotherapy of Lambliosis. V. L. Yakimoff and others.—p. 232.
146 *The Physiologic Bases for Electrocardiography, and its Clinical Importance. M. M. Gubergritz.—p. 233.

141. **Retrograde Catheterization with Obstructed Urethra.**—Veber refers in particular to obstruction caused by a war wound, and expatiates on the advantages of catheterizing from the bladder downward. Only a very small opening in the bladder is necessary to introduce the catheter, but the anterior wall of the bladder must be drawn taut as otherwise the neck region might protrude and block the entrance into the urethra. By passing a silk thread through the entire urethra from above it is possible to keep up the catheterization indefinitely, finally getting a retention catheter in place. All this immensely simplifies treatment of war wounds in this region and of suppurating processes around the urethra. He mentions that Verguin published the first attempt at retrograde catheterization in 1757. Veber reports a particularly instructive and successful case from his own service.

145. **Treatment of Lambliosis.**—Yakimoff and his co-workers comment on the wide distribution of the *Lamblia intestinalis* in animals as well as man. It has been found in mice, rabbits, dogs, sheep and African hawks. They experimented with it in white mice, giving salvarsan to the infected animals, and report that salvarsan thus proved its efficacy in the cure of lambliosis. A 1 per thousand solution of salvarsan seemed to answer the purpose completely, no lambia parasites being found in the intestines of the infected mice thus treated and killed from one to over three months later. The salvarsan did not seem to affect the *Octomitus muri* which was occasionally found in the mice, but its prompt success in eradicating the lambia suggests that it may prove effectual for lambia dysentery and diarrhea in man. In their experience on the firing line in the Caucasus in 1915, numerous cases of dysentery and diarrhea were encountered in which neither the dysentery bacillus nor ameba could be discovered and for which the lambia seemed alone to be responsible. In Yakimoff's laboratory, about 70 per cent. of the mice harbored the lambia, but salvarsan treatment seems now to have exterminated the lambliosis among them. It was given by intravenous injection in 1:300 up to 1:1,000 solutions, allowing 1 c.c. of the solution to each 20 gm. of body weight of the mouse.

146. **The Physics Involved in Electrocardiography.**—Gubergritz gives an illustrated description of the physical and mechanical principles involved in electrocardiography, and discusses the various theories that have been advanced to

explain its nature. The conclusion follows in the next issue of the *Vratch*.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

June 2, I, No. 22, pp. 1783-1858

- 147 *Inversion of the Uterus. J. G. de Lint.—p. 1785.
- 148 The Taking Up of Odorous Substances and Narcotics by the Nerve Cells. (Over het opnemen van reukstoffen en riekende narcotica in zintuigcellen en cellen van de hersenschors.) J. H. Kremer.—p. 1800.
- 149 *Improved Technic for Detection of Occult Hemorrhage in Alimentary Canal. J. R. F. Rassers.—p. 1808.
- 150 Presenile Dementia of Alzheimer Type; Two More Cases. G. P. Frets.—p. 1812.
- 151 Medical Impressions of America. C. W. F. Winckel.—p. 1834.

147. **Inversion of the Uterus.**—De Lint recently had a case of puerperal inversion of the uterus and describes two other unpublished cases. He also tabulates the details of five cases of inversion for which a tumor was responsible, and a number of puerperal cases bringing the total to twenty-nine during the last twenty years in the Netherlands. This is a proportion about three times as large as is on record in German-speaking countries during a similar period. Ruysch reported in 1691 that he had encountered two cases in one week, and remarked that probably more cases of inversion occur than get recognized. In one of the more recent cases the inversion occurred at the woman's fourteenth delivery, but over 33 per cent. were at the first or second childbirth. In de Lint's case the complete inversion followed forcible pressure by the nurse on the fundus through the abdomen, for expulsion of clots, the day after delivery. Attempts to push the uterus back by pressure from the bottom were unsuccessful. He finally managed to work part of one side back into the cervix, and then as he was striving to do the same on the other side, the uterus suddenly slid back entirely into place. The manipulations had evidently induced the organ to contract and its elasticity enabled it to reduce itself spontaneously. Hot irrigation afterward with 1:1,000 thymol was followed by tamponing the vagina and the pelvis was raised and ergot injected and fluid given by the drip method. At first there was a febrile temperature and excessive lochia, but by the end of the week the patient was sitting up and by the end of the month the uterus seemed to be in its normal position.

All the patients recovered in de Lint's compilation except one who succumbed to anemia and one whose uterus had ruptured. One of the women died a year later from cancer of the uterus. In only very few cases did the inversion occur spontaneously during urination, defecation or stooping over. Several writers mention that attempts to reduce the whole *en masse* always failed, while gentle manipulations, forcing small areas back into place, started natural contractions of the uterus, and the organ slid back of itself. In five of the total twenty-nine cases, after failure of manual reduction, the uterus was restored to place by working through an incision in the pouch of Douglas or in the posterior wall of the uterus itself, or the fundus was seized with forceps introduced through a laparotomy opening. The reduction was facilitated by seizing the uterine ligaments while the uterus was pushed up from below. Thorn published in 1911 a compilation of 521 cases of puerperal inversion of the uterus, from international literature during a twenty-two year period. The mortality was 16 per cent.; three of the women died from the shock of the reduction. In de Lint's series, the mortality was 20 per cent. but none succumbed to shock. This seems to be the result of traction on the peritoneum, and reduction puts an end to this, aided by camphorated oil, etc., drawing a rubber tube around the uterus to prevent further hemorrhage. The cases reported by de Lint show that even when the inversion has lasted a long time, patient and persevering manual reduction may safely reduce it. The interval in some of the cases was four days, eight days and eight months. In one case the diagnosis was made the twelfth day and reduction occurred spontaneously a week later. In conclusion he mentions a case seen by Castex in an Arab tribe. The woman was lifted up by her feet by two men, the head down, and a bottle of oil was poured over the protruding uterus which was then easily pushed in. Castex had found reduction absolutely

impossible before this. The woman succumbed to peritonitis a few days later.

149. **To Facilitate Detection of Occult Blood in the Stools.**—Rassers writes from the Pharmacotherapeutic Laboratory of the University at Leyden to call attention to a technic for determination of occult blood by which error from the presence of ferments seems to be obviated. The tests hitherto in vogue give a positive response with other substances besides hematin, and Boas in a recent communication said that these misleading substances are probably inorganic thermostable oxidases derived from the food. This latter assumption Rassers was able to confirm as he obtained from potato, soy bean and cornmeal—by a technic described—two ferments, one soluble in water, with a specific response to the guaiac test but becoming inert when heated to 100 C. The second ferment, in an acetic acid-alcohol extract, gives no reaction with the guaiac test but responds positively to the benzidin and phenolphthalin tests, and does not become inert in this respect until heated to 170 or 180 C. Hematin does not stand well heating to this point. This he proved by adding equal portions of hematin to equal portions of chemically pure sand, and heating one. The heated portion gave much weaker responses to the various tests applied thereafter than the unheated portion. To avoid these sources of error he has worked out a simple technic by which disturbing ferments seem to be entirely eliminated. It is based on the property possessed by ferments of being precipitated by concentrated solutions of cooking salt. He first binds the ferments with the salt solution, and then makes an ether-alcohol extract. The alcohol is not able to separate the ferments from their combination with the salt, but it extracts the hematin, and thus if any hematin is present in the fluid it can be readily shown up. After certainty that no blood from gums or hemorrhoids will falsify the test, and the patient has refrained for at least five days from food containing blood, 20 gm. of stool is thoroughly rubbed up in a mortar with equal parts acetone or equal parts of alcohol and ether. From the mass left on the filter, allowed to dry a little, 1 gm. is weighed out and after addition of ten drops of glacial acetic acid, it is thoroughly mixed with 20 gm. of a 5 per cent. solution of lithium salt. Then 100 cc. of absolute alcohol is added and the whole filtered. When this technic is applied to feces rich in ferments but free from blood, such as normal infant stools, no ferments will be found in the filtrate. If hematin has been added to the stools, it will show up as plainly or at least only very slightly less distinctly than without this treatment.

The method has one single drawback, namely, that with it the benzidin and guaiac technics cannot be applied to show up the hematin. However, Rassers remarks, a mixture of acetic acid-alcohol and cooking salt gives a positive reaction with these tests even without any hematin. The loss of the benzidin reaction is to be regretted, but the fact that kitchen salt is able to give a positive reaction with it does not enhance the reliability of this reaction as a test for occult blood. The guaiac test, on the other hand, is not sensitive enough for negative findings with it to be conclusive. The phenolphthalin test may answer the purpose. He never obtained positive findings with it in normal persons.

Hospitalstidende, Copenhagen

June 20, LX, No. 25, 597-620

- 152 *Case of Myocarditis Localized in the Interventricular Septum with Peculiar Anomalies in the Electrocardiogram. L. S. Fridericia and P. Møller.—p. 597. Commenced in No. 24, p. 573.

152. **The Electrogram with Myocarditis of the Ventricular Septum.**—Necropsy showed fibrous changes in the interventricular septum. The electrocardiograms displayed certain special features which will in future differentiate affections of this type, especially the absence of any sign to show that the auricles were pulsating, notwithstanding the regularity of the heart beat. The tracings of the ventricle beat also varied in shape in the different systoles. All the four hitherto published cases of varying electrographic systole-complexes were from patients with severe symptoms of cardiac insufficiency, but there has been no necropsy in two and in the third the necropsy findings seemed to be negative.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXIX, No. 9

CHICAGO, ILLINOIS

SEPTEMBER 1, 1917

TRUTH ABOUT INTRASPINAL INJECTIONS IN TREATMENT OF SYPHILIS OF NERVOUS SYSTEM *

BERNARD SACHS, M.D.
NEW YORK

Intraspinal injections of salvarsanized serum or serum plus salvarsan in the treatment of syphilis of the nervous system is a form of antisyphilitic medication which has exercised a curious fascination over the medical man during the past few years and has gained a large number of adherents among the general medical public. This was due, first, to its very respectable parentage, and secondly, to the fact that nothing was hailed with greater satisfaction than the prospect of striking at the very root of serious disease by injecting the remedy directly into the spinal canal in almost immediate proximity to the chief seat of trouble. I was one of the earliest victims of this fascinating belief, and at the International Congress in London, stated frankly that I thought this newer method of antisyphilitic medication promised better results than anything else that had heretofore been suggested. The large experience of later years has convinced me and my associates, Drs. Strauss and Kaliski, that the hopes placed on this intraspinal method were unwarranted, and that it has achieved nothing that cannot be obtained by the intravenous method.

The present-day aim of specific therapy is to bring the spirocheticidal remedy, if possible, into immediate contact with the foci of disease in the tissues of the brain, the spinal cord and their coverings. It so happens that in general paresis the spirochetes, as Noguchi has shown, are inserted in the gray matter of the cortex at some distance from the surface, and that in tabes dorsalis, excepting in the very earliest stages, syphilitic disease has brought about marked degenerative changes in the spinal cord which we could hardly expect to be affected by any remedy in whatever way it may have been introduced. There remain, however, a considerable number of specific meningo-encephalitic and meningomyelitic processes, truly exudative in character, which could be reached readily enough by intraspinal medication if such remedies were allowed to course freely in the cerebrospinal fluid, and if it could be shown that they were retained in this fluid for any satisfactory period of time.

My clinical experience had taught me some years ago that the intravenous injection of salvarsan or

neosalvarsan produced results that were entirely satisfactory and that were at least comparable with those obtained by intraspinal medication. Other things being equal, the intravenous method is much the safer and for that reason alone would have been preferable, for in hundreds of intravenous injections I have not had a single unfavorable experience so far as life is concerned, whereas no one who has had much experience with the intraspinal form will deny that often enough serious results follow on this form of medication, and that even if life is not actually in danger, as it sometimes is, paralyzes and serious vesical disturbances often ensue. The claims made for the superiority of the intravenous over the intraspinal method would, however, remain unsatisfactory unless some substantial explanation could be given for failure of the intraspinal method to accomplish more than its rival. Three years ago, in a research in which I took part in association with Drs. Strauss and Kaliski, and with the assistance of as able a chemist as Professor Benedict, it was shown that salvarsan introduced in the usual quantities into the blood current actually appeared in the cerebrospinal fluid in appreciable quantities. The older doctrine, therefore, that the choroid plexus is impermeable and that salvarsan introduced intravenously cannot be expected to reach the cerebral or spinal tissues had to be abandoned.

In view of these findings, the question arose whether after intraspinal medication the infinitesimal amount of salvarsan that could be introduced with safety directly into the canal was any greater than the amount which would naturally reach the cerebrospinal canal after the antecedent intravenous injection. Later on it was suggested that instead of using the patient's serum withdrawn after intravenous injection, salvarsan or neosalvarsan be added to the blood serum and injected into the spinal canal by lumbar puncture. Rational as such procedures may appear to be, they were entirely discredited by subsequent studies on the functions and behavior of the cerebrospinal fluid.

The important facts that have come to our knowledge are, first of all, as Weed has pointed out, that, since pressure in the cerebral capillaries is considerably higher than the cerebrospinal tension, it is far more likely that fluid leaves the cerebral capillaries, and circulates in the pericapillary and perineuronal spaces, yielding nourishment and receiving waste products and finally leaving the tissues by the pericapillary and perivascular spaces to the subarachnoid cavities over the surface, whence absorption into the venous sinuses takes place.

It is evident, therefore, that a metallic substance like salvarsan introduced into the spinal canal does not remain in the cerebrospinal fluid for any length of time, but is rapidly absorbed into the venous system.

* Chairman's address, read before the Section on Nervous and Mental Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

Secondly, it has been shown that the cerebrospinal fluid circulates very imperfectly and that the natural course of this fluid is not favorable to the absorption of substances from the cerebrospinal fluid by the cells of the cortex. It is by no means certain, therefore, that substances introduced into the lumbar region would be brought into immediate and repeated contact, even if retained, with foci of disease within the tissues of the brain or cord. Naturally enough, the question would be more readily solved if less toxic substances than salvarsan, or salvarsan in larger quantities, could be introduced. As Halliburton properly puts it, "The use of salvarsan in locomotor ataxia and similar late syphilitic affections, via the cerebrospinal fluid, has been abandoned, as it is fatal not only to the syphilitic organisms, but also to the patient."

It is further known that salvarsan and its homologues are of little or no use in tabes dorsalis and general paresis when it is given by the ordinary channels, for in these later manifestations of syphilis the baneful spirochete has entered into the harbor of refuge, which we may speak of as extravascular, beyond the reach of the poison. All recent physiologic experiments would go to show that metallic substances introduced into the cerebrospinal fluid are not retained, but passed into the venous system, and, furthermore, that certain substances coursing in the blood may pass through the choroid plexus into the cerebrospinal fluid by way of the capillary vessels. If such substances are compelled to take this circuitous route, it would be far better to trust more implicitly to the blood stream and to endeavor to discover remedies which will pass easily and positively from the blood vessels into the brain substance. As MacIntosh and Fildes assert, correctly enough, the present-day remedies are to some extent inefficient in the treatment of syphilis of the central nervous system because they do not possess the necessary solubility to allow them to pass through the blood vessels into the brain substance.

Some of the ardent advocates of the intraspinal method are beginning to see the light; and since they have acknowledged, as Amoss did recently, that the virus in poliomyelitis within the brain and spinal cord cannot be reached by intraspinal treatment alone, they will also be compelled to concede that what is true of the poliomyelitic virus must also be true of the syphilitic virus similarly located within the tissues of the central nervous system. Physiologic evidence is, therefore, wholly adverse to the claims of those who favor intraspinal injections of salvarsan for the cure of syphilis of the nervous system. But there are other reasons why the method is not satisfactory, and chief among these is the greater danger attendant on intraspinal therapy. Furthermore, the successful treatment of many of the cases of syphilis of the nervous system calls for intensive salvarsan treatment, by which I mean intravenous injections of 0.3 or 0.4 gm. of salvarsan repeated every three or four days until the patient has had from fifteen, twenty or even fifty injections. A similar number of lumbar punctures for the purposes of intensive treatment would necessarily prove most disagreeable, if not harmful, to the patient; but beyond all these facts it has been definitely ascertained that the serious forms of general paresis or of tabes dorsalis have not been favorably affected by intraspinal injections, and nothing has been accomplished by them that could not have been achieved by the intravenous method.

I am in entire sympathy with Halliburton's view that "particularly regrettable is the divorce between those who pursue their investigations by the bedside and those who work in the laboratory." It is especially regrettable, I would add, that changes in biologic findings should be made the criterion of the efficiency of any therapeutic method. Claims were made for the intraspinal method chiefly by men whose interest was centered on a change in the Wassermann reaction, in the reduction of the cell count of the cerebrospinal fluid, and in a change in the globulin reaction, rather than on improvement in the clinical condition of the patient. After all, the patient remains the chief consideration. One may speak glibly of remissions in general paresis and of improvement in tabes dorsalis, but it takes the experience of a trained neurologist and psychiatrist to estimate at their true value changes in clinical symptoms.

In many particulars the advantages of the intraspinal method have been grossly exaggerated. The opinion has reached the laity, as promulgated by advocates of the intraspinal method, that now general paresis can be cured and by the intraspinal method alone. I have personal knowledge of patients suffering from general paresis who have been treated persistently and on innumerable occasions by intraspinal injections administered by the chief apostles of this method. Some of these patients have had remissions, but I doubt whether a single one has been definitely cured, while all the others have taken the natural but gradual course toward a fatal termination. As for the remarkable reduction in the number of the lymphocytes and the change in Wassermann reaction claimed as a result of the intraspinal method, I can assert definitely, and the truth is already known to many, that the same changes have followed on intravenous injections, pure and simple, on repeated lumbar punctures, and on the introduction of the patient's nonsalvarsanized serum. Evidently the changes in the cerebrospinal content may be brought about in a number of different ways. I do not for a moment question the accuracy of the attractive tables published by the advocates of the intraspinal method, but of one thing I am very certain, that there is absolutely no correspondence between a change in the cerebrospinal content and the condition of the patient. I could instance patient after patient, and some of them I have been able to demonstrate to a number of the members of the section, in whom after both intraspinal and intravenous treatment, for general paresis or for tabes dorsalis, there has been no change in the Wassermann reaction or in the number of cells in the cerebrospinal fluid, and yet the patient has shown most satisfactory improvement in his general condition. To speak of only one patient, who had been given in ten months seventy-seven intravenous injections, the Wassermann reaction was ++++ before the treatment and ++++ after the treatment. The same is true of the cerebrospinal fluid. There were twelve cells before and twelve cells after treatment. The man had a typical paretic speech and severe headaches, but he has, in spite of the lack of change in biologic reactions, shown a most complete remission and has for at least a period of a year and a half returned to his former work and is doing his work satisfactorily. In a large number of cases of tabes in which the patients had received numerous intraspinal injections without distinct improvement, a satisfactory result was obtained when intravenous treatment had been given in our intensive way. I do not wish to

make extravagant claims for the intravenous method, but I do claim that there is nothing which the intraspinal method achieves that cannot be accomplished by the intravenous.

When it is remembered also that in more than a thousand intravenous injections given to patients under my care at the hospital, we have had but two or three untoward results and not a single fatal termination that could in any way be attributed to the salvarsan injections, there seems to be no reason to resort to the more dangerous and to the patient more costly intraspinal method.

My impressions, based on experience of the actual achievements by the intravenous injection of salvarsan are as follows:

The best results are obtained in the cases of cerebrospinal syphilis that are either distinctly vascular in origin or are of the meningo-encephalitic and meningo-myelitic type. The meningosyphilitic cases that so often suggest the possibility of latent paresis have been cleared up by a few salvarsan injections. The immediate effect has often been most striking; but however great the immediate effect may have been, I have always made it a practice, even in such cases, to push the intravenous treatment until I was reasonably certain that the morbid process had either been checked or at least made less active. There is often difficulty in establishing the differential diagnosis between these meningo-encephalitic cases and those of true general paresis, so that the doubt may arise whether or not some of the cases of general paresis claimed as cures may not have been cases of this type. Meningomyelitis of the syphilitic type also yields to intensive treatment in the most satisfactory way. The spastic forms of spinal paralysis, the Erb type in particular, which is in all probability a form of a true degenerative disorder, gives unsatisfactory results. In a number of these patients I have been able to bring about all degrees of reductions in the Wassermann reaction and in the cell count, but have never been able to cure, rarely enough ever to improve, a true spastic paraplegia such as Erb described.

As for tabes dorsalis, I cannot claim any actual cure, but in reviewing my cases and seeing the patients months and years after treatment had been instituted, there is no doubt that the patients were satisfied with the results of treatment; that they are better in many ways, and that we cannot afford to disregard this treatment in tabes without, however, claiming more for it than the results justify. There is no doubt that in many instances the vesical symptoms, the sexual impotence, the lightning pains, even the gastric crises, have disappeared under intensive intravenous treatment. On the other hand, I am firmly convinced that in a large number of cases, particularly in private practice, in which the intravenous treatment has been given from the outset, the symptoms have progressed, and full-fledged tabes dorsalis has been developed in much the same way that it would have progressed if no active treatment had been given. The meningo-myelitic forms of a tabetic type are the ones that can be benefited most readily.

Finally, in general paresis, salvarsan treatment has not helped me to effect a cure, but it has in some instances retarded the rapid progress of the disease. It has permitted, if not caused, marked remissions to be established for a considerable period of time. Some believe these remissions are the expression of antibody formation. Following the treatment, a number

of the patients have been enabled to return to their accustomed work for one, two or even more years, but I do not claim that a single patient suffering from general paresis has been cured of his disease by this or any other method.

The problem for the future is to find some more diffusible remedy, lipid soluble and less toxic than salvarsan that would be able to pass through the blood stream into the tissues of the brain through the choroid plexus into the spinal canal and attack the foci of spirochetes wherever they may happen to be located. We need not despair of the future, and I believe that if the neurologist and the laboratory worker will cooperate with one another in a rational and impartial manner, an era of satisfactory antisyphilitic therapy may happily dawn on us.

116 West Fifty-Ninth Street.

INTRAVISCERAL AND INTRA-ABDOMINAL PRESSURE *

R. C. COFFEY, M.D.

Fellow of the American College of Surgeons
PORTLAND, ORE.

The peripheral abdominal wall is a flexible structure, composed chiefly of flexible and elastic muscle enclosed in a flexible but nonelastic aponeurosis. While the wall is flexible to a large degree, it is collapsible only in its front portion. The collapsible portion, or anterior abdominal wall, contrary to the ordinary belief, is but slightly elastic under an ordinary acute strain, owing to the strong layers of aponeurosis surrounding the muscles. Except in chronic processes, such as the development of a tumor by cellular increase, a cyst or ascites, which has behind it the blood pressure or pregnancy, there is but little change in the capacity of the abdomen of an otherwise normal person. Extreme distention of the abdomen may noticeably enlarge the abdominal cavity by pushing up the diaphragm at the expense of chest capacity. By elevation of the ribs, the girth of the upper portion of the abdomen may be increased, but the lower or middle part of the abdomen will be correspondingly diminished. Elevation of the ribs plus extreme distention of the abdomen make tense and collapsible part of the abdominal wall, and increase the girth of the abdomen at all points; but the only actual increase of abdominal capacity is made at the expense of chest capacity by elevation of the diaphragm. The abdominal cavity is air tight, but is by no means a vacuum.

There is always a variable and indefinite amount of pressure in the peritoneal cavity, known as intra-abdominal pressure. This pressure may be greater, but is usually less than the atmospheric pressure.¹

The degree of intra-abdominal pressure depends on the variable contents of the abdominal cavity. The variable contents are: (a) extraperitoneal and mesenteric fat; (b) the visceral contents. The visceral con-

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. This paper was presented in New York from hurriedly prepared notes and lantern slides. At that time I made the unwarranted statement that the pressure within the abdomen was greater than atmospheric pressure. Dr. Edward Martin of Philadelphia, who opened the discussion, very properly assailed this statement. I think Dr. Martin was entirely right in his statement that the pressure within the abdomen is ordinarily less than atmospheric pressure, but the question of whether the pressure is more or less than atmospheric pressure need not influence the vital part of this subject, which is "the relative amount of intravisceral and intra-abdominal pressure."

tents are liquids and gases and may be intermittently expelled at any time, thus acting as an immediate safety valve for the establishment of an equilibrium and a normal intra-abdominal pressure. The extra-peritoneal and mesenteric fat is included within the inelastic abdominal wall, and lessens the abdominal cavity in exact proportion to the amount of fat thus included.

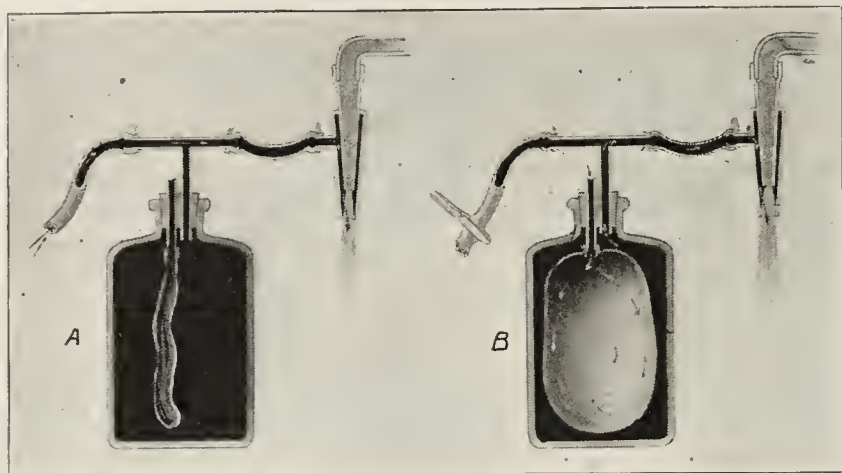


Fig. 1.—Experiment to illustrate the relation of intra-abdominal to intra-visceral pressure: *A*, air in jar and in bag in state of equilibrium; suction not operative on contents of jar; *B*, pressure in jar being reduced by suction apparatus, showing inrush of air and distention of rubber bag in the effort to reestablish equilibrium.

The law of osmosis, by which fluids of different densities pass through an animal membrane and establish an equilibrium, has its counterpart in the relation of intra-abdominal and intravisceral pressure.

I made an interesting experiment, as follows: An ordinary suction apparatus, connected with a water faucet by a rubber tube, which in turn is connected with an aspirating bottle by a T connection, tends to create a vacuum in the bottle, provided the distal end of the horizontal portion of the T is closed. If it is not closed, the air is drawn directly through the tube from the outside, and the air in the bottle remains in a state of equilibrium. If a very thin rubber bag

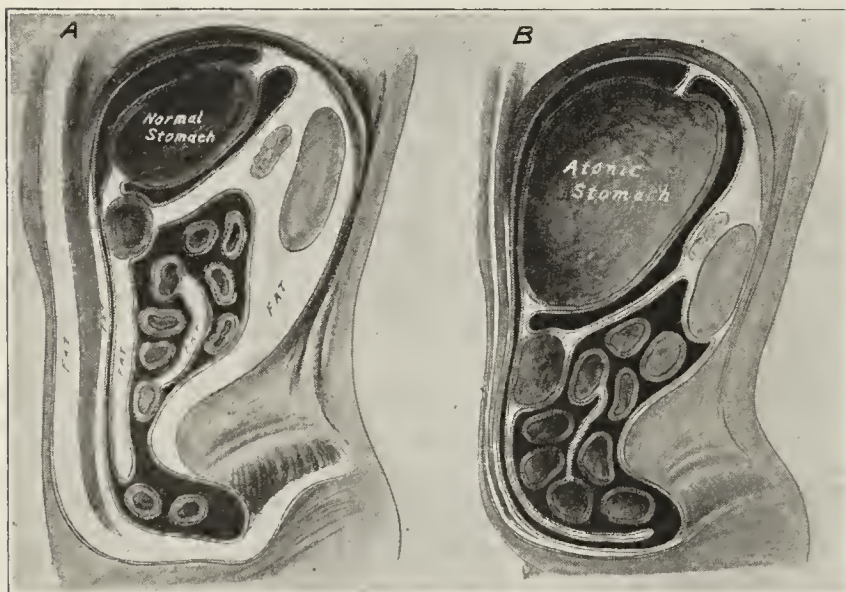


Fig. 2.—Diagram illustrating the rôle of fat in maintaining the tonicity of the hollow viscera: *A*, normal amount of fat in fairly stout person (fat represented by white); stomach and intestine of normal thickness and size; *B*, patient reduced in health, fat having been absorbed; abdominal cavity is enlarged, intra-abdominal pressure is reduced, and hollow viscera are extended and thinned in an effort to establish an equilibrium as shown in Figure 1*B*.

is suspended in the bottle by a hollow tube passing through the cork and connecting the bag with the outside atmosphere, the air within the bag and within the bottle remain in a state of equilibrium so long as the distal end of the T connection remains open (Fig. 1 *A*).

If this distal portion of the T connection is closed by forceps (Fig. 1 *B*), suction at once begins to reduce the pressure within the jar and thus tends to make a vacuum. Immediately the atmosphere rushes into the enclosed, suspended rubber bag and distends it in proportion to the degree of vacuum thus produced in the jar.

Thus, a law parallel to the law of osmosis can be formulated: If a thin, elastic container with an outside connection for a source of supply of fluids or gases is enclosed within an inelastic container, there is a constant tendency to establish an equilibrium of pressure. Thus, if a portion of the contents, consisting either of gas or of other substance, is withdrawn from the outside, inelastic container, the pressure on the outer surface of the elastic container is reduced, and a corresponding inflow of contents is brought into the elastic container from the outside, for the purpose of establishing an equilibrium.

In the case of the abdomen, the abdominal wall is the outside, inelastic container, and the hollow viscera represents the inside, elastic container with the outside source of supply through the mouth. Within, and partially filling the abdominal cavity, is a variable

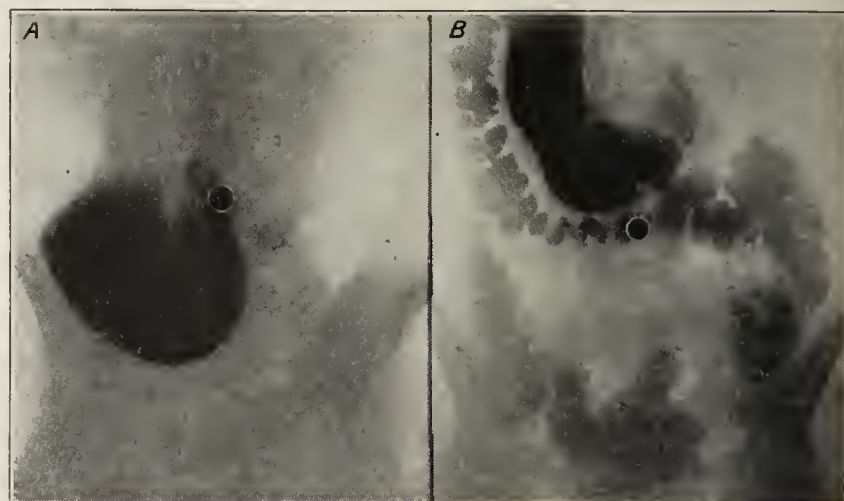


Fig. 3.—Roentgenogram illustrating the influence of fattening on position and tonicity of the hollow viscera: *A*, prolapsed, dilated, atonic stomach of a young woman who was a bed invalid, weighing 62 pounds; *B*, small, tonic stomach, with normal peristaltic waves, observed in same patient two months later, after forced feeding and increase of weight to 119 pounds; patient restored to perfect health by no other treatment than forced feeding. (Courtesy of Dr. Sears, who directed the treatment.)

quantity of fat. Intra-abdominal fat is apparently deposited under much lower pressure than are the cells of a tumor, pregnant uterus or ascitic fluid. The deposition of fat, therefore, within the abdominal cavity does not materially stretch the abdominal wall in a normal person. However, it is sufficient to increase the size of an already existing umbilical or postoperative ventral hernia. If a large umbilical or postoperative ventral hernia exists for a long time in a fat patient, intra-abdominal fat is deposited in proportion to the contents of the hernial sac, making it difficult, and at times impossible, to replace the hernial contents without removing some of the abdominal contents, such as the great omentum.

A patient who has been moderately fat for some reason loses flesh; the fat in the abdomen is correspondingly absorbed (Fig. 2 *A* and *B*). The intra-abdominal pressure is lowered, and there is a tendency to a gradual, atonic dilatation of the hollow viscera in establishing an equilibrium. Digestion is disturbed, bowel action becomes torpid, and all of the secretions are below par. The patient often develops into that low state of health ordinarily referred to as "asthenic,"

and, in extreme cases, has even been referred to as "neurasthenic." If this poor state of health is permitted to go on for months or years, the abdominal muscles become weak and flabby and give way under the malnutrition and gas distention as well as the weight of the lowered organs, until finally the entire shape of the abdomen is changed.

The late Weir Mitchell evolved a successful empiric way of treating these patients by rest, recumbency, forced feeding and massage. Being a neurologist, he attributed his success to "padding the nerves with fat." To the plan of treatment thus evolved by Mitchell, the orthopedic and postural phases of the subject have been added, and have been notably developed by Goldthwaite of Boston and Franklin H. Martin of Chicago.

Dr. N. W. Jones states that he has frequently been able by these methods to increase the girth of the abdomen at the rib arch 6 inches or more—largely by position and exercises which tend to lift the chest and upper abdomen and strengthen the muscles of the lower abdomen. Thus, we may say that by strengthening and

tion of fat combined with athletic development of the abdominal wall.

Having briefly discussed the relation of intravisceral to intra-abdominal pressure, and its bearing on clinical medicine, I shall next consider the relative pressure in the various parts of the intestinal canal, and its clinical importance. The word "jejunum" means empty. Very



Fig. 4.—Anatomical importance of the ileocecal valve: *A*, ileocecal slit and valve (Gray's Anatomy); *B*, diagram illustrating a competent ileocecal valve (elaborated from Gray's Anatomy); *C*, partial incompetence of ileocecal valve (Kellogg); *D*, complete incompetence of ileocecal valve (Kellogg).

readjusting the abdominal wall, combined with the deposition of fat within the abdomen, the normal intra-abdominal pressure can be restored. Roentgenologic examination of patients relieved by these methods often shows that a stomach which is ptosed and atonic before treatment assumes its normal position, takes on its normal size and normal peristaltic action after treatment. Figure 3 *A* and *B* shows but one of many similar results which I could exhibit. In a certain percentage of these patients the cecum and ascending colon are entirely mobile and have a long mesentery with acquired bands, referred to by Lane, which may attach to the colon in an effort to hold it up, and which may cause great pain on the right side (usually taken for appendicitis), or may come across the duodenum, making a direct drag on the duodenum (producing symptoms similar to duodenal ulcer). These cases are often definitely surgical, but the surgical measures which, in my opinion, should always be limited to replacement and indirect fixation, must be followed by increase of intra-abdominal pressure through deposi-

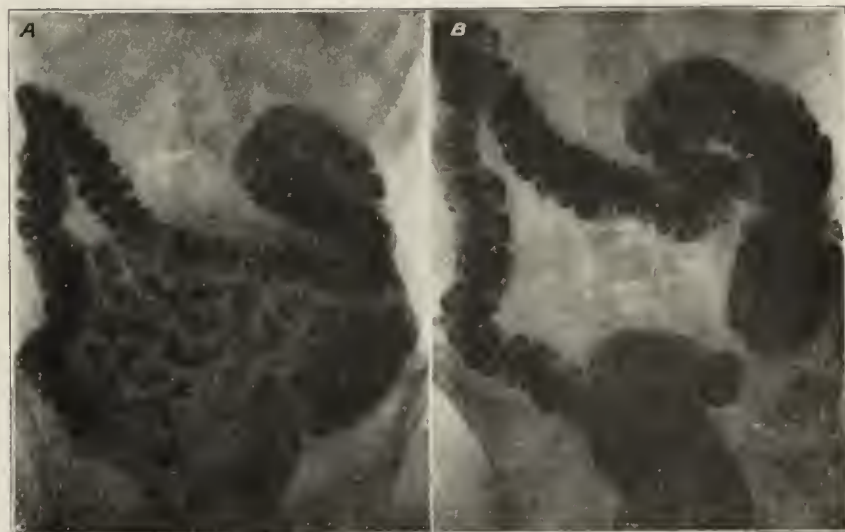


Fig. 5.—Roentgenogram showing case of completely incompetent ileocecal valve, before and after operation: *A*, complete incompetence of the ileocecal valve, showing filling of entire small intestine with barium enema; clinical symptoms very marked; *B*, intestine of same patient two months after operation; roentgenogram taken by same technic as in Figure 5 *A*; clinical symptoms entirely relieved. (Another picture taken one year after operation showed valve still competent. A picture taken two years after operation showed partial incompetence of valve, and partial return of clinical symptoms.)

little gas or fluid is found in it at one time. As the food passes down to the ileum, gas begins to form, and the intravisceral tension is greater. In the large intestine, a portion of the food and waste takes on bacterial digestion, producing a great deal of gas, and as a consequence the pressure within the large intestine is much greater than within the small intestine. So great is this liability to distention that nature has produced a valve, which has been done by a form of intussusception of the small bowel into the large (Fig. 4 *A* and *B*). This valve in a normal person is usually

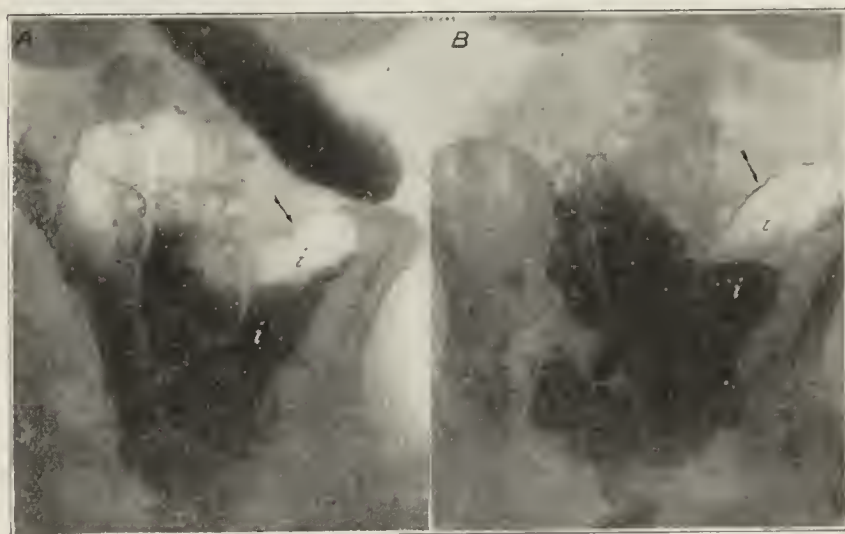


Fig. 6.—Roentgenogram showing distended ileum which commonly follows ileocolostomy: *A*, ileum distended with gas and barium, immediately after one meal and twelve hours after another; *B*, barium and gas in widely distended ileum twenty-four hours after meal.

competent, so it is often found that the large intestine is intensely distended while the small intestine is relatively collapsed. A peristaltic wave traveling from the cecum toward the hepatic flexure creates diminished intravisceral pressure behind it. This diminished intravisceral pressure, following in the wake of the peristaltic wave, permits the ileum to empty a portion

of its contents into the distended large intestine. When the wave has exhausted itself, the normal intra-intestinal pressure is again resumed and the valve again closed. The gradual obstruction of the large intestine in its lower portion, by a growth of any kind, often produces such extreme intra-intestinal pressure as to reduce the normal intussusception of the small intes-



Fig. 7.—The result of the direct implantation of the bile duct into the intestine: *A*, direct implantation of the bile duct, without valve protection; *B*, bile duct a month later, showing distention from intra-intestinal pressure.

tine into the large and thus destroy the competence of the ileocecal valve. This I have demonstrated in doing Brown's ileostomy for obstruction in the sigmoid, for in those cases fluid passed through the distal segment of the ileum into the large intestine usually runs back, even though the obstruction has been removed below, while in ileostomy performed for ulcerative colitis, the colon may usually be flushed out through the distal segment of the ileum without a return from the colon through the ileocecal valve. Long-continued constipation, with large accumulations of gas in the cecum, is frequently followed by incompetence of the ileocecal valve, as pointed out by Kellogg and Case. If this incompetence is complete and the regurgitation



Fig. 8.—Artificial valve in a rubber bag, to illustrate the principle of intravisceral pressure: *A*, fluid flowing into a rubber bag under pressure; *B*, closure of valve as soon as extra outside pressure is removed.

is extensive, it often has important clinical significance. Kellogg has devised an ingenious operation for reproducing the normal intussusception. I have seen a few cases in which the incompetence of the ileocecal valve produced such serious symptoms that I performed a modified Kellogg operation for its relief, with

functional satisfaction and complete mechanical cure, as shown by the pictures before and after operation. Figure 5 *A* and *B* shows one of six similar cases. While I do not do the operation exactly as Kellogg recommended, I used his idea, and was surprised at the results, for I did not expect much of it. As yet, however, I am not prepared to say how valuable the procedure is.

I have had occasion to operate on a considerable number of patients who had had short-circuiting operations performed by other surgeons who used Lane's method. In some cases, performed by amateurs afraid to do the complete operation, a simple ileosigmoidostomy without severing the distal portion of the ileum had been performed. In all cases, whether or not the ileum was severed, it was very much dilated, showing that when the ileum is subjected to the greater pressure, of the large intestine by an absence of an ileocecal valve it becomes permanently dilated, no matter whether there are clinical symptoms or not. Figure 6 *A* and *B* shows this point in one of my own cases following ileosigmoidostomy. The colon in this case was later removed, at which time the ileum was found to be much distended and thick and contained semi-

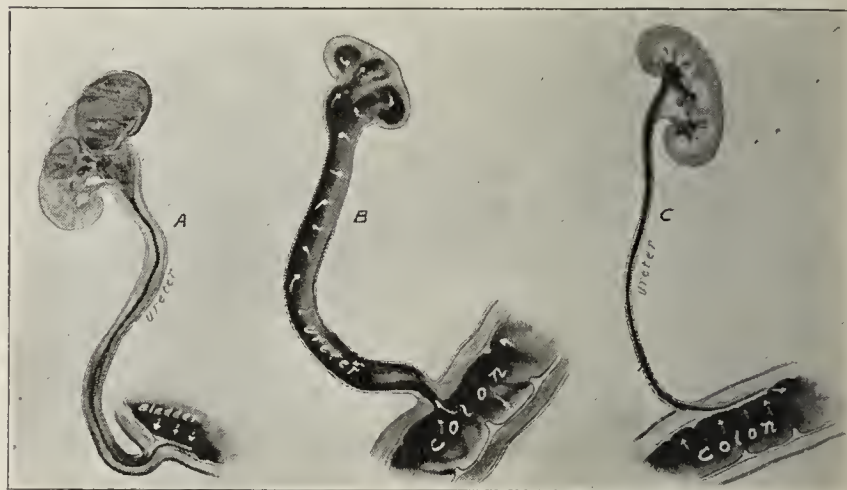


Fig. 9.—*A*, thickened ureter and pus kidney, which may be produced experimentally by infecting the tissues around the lower end of the ureter (true ascending infection); *B*, "dead kidney" and dilated ureter, following direct implantation of the ureter into the colon; this result has been questionably referred to as "ascending infection;" it is more probable that the kidney has been destroyed and the ureter dilated by intra-intestinal pressure applied to the inside of the ureter; *C*, normal kidney and undilated ureter which follows the submucous, or indirect, implantation of the ureter into the colon.

solid fecal matter for 3 or 4 feet above the point of anastomosis.

Next we may consider the relative degree of pressure in the hollow viscera themselves, and in the glands and ducts emptying into the viscera. In 1908-1909, while I was experimenting with methods for removal of the head of the pancreas in two stages, the first of which included the transplantation of the common bile duct to another portion of the duodenum, it was discovered that the duct which had been directly planted into the duodenum at the first operation was invariably found dilated at the time of the second operation (Fig. 7 *A* and *B*). In one instance the duct was as large as the duodenum itself. The opening of the duct into the intestine was large, and all of the ducts well up into the liver were much dilated. This phenomenon, being observed universally, left but one rational conclusion to be drawn, namely, the greater pressure within the intestine was too much when applied to the inside of the thin bile ducts. Investigation of the duodenum and bile ducts of dogs showed that the normal duct, after passing through the muscular wall of the intestine, passed along immediately under the loose,

movable mucous membrane for a distance of approximately half an inch before it entered the intestinal lumen. This was sufficient explanation of how the normal entrance of the bile duct prevented its dilatation by intra-intestinal pressure. To prove this abstract principle further, a catheter was cemented into a hole in the wall of a fountain syringe. On the inside of the fountain syringe a thin flap, or pocket, was cemented. Another fountain syringe, hung some distance higher, was attached to the catheter through which the fluid was permitted to run from the higher bag into the lower one. When the nozzle was withdrawn from the end of the catheter, the weight of the fluid from within forced the valve closed and no fluid escaped (Fig. 8 *A* and *B*). This problem, then, was clear—the duct must be placed immediately under the loose, movable mucous membrane for some distance before it is permitted to emerge into the lumen of the intestine, if the intra-intestinal pressure is to

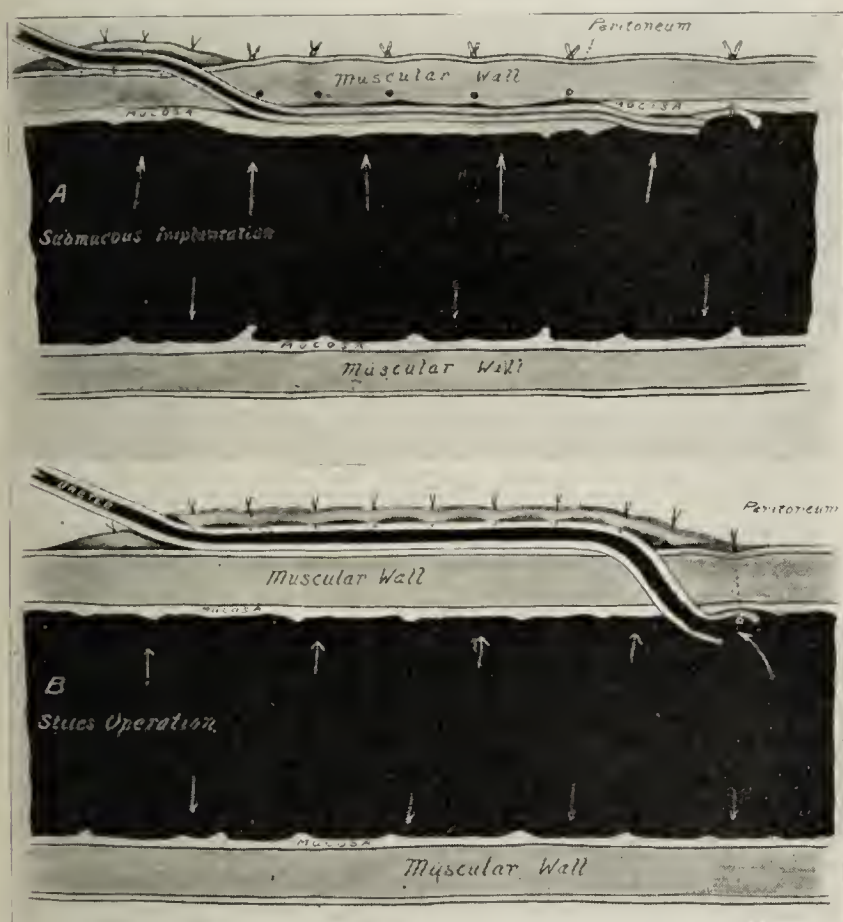


Fig. 10.—Scheme of two methods of ureteral implantation into the colon: *A*, diagram illustrating technic of submucous implantation into the intestine; showing how the intra-intestinal pressure, acting on the movable mucous membrane, collapses the ureter and makes a valve; *B*, diagram illustrating the scheme of Stiles' operation, which is a direct implantation, supplemented by the application of the Witzel principle as applied to gastrostomy; in this instance the ureter runs along on the outside of the intestine, and is covered by folding over it the wall of the intestine; valve action is not probable in this operation, owing to the thickness of the intestinal wall.

be brought to bear in closing the duct. The technic of implanting the duct in this manner was quickly devised and tried on the living dog. Six ducts were implanted by this method, and not a single one of the ducts thus implanted showed material dilatation, in contrast with six implanted by the direct method, all of which were enormously dilated, as stated before.²

While this experiment with submucous implantation of the bile duct had been a complete success, so far as creating a perfect valve was concerned, there seemed to be some doubt as to whether the ureter, which entered the bladder in much the same way, could be implanted into the intestine with the same degree of success. A complete search of the literature of the

Surgeon General's Library, consisting of a review of some 254 articles on the subject, found the admission of practically every experimenter that up to that time a successful method of implanting the ureter into the bladder had not been devised. In the beginning of my experiments with the ureter I found that it also emptied into the bladder in a submucous position. My first set of experiments included six ureters implanted

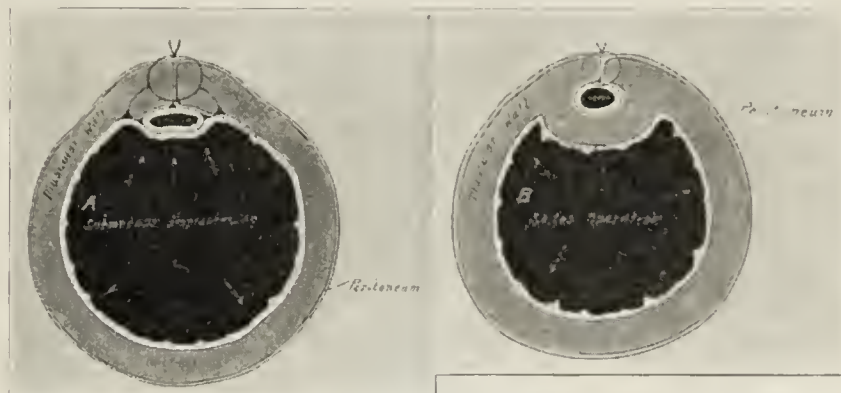


Fig. 11.—Cross section scheme of submucous implantation and of Stiles' operation, for comparison. (See Surgery, Gynecology and Obstetrics for technic of Stiles' operation, 1911, 13, 127.)

into dogs' intestines by the direct method. When the dogs died or were killed some months later, the ureters were in every instance found to be enormously dilated for the entire distance between the intestine and the kidney. In one instance the ureter was an inch in diameter. In those dogs living for several months, the kidney tissue had all been absorbed, leaving a hull. Whether these kidneys had been destroyed by an infection, ascending the widely dilated ureteral opening and ureter, or by excessive intra-intestinal pressure brought to bear within the ureter and along the ureter to the kidney, could not be definitely determined, but one thing was apparent: A ureter implanted directly into the intestine, without a protecting valve, invariably becomes an elongated and distended diverticulum of

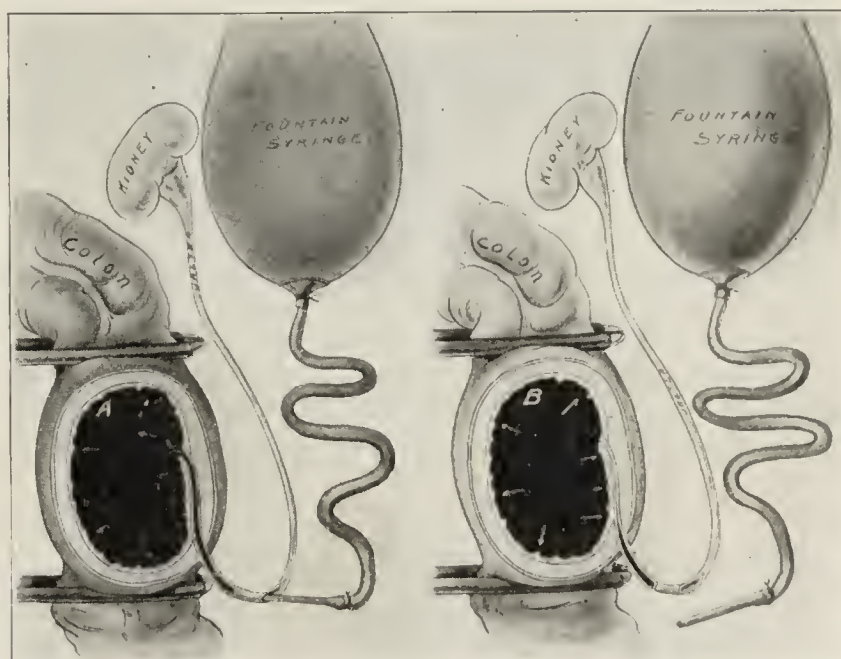


Fig. 12.—Testing competence of the valve in a removed specimen following submucous implantation in a dog: *A*, fluid run into the segment of intestine including the implantation area under pressure; *B*, outside pressure has been removed; intra-intestinal pressure closes valve completely.

the large intestine and is accompanied by destruction of the kidney (Fig. 9 *B*).

Six kidneys in which the ureter was implanted into the large intestines of dogs by the submucous method (Figs. 10 *A* and 11 *A*) showed that in not a single instance had the kidneys become infected or diseased

2. The technic of this operation and the details of the experiments were published in the *Annals of Surgery*, December, 1909.

in any manner.³ The dogs in these cases were killed from four to six months after the implantation. The intestine, ureter and kidney were all removed for tests. The intestine in each case was clamped above and below the implantation, thus isolating and making a closed sac of this segment. The ureter was split, the nozzle of a fountain syringe was inserted into the opening, and the water run into this clamped segment of the intestine under pressure. When the nozzle was withdrawn, not a drop of water flowed back through the ureter, even though the intestine was squeezed with a good deal of pressure (Figs. 12 and 13, *A* and *B*). In one instance the intestine was actually squeezed to the point of rupture elsewhere before a single drop of water would flow back through the ureter.⁴ I feel that I have proved my principle mechanically and experimentally, but one may ask,

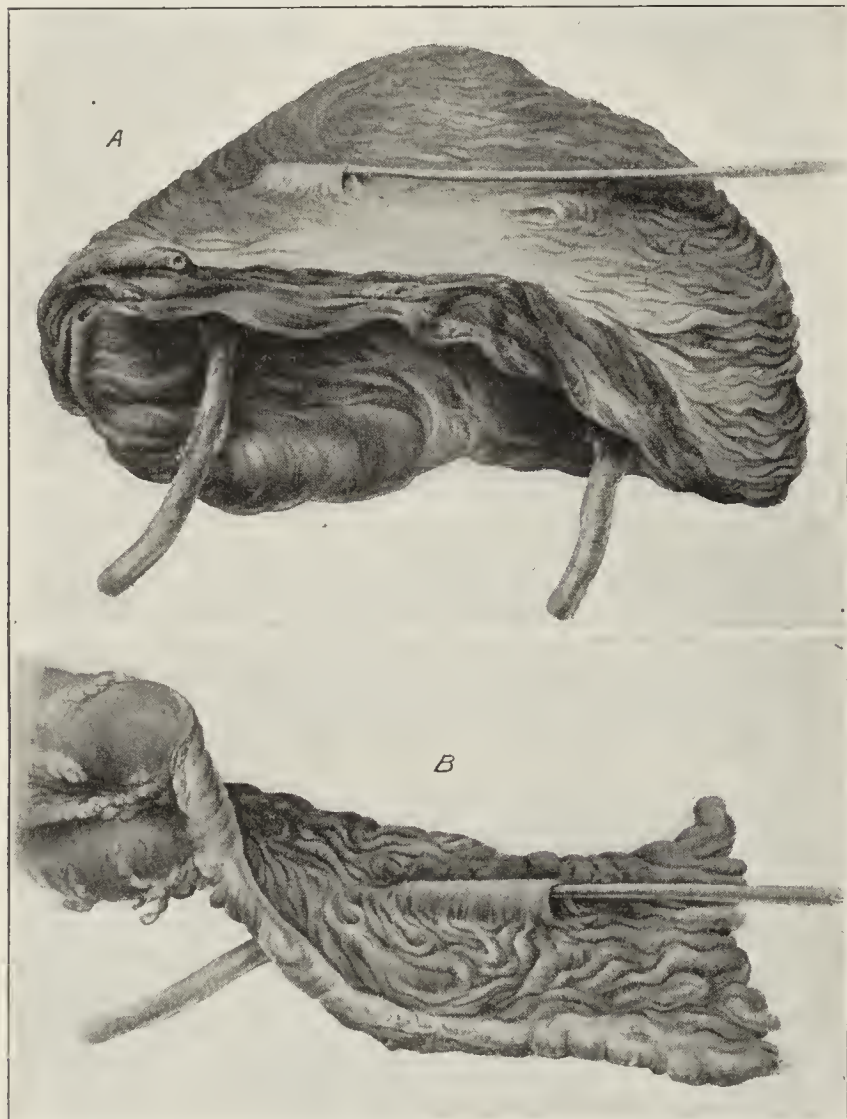


Fig. 13.—Comparison of normal valve in dog's bladder (*A*) with postoperative valve, following submucous implantation of ureter in a dog's large intestine (*B*). This represents the same specimen shown in Figure 12 *A* and *B*, in which the valve acted perfectly, without leakage.

"How about clinical results?" Dr. Charles H. Mayo, who was chairman of the section when these experiments were presented, immediately applied the principle clinically, and in an interview (December, 1916) he told me that he had implanted both ureters (doing the operations one ureter at a time) in something like fourteen cases, making twenty-eight ureteral implantations in all. Some of these were done for cancer and some for exstrophy of the bladder. In only one case has there been a bad result, or evidence of destruction of the kidney. In this case (which was

for cancer of the bladder) the ureter was much thickened and dilated at the time of the operation so that it was not collapsible. This patient died. Dr. Mayo says that he has realized that this was not a proper case for this operation and recommends that in cancer cases in which the ureter is much dilated and not easily collapsible, the ureter should be drawn out through the loin. One of Dr. Mayo's patients lives in Rochester, and, therefore, has been under close observation

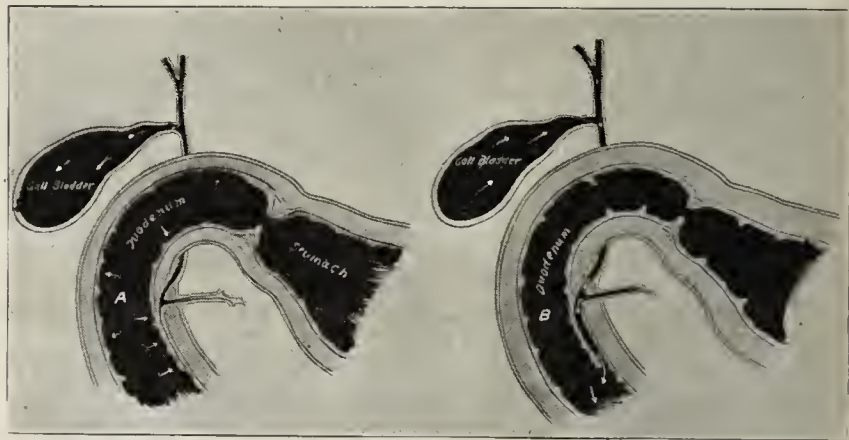


Fig. 14.—Scheme showing theory as to the probable function of the gallbladder: *A*, intra-intestinal pressure, being normally greater than pressure in the liver ducts, closes the valve during intervals of digestion when bile flows into gallbladder; *B*, intra-intestinal pressure is diminished or released in the wake of a peristaltic wave; this permits the opening of the valve, and a consequent outpouring of bile.

for more than five years. This series of cases, when Dr. Mayo reports them, will, I believe, mark a new era in urologic surgery, for no such successful report of cases in which the ureter has been transplanted into the intestine has been made up to date. While I myself have had the opportunity to implant only four ureters in three patients, these cases have been equally successful.

In connection with this subject, I wish to call attention to two other points: 1, Every surgeon has noticed that the common bile duct becomes dilated sometimes to a large size after the gallbladder has been removed or has been functionally destroyed by contraction down on gallstones. In one instance of contracted gallbladder I found the common duct dilated

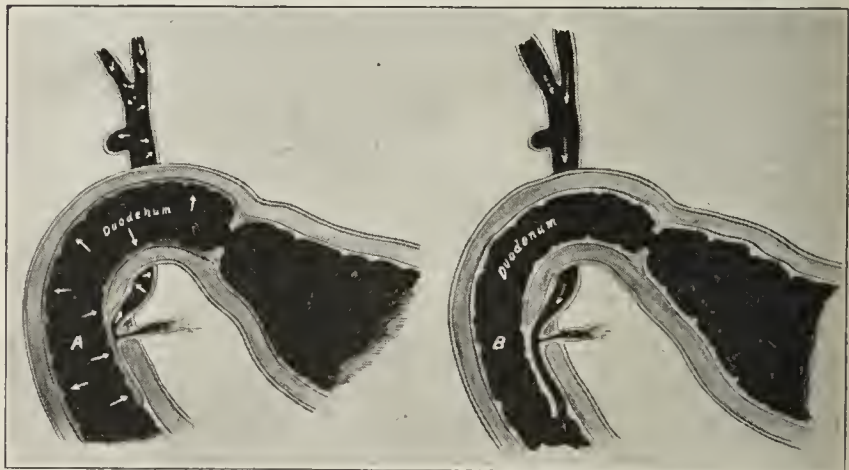


Fig. 15.—Diagram illustrating a theory as to the probable cause of dilatation of the common duct following removal or destruction of the gallbladder: *A*, during intervals of digestion (as at night) the valve is closed by intra-intestinal pressure, thereby producing an equal pressure in the ducts, causing them to dilate; *B*, during digestion, local intra-intestinal pressure is intermittently released in the wake of peristaltic waves, permitting the emptying of the dilated bile ducts, just as the normal duct and gallbladder is emptied.

to fully three-fourths inch in diameter, which caused me to open the bile duct looking for a duct stone, notwithstanding the fact that the patient had shown no jaundice or other evidence of common duct obstruction. Nothing was found in the duct, and the mouth was

3. The details of these experiments were printed in THE JOURNAL A. M. A., Feb. 11, 1911, p. 397.

4. The specimens resulting from these experiments were exhibited to the Section on Surgery at the St. Louis Session of the American Medical Association, 1910.

well open into the duodenum. 2. When a gallbladder fistula is established with the surface, all observers have noticed that the bile flows more freely during the night or during intervals of digestion than during digestion. In other words, the bile flows into the gallbladder during the intervals of digestion. The gallbladder seems to serve as an elastic safety reservoir which takes off the pressure from the bile duct during certain times of the day. It seems likely that this may be explained on the basis that during active digestion peristaltic waves are intermittently passing down the intestine. In the wake of these waves there follows a diminution of the intra-intestinal pressure, which permits the temporary flow of bile from the duct. As soon as the wave has ceased, the normal intra-intestinal pressure is resumed and the valve is closed. During long intervals of digestion, and particularly during the night, the peristaltic waves are few. The intra-intestinal pressure is more nearly constant, and the bile is forced out into the gallbladder, or out through a gallbladder fistula as the case may be (Fig. 14 *A* and *B*). If the gallbladder has been removed or destroyed, an equilibrium of pressure in the gall ducts and intestines is established in the long intervals between peristaltic contractions, with the result that the full degree of intra-intestinal pressure in the bile ducts during the intervals of digestion produces permanent dilatation of the duct (Fig. 15 *A* and *B*).

In connection with this problem, it is well to mention the fact that the urine coming into the bladder through the normal valve is seen to come in jets of several drops at a time, while it passes through a ureteral catheter with a steady drip. Is it, therefore, not probable that the jets seen in the first case are due, partially at least, to the rhythmic contraction of the bladder which at certain intervals increases the intravesical pressure and temporarily closes the valves, while, when the catheter is passed up into the ureter, the bladder contraction is not operative on the flow?

ABSTRACT OF DISCUSSION

DR. EDWARD MARTIN, Philadelphia: As to the statement in regard to inelasticity of the belly wall, it is one of the most elastic of all structures, to wit: the circumference changes before and after dinner, as shown by the relative bigness of your garments. As to intra-abdominal pressure, on operation, with the first admission of air there is a cavity, hence a negative pressure. The pressure is constantly varying; at times it is life-threatening from its effect on the circulation and the respiration. Every vital process and every reparative process depends on the freedom and rapidity of the blood supply, and probably the underlying reason for abnormal abdominal conditions associated with ptosis is a circulatory interference and not a mechanical interference with the progression of the intestinal contents. Of all deceiving factors, the roentgenogram ranks among the first. Ochsner has shown that any viscus may be in any position and function normally if the blood supply is not interfered with.

Concerning the mechanism of the valves, going back to fundamental principles, the law of sphincters is that when irritated they contract. Flaccidity is almost unknown; the anal, the pyloric, the cardiac, urethral sphincters give us trouble only by contracting. In the first few months of life the cardiac valve is normally incompetent, a period for quantitative errors of judgment. Later, if abnormal, it becomes permanently tight. Any neighboring pathologic condition may cause it to grip tight, the sphincter having its own centers which respond in only one way. An incontinent ileosphincter is extremely rare. They all yield to continued abnormal back pressure. The cecum is usually empty and the stimulus

to the cecum to contract is a sudden, violent gush from the ileum. A slow ooze, as through a spasmodically contracted sphincter, will not give this stimulus. I cannot see the mechanism of a vacuum formed in an absolutely soft gut. It is probable that the beneficial effects of operation are not from tightening a loose sphincter, but from loosening a spasmodically tight sphincter. We are cursed by pylorospasm. How do we cure pylorospasm? Usually by curing the lesion reflexly responsible for it, and sometimes by paralyzing and putting out of service the muscle. The rule of the sphincters is that they are always tight. Why is a patient with chronic appendicitis constipated and toxic? Because he has a loose sphincter? No; because he has a tight sphincter. The lower ileum is the portion where the intestinal contents remain longer than in any other part of the intestinal canal. With a teasing chronic appendix the reflex spasm prevents that rapid distention of the cecum which excites cecal contraction. Why do these patients get well of their constipation by the taking out of a fibrosed appendix? And why do so many of them suffer from pylorospasm? Because the sphincters work together; that is, the ileocolic and the pyloric. We have had no success in implanting the ureters, and we have done it very carefully; no success because there always occurs a narrowing at the point of implantation and an ascending infection. Sweet has attempted it many times. In only two reputed cases has it been done successfully without a segment of the bladder wall. I agree that the mechanism of the vesical sphincter of the ureter is, in part, a mechanical one.

ORGANIC CHANGES IN THE CENTRAL NERVOUS SYSTEM PROBABLY DUE TO FOCAL INFECTIONS*

GEORGE W. HALL, M.D.

CHICAGO

It is with a full knowledge of the vulnerable points which may be cited in reasoning from cause to effect that I present the history of these cases which compose the nucleus on which this paper is based. However, clinical evidence and resulting treatment in other cases not here reported encourage me to present this article, for I realize the fact that the chain of infection leading from the tonsils and teeth to the central nervous system in these cases is not complete, since two of the patients are still living.

Orr and Rows¹ state that infections may ascend from deep foci of infection through the lymph channels which surround the spinal nerves and roots, and extend to the pia and there set up inflammatory reaction. They have observed such conditions in staphylococcus infection. They state that toxins can spread along the roots of these nerves without injuring the individual nerves. They have shown that bedsores may produce degeneration in the lumbar enlargement, and sores on the arms have produced degeneration in the posterior columns of the cord on the same side as the focal infection. They have demonstrated similar changes in the lower portion of the cord arising from a pelvic cellulitis and renal abscess. While in their experience the dorsal columns of the cord have more often become involved than other regions, yet they have explained that these toxins may so spread as to produce changes in the anterior radicular fibers, and also in the lateral columns of the cord. Such changes, according to their statement, are the direct result of absorption from some peripheral septic focus.

* Read before the Section on Nervous and Mental Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Orr and Rows: *Brain*, 4, 1906.

Walker² described three cases in which an acute ascending paralysis occurred in the course of a chronic cystitis, and suggested that the cord lesion was due to an extension of inflammation along the nerves from the bladder. That such conditions may exist is verified in tetanus and rabies, which no doubt spread to the cord by way of the nerves.

Marie and Morax cut the nerve of the limb of an animal and injected a lethal dose of tetanus organism into the animal's paw, and no convulsions followed.

Homen and Laitinen, after injecting streptococci into the sciatic nerve, traced the organisms to the meninges of the cord.

Pirrone experimented in like manner with the pneumococcus, and found changes in the cord. In the peripheral nerves, spinal roots and cranial nerves, there is a constant stream of lymph ascending toward the central nervous system, the main current of which lies in the inner meshes of lymph spaces of the perineural sheath. Through these passages, according to this author, the toxins no doubt reach the central nervous system and may spread in the lymph spaces of the pia and arachnoid to distant points. Changes in the central nervous system, as we all know, frequently accompany primary anemia, less often secondary anemia, occasional chronic uremia, diabetes, etc. It is generally accepted that these changes are due to toxins rather than actual organisms. The source of these toxins, especially in pernicious anemia, may be found in the gallbladder, appendix and other foci, so that it is just as reasonable to believe that focal processes in the teeth and tonsils may produce similar changes.

It has been definitely determined that a primary lesion of specific origin on the skin may produce toxic conditions in the spinal fluid, even before the Wassermann test shows a positive reaction. Such conditions can arise by direct transmission through the peripheral nerves from the focus of infection to the meninges of the cord.

Lugaro states that the stronger and more local the action of the toxins, the more often does secondary change take place, while a diffuse and weaker toxin produces a purely primary degeneration.

In a series of eight cases, comprising lesions of varying nature and situated in different parts of the body, Orr and Rows found in each case a cord lesion much more intense in the segment of the cord corresponding to the nerve supply of that area.

REPORT OF CASES

I report three cases which I believe demonstrate the work of these investigators:

CASE 1.—R. M., aged 55, was referred to me by Dr. J. L. Miller in the latter part of September, 1916. His present trouble commenced about eighteen months previous, when he complained of pain in the left shoulder and cervical portion of the spine. This pain continued with exacerbations at times for a period of one year, and then disappeared. About six months after the onset of his first symptoms he noticed that his right hand was becoming shaky when he tried to sign his name. In the spring of 1916, he noticed a weakness in the right leg and small blisters on the sole of the right foot; at times he experienced cramps in the muscles of the right calf.

Examination by Dr. Campbell in 1915 revealed large tonsils, and pyorrhea of the two lower incisors; the sinuses were normal.

My examination revealed an atrophy of the shoulder group muscles on both sides, more on the right, with an atrophy of the muscles of the arms and forearms, and also of the thenar

and hypothenar muscles of the hands, these atrophic changes being more pronounced on the right side. Marked fibrillary twitchings were present in these different regions. The left lower extremity was practically normal; the right lower extremity was spastic, with increased reflexes and a positive Babinski reflex; there was no atrophy of muscle in the lower extremities, and no sensory disturbances over any part of the body. The optic nerve was normal. There were no bladder disturbances. The abdominal reflexes were present.

We deemed it advisable to exclude syphilis; therefore the patient was sent to St. Luke's Hospital and spinal puncture made. The spinal fluid was normal in every particular and the blood Wassermann test negative. We made a diagnosis of degenerative changes in the spinal cord, involving the anterior and lateral portions in the cervical region of the spinal cord. We recommended that a Roentgen-ray examination be made of the spinal vertebrae. Changes of an osteoarthritic nature were found, especially in the cervical portion, and to a less extent in the lumbar portion of the cord.

CASE 2.—Mrs. S., aged 58, was referred to me by Dr. John L. Porter in January, 1917. She stated that her present trouble began about September, 1915, when she experienced some pain in the lumbosacral region, and some stiffness in the calf muscles of the left leg. About one year ago the calf of the right leg became stiff and she still has that feeling of stiffness in both lower extremities. A few weeks after the onset of this trouble she noticed a weakness in the extensor muscles of both feet, stating that she could not raise the toes from the floor normally. She has never suffered any pain in the lower extremities. The weakness in the lower extremities gradually increased until, at the time of examination, she was compelled to support herself with crutches in order to walk around the house.

Examination showed some atrophy of both lower extremities below the knees, more marked on the right than on the left, a partial foot drop on both sides, with a possible Babinski reflex on the right. There were no fibrillary twitchings, the knee-jerks were present and the Achilles reflex absent; there were no sensory disturbances.

We made a diagnosis of organic change in the anterior portion of the spinal cord in the lumbar region, and suggested spinal puncture and blood tests. Both fluids proved to be normal. We further suggested that roentgenograms be made of the spinal vertebrae, which revealed positive arthritic changes. A history of pyorrhea was obtained, on account of which six teeth had been extracted in August, 1916. A pelvic examination was made by Dr. T. J. Watkins at my request, and the report was negative. A laparotomy had been performed fifteen years previous for the removal of a benign tumor of the right ovary. The only apparent cause for the changes in the central nervous system of this case originated in the teeth.

CASE 3.—Through the courtesy of Dr. Peter Bassoe, I wish to report a third case which came under his observation for the first time, June 8, 1912. Single man, aged 25, of excellent habits and with a negative venereal history, a history of nephritis following influenza when 11 years old, in April, 1911, had a slight swelling of the knees and ankles for about two weeks. The patient was apparently well after this attack until March, 1912, when nodules developed in the skin of the legs and swelling about the ankles (erythema nodosum?). In April, he had occasional chills, followed by a temperature rising to 102 F. These chills occurred at first once a week, then twice a week. Late in May, he began to have attacks every few days, consisting of vomiting followed by diplopia. These symptoms were followed by numbness in the left leg and slight difficulty in swallowing. For some time previous, the gums had been swollen and the teeth sore.

Examination revealed right external rectus paresis; slight right facial paresis of the right side; loss of pain and temperature sense over the right trigeminal area; absence of right corneal reflex; analgesic areas on the left side of the chest and abdomen, and in places on the left arm; tactile sensation normal; tendon reflexes normal. June 9, he was admitted to the hospital with a temperature as high as 102 F., which continued for five days, when it returned to normal. He had

2. Walker: *Lancet*, London, March 11, 1905.

almost a continuous hiccup, and repeated vomiting attacks during the first four days in the hospital. He received treatment for pyorrhea by Dr. Frederick B. Moorehead. The Wassermann test was negative. The patient gradually improved, could again walk, although he staggered somewhat, and a slight diplopia persisted. In August, 1912, he had a relapse for a time, and when examined again, presented analgesia of the right side of the face and the entire left side of the trunk and extremities. The right arm and leg were slightly weaker than the left. He had a bilateral ankle clonus, more marked on the right side; other tendon reflexes stronger on the right side. He again improved after his mouth had been treated. In December, 1912, left hemiplegia quite suddenly developed, and it was definitely stated that this attack was preceded by an aggravation of the pyorrhea. In June, 1913, he returned to the hospital for a week, when examination showed a right trigeminal anesthesia, left spastic hemiplegia, right hemianalgesia, and thermanesthesia.

Nov. 4, 1913, he became stuporous, and had dysphagia, bilateral Babinski reflex and ankle clonus; no voluntary movement of either extremity; abdominal reflexes absent, right corneal reflex absent, and left present. He developed a rise of temperature, and signs of pneumonia appeared. He died Nov. 6, 1913.

A necropsy was held, November 7, by Drs. F. R. Nuzum and Peter Bassoe. The only finding outside of the brain was a bronchopneumonia. The brain revealed moderate edema of the pia; the right half of the upper portion of the pons was distinctly softened. A pipet was introduced to secure material for culture. No pus was present. Subsequent examination of the brain after hardening with liquor formaldehydi revealed a distinct, nonsuppurative inflammation in the softened part of the pons, chiefly characterized by large accumulations of mononuclear cells about the vessels.

COMMENT

The history of these cases shows not only a history of focal infection, but also in two of the patients slight arthritic changes in the vertebrae, most pronounced at those points which correspond to the most definite changes in the central nervous system.

104 South Michigan Avenue.

ABSTRACT OF DISCUSSION

DR. H. T. PATRICK, Chicago: I am far from wishing to deny involvement of the central nervous system from focal infection, but I think Dr. Hall has hardly proved his case. In all his cases he found evidence of arthritis, and I do not see the necessity for assuming infectious involvement of the central nervous system to account for the symptoms. These could all be accounted for by secondary involvement of the nerve structure by way of the arthritides. In the last case we are in doubt whether or not there was softening due to vascular occlusion. If these cases were due to teeth and tonsils, they were hemogenic, which had nothing to do with direct invasion of the nerve trunks and thence by way of nerve roots to the spinal cord. This route is as yet hypothetical, but this does not prevent it from being an attractive field for investigation, and I am glad that Dr. Hall has called attention to it. My own experience has been that in the vast majority of these cases what seem to be neuritides are really arthritides.

DR. J. P. MUNROE, Charlotte, N. C.: I am inclined to agree with the last speaker. Most of these cases can be explained otherwise than by an involvement of the central nervous system.

DR. A. L. SKOOG, Kansas City, Mo.: It is interesting to note that we find infections of the central nervous system secondary to other foci in the body. In these cases I am inclined to think they are not conclusively proved. I believe the fault rests on the bacteriologic examinations, which have not been completely conducted.

DR. G. W. HALL, Chicago: I am entirely satisfied in my own mind as to the relation between cause and effect in these cases. I think in the course of two or three years these same

gentlemen will have changed their minds as expressed today. In the first case the patient was taken to a hospital where they found, according to the roentgenograms, changes in the cervical vertebrae, as I have reported. The same patient was taken to a different hospital, and Dr. Billings was called in and gave an independent opinion. He declared that there were no arthritic changes in the spine, and felt that the changes were of a multiple sclerotic nature and that the primary infection came from the teeth. This opinion was independent of mine.

A REPORT OF A GROUP OF ONE HUNDRED AND TEN CASES OF POLIOMYELITIS

FROM THE ACUTE ONSET TO THE PRESENT TIME*

CHARLES OGILVY, M.D.

NEW YORK

The group of 110 cases of poliomyelitis on which this report is based, with fifteen additional cases, represents the result of the study of an epidemic in a suburb of 35,000 inhabitants of New York City during the summer of 1916. These 110 cases were all isolated in hospital accommodations where each patient could be continuously observed.

The origin of the disease in this community was definitely traced through a carrier coming from an infected household in Brooklyn. The district first infected was an Italian community, in which particular section forty-two cases developed. This community was somewhat crowded, although in a comparatively clean neighborhood.

The first case developed on July 13 and the last one on Oct. 25, 1916. No other cases have developed from that time up to the present date.

Early Diagnosis.—The majority of the cases were somewhat similar and developed as follows: The child was said to have been sick from one to four days with fever, usually vomited and frequently gave a history of pain in the head, neck, back or extremity. On examination, the child was found to be lying on its side, with the head thrown back, quiet or asleep. When aroused it was usually irritable. In 81 per cent. of the cases there was stiffness of the neck.

Other evidences of the disease were found to be an abnormal condition of the knee jerk, and disturbances of reflexes throughout. In addition to these clinical findings, the diagnosis was corroborated by a spinal fluid examination. These specimens were all examined at the von Wedel Laboratory of the New Rochelle Hospital, and the diagnosis was confirmed in many doubtful cases by this examination. A lumbar puncture was made in eighty-two cases.

One course of the disease frequently seen was that in which the child was sick for a day or two and then apparently better, being allowed to get out of bed, after which the fever returned and the typical symptoms developed. It may be here remarked that there was but one case resembling the classical picture so often described in textbooks, of the child going to bed perfectly well, taken ill during the night and found to be paralyzed in the morning.

There were twenty-five cases of suspected poliomyelitis in which the spinal fluid gave negative findings. In each instance, the cell count was under 20.

* Read before the Section on Orthopedic Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

The fluid was normal, Fehling's always unreduced. The fluid was always clear, and there was no increase in albumin or globulin. In none of these twenty-five suspected cases of poliomyelitis giving negative spinal fluid findings did poliomyelitis subsequently develop. On the other hand, in none of the cases in which the spinal fluid gave positive findings was a mistaken diagnosis made—all developed poliomyelitis. From these data, it is fair to assume that a definite early diagnosis can be made by carefully studying the clinical symptoms in conjunction with the laboratory findings of the spinal fluid.

During the first week nineteen patients were admitted to the hospital. In one month there had been eighty-one patients admitted. By October 25, 110 patients had been admitted, the time of detention in each case being not less than six weeks. There were fifty-six male patients, or 50.9 per cent., and fifty-four female patients, or 49.1 per cent. There were only three colored children, or 2.7 per cent. This is undoubtedly due to the fact that a small proportion of the population are colored people.

The ages varied from 2½ months to 45 years. Those patients under 5 years numbered eighty-five, or 77.3 per cent.; from 5 to 10 years of age, fourteen, or 12.7 per cent.; from 10 to 15 years, eight, or 7.3 per cent.; over 15 years, three, or 2.7 per cent.

It is interesting to note that in eight families there was more than one case. Also, that the houses having more than one case, not in the same family, were six in number, so that no fewer than seventeen cases of the disease might be assumed to have been contracted from other members in the same house, a percentage of 14.5.

On further study of this subject, however, we learn that in but six of these seventeen cases did a sufficiently long period elapse to justify the conclusion that the disease was contracted from other members of the same household, as explained in the accompanying table.

CASES OCCURRING IN SAME HOUSEHOLD

Name	Date of Onset	Name	Date of Onset
J. C.	July 24	B. T.	September 4
T. C.	July 26	S. G.	July 18
J. H.	July 27	M. M.	July 18
P. H.	September 8	J. P.	July 19
P. F.	August 9	A. P.	August 1
T. F.	August 10	M. D.	August 3
J. P.	August 9	D. C.	July 21
I. P.	August 10	A. L.	July 26
G. P.	August 17	F. O.	August 5
J. H.	August 24	W. D.	August 7
A. H.	August 26	R. H.	July 31
E. N.	August 11	W. S.	July 31
H. N.	August 14	R. T.	August 10
D. S.	August 15	H. S.	August 4
F. S.	August 21	M. H.	August 15
I. T.	August 26		

In one family three out of seven children contracted the disease, two of whom died. In another family, two of three children developed the disease. In another, two out of five and in a fourth family, two out of four children. In a fifth family, two out of six children, and in two other families both of the children in each family were affected.

Of houses in which more than one case occurred not in the same family (tenement and two family houses) there were three cases each in two houses and two cases each in three houses. This gives us a total of twenty-nine cases, or 26 per cent., all of which were associated with one or more cases in the same family or house.

Paralysis.—Paralysis occurred within the first few days of the disease. The average time of the onset

of the paralysis was the fourth day. The percentage of paralyzed and nonparalyzed patients was from fifty-eight to forty-two. The day on which the largest number of cases of paralysis occurred was the third day. The result of my observations led me to expect a recovery without paralysis, if the patient showed no signs of it within the first eight days of the disease.

It is of interest to note that eight patients in whom facial paralysis developed had no other paralytic involvement, and but two of the other paralyzed patients had facial involvement. Deducting the patients who died, 55 per cent. of the paralyzes involved the lower extremities.

In studying the relation of the paralysis, both in degree and extent, to the cell count in the spinal fluid, I found that there is nothing to indicate either the type, degree or extent of paralysis by this means. In some cases, in which the paralysis was very extensive, the cell count was low, as in Case 2, cell count 43; Case 5, cell count 80; Case 7, cell count 65. In cases in which the paralysis was nil, the cell count was high, as in Case 46, cell count 265; Case 83, cell count 380; Case 84, cell count 392; Case 91, cell count 880; Case 107, cell count 1,160. In taking an average of the cell count, I have found that it did not average as high in the paralyzed as in the non-paralyzed patients.

It may also be here stated that the degree of temperature in no way indicates the amount of paralysis which may or may not follow.

It was occasionally noted that shortly after admission the child would become quite rigid with tetanic spasms. These patients recovered without paralysis.

Deaths.—There were nineteen deaths, or 17.3 per cent. One of these patients died of bronchopneumonia on the twenty-third day of illness. With the exception of two other patients, all died within the first five days of the disease, so that I learned to look for recovery, provided the child did not die within the first few days of the acute attack.

A large majority of the patients died from respiratory paralysis. With one exception stupor set in early, the temperature running from 102 to 105 F. The majority of the patients, also, had difficulty in swallowing—involvement of the glossopharyngeal nerve. Stupor and inability to swallow were invariably looked on as precursors of death.

Immunized Serum.—Fifteen patients were treated with immunized serum. Administration was begun in each patient at the onset of the disease (the first to third day). Two groups of cases were selected for treatment; namely, the first, the nonparalyzed patients with but mild symptoms, the other, the severely affected patients. Seven were selected for the first group, eight for the second.

Of the seven nonparalyzed patients, but one subsequently developed paralysis. It was at first thought that this case was rather promising and that the serum in all probability had been a factor in preventing paralysis from occurring in the other six cases. In this relation, however, in studying twenty-nine other patients who were not paralyzed and who did not receive serum, only five developed paralysis subsequently. This percentage is practically the same as might have been expected had serum been used, so that I feel justified in concluding that the administration of serum in the nonparalyzed patients does not materially affect the prognosis. In the eight severely prostrated patients, six died, and of the two who

recovered, one gradually became more severely paralyzed, the other recovered without paralysis. It is very doubtful, therefore, that serum affected in any way these severely paralyzed patients.

Epinephrin.—This was administered in three patients without any apparent beneficial effect.

After-Care.—All the patients, without exception, on their discharge from the hospital were referred directly to an orthopedic clinic which was organized specifically for this purpose. To this immediate and continuous supervision and treatment I attribute in great part the excellent results which are now being obtained. The plaster of Paris fixation splints which were used in the hospital have been continued in the clinic with the same object in view.

That which has most impressed me in regard to the recovery from paralysis is the fact that long continued rest extending, if possible, over six months' duration in a light fixation splint, such as a posterior plaster of Paris shell, has been the one greatest factor in obtaining the best results.

Massage was begun within two months after the acute onset. It was soon learned that patients so treated did not do as well as those in which the massage was postponed until the third or fourth month.

The greatest difficulty has been to keep the limb at perfect rest after it has recovered sufficiently to allow the child to get about. In those cases in which it has been practically impossible to keep the children off their feet, light, carefully adjusted braces have been supplied. These braces have been furnished simply to prevent deformity in carrying the body weight. Overfatigue in these cases has been noted time and time again, with resultant arrest of progress in the return of function.

In paralysis of the deltoid, I have found the most convenient and comfortable brace to be that of a plaster of Paris splint molded to the side of the chest and extending out at right angles to support the arm. This is bandaged to the body and has proved a practical application.

Muscle Testing by the Balance Weight.—At first, I regarded this measure with a good deal of scepticism. My opinion, however, has now changed since I have learned that in patients on whom it can be applied, the physician will have a much more definite knowledge of the progress of the case and can then more intelligently advise regarding muscular activities. I have in several instances, for example, passed opinion on the extent of the progress of a case by an ordinary manual examination, after which muscle testing by the balance weight having been made, I have recognized decided errors which otherwise it would not have been possible to check up.

A large majority of the patients affected, namely 77 per cent., were under 5 years of age. This necessarily eliminated all but 23 per cent. of the patients, some of whom were not paralyzed, and other of whom died, leaving a small minority of patients in whom muscle testing by the balance weight was applicable. This muscle testing should be made by the same individual each time in order to be accurate.

Muscle Training Exercise.—The exercises have been attempted in all the patients. My experience has been that these exercises are of great value when they can be closely supervised by both the physician and nurse. When, however, this supervision must be left in great part with the parent, the results are not

nearly as good, although it may be said that they appear to be better than would be expected if no such muscle exercises were undertaken. I have not employed electrical currents of any kind in the treatment of any of these patients.

Bath Exercises.—A method which I have found to be of great advantage, both in examination and in muscle training exercises, has been bath exercises. For this purpose, I have had installed in our clinic a bath 4 feet by 3 feet. In this bath, the slightest response of returning power in a muscle or group of muscles can be detected and recorded. In addition to this, the patient is encouraged to attempt and obtain motion which would otherwise be impossible—and this without the slightest overfatigue.

Thirty patients have been discharged from our clinic, having completely recovered and being in need of no further supervision. This number represents 33 per cent. of all the patients, exclusive of those who died. To these, I may add another 26 per cent. who will in all probability be discharged as cured within six months' time. This leaves 41 per cent. who will require further treatment. Of these patients, 26 per cent. are able to walk comfortably, but 15 per cent. are unable to do so. Of this 15 per cent., however, one half of the patients are 2 years old or under; which accounts in part for their disability.

CONCLUSIONS

1. A reliable early diagnosis can be made in a large majority of the cases.

2. We are unable to prognosticate regarding the subsequent severity of the paralysis, either by the acuteness of the febrile stage or any laboratory findings thus far submitted.

3. When death occurs, it takes place with few exceptions during the first few days following the acute onset.

4. Treatment outdoors during the convalescent stage is most beneficial.

5. In my experience, immunized serum treatment has not proved efficient.

6. Although there is nothing to disprove the possibility of an insect carrier, the evidence herewith submitted would sustain the assumption that poliomyelitis is a contagious disease.

7. Although muscle testing by balance weight is applicable in only a small percentage of the patients, in these patients it is of much value.

8. Continuous supervision is most important.

9. Continued electrical treatment is not essential for the recovery of lost muscle function.

10. Bath exercises in relation to muscle training form one of the most practical and useful lines of treatment that can be followed out.

11. Complete rest extending over six months is one of the most important factors in obtaining perfect return of function.

12. Overfatigue is of the greatest detriment to improvement, and is most difficult to guard against.

13. Braces should be made as light as possible and should be supplied immediately when body weight-bearing tends to produce strain or deformity.

14. The percentage of paralyzed and nonparalyzed patients in an epidemic may be expected to be about 58 per cent. paralyzed, 42 per cent. nonparalyzed; or, excluding those who died, 49 per cent. paralyzed, and 51 per cent. nonparalyzed.

40 East Forty-First Street.

THE ORTHOPEDIC TREATMENT OF ACUTE AND CONVALESCENT POLIOMYELITIS *

E. D. EBRIGHT, M.D.

Fellow of the American College of Surgeons

WICHITA, KAN.

So much has been written during the past year of poliomyelitis that one naturally hesitates to add to the literature on the subject; and yet the feeling of certainty that the problem is much bigger than anything so far written or said, and the hope that out of our experiences at the Seaside Hospital there may come a little help in the efforts to meet the challenge of this terrible disease, impel me to briefly report the results of the work done in that institution. It is, of course, to be understood that this is a preliminary report only.

I feel quite confident that soon the questions of specific agency and the mode of transmission of the disease will be settled, but so far orthopedic surgery is the one branch of medicine that has contributed something definite to the problem of curing crippled and deformed children. Out of the maze of uncertainty and wild theories, one fact stands out clearly: We have prevented and corrected deformities, and we have hastened the restoration of muscle power.

That is good, but the time has now come, if we are to be of the most service to humanity, for us thoroughly to recognize the fact that a large percentage of the deformities that heretofore have given us the opportunity of appearing in the more spectacular rôle of operative surgeons would not have occurred if the proper treatment had been carried out in the acute and subacute stages. Clever operations designed to correct deformities is not enough; we must prevent these deformities; and what is of vastly more importance, we must prevent permanent paralyses.

We must not be satisfied when in one, two or three years, by our muscle reeducation, we have opened up new paths of conduction and thus brought about a partial or complete restoration of muscle power. We must so treat the child in the acute stage that the normal paths of nerve conduction will not be destroyed.

While the major part of this paper is a report of the work done at the Seaside Hospital in the treatment of the disease in what is known as the convalescent stage, I feel that by far the most important thing I can do is to insist on a plan of treatment of the acute stage which I think will render much of this tedious and uncertain work unnecessary.

I wish to observe, first, that the division of the ordinary spinal type of the disease into the acute, convalescent and chronic stages is not sufficiently accurate and does not correctly correspond with either the pathology or the clinical course of the disease. Rather, it seems to me that a better division would be into acute, subacute, convalescent and chronic stages. If I were obliged to make an arbitrary time division of these stages, I should say that the acute stage covers the first four weeks and corresponds to the active inflammatory process in the cord, and lasts until the cells that have been disabled by effusion have recovered. The subacute stage begins at the fifth week and extends to the time when the cells that have been disabled by light hemorrhage have cleared up. This I

should place at the end of four months. The convalescent stage begins at the fifth month and extends to the time when the motor cells that have been disabled by deep hemorrhage have recovered. This I should place at the end of two years. The chronic stage begins at the third year and represents the permanent paralyses of muscles receiving their nerve supply from the motor cells destroyed by toxemia.

A knowledge of the pathology of the disease and of the physiology of the nervous system would seem to indicate that the proper treatment of the acute stage is the inhibition of afferent impulses to the sensory cells of the central nervous system, thus making it impossible for the diseased motor cells in the anterior horn of the cord to be stimulated through the reflex arc. A motor cell that is diseased through effusion or hemorrhage should receive the same rest that we attempt to produce in any other diseased structure. To produce this motor cell rest it is not sufficient to inhibit the afferent impulse from the muscles involved or even of the member involved. All afferent impulses from the entire body, those arising from the surface of the body as well as from the deeper structures, should be checked. There can be no question that cells which are disabled by effusion and which should resume their function by the end of the acute stage, if they receive the proper rest, are hindered in their recovery and further disabled by attempts to functionate. And in the same manner cells which are disabled by light hemorrhage and which should resume their function by the end of the subacute stage are further diseased by use and converted into the more seriously diseased type of cell.

I think it is agreed that the cells destroyed by toxemia form a small percentage of the cells affected, probably not over 10 or 12 per cent., and yet we have had permanent paralyses vastly in excess of that. What does that mean? It means simply that by our lack of understanding of the conditions present and the indications to be met, we, by our meddlesome efforts to assist Nature, as we think, are pouring impulses, or allowing them to be poured, into a diseased cell that has its outlet blocked, thus either destroying it entirely or converting it into a more seriously diseased condition. Any end-result that carries a permanent paralysis in excess of the cells destroyed by toxemia is a sad commentary on our treatment or lack of treatment. Early in the work at the Seaside Hospital in treating the disease in the subacute stage, we proved to our entire satisfaction the beneficial results following complete immobilization of the entire body. I am quite sure that the results will be even more striking if this plan of motor cell rest is applied in the acute period. Our method of obtaining this result in the subacute stage was by encasing the child in a plaster bed, separated so that it could be removed if necessary. It was really remarkable how comfortable it was to the patient and how much struggling and fear it overcame. I have not had a large opportunity of using the method in the acute stage, but in the future if the chance should come, I shall treat every child, as soon as the diagnosis is certain, by immobilization in a plaster bed, putting it in a dark, quiet room, covering the ears to keep out all sounds, and with a careful attention to diet and excreta.

CONVALESCENT STAGE

Seaside Hospital was opened, Sept. 18, 1916, for the hospital after-care treatment of the disease. It grew

* Read before the Section on Orthopedic Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

out of the desire of the "Brooklyn Children's Aid Society" and some public spirited men to help meet the emergency that followed the epidemic of last summer, and the desire of Dr. Truslow and myself to put into practice some ideas we had as to the proper treatment of the disease, chief of which was the firm belief that in the seriously paralyzed children the treatment should be hospital rather than home or dispensary. There have been admitted to date 146 children, all seriously paralyzed. Twenty-four of these at admission were still in what we consider the subacute stage. It is worthy of note that these have made a more satisfactory improvement than those admitted later in the course of the disease.

TABLE 1.—RESULTS IN ONE HUNDRED AND FORTY-SIX CASES	
	No.
Discharged wearing braces and practically recovered.....	5
Left within a day or two of admission.....	5
Here too short a time to be included in an estimate of our results..	10
Cases in hospital long enough to be included in our estimate.....	112
Cases of the encephalitic type—"spastics".....	14

TABLE 2.—DISTRIBUTION OF PARALYSES	
	No.
Paralysis of one arm	7
Paralysis of both arms.....	6
Paralysis of one leg.....	14
Paralysis of both legs (paraplegia).....	68
Paralysis of one side (hemiplegia).....	0
Completely paralyzed (both arms, both legs, back, abdomen, neck and chest)	17
Paralysis of one side of face.....	2
Paralysis of speech center (one has perfectly recovered, one just beginning to say a few words)	2
Backs involved	86
Backs involved, with marked curve	42
Abdomens involved	66
Abdomens involved, with large globular bulging of some part of wall	7
Paralysis of sphincters	5

In the list of cases in Table 2 it should be particularly noted that we had no case of hemiplegia, though we have had three cases with the arm of one side and the opposite leg paralyzed.

TABLE 3.—DEGREE OF IMPROVEMENT	
	No.
Very great improvement	64
Fair improvement	42
No improvement as yet	5
Died, from pneumonia	1
Abdomens improved	61
Of these very great improvement in	5
Abdomens unimproved as yet	5
Backs improved	86
Of these, very great improvement in	8
Of the 14 spastic cases:	
Improved	8
No improvement as yet	4
Died, both from pneumonia	2

On admission, the child is carefully examined and the condition of every muscle thus recorded on the history chart:

N, normal.

—1, weak, but can lift and sustain moving segment against gravity.

—2, can lift but cannot sustain moving segment against gravity.

—3, cannot lift moving segment but can assist.

—4, cannot assist, but examining fingers feel response in tendon.

—5, completely paralyzed.

Table 4 shows the present condition of some of the more important muscles that were marked — 5 on admission.

It will be noted that of these important muscles we have had the most marked improvement in the deltoids and the least improvement in the quadriceps. The same rule we have found to hold in the case of these same muscles marked less than —5 on admission. We feel particularly gratified in the improvement we have had in the deltoids. In this connection we have found that all the muscles of the shoulder recover in about the same degree as the deltoids with the exception that the external rotators, supraspinatus, infraspinatus and teres minor, seem to be slower. This fact will be noted later. Of forty-six paralyzed shoulders, thirty-two of which are noted in Table 4 as —5 deltoids, all but two already show a marked improvement, and we feel quite sure eventually will be useful joints.

TREATMENT

I have already discussed the problem of the treatment of the acute stage. I repeat that the bringing about of a condition of motor cell rest is the thing to be desired. If better methods than I have indicated can be thought of, they should be used. However it is brought about, I am quite sure that it will mark the most important advance made in the treatment so far, and will save many children from the crippling and deforming results that heretofore have attended the disease.

In the subacute stage the treatment is rest and support of paralyzed muscles and the prevention of deformities. The same general rules are to be followed as in the treatment of the convalescent stage, with one exception.

In discussing the treatment of the convalescent stage, which is the work that has occupied practically all of our time, the treatment followed and some of our more important conclusions are so related that it is impossible to discuss them separately. I wish to observe that:

1. The most frequent paralyses, in the order named, are anterior foot muscles, quadriceps, glutei, hamstrings, deltoids, hip flexors, internal rotators of the thigh, and external rotators of the shoulder.
2. The treatment of the spastic cases is most unsatisfactory so far, but rest is indicated. We have found that attempts at massage and muscle training are neither agreeable nor beneficial.
3. A stretched muscle will not regain its tone. This is very important and is the key to all treatment. Every weakened muscle, the dorsal flexors of the ankle, the quadriceps, the deltoids, or the muscles of the back and abdomen should be treated with this fact kept in mind. We attribute our results in the treatment of deltoids to the fact that the muscle has been kept in a relaxed position continually. This we have done with a brace that elevates, externally rotates, and abducts the arm. Whether the elbow is extended or

TABLE 4.—PRESENT CONDITION OF MUSCLES MARKED MINUS 5 ON ADMISSION

Muscle	Number	Improved from —5 to —4	Improved from —5 to —3	Improved from —5 to —2	—5 to N	Unimproved as Yet
Deltoids.....	32	8	8	10	4	2
Glutei.....	69	24	19	9	9	8
Hip flexors.....	64	13	23	11	12	5
Quadriceps.....	84	19	27	20	8	10
Hamstrings.....	71	20	19	14	10	8
Gastrocnemius.....	16	6	2	3	2	3

flexed depends on the condition of the biceps and triceps.

4. Many muscles marked —5 on admission have been found to be cases of muscle fatigue and not true paralysis. This we have proved time and time again in the case of feet that have been in a position of valgus for four or five months. After putting the foot up in plaster for two or three weeks in position of marked dorsal flexion and inversion and then removing the cast, we have been surprised to find very good anterior and posterior tibial muscles.

5. Contrary to the plan of getting the children up as soon as possible we have followed the opposite course. We are convinced that many backs are injured because the child is put in braces and encouraged to walk. Even though some particular muscle or set of muscles can be braced sufficiently to allow the child to walk, it should not be done until it can be done without injury to other weakened parts. The effort should be to bring about a symmetrically recovered whole. If the child receives the proper massage and muscle training treatment, prolonged rest in bed can do no possible harm.

6. The treatment is hospital rather than home or dispensary. It is impossible to carry out the treatment that follows an appreciation of the law that a stretched muscle will not regain its tone by taking the child to a dispensary every other day. Casts will be loosened, braces will be allowed to slip and supports will need readjusting even with the most frequent watching.

If we have had any superior results in our work, it is not that we are more capable orthopedists than others or that our muscle trainers are more skilful than others; it simply represents the superiority of hospital treatment over any other plan that does not give the same careful and constant attention to details.

7. Electricity has no place in the treatment of the disease before the chronic stage, and even then we question its benefits.

8. Muscle training or muscle reeducation is very valuable in the convalescent and in the chronic stages, but not indicated in either the acute or subacute stages. It is illogical to attempt to build a new communicating line from brain to muscle while the probability remains that the old line will do the work. This is the one exception we noted in speaking of the treatment of the subacute stage. It may do harm if used early in the disease by stimulating the diseased motor cells that require rest to bring about their recovery.

9. A reference to our statistics will show that out of 112 cases, eighty-six showed a very weakened condition of the back muscles, and forty-two presented a decided curve. We feel quite sure that poliomyelitis, either frank or unrecognized, furnishes us the reason for most of our cases of scoliosis. We do not feel that faulty posture alone causes scoliosis. It may be the exciting cause, but in our opinion a careful examination into the history of the case will disclose the fact that there has been a predisposing cause, and with the exception of those cases caused by empyema, rickets or asymmetry, we believe this predisposing cause will be found to be due to a disturbed relationship between the muscles of the back from a previous attack of poliomyelitis. In speaking of the treatment I have attempted to state general principles rather than to give bare statistics.

CONCLUSION

I wish to repeat, as emphatically as possible, these two points:

1. Treatment of the acute stage should have in view the bringing about of a condition of motor cell rest.

2. All treatment of weakened or paralyzed muscles, in whatever part of the body they may be, should be based on the law that a stretched muscle will not regain its tone, and methods and appliances used that will keep the muscles in a position of constant relaxation.

TREATMENT OF ANTERIOR POLIOMYELITIS AT FORDHAM HOSPITAL*

SAMUEL W. BOORSTEIN, M.D.

Instructor of Orthopedic Surgery, Fordham University, School of Medicine; Chief of Orthopedic Department, Fordham Hospital
Outpatient Department; Clinical Assistant, Orthopedic Department, Vanderbilt Clinic, Columbia University

NEW YORK

The recent epidemic of anterior poliomyelitis in this city with the tremendous number of unfortunate victims put a special task on the general hospitals in which orthopedic clinics are held. At the regular orthopedic hospitals, there was no need for making special preparations for treating the anterior poliomyelitic patients from this epidemic during the convalescent stage, for they always had such cases. The general hospitals, while they had orthopedic clinics, had to make special provisions to meet the vastly increased demands. As we had such a problem in Fordham Hospital, I will first review briefly the provisions made here.

FACILITIES AT FORDHAM HOSPITAL

There was no adequate room in the hospital to spare for administering treatments to these patients, but we had plenty of ground facing the Bronx Park. We constructed a large tent with a wooden floor and steam pipes (Fig. 1). The location of the tent outside of the hospital helped also to avoid the interference of these small cripples while passing through the general dispensary rooms. The advantage of a tent in summer need not be elaborated on but, even in winter, we found that the sun shining on the canvas helped to warm the tent very quickly. During the entire season we missed treatments only about five times owing to the strong wind then prevailing, especially as the hospital is located on a high level surrounded by parks. We really feared the wind more than the cold. Few of the children ever caught cold in the course of the treatment. The inside of the tent is cheerful and has an excellent effect on the little children (Fig. 2). They run around and enjoy themselves and do their exercises freely.

Inside this tent we placed massage and examining tables and electrical apparatus. At one end we have special toys, large and small, for exercising the younger children and for making the time more pleasant for the older ones. Often an older child will help a younger one use the toys, and thus double benefit is derived. Such provisions, in my opinion, can be made in any general hospital on short notice.

* Read before the Section on Orthopedic Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

* Because of lack of space, this article is abbreviated in THE JOURNAL by omission of the illustrations. The complete article appears in the Transactions of the Section and in the author's reprints.

The treatments are given by experienced masseuses and muscle educators. At least one physician, a member of the orthopedic staff, is always on duty in the tent to see that the massage and exercises are properly administered, not overdone and, if necessary, to change the orders. We have also a special social service nurse who devotes her entire time to this work.

REGULATIONS OF THE CLINIC

As orthopedic patients are in the habit of roaming from one clinic to another, and as we desired to watch the results carefully, we have established the following regulations, which proved practical:

1. No patients are permitted to attend any other orthopedic clinic during the time that they are receiving treatments at our hospital. If the social service nurse discovers that they do attend another clinic they are informed either to stay with us or to go to the other place. At the beginning, we lost many patients; namely, those who have the tendency to migrate to many hospitals, while the more settled stayed with us. Of course, we have somewhat the advantage that we are away from the center of the city, and thus the patients are less tempted to visit other hospitals.

2. On admission every child was carefully examined and the mother was told that the child could not be assigned to us unless she was willing to comply with our orders. The child had to be under our control and the treatments would be changed only when we considered it necessary. The distrustful mothers left us at the beginning, because of what they considered "strict discipline," while most of them realized it was for the child's welfare and remained with us.

3. Every mother had to consult the physician in charge of the tent at least once every two weeks, reporting to him then how the child was getting along at home and to receive from him further instruction. Of course, her reports were accepted with due consideration to her intelligence. At the beginning, to our surprise, some mothers were not able to see the benefit of this additional burden and had to be urged to come. Most of them, however, were so interested that they used to wait anxiously for their turn to consult the physician. Within a short time the mothers learned that, if they noticed no improvement and if the child complained of any trouble of an orthopedic nature, they could come to the clinic and ask the social service nurse to make an appointment for the physician to examine the child. No child was examined except in the mother's presence.

4. After the first three months, no patient was admitted to the clinic who had attended another hospital unless he was transferred to us from there, or if the Society on After Care found it necessary to transfer the patient to us. Thus practically most of our patients were with us all the time and, if transferred from another hospital, their records could be traced. We were also able to prevent them from coming just for examination and then returning to the previous hospitals.

5. The child was examined in the regular orthopedic clinic and then sent with the chart to the tent. There the attending physician, by consulting the chart, informed the masseuses what muscles were paralyzed and instructed them what exercises to give; thus the masseuses received personal instruction in reference to each child.

6. The mothers have not been allowed to choose the masseuse who was to treat their children. While it may be of advantage to have one masseuse treat the child all the time, as in private practice, it seems to me that for dispensary patients it is of extreme disadvantage. It causes the masseuse to be partial, leads quite often to bribery and jealousy and, besides, in the absence of that particular nurse the child is left without treatment. Our arrangement has been that all the masseuses should acquaint themselves with each patient. For that reason the physician in charge has frequently changed the masseuses to different tables.

METHODS OF TREATMENT

As far as examinations are concerned, we adhered closely to Dr. Lovett's method. Even with infants we were able, with a little patience, to isolate the group of muscles that were paralyzed. We have not found it necessary to resort to the use of electricity for diagnostic purposes. Before we started the treatments, we decided to use for the first six months massage and muscle training only and then, if necessary, to resort to electricity or, at that time, to choose cases for testing the value of electricity compared with massage and muscle training.

We have mapped out that plan for the following reasons:

1. We were in full accord with Dr. Lovett's statement that electricity was valueless and that excellent results might be obtained by proper massage and muscle training.

2. At the previous epidemic, I had used electricity alone and likewise in combination with massage and muscle training for a period of six months on more than a hundred children and did not see any benefit derived from the electricity.

3. The use of electricity is quite often resorted to at home by many parents without any scientific knowledge, while muscle training is usually applied by one who is competent to do the work. Even if the parents watch, they easily understand that special training is required for that kind of treatment and they will not rely on their own limited capacities. When certain exercises are shown them, they follow those with greater interest than the electrical treatment and return frequently to receive further instructions.

4. The mental condition of the youngsters is to be taken into consideration. When one comes to our tent, where from thirty to forty children of different nationalities are being treated, one seldom hears a child cry, while in some clinics, the sight of the electrical machines is enough to frighten them. This point was particularly noticed by all the social service nurses who visited our clinic.

As all the patients showed marked improvement within the first six months, we did not feel justified to experiment on them. We left to others to test the value of electricity, and we were willing to follow their records and compare with ours. Fortunately, we had a chance to reexamine six patients. They returned after three months, having left us to get electrical treatment. We found less improvement in them than in similar cases treated at our clinic.

At one time we had decided to follow Dr. Lovett's experiment in choosing one side for electricity and the other for massage and muscle training, but the mothers had become so used to the undivided attention given to each child while using muscle training and had felt so delighted with the results, that we

were certain we could retain them until the patients were cured and thus be able to report carefully on the results of the foregoing methods. Though many mothers left us at the beginning because they wanted electricity, many new patients came to us from other clinics for the sole reason that they heard we were able to obtain improvements without resorting to mysterious remedies that frighten the children.

The treatments were given three times a week. Only on rare occasions were they ordered daily for from two to three weeks in succession. If the child was very ill or home conditions bad, he was admitted to the hospital. The massage given was very light, from five to eight minutes on a limb, effleurage being used first, and then kneading, alternating with slow friction from periphery to center. We found that no child complained of the massage. If it was painful the massage was diminished. We had many patients who were previously treated elsewhere with vigorous massage and did not improve, while with light massage the pain discontinued and the improvements were rapid.

In muscle training, we followed the Wright system advocated by Dr. Lovett in his book on infantile paralysis. We found that muscle training can be applied to infants even below 2 years of age. Many infants from 13 to 14 months old could understand the order of "up," "down," "in" and "out." Some of them who were able to talk early even repeated the words as the masseuse gave the order. For some, we used toys to attract their attention. Of course, when the child showed insufficient intelligence, we gave passive motion, while at the same time repeating the orders, so that the meaning could finally be grasped.

We resorted to braces freely. Almost every shoulder patient was put in a brace, for we felt that the danger of stretching the deltoid was too great. Only two children improved without the shoulder brace. There were a few for whom these were not ordered at the beginning. After from six to eight weeks we found that they did not improve as well as those who had them. At the start they had to sleep in them; then as they improved, the braces were worn only during the day, and later on during part of the day. For the lower extremities, no brace was ordered before four weeks unless a deformity was present or feared. After receiving treatments for four weeks, the child was reexamined, and in most cases it was possible then to decide whether or not the patient had improved. Sometimes we had to reexamine the patient before the braces were given. We found that the children with the braces which allowed them to walk early improved faster than those without, and that atrophy was present to a lesser degree.

We urged the proper use of the limbs and watched not to overuse them. As the mothers had to report every two weeks, we asked them particularly not to overuse the muscles. It was interesting to note that in many children with similar paralysis of both legs, when only one limb was put in a brace and the other limb used as a control, the leg with the brace improved quickly and showed less atrophy. This seems to be due to improper and excessive use of the leg without the brace. The mothers quite often begged to put a brace on the second one. In many cases the brace was removed after three or four months. It became evident that braces were helpful when only used for a short time.

ANALYSIS OF THE CASES¹

In the first hundred cases there were forty-three male and fifty-seven female patients. The average age was 4 years, the youngest being 11 months and the oldest 18 years. Other data are given in Table 1.

TABLE 1.—CONDITIONS PRESENT IN ONE HUNDRED CASES

Description	Number
Patients who on examination showed no deformity.....	7
Patients with paralysis of the face.....	10
Paralysis of one upper extremity.....	3
Paralysis of one lower extremity.....	26
Paralysis of face and one lower limb.....	1
Paralysis of face and one upper limb.....	1
Paralysis of spine and one lower limb.....	2
Paralysis of abdomen and spine.....	2
Paralysis of both upper limbs.....	1
Paralysis of both lower limbs.....	17
Paralysis of one upper and one lower limb.....	5
Paralysis of one upper and two lower limbs.....	5
Paralysis of one lower and two upper limbs.....	1
Paralysis of one upper and one lower limb, abdomen and spine.....	1
Paralysis of one upper and two lower limbs, abdomen and spine...	1
Paralysis of two lower limbs, spine and abdomen.....	12
Paralysis of four limbs, spine and abdomen.....	5

Ten of the patients were so sick and the home conditions so bad that they were admitted to the hospital. There were a few more who needed hospital care, but the children had just returned from forced quarantine and the parents wanted to have them at home. As we were not anxious to force any of them and, seeing that they may be justified in seeking home care, we arranged to have them brought by the transportation bus of the Society of After Care of Anterior Poliomyelitic Cases.

Braces were applied to thirty patients. Deformities were not as frequent as in the previous epidemic. Most of the children, as known, were treated in the hospitals at the acute stage by orthopedists, and deformities guarded against. I had only eight cases in which contractures had to be corrected before exercises could be given and braces worn.

The results of eight months' treatment (October, 1916, to June, 1917) on the first hundred patients that were admitted to our dispensary are given in Table 2. Of the hundred only ninety patients needed treatments; the other ten were ordered to come only for observation. Of the ninety patients, twenty-one left us at the beginning, of their own accord. This, in our opinion, is the average result that one could expect in the first eight months.

TABLE 2.—RESULTS OF TREATMENT

Condition	Number	Percent.
Patients recovered	8	11.6
Showing marked improvement	23	33½
Showing moderate improvement	31	44.9
Showing slight improvement.....	7	10.1
Patients who did not improve.....	None	
Patients who became worse.....	None	
Patients who could dispense with the braces.....	4	13.3
Patients still wearing braces	26	86.7

CONCLUSIONS

1. The best results can be obtained if each patient is studied individually and controlled from beginning to end. This can be done even in a clinic by taking enough interest in the children.
2. In light massage and muscle training, we have all the facilities for improving these patients without resorting to the mysterious electricity.
3. It is easier to get the assistance of the mothers when electricity is not used than when it is used.
4. The benefit derived from proper use of braces far outweighs the atrophy which it produces. They

1. This analysis is given to show general extent of paralysis in the first hundred cases.

are especially useful in deltoid paralysis. Braces should be discontinued as early as possible.

5. If proper orthopedic treatments are carried out, there will be marked improvement within a short time, and deformities will be prevented.

6. The earlier the children begin to walk, the quicker they improve, provided, of course, they do not use the limbs excessively.

529 Courtlandt Avenue.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRs. OGILVY, EBRIGHT AND BOORSTEIN

DR. CHARLTON WALLACE, New York: The treatment of infantile paralysis during the acute stage, in my opinion, consists in rest. Protection in plaster of Paris during the stage of pain and tenderness is essential to relieve the patient from discomfort. During that time fresh air is, I believe, a necessity, as for the tuberculous patient. Good general nursing and hygienic surroundings are also very important. Some attention should be paid, at this stage, to the bowels, in order to clear up congestion anywhere. During the apparent paralytic stage—and by this one means the stage when many muscles seem to be paralyzed—the use of braces is preferable, when intelligently applied. However, even bracing not intelligently applied is better than no bracing at all. As the patient progresses and gets around, the amount of bracing can be cut down. Braces not only help the patient to use the extremities physiologically, but also prevent contractures. If the braces are made properly, with the weight evenly distributed, and with proper joints, corresponding with the joints of the patient, the apparatus need not be cumbersome.

The bath exercise is an exceptionally good thing. It has been used for many years in our institutions. We have seen some patients who showed no power in certain muscles, but who, when put into the water, were able to demonstrate motion in these muscles. That is probably accounted for by gravity having been overcome by the water's buoyancy. If the patient displaces his weight in water, he has a little more voluntary control over muscles that are apparently not useful.

One believes that any child that has infantile paralysis should have the benefit of anything that anybody says is helpful. I therefore use massage and muscle training, which are assets. The questionable asset is electricity. Whether or not it is beneficial, no one can prove; but one can prove just as much about the beneficial effects of electricity as one can that any treatment is beneficial, for we know that all patients improve during the first year or year and a half, no matter what treatment is employed.

The prognosis, unfortunately, is the thing that the mother is most concerned about; and no one can give the prognosis of a case of infantile paralysis until a year and a half or two years have passed. Then the damage is done, and we know what muscles are going to be paralyzed.

DR. WALTER TRUSLOW, Brooklyn: The detail of treatment is what I find of most interest. I wish to discuss the relative value of entire hospital care for these cases, dispensary control of home muscle-training treatment, and dispensary control with dispensary muscle-training treatment.

When infantile paralysis struck New York City last summer, it was so thoroughly frightened that it made its fright known, not by falling under the load, but by doing everything possible to meet it. The more we look back over this period, the better we shall realize the debt of gratitude we owe to our health commissioner, Dr. Haven Emerson. He is entitled to thanks for having put forward the orthopedic surgeon as the one best qualified to supervise the after-care. We had 1,800 children at the Brooklyn Contagious Hospital, where we began to use protection almost from the first. Then Brooklyn had the opportunity to secure Seaside Hospital for immediate follow-up treatment of these cases. A public spirited man made it possible to treat 100 children there. I have had charge of this group. It was a wonderful

opportunity. Dr. Ebright has shown the difference in the results in the children who were with us there from the first, as compared with those who came later.

We orthopedic men went into this epidemic with the great belief that we could prevent deformities; and that if we did so we should be doing much toward the permanent usefulness of the parts involved.

I do not want to be misunderstood as saying that we have not learned anything new from this epidemic; for we have, of course. But we have had the good fortune to see our previous beliefs verified to a great extent this year.

I believe that entire hospital care is the ideal method. Absolute protection is the first essential, and this, plus progressive muscle training, is the correct treatment. Nowhere else than in the hospital can this be attained. Our workshop is one of the important features of the place. The child is sent there, and the particular problem before it is attended to at once. If we sent for an elaborate brace, it would be costly; and, by the time it arrived it would not be adapted to the child's needs of that particular period. When the child recovers more we find what its need is then, and apply the apparatus adapted for it.

DR. HENRY B. THOMAS, Chicago: I want to emphasize the importance of the care of the child in the acute stage, during the hospitalization period, which last summer in Chicago was five weeks. It so happens that when the cases were brought to Cook County Hospital they were properly put on the contagious side. They were, however, also seen by the orthopedists. At this time it occurred to us that it was very important to take care of the child in this early, acute stage of the disease. If a limb or the body was moved, producing pain, we thought the muscle was injured and probably the nerve, and thus the child was given less opportunity to regain the normal muscle power than if we had left the muscles quiet. We found that when the child was bathed every day, even with a sponge, and turned over once or twice a day, with acute pain, the result was bad. The child did not do so well as when left absolutely quiet. These children will do best without the sponge bath if in giving it there is pain. If one can get the light massage that comes from the bath treatment, and can get the child in and out from the bath, even in the acute stage, without causing pain, we believe that one secures the most delicate massage there is, from the change in pressure, and that this will help the child's musculature. We advised in some cases that the children be put on a Bradford frame, that the entire frame be immersed in the warm bath, even in the early stage. Some of our children at first had heavy woolen stockings placed on their feet, though it was August; we had in mind the chronic infantile foot in cold weather. In the early stage this is not necessary in most cases.

DR. WILLIS C. CAMPBELL, Memphis, Tenn.: It is true that we have learned nothing very new from this epidemic, but the older methods have been better systematized, and we are better able to teach the profession as a whole the necessity of early orthopedic treatment in these cases. What is most important is, of course, as we all know, the prevention of deformity; and this should be attended to as early as possible. Massage and muscle training should, of course, not be given until after all acute symptoms have subsided. I have found that individual muscle training is far superior to instruction in classes, and that the child should receive daily attention. Dr. Truslow has brought out the fact that we may obtain better results by keeping the children in the hospital for an indefinite period. This is because the children have special care and daily treatments. Prolonged rest after the onset of the condition, and long after the acute symptoms have subsided, is usually necessary. Too early walking is to be deplored. The child should be kept off his feet for six months or even a year, in order to prevent deformity. Proper braces and splints must be applied. Deformity may often be corrected without tenotomy or other surgical procedures, as late as one year after onset of paralysis, by successive casts or adjustable braces, with appreciable return of power to the overstretched muscles, as well as restoration of proper mechanical balance.

DR. JEFFERSON D. GRIFFITH, Kansas City, Mo.: May I ask the gentlemen in closing the discussion to tell the temperature curve on the initiation of this disease, and also the blood count in this condition? The reason I speak of this is that it seems to me that we ought to broaden out, and prevent, if possible, the bad conditions that we obtain, by learning all that we can in regard to the care of these cases. It seems to me that if we can meet other infections, such as staphylococcus and streptococcus infections, that disturb metabolic processes to the great extent that they do, we should be able to control poliomyelitis. In this disease we evidently have an infection. We find that many infections lead up to a condition of metabolism termed acidosis; if we could find anything that would ameliorate this condition, it would prevent death during the acute stage. We know that in a marked disturbance of metabolic processes in infections, we can, by proctoclysis of hypotonic salt, sugar, or soda solution, 8 to 10 drops to the minute, bring about a condition that will reduce the ordinary blood count—not only the leukocyte count but the polymorphonuclear count—rapidly. We may be able to reduce the results of the acute infection in this way.

DR. WALTER G. STERN, Cleveland: A topic that has many practical applications is the difficulty with which the parents and, through them, these paralyzed patients, are controlled. To me, the situation in New York in the matter of hospital and dispensary abuse is untenable. I found, in the three days that I have been here this trip, many free patients in the dispensaries who confessed to the attendance of private physicians at their homes, or to the fact that they had already that day been to two other free dispensaries for advice and treatment. I think that a charities clearing house would prevent this sort of thing and put the patients under better medical control, which Dr. Ebricht demonstrates is so necessary.

Dr. Thomas of Chicago, in a paper in *THE JOURNAL*, said, last August, that one of the principal things in the treatment of the subacute stage was the "avoidance of fatigue"; it would be a great step forward if we could have our patients under better control and prevent their running from one dispensary to another. As it is, they go from one man, who says, "Keep the patient off his feet, because it will exercise the stronger muscles at the expense of the weaker," to another man, who says, "Keep the child on its feet as much as possible." I think that "the home control" is as important a measure of treatment as anything I have heard mentioned.

DR. EUGENE ROSAMOND, Memphis, Tenn.: In regard to house control of these patients, Dr. Wallace has, to my mind, given us the best hint. The general public does not know that electricity is not useful, and any man who fails to play with electricity, at least in some way, is going to lose the control of these patients, especially in the families of the well-to-do. The surgeons and general practitioners, and often specialists along all lines, will be consulted by the family; and if electricity, if massage, if anything that every one knows is not used in some way, under the careful supervision of the man in charge, we are going to lose the control of these patients. It is just as reasonable to expose an acutely inflamed, painful muscle to manipulation, massage and electricity, or anything that hurts, as it is to expose an acutely inflamed eye to the sun. Absolute rest for too long a time, rather than not enough time, is the keynote in the treatment of the acute condition. Later, although I am a pediatricist, I believe in turning the cases over to the orthopedists. But I just want to say that we have to do a little bit of everything, carefully supervised, so as not to injure and overfatigue an acutely inflamed muscle and nerve cell, until such time as nature can discover another way around for the nerve impulse, or can repair the damaged nerve line.

DR. PETER BASSOE, Chicago: Apropos Dr. Ebricht's remark that stretched muscle loses its tone, galvanic treatment by means of an interrupter electrode does produce contractions in flaccid, paralyzed muscles which cannot be made to shorten themselves in any other way. Hence, while admitting that

we cannot expect much from electric treatment in these cases and that too much has been claimed for it in the past, yet I believe that the pendulum is now swinging too far the other way when some of the speakers deny any virtue at all to electric treatment.

DR. CHARLES OGILVY, New York: We are asked very often, not only by the laity, but also by our fellow associates in the profession, whether we have made a great deal of progress in relation to the treatment of infantile paralysis. I think we have obtained a great deal of knowledge on the subject. We are continuing to gain more. We have learned more of the benefit of rest, and emphasis has been laid on that; and we also have learned about the continuous control of the treatment. The basis of treatment is, first, prevention of deformity, and second, return of function. To these the orthopedist is particularly adapted; and it should be our work to control these cases from first to last, with the association and cooperation of others interested. We should take this responsibility, and if we do so, we shall obtain better results than heretofore in the treatment. I am sure that the results we are getting now will show that we are obtaining much better results than in previous years.

DR. E. D. EBRIGHT, Wichita, Kan.: As orthopedists we have been insisting all the time that the treatment of these patients should be handed over to us from the very first. I think our attitude is correct, but we owe it to our patients that our treatment should be based on a correct understanding of the pathology. Any stimulus to the muscle should be intrinsic, rather than extrinsic. I mean by that, that massage, muscle training, electricity, or any other form of stimulation from the periphery that is supposed to cause the diseased motor cells to functionate through the reflex arc, should not be attempted until the cells are sufficiently recovered to carry out their part of the reflex act without damage.

A stretched muscle does not regain its tone for two reasons: first, because of the trophic disturbances present, due to a continuously stretched condition, and second, because of the fact that a muscle so stretched is sending sensory impressions to the posterior horn of the cord that are in turn transmitted to the diseased cells in the anterior horn. These then attempt to functionate. What we are really doing is producing a vicious circle. That is why rest is so very important in the acute and subacute stages. These children should be constantly supervised. If you put a brace or cast on a baby, the chances are that in an hour, or even a half hour afterward, the child will have it off. If you send these children home, telling the parents to bring them back every day, they will not come back supported as they were when they left. It is impossible to keep them so unless they are constantly supervised.

Out of thirty-two deltoid paralysis cases, all but two have regained some degree of muscle power. We think that in thirty of these thirty-two deltoids we are going to have useful joints, not by putting the arms in a position in which the external rotators are on the stretch instead of the internal; the arms should be kept at more than a right angle and rotated outward to protect the external rotators.

DR. SAMUEL W. BOORSTEIN, New York: Dr. Wallace spoke of fresh air. Administering treatments in a tent instead of in a dispensary affords the children the opportunity to be in the open air for three or four hours. In encouraging walking, parents are told how many times and how often the paralyzed muscles should be used daily, and also for how long weight-bearing should be permitted. If explanation is not given to the parents, they will permit the children to walk and overuse the muscles. If one puts on braces, the children will not use their feet to excess. At the same time it has a good psychologic effect, for walking is the natural exercise for children.

With reference to hospital care, I do not think that parents can be induced to leave the child in the hospital; neither is it necessary, for home surroundings are more beneficial. The earlier we return them to the home surroundings the better, unless the home surroundings are bad or we find that our orders are not carried out at home. In that case it is better to have the children in the hospital.

With reference to daily or every other day exercises, I think that if mothers carry out the exercises at home and the children are brought to the hospital every other day, it is sufficient. Then the muscles are not overtaxed and they get exercises every day. By showing the mothers once or twice, they can give the exercises very well.

OVARIAN ORGANOOTHERAPY

A PRELIMINARY REPORT*

W. P. GRAVES, M.D.

BOSTON

It has been justly asserted that most of the work thus far done on ovarian organotherapy has been unscientific in character, and that the clinical results from its use which have been reported are therefore in large part untrustworthy.

The lack of greater progress in this important subject is due to certain impending factors which serve as a serious handicap to proper scientific investigation. Foremost among these factors is the vagueness of our knowledge of the physiologic processes of the pelvic organs. We do not know, for example, the cause of menstruation, or why menstrual blood does not coagulate. We have no definite knowledge of the relationship between menstruation and ovulation. We are fairly secure in our belief that the ovary is an organ of internal secretion, but it has not yet been proved conclusively in what part of the organ the secretion is manufactured. Moreover, we are quite at a loss to know whether the secretion of the ovary acts directly on the organism or whether it serves only as a balance to the products of more powerful glands in other parts of the body. In addition to our ignorance of pelvic physiology, of which the foregoing statements are only a few examples, we are greatly hindered in the study of ovarian extracts by the fact that it is impossible to make standard tests for most of the clinical reactions for which administration of the extract is chiefly indicated, animal experimentation being inadequate, on account of the exclusively human character of the reactions. The admirable experiments of Frank and others showing the effect of ovarian extracts on the uterine tissue of castrated animals are valuable in proving the actual existence of an active internal secretion in the ovary, but they do not lead us to definite information as to the effect of the ovarian secretion on such complicated human phenomena as menstruation and the vasomotor symptoms of ablation.

A serious handicap in the study of ovarian therapy is the fact that the nature of the secretion is not yet known. On account of this doubt as to the nature of the potent substance there has been no effective standardization in preparing the various extracts used clinically and experimentally.

As a result of our deficient knowledge of the physiology of the pelvic organs and the consequent limitation to more scientific methods of research, most of our information bearing on the subject of ovarian organotherapy has been derived from observations made in a somewhat haphazard way in connection with the clinical administration of the numerous commercial preparations put on the market by various drug firms. The statistics to be reported in this paper have been to a considerable extent taken from sources of this

kind, and, as will later be pointed out, must be rigidly scrutinized in order to avoid drawing false conclusions, such as might possibly be deduced from an obviously inaccurate though by no means valueless method of research. However, after making due allowance for the inadequacy of the method, certain results have appeared in our work of such significance that this preliminary report seems justified.

Before enumerating our results in ovarian therapy it is necessary first to review briefly the present theoretical knowledge regarding the special sources of internal secretion contained in the ovary.

That the corpus luteum is an organ of internal secretion was first suggested by Gustav Born, who, after studying the corpus luteum verum of pregnancy, expressed the opinion that in histologic structure it corresponds to an internal secretory organ, and that it probably presides over the implantation and development of the fertilized egg in the uterus. Fraenkel supported the theory of Born by experimental work and attributed new physiologic functions to the corpus luteum; namely, the increase of the uterus at the time of puberty as well as its cyclical hyperemic changes of menstruation. Fraenkel concluded that the effect of the internal secretions of the corpus luteum is a preparation of the uterus for the insertion and development of the fertilized egg, menstruation taking place in case of failure of impregnation. Notwithstanding considerable opposition to many of Fraenkel's views, it is at present almost universally accepted that the corpus luteum is an organ of internal secretion, though the knowledge of its specific action is incomplete.

The designation of the corpus luteum as an "organ" of internal secretion is perhaps inaccurate, for it seems to set apart the corpus luteum from the rest of the ovary. It confuses the fact that the real organ of secretion is the ovary itself, of which the corpus luteum is only an integral part, containing as it does certain specifically developed cells from elements that are primarily scattered throughout the ovarian substance. That the corpus luteum is not the sole source, or even the most important source, of the internal secretion of the ovary is sufficiently evident from the fact that during the period of life of sexual immaturity in which the internal secretion is performing its most important function of body formation, the corpus luteum is wanting. It is necessary, therefore, to seek in some place in the ovary other than the corpus luteum for the primary source of the internal secretion.

There are found in the ovary certain connective tissue cellular elements, termed "interstitial cells," corresponding morphologically to the cells of Leydig, which are generally believed to constitute the source of the internal secretion in the testicle. These interstitial cells of the ovary occur in different form in different species of mammals. They correspond in histologic structure to the corpus luteum cells, being large and polyhedral in form, with granular protoplasm in which fatlike granules are embedded. The nucleus is relatively small, usually acentric, and is poor in chromatin. The cells have, like lutein cells, a yellow tint, and in this way resemble the interstitial cells of the testicle of many species. Just as in lutein cells and in the cells of Leydig, mitotic figures are not seen (Tandler and Gross).

The existence of the interstitial cells has long been recognized, having first been discovered by Pflüger in 1863, who demonstrated them in the ovaries of cats and dogs. Successive investigators found the cells in

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

numerous species and finally in apes and in human beings. It was found that they occur with great inconstancy, in some species appearing in separate glandlike masses, in others as scattered cells. They also exhibit marked variations in the same species. Thus in the embryo of the horse, the interstitial cells are strongly developed, while toward the period of birth they become gradually less well defined (Born). In some species they increase at the time of sexual maturity and then diminish with age. In other animals they are most prominent during the spring of the year or during the season of rut. In still others they are affected by environmental changes, such as long continued isolation. More recent investigation has shown that the interstitial cells become more highly developed after roentgenization of the ovaries, while in the male the homologous cells of Leydig undergo a like development as a result of vasectomy. These observations have paved the way for valuable experiments which have added much to our knowledge of the nature and morphology of the interstitial cells.

Equally interesting have been the speculations regarding the origin of these cells. Schroen in 1863 regarded them as fragments of disintegrating corpora lutea. His and Waldeyer considered them wandering cells. Tourniaux recognized the homology between them and the cells of Leydig, and ascribed their origin to the preexisting connective tissue, a theory which we shall see harmonizes with views of the present time. Schulin described them as epithelial structures; Harz as offshoots of the glomeruli of the kidney; Chiarugi saw in them rests of the wolffian body.

Limon was the first to recognize their origin from the lutein cells of the theca interna of the atretic follicles. Limon's views have been adopted by the best investigators, and it is now generally accepted that *the interstitial cells of the ovary either are identical with the lutein cells of the atretic follicles or at least are derived from them* (Tandler and Gross). The inconstancy of the appearance of the interstitial cells is explained by the fact that in some species or under certain conditions during the process of follicle atresia the theca lutein cells become "disaggregated," that is to say, separated from the surrounding envelop of the follicle (theca externa) and deposited in glandlike masses, or scattered indiscriminately through the ovarian stroma. Thus, in the rabbit, disaggregation takes place and the theca lutein cells are found in glandlike masses to which the term "interstitial gland" has been given. In the human ovary, on the other hand, disaggregation takes place only rarely, and the theca lutein cells remain confined by the external envelop of the follicle. Hence an interstitial gland is not seen in the human ovary. It is quite conceivable that the function of the interstitial cells as producers of an internal secretion might be performed equally well whether limited by a theca externa or scattered in the stroma.

If we accept the theory of the identity of the interstitial cells and the follicle lutein cells, we must conclude that the production of the interstitial cells is in reality a function of follicle atresia.

If, now, it can be shown by animal experimentation and otherwise that the interstitial cells are producers of an internal secretion, then we must conclude that follicle atresia is not a pathologic but a physiologic process, the object of which is the elaboration of an internal secretion.

The proof of the internal secretory power of the interstitial cells cannot be included in the scope of this

paper. We can only allude to the influence of the ovary on the growth of the individual before puberty as shown by early castration; to the experiments with roentgenization, showing the influence of the interstitial cells on secondary sexual characteristics; to the homology of the interstitial cells and the cells of Leydig, and to the effects of ovarian transplantation and ovarian therapy, in which the influence of the corpus luteum is excluded.

Thus we have sufficiently convincing evidence that the internal secretion of the ovary is manufactured both by the corpus luteum and by the atretic follicles. It is now necessary to point out the relationship between these two mechanisms from a physiologic standpoint. The exact nature of the lutein cells of the corpus luteum has been a matter of much discussion. Some have regarded them as epithelial in origin, others as derivative of connective tissue. According to Pfannenstiel, the lutein cells are partly epithelial and partly connective tissue in structure. By this theory the innermost layers of cells toward the center of the corpus luteum represent a luteal reaction of the granulosa cells which develop from the original epithelial lining of the graafian follicle; while the outer or theca layers represent a like reaction of proliferating cells springing from the connective tissue envelop, or theca interna. These last named elements of the corpus luteum were termed by Pfannenstiel "theca lutein" cells. They correspond in the matured corpus luteum to the lutein, or interstitial cells of the atretic follicle.

The function of the theca lutein cells is probably twofold. The presence of fat in the protoplasm and the rich network of blood vessels with which they are invested early suggested that they supply nutritive material for the development of the egg. The theory that they elaborate an internal secretion is of comparatively recent date. To them was first ascribed hypothetically a specific influence on the sexual impulse and the development of the secondary sexual characters, the latter theory being now well established by experimental proof.

Between the corpus luteum and the interstitial gland (i. e., disaggregated interstitial cells in glandlike mass) an interesting reciprocal relationship has been pointed out by Bouin and Ancel, who have divided animals into two groups according to their methods of ovulation. To the first group belong those species in which ovulation occurs spontaneously and periodically, as in the human race, the primates, the dog, the mare, the pig and the cow. To the second group belong those species in which ovulation occurs only after coitus, as in the rabbit, guinea-pig, mouse and cat. Representatives of the first group exhibit a periodic corpus luteum and a corpus luteum of pregnancy, but not a well-defined interstitial gland; while those of the second group have a corpus luteum of pregnancy, but in place of a periodic corpus luteum an interstitial gland (Tandler and Gross).

It has been objected that the interstitial cells, being of connective tissue origin, are not of the true endocrine type, which is usually epithelial in character. This objection is met by the fact that certain other connective tissue elements are known to possess endocrine power, notably the suprarenal cortex and the cells of Leydig. It has been demonstrated that the endocrine elements exhibit characteristic staining properties, and among these elements has been included a list of cells of connective tissue origin, such

as the cells of the serosa, the stellate cells of the liver, the reticulum of the blood and lymph apparatus, and the bone marrow (Goldmann).

Another point of interest is the manner of growth of the interstitial cells. It is quite evident that they develop from the preexisting connective tissue cells of the ovarian stroma, which at a given moment "become activated" and take on the morphologic character and functional properties of interstitial cells (Tandler and Gross). It is conceivable, therefore, that the undifferentiated stroma cells of the ovary have endosecretory powers which may be of value in the manufacture of ovarian extracts for therapeutic purposes.

An important phase in the study of the ovarian internal secretion is the question of the selective action of certain of the secretory elements. This part of the subject is at present very much in the dark. Fraenkel's assertion that the corpus luteum regulates the nidation and early growth of the egg is by no means universally accepted. The early theory that the corpus luteum presides over menstruation is no longer tenable, some even holding that menstruation is determined by the elimination of the corpus luteum. Somewhat more definite is the evidence that the interstitial gland presides over the development of the secondary sex development, experiments having shown that the sex characters remain if the purely generative portions of the ovaries, after early castration, are excluded by the Roentgen ray, whereas these characters undergo wide variation after early castration (Tandler and Gross). There is much to show, on the other hand, that the action of the ovarian secretion is neither direct nor selective, but that it exerts only a balancing influence on other correlated and more powerful glands, the activity of which the ovarian secretion discharges or suppresses, as the case may be.

Our clinical observations in the study of ovarian therapy are confirmatory of this theory.

To sum up then, present knowledge indicates that there exist both in the corpus luteum and in the atretic follicles cellular elements identical in their origin from a specific connective tissue structure with the theca interna, and capable of producing an internal secretion which is important to the growth and normal functioning of the organism. If this is true, we have a basis on which to found a rationale for ovarian therapy.

If an internal secretion is manufactured from both the corpus luteum and the atretic follicles by cells of identical structure, extracts made from the corpus luteum alone lack that valuable part of the secretion which is derived from the atretic follicles. Moreover, it is impossible to tell by inspection whether a given corpus luteum is in the process of maturation or at the height of its development, or in a stage of involution and disintegration. It must happen that in the preparation of many corpora lutea for therapeutic purposes, a varying number are included in which the essential cells are no longer active as organs of internal secretion, and are actually in a condition of protein dissolution. We should expect, therefore, that commercial preparations of corpus luteum would present a wide variation in their therapeutic effects, and, owing to their readiness to decompose, would have a special tendency to become toxic.

On the other hand, if the preparation be made from the whole ovary, including corpus luteum, stroma, and follicles, the important follicular secretion is not lost. Preparations of this kind would be expected to be more

stable in their composition and more constant in their effect than those of the corpus luteum alone. These conclusions have been amply borne out by our clinical experience.

In estimating the comparative merits of preparations of the whole ovary and those of the corpus luteum alone, most of our observations have been made in treating the vasomotor symptoms following hysterectomy. In this type of case the corpus luteum showed a great variation in effectiveness, often being entirely valueless, and occasionally producing digestive disturbances. On the other hand, the whole ovary, used in a large number of cases, showed great constancy in therapeutic effect, so that we have come to regard it as almost a specific in the treatment of ablation symptoms, both of the artificial and natural menopause. Striking results have also been obtained in the treatment of functional amenorrhea, and in the circulatory disturbances of the external genitals, such as kraurosis and the discomforts of senile atrophy.

In order to test further the effect of luteal preparations compared with those of the whole ovary, a series of clinical observations was undertaken with desiccated corpora lutea of pregnant animals. In all, nineteen cases were treated, representing hot flushes from the menopause, oligomenorrhea, dysmenorrhea and amenorrhea. In all but two of the cases, toxic symptoms of a digestive nature were produced. Preparations from both the cow and the pig reacted in the same way. The symptoms were invariably those of nausea and vomiting following one or two doses. In one case the ingestion of one 5 grain capsule resulted in continuous nausea and occasional vomiting for a period of ten days. The result of these clinical experiments cannot easily be explained. It was at first thought that the effects might be due to decomposition of the extract, but fresh preparations produced the same symptoms. They could hardly be due to anaphylaxis, on account of the high percentage of patients affected.

These observations suggest the possibility that the nausea and vomiting of pregnancy may be determined by the toxic effect of the internal secretion of the gestative corpus luteum.

In view of the favorable results obtained from the whole ovary compared with the corpus luteum alone, and of the positively bad results from the corpus luteum of pregnancy, we next determined to try the effect of the ovarian substance alone minus the corpus luteum.

In this experiment, the ovaries of pregnant animals were chosen partly as a check to the experiment with the gestative corpus luteum and partly to test the therapeutic effect of the internal secretion of the atretic follicles. It was thought that pregnant ovaries would be particularly favorable for studying the follicle internal secretion, owing to the well-known fact that during pregnancy the process of follicle atresia is especially active.

The results with this substance were interesting. The toxic effects created by the corpus luteum of pregnant animals was entirely absent, thus showing that its poisonous reaction could not have been anaphylactic in character. The new substance produced results similar to those of the nonpregnant ovary, but in general more striking. This was especially true in the treatment of vasomotor symptoms following hysterectomy. The preparation, as will be seen from later statistics, proved generally successful in the treatment of hot flushes,

and in certain cases of amenorrhea, dysmenorrhea, intermenstrual pain, catamenial nausea, headache and the genital discomforts of senile atrophy.

From observations made with this substance, incomplete as they are, we have at least suggestive evidence that an internal secretion is elaborated from the follicles which in therapeutic value is equal to and probably greater than that produced by the corpus luteum.

THERAPEUTIC EXPERIENCE

Ovarian therapy was extensively employed for a number of years in our hospital and private practice, before exact statistical records of the cases were instituted. Our experience during this period, though unrecorded, is, however, not without significance, for as a rule the reactions from ovarian therapy are sufficiently marked to make very definite impression. It was during this period that we observed repeatedly the therapeutic superiority of the whole ovary over the corpus luteum. Many commercial preparations of each type were tried, and a great variation in therapeutic effect was discovered. Of the preparations of whole ovary, a desiccated product put up by Armour & Co., administered in 5 grain capsules, proved the most efficacious. For the best results, it was found necessary to have fresh preparations and to impress on the patient the importance of keeping the capsules in a cool place to prevent decomposition. The corpus luteum products, though generally inferior to those of the whole ovary, were nevertheless not without therapeutic value.

Since the institution of careful records of therapeutic results, fifty-three cases have been observed in which the whole ovary has been employed. The following conditions were treated: vasomotor disturbances of the natural and artificial menopause, general debility, furunculosis of the external genitals, external genital discomfort from senile atrophy, amenorrhea, dysmenorrhea, oligomenorrhea, irregular menses, menstrual headache, nausea and vomiting, and sterility. Full statistical results of these cases will be given in a later report. It may be said that the most striking results were obtained in the treatment of menopause symptoms, and the circulatory disturbances of the external genitals. In all the conditions enumerated above, excepting sterility and essential dysmenorrhea, the preparation proved therapeutically valuable, though in each of the conditions it often failed to be effective.

Since the employment of the ovaries of pregnancy without the corpus luteum, all the cases have been carefully recorded. Reports of thirty-four of these cases have been collected, of which a complete report will be made at a later date. The conditions for which the substance was administered were the same as those mentioned above, for which the whole ovary was used. The results were in general similar to those from the whole ovary, excepting that they were somewhat more constant and in many instances more brilliant. In several cases a comparison was made with the effects of the whole ovary. In all of these cases, with one exception, the ovary of pregnancy without corpus luteum had the advantage. In three of these cases in which the whole ovary had completely failed, the ovary or pregnancy produced surprising results.¹

CONCLUSIONS

1. Studies in ovarian organotherapy are at present necessarily confined for the most part to clinical obser-

vations. Such observations, though admittedly inaccurate, may, to a limited extent, be of scientific and practical value.

2. Personal clinical experience with preparations of ovarian substance has revealed that preparations of the corpus luteum alone are less efficacious therapeutically than are those of the whole ovary.

3. Theoretical knowledge and scientific experimentation tend to show that an important part of the ovarian internal secretion is elaborated by the interstitial cells.

4. It is probable that the interstitial cells correspond to the lutein cells of the theca interna of the atretic follicle. In some animals these cells become disaggregated and appear as glandlike masses (interstitial gland); in others they remain confined to the follicle by the outside envelop (theca externa).

5. The interstitial cells, therefore, correspond to the theca lutein cells of the corpus luteum.

6. The interstitial cells of the ovary are analogous to the testicular interstitial cells of Leydig, which are known to elaborate an internal secretion.

7. Ovarian therapy, for its best effectiveness, should include at least the product of the interstitial cells. Preparations should, therefore, comprise the ovarian stroma, in order to take advantage of the atretic follicles.

8. Preparations made from the corpora lutea of pregnancy proved too toxic for practical use.

9. Preparations made from the ovaries of pregnant animals, with exclusion of the corpora lutea, proved superior therapeutically to preparations of whole ovaries of nonpregnant animals that included the corpus luteum.

10. The superiority of the follicular products of pregnancy is explained by the fact that during pregnancy, follicle atresia is especially marked, and is accompanied by a corresponding increase in the activity of the interstitial cells.

244 Marlboro Street.

ABSTRACT OF DISCUSSION

DR. S. W. BANDLER, New York: A year ago I had the pleasure of discussing a paper by Dr. Graves on this subject. We agreed then that better results were obtained from ovarian extract than from the extract of corpus luteum. One needs only to see the ovary under the microscope to realize that there must be two distinct secretions in the ovary. The experiments of Schafer have shown that if corpus luteum is injected into animals, contraction of muscle fibers results. Injection of extract of the hilus causes no contractions of the uterine muscle fibers. Therefore, we must conclude that there are at least two hormones in the ovary; one which contracts muscle fiber and one which does not.

On what depends the difference in structure and form of the body in the female and the male? We must remember that the ovary acts for many years before the girl menstruates. During these years before menstruation no ova are given out. Yet we see the difference physically between a boy and a girl of the same age. We have interstitial cells in the testis, we have interstitial cells in the ovary, and they act differently on the different areas of the pituitary gland. We have the interstitial cells of the testis stimulating the anterior lobe more than is done by the ovary in the female. Hence the anterior lobe of the hypophysis is much more of a male gland than a female gland. We have the aid of the ovary in stimulating the posterior lobe more than does the testis in the male. Hence the posterior lobe of the pituitary gland is more a female gland than a male gland.

The growing fecundated ovum with its trophoblast and later chorion is a parasite attempting to invade the maternal uterine structures. The protective power of the maternal

1. I am indebted to Parke Davis & Co. for their courtesy in furnishing me with material with which to carry out these clinical experiments.

structures prevents too great an invasion, and among these protective, ductless gland forces the pituitary and the corpus luteum must be reckoned. Hence we see that the ovary, as well as the other ductless glands, presents numerous hormones.

Twenty years hence we shall be treating various pathologic states and conditions by the administration of tested, isolated hormones instead of giving, as we are compelled to do at present, the whole gland extract.

DR. EMIL NOVAK, Baltimore: Dr. Graves has approached the problem from the proper point of view, but I know he will agree that it is still far from being solved. Of the elements making up the ovary, the one most clearly associated with the menstruation is the corpus luteum. This structure, in one phase or another, is always to be found in the ovaries of menstruating women, exhibiting cyclical changes corresponding to the stages of the menstrual cycle. On the other hand, corpora lutea are not found in the ovaries of young girls before puberty or in those of women beyond the menopause. Furthermore, administration of corpus luteum extracts at times induces menstruation in amenorrheic women. For such reasons as this, I have personally been inclined to the employment of corpus luteum preparations in the treatment of menstrual disorders. The results cannot be said to be brilliant, but they are often satisfactory, especially in the psychoneuroses of the menopause.

Aside from menstruation, the ovary is important also in the determination of the developmental changes characterizing puberty—such changes as the configuration of the body, the distribution of the hair, the character of the voice, etc. The evidence indicates that the hormone concerned in these secondary sex changes is derived from some element in the ovary other than the corpus luteum. What this element is we cannot say, and hence in the treatment of such developmental conditions as retarded puberty, it has seemed to me that extracts made from the entire ovary are indicated rather than those derived from the corpus luteum alone.

As for the interstitial cell, I do not believe that Dr. Graves has made out a case for it, as far as a rôle in menstruation is concerned. These cells, so characteristic of the ovaries of such animals as the rabbit and guinea-pig, are not found in the human ovary. It is true that in pregnancy the theca cells of atretic follicles multiply and form what is called the interstitial gland. In this sense the interstitial cell of the human female is important in pregnancy, but I know of no evidence showing that it influences menstruation. During the early part of pregnancy a corpus luteum is present, but menstruation is absent. This apparent paradox is easily explained on the assumption that the corpus luteum hormone is inhibited or counteracted by a hormone of fetal (trophoblastic) origin.

From a practical standpoint, the gynecologist or general practitioner may limit himself to three extracts in the treatment of menstrual disorders: (1) ovary or corpus luteum; (2) pituitary; (3) thyroid. Of these three, I believe the one which is most valuable in the largest number of cases is the extract of thyroid.

DR. LAWRENCE W. STRONG, New York: I wish to accentuate the difficulties of drawing conclusions, which Dr. Graves pointed out. Indeed, I wish to deprecate the drawing of any conclusions from the exhibition of the commercial preparations of the corpus luteum, at least, until further experimental work is done. Much has been said about the interstitial glands. It is unfortunate that we have no exact knowledge of these glands. According to a recent hypothesis of Shroeder the follicle has a definite function—stimulation of the growth of the uterine mucosa—while the corpus luteum has quite a different function—stimulation of secretion of the uterine mucosa. If this is the case, and possibly it is, there might be antagonism between the secretion of the theca cell and that of the true corpus luteum. For that reason, in experimental work, instead of using the entire gland, we should use the pure secretions from definite organs. It seems to me necessary to get exact information in regard to the secretion of the corpus luteum itself. There is not

a unanimity of opinion at present on this. Perhaps the best opinion held is that it inhibits menstruation rather than causes it. That being so, we are certainly in doubt as to the actual cause of menstruation; it is therefore perfectly obvious that one cannot use the commercial preparation in an intelligent way.

DR. P. B. SALATICH, New Orleans: From our observations we are sometimes forced to feel that the internal secretion of the ovary has something to do with holding the weight down. In one patient operated on for pelvic conditions, the woman weighed 98 pounds, eight years ago. The right ovary was removed and most of the ovary on the left had been taken out. When I operated again five weeks prior to this meeting she weighed 240 pounds, having steadily gained weight, and had had very little menstruation at each period. I found that the part of ovary left was doing very little work. It was bound down by adhesions and it was necessary to remove it. An interesting point in this case is that about three weeks afterward, at about the time she should have menstruated again, she had severe headache. I treated her with all kinds of remedies, even morphin. I put her on ovarian extract and in twenty-four hours the headache had disappeared. We find many patients who gain weight rapidly, and these patients we know do not menstruate. It is important in all gynecologic cases to try and save a part of both ovaries. If this cannot be done in situ, I save a part of the ovary and put it between the fascia and the muscle. I had one such case and after two or three months the woman began to menstruate. I have had more than one case of high blood pressure coming on after the menopause, and in trying to locate some probable cause for this from a physiologic standpoint, I put these women on ovarian extract. To my surprise the blood pressure lowered.

DR. ADAM P. LEIGHTON, JR., Portland, Me.: For the past five or six years I have used quite extensively the extract of corpus luteum in the treatment of those gynecologic conditions dependent on ovarian deficiency. I have used ovarian extract as well as corpus luteum, but it is with the latter that I have obtained my good results. The only reason that good results have not been forthcoming in some cases in which corpus luteum has been indicated is that we have not given it in sufficient quantity or for a sufficient length of time. One must administer it for six or eight weeks, as a rule, before the desired results may be expected or obtained in any given case of ovarian insufficiency. The action of corpus luteum by mouth is slow and cumulative, and we should impress this fact on the patient at the time when treatment is commenced.

DR. WILLIAM P. GRAVES, Boston: The contradictions which exist in regard to this important subject are illustrated by the remarks of Drs. Novak and Strong. Dr. Novak said that menstruation is dependent on the corpus luteum, while Dr. Strong expressed the opinion that the corpus luteum actually inhibits menstruation. The latter view is one which I have come personally to believe. It is supported to a certain extent by a clinical experiment which I recently made.

Two amenorrheic women came to the hospital at the same time. One of them, 26 years of age, had menstruated only a few times in her life. She had been married five years, without children. She was perfectly developed, both as to her primary and secondary sexual characters. The second was a young woman of 21 who had menstruated only two or three times in her life, the last time four months previous to her coming to the hospital. It happened that there was at the hospital at the same time a woman who had had menorrhagia and metrorrhagia for five years as a result of uterine insufficiency. Repeated curettages had been of no benefit. The uterus was anatomically normal. The Wassermann test was negative. Inasmuch as a hysterectomy seemed advisable, it was determined to graft ovarian tissue from the menorrhagic woman into the two amenorrheic patients. Accordingly, during the hysterectomy on the last named patient, sections were taken from the ovary in which there was no corpus luteum. These sections were immediately transplanted into the anterior cervical lip of the amenorrheic patients. The first patient a few days after the operation

had a perfectly normal menstruation for the first time in three years. The second patient menstruated normally in about twelve days and has menstruated regularly since for about five months.

In these two cases the action of the ovarian internal secretion was apparently exerted by a portion of ovarian tissue from which the influence of the corpus luteum was excluded.

SUDDEN AND PROFOUND DEAFNESS: ITS SIGNIFICANCE*

OTTO J. STEIN, M.D.

CHICAGO

A more exact distinction might and should be made between acute deafness, that is, actual loss of all practical hearing in one or both ears, and impaired hearing or so-called deafness. The type of deafness I have in mind to discuss is one that is profound and at the same time appears suddenly. To draw an absolutely arbitrary line of distinction between this and all other types of deafness is manifestly impossible, but it is practicable to separate them into two groups for the purpose of aiding in the diagnosis and of rendering immediate first aid in order to avoid irreparable damage. Hearing many times is relative as far as it is a symptom, but when a person with normal or satisfactory hearing rapidly loses all of the hearing in one or both ears, his condition assumes a significance distinctly in a class of its own. Therefore, under the grant of this title, consideration will not be given to such types of deafness that present slight or only partial impairment of hearing, although possibly taking place suddenly, or to such cases in which profound or absolute deafness ensues gradually from chronic changes in or about the hearing apparatus. In the latter class of cases the same importance is not attached to the deafness as where such a calamity occurs apparently out of a clear sky. The patient at the end of a day's hard work, or after some active exercise, suddenly finds his hearing gone on convalescing from a protracted illness, but with ordinary good ears, he suddenly loses his hearing, or while going about his daily routine, or on awakening after a night's rest, there is a total extinction of his hearing powers. And then again in the presence of a suppurative ear disease his hearing may suddenly be lost. Such a condition most reasonably creates a state of alarm, if not panic.

The symptomatology in a patient stricken with sudden and profound deafness is often that of Ménière's syndrome: that is, sudden deafness with tinnitus and vertigo, occasionally nausea and vomiting, and at times loss of consciousness. But the pathogenesis, as well as the location of the lesion, determines the presence or absence of these and other symptoms that may be present, such as nystagmus, facial paralysis, ataxia, headache, aphasia, convulsions, hemiplegia, mental bewilderment, and in case of a petrous fracture, a serosanguineous discharge from the ear and nose. The tests show obliterated perception of all ordinary sounds. Sometimes there may be gaps in the hearing scale where some slight perception still lingers, but oftentimes the supposed remnants of hearing are only perceptions of other sensations like those of touch, temperature, vibration and vision.

Consideration of the fact that malingering and hysteria may contribute to the exhibition of these symptoms should at all times be in mind, but ordinarily such causation may be dismissed. In traumatism the causative factor is so apparent that only occasionally will the diagnosis be obscured. The same may be said of the occupational causes, an example of which is the caisson worker. A few cases may be caused by various toxicities, either drug or disease, although ordinarily such exciting factors bring about a more gradual loss of hearing. Following the use of salvarsan or its allies, complete paralysis of the eighth nerve has been reported at various times. It is still debatable whether or not the paralysis occurs as a result of a Jarisch-Herxheimer reaction. In a similar way anaphylactic cases may occur following the use of certain serums. The greater number of cases are caused by certain systemic diseases like syphilis, the various anemias and leukemias, diabetes, arteriosclerosis, mumps, pertussis, and, as mentioned before, in some of the suppurative ear diseases. Also among the insane this type of deafness occurs.

The site of the lesion directly causing the symptoms of deafness may be in the labyrinth, in the eighth nerve or in the cranial cavity, the labyrinth cases being perhaps the more numerous. The causative factor may operate directly on these centers or indirectly through neighboring channels. Both the vestibular and auditory functions may be involved simultaneously or separately. Ordinarily disorders of the conduction apparatus rarely cause sudden and absolute deafness. The following case, therefore, is unique in my experience and of unusual interest:

CASE 1.—A woman, aged 28, while still in bed, during convalescence from pernicious anemia, there being no previous history of hearing impairment, was suddenly seized with a buzzing sound in the head. There was a feeling of tension and fullness in the ears accompanied by some pain. Complete deafness resulted, accompanied by nausea and blood stained sputum. Inspection showed that the drums were bulging and blue gray. Incision was followed by free bleeding and bloody serum. The hearing gradually returned to almost normal.

Similar cases of bleeding in the middle ear have been reported from other causes, such as gun fire, especially from the big field pieces now in use, and also from head injuries due to blows or falls.

Hemorrhagic effusions into the labyrinth will bring about sudden and complete loss of hearing. In injuries due to a fall or blow, the hemorrhage frequently becomes manifest, but occasionally it is concealed, thus obscuring the direct cause of the deafness. In the apoplectiform variety of hemorrhages, such as occur in hematopoietic disorders like pernicious anemia, leukemia and chlorosis, the deafness is usually sudden and profound. In the labyrinth cases that are due to congestion or anemia, the deafness and tinnitus may be only temporary, while the hemorrhagic cases and those due to emboli are far more serious and profound. The embolism or hemorrhagic variety is illustrated in Case 2:

CASE 2.—A man, aged 50, an accountant, while at work at his desk, had a severe ringing tinnitus in both ears followed immediately by loss of equilibrium causing him to fall from his chair. There was no loss of consciousness and no muscular spasm or paralysis. His mind remained clear. There was some nausea, and profound deafness appeared immediately. There was no previous ear disease, suppurative or otherwise, and no previous attacks of vertigo.

A week later there was no response of either the vestibular or hearing labyrinth. His deafness remained permanent.

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

In syphilis and suppurative ear cases there is more often a history of various degrees of vertigo and perhaps tinnitus before the grand attack.

In the labyrinth cases complicating either acute or chronic middle ear suppurations, there may result sudden and complete deafness either alone or associated with vestibular disturbance; but more usually this deafness is not sudden or completely lost at once, unless from rough or unnecessary manipulation during operation or treatment. In the serous type of labyrinthitis the hearing usually returns on convalescence or recovery. I have seen several such cases.

Of the constitutional causes the syphilitic cases are probably the most numerous. In these cases the lesion may be due to the toxins or to a gumma. In some cases it may be due to a destructive process and an endarteritis or an acute inflammatory process. The site of the lesion may be in the labyrinth, in the nerve or in the brain centers, and it may occur in either the acquired or the hereditary cases. In the acquired form a neuritis from the toxins may occur as early as the primary period of the disease, although more commonly the changes show later during the secondary and tertiary stages, which may be years after the primary and after a presumable cure. The following case illustrates this type:

CASE 3.—A man, aged 62, experienced a sudden and absolute loss of hearing in both ears following a "cold" in the head the week before. He had had some slight impairment of hearing of late years which presumably was of a middle ear catarrhal type. At the time of losing his hearing suddenly he was still in bed suffering from his "cold." The attending physician said it was due to the "cold" and would pass off in a day or so. The deafness was accompanied by a severe tinnitus and vertigo, the latter occurring both while standing and lying. There was some nausea but no vomiting. The patient recovered from his "cold," but the deafness continued; the vertigo lessened but was not entirely absent; tinnitus was very annoying. When first seen by me, while he was still in bed, due to the vertigo, examination of the ears with tuning forks and whistle elicited no response. Inflation of the eustachian tubes did not improve the hearing. Inquiry at this time brought out the fact the patient had acquired his syphilis forty-five years before. He was under treatment at that time for three or four years and considered himself cured, having had no evidences of the disease since that time, meanwhile having married and raised a healthy family. The Wassermann test was strongly positive. He was immediately placed on vigorous treatment, starting with mercury and iodids in solution and then sodium cacodylate in increasing doses. Improvement seemed rapid after this. Later he was given five injections of neosalvarsan in doses of 0.9 gm. Repeated Wassermann tests since that time, which was fifteen months ago, have been negative. His hearing has improved so that it is better than before his recent illness.

It will be noted that in this case the attending physician attributed the deafness to the "cold" and made a prognosis of speedy recovery within a few days, and that he did not recognize the syphilis as a causative agent. Fortunately the true condition was recognized early enough, and by the institution of vigorous and proper treatment at once, recovery was possible. If cases of this kind pass unrecognized for any length of time no such brilliant results can be expected.

Another case of probable endocranial syphilis exhibited, in addition to an abolition of auditory perception, distinct diabetic symptoms.

CASE 4.—A man aged 41, returning from a fatiguing ride and exposed to inclement weather, suddenly and absolutely lost all hearing in both ears. There was no vertigo, nausea, vomiting or tinnitus. The right ear previously was apparently

normal, the left ear was somewhat impaired as to hearing and had a mild tinnitus, but no paracusis willisiana. Following this attack he was under the care of several physicians and one aurist. No one diagnosed syphilis, or treated him for it. Four months later he presented himself to me for examination. The patient was apparently well and robust and absolutely denied syphilis. Tests with voice, tuning forks, whistle, bells, etc., elicited no response. In speaking the patient fairly shouted. Both drums were fairly normal and the tubes were open. There was no spontaneous nystagmus, but it was easily induced calorically but not exaggerated. Turning evoked a normal and strong horizontal nystagmus. There was no Romberg except after testing. There was no hereditary deafness. Two Wassermann tests of the blood were strongly positive. The spinal fluid showed a lymphocytosis and serum globulin in excess; Fehling and Wassermann tests were both positive. The patient was placed in the hospital for treatment with potassium iodid, and mercury was administered in large doses. Two weeks later 0.6 gm. of salvarsan was given intramuscularly. This was repeated in four weeks. In the interval, mercury and iodids were used. The urine was examined before and after treatment commenced, and was negative. Shortly following the first, as well as after the second injection, he spoke of a great desire for drinking water. About seven weeks after commencing treatment he began to experience symptoms of myasthenia. General muscular weakness and easy fatigue on slight exertion appeared. He was constipated and lost his appetite. Later, there were attacks of cardiac oppression and polyuria, and a large quantity of sugar appeared in the urine. Within two weeks, more difficult mastication and deglutition developed, with attacks of vomiting, extreme exhaustion and finally coma, in which the patient died. No necropsy was held. No improvement in hearing followed the treatment.

In these cases there may be hemorrhagic areas. The labyrinth and its nerve may show round cell infiltration and beginning atrophy in the spiral ganglion, lamina spiralis and the nerve. The inherited cases may occur at any age; often in the babe, deafmutism results. Again, it may occur just before puberty, when it is recognized as one of a triad of symptoms, namely, interstitial keratitis, notched incisor teeth and deafness. The disease may originate endocranially as a meningitis or an endarteritis, and then extends along the nerve and vessels to the labyrinth.

In Case 4, the lesion, prior to the grand attack, and when the patient was having some impaired hearing and tinnitus in the one ear, appears to have been an endarteritis of the cochlear artery. This might then have culminated in the apoplectiform attack, resulting in the sudden and total extinction of all hearing and tinnitus. That the cochlear nerves alone were involved is shown by the absence of all vestibular disturbance. But from the subsequent course of the case presenting diabetic symptoms and medulla disturbance, it is reasonable to infer that the site of the lesion was near the floor of the fourth ventricle. Fibers of the cochlear-nerve decussate in this region, passing across to the trapezium and upper olive, and a lesion in this neighborhood might not only destroy the function of the cochlear nerves but also irritate sugar production, etc.

In many of the acute diseases, like influenza, mumps and pneumonia, without an acute inflammatory or a suppurative ear process being present, the pathology recently has been attributed to changes within the labyrinth the result of toxic agents. The toxins may cause a serous effusion or a true neuritis, while in the other cases actual destruction to the end organs may result, particularly the organ of Corti.

A meningic deafness that may accompany cerebrospinal meningitis is usually sudden and profound, and

is due to a diffuse labyrinthitis. Its appearance at the time may be overlooked, owing to the crisis present of the fever itself. The drum and middle ear are almost always normal or nearly so, differing in this from panotitis seen in scarlet fever and measles. All of these cases assume an importance much beyond the average case of deafness and much beyond what many physicians appear to recognize. With a fuller knowledge of their seriousness, many of these patients might be rescued from a probable hopeless and helpless future. By instituting prompt and vigorous measures in treatment, some of them can be cured or at least greatly benefited. Auditory reeducation will benefit a certain number. Where such gratifying results are impossible, the prompt employment of lip-reading as a new education should be advised.

30 North Michigan Avenue.

ABSTRACT OF DISCUSSION

DR. HENRY S. WIEDER, Philadelphia: Dr. Stein calls attention to the necessity for early treatment, especially of syphilitic deafness, if one hopes to obtain results. I have been fortunate enough to have something to do with one case, a man who was almost totally deaf for five years. One had to shout through a megaphone to make him hear. He showed no nystagmus, and no definite evidence of vestibular trouble. We put him in the Bárány chair and from our vestibular tests suspected syphilis. We had a Wassermann test made which showed a four plus. Following salvarsan treatment he had two intraspinal injections of Dr. Schamberg's new antiseptic, mercurophen, and now he can hear an ordinary voice tone. He shows peculiar manifestations in that when he turns his head to one side he can hear more plainly than when he holds his head erect. Syphilitic cases should not be given up no matter how long they have gone on, and in all cases of profound deafness, the patients should be subjected to the Bárány test, whether they show definite evidence of vestibular trouble or not, because we are finding in many cases that latent syphilis will show itself earlier in the eighth nerve than in any other nerve in the body.

I have recently seen two cases of cerebrospinal meningitis, one in a young child who is absolutely stone deaf and shows no cochlear or vestibular reaction. I also have a child that came recently with a ready-made diagnosis of having had cerebrospinal meningitis at 6 months of age. This child's hearing is very good, but on turning as fast as we can, no vestibular reaction can be obtained. I cannot quite conceive of the inflammation completely destroying the vestibular portion of the nerve on both sides and leaving the cochlear portion alone. The case is still under observation.

DR. T. O. EDGAR, Dixon, Ill.: In illustration of the ear manifestations that may occur in leukemia, I wish to report the following case: A farmer, aged 44, referred to me for ear examination, presented the typical blood and other findings of myelogenous leukemia, probably of several years' duration. At 7 a. m., ten days before his death, the patient failed to answer even the loudest voice of his nurse, whereas three hours previously his hearing appeared to be entirely normal. The patient was conscious and able to respond readily when made to understand by writing, or otherwise. Otoscopically, the membranatympani appeared quite normal. With the noise apparatus of Bárány in his left ear, he was able merely to detect a noise when one yelled in his right ear, and he was able to hear for a few seconds the loudest vibration of the small Steinger "A" fork. The vibrations of all the other forks of the Bezold series were unperceived. The left ear was completely deaf to the loudest voice and to the tuning fork mentioned. There was no pathologic, spontaneous nystagmus; the patient had, however, for the previous ten days been a little dizzy, but, so far as could be learned, did not exhibit a tendency to fall in any particular direction. Unfortunately, a postmortem was refused. The histologic findings, according to Schwabach and Alexander, are as follows: In

the middle ear, free extravasation of red and white blood cells, infiltration of the mucous membrane with lymphocytes or effusion of blood, and accumulation of lymphocytes in the blood vessels; in the labyrinth were found (1) marked infiltration of the nerve stem and its branches and of the membranous parts with lymphocytes, with or without simultaneous effusion of red blood corpuscles, leading to rupture or compression of the soft part; (2) inflammatory reactions with leukemic infiltration of the soft parts; and (3) secondary changes, such as formation of connective tissue, bone and pigment deposit, and secondary degeneration of the nerve.

DR. CULLEN F. WELTY, San Francisco: A neuritis of syphilitic origin is amenable to treatment, but the neuritis that comes from other sources, say a neuritis produced by scarlet fever, etc., is not. Such patients do not improve. A young lady about 20 years of age while consulting an ophthalmologist for a syphilitic cornea, from which she was almost blind, suddenly one morning became deaf. She could not hear a shout with a tube put in her ear. I did not wait for a Wassermann reaction. She was given salvarsan, which was continued for a month and her hearing was restored. That was about three years prior to this meeting.

One-sided deafness, I believe, is somewhat different from deafness on both sides. If we have a one-sided deafness, I am somewhat inclined to lay it to a syphilitic origin rather than to toxemia or neuritis. The toxemia or neuritis seems to affect both sides equally. It is a fact that the vestibular side is more amenable to treatment than the cochlear side. In a number of patients who complain of some dizziness and possibly nystagmus at times, on testing them with the rotary chair there will be a reaction, but at the same time, their hearing remains about the same.

DR. OTTO J. STEIN, Chicago: The remarks of Dr. Wieder were interesting to me because he believes that old syphilitic cases that have been overlooked and neglected, and in which the patients have lost their hearing entirely, can be improved so that they may hear well. That is news to me. I do not think that is a common observation, but I can understand how this may be brought about by the intensive way of treating syphilis, especially by the intraspinal method of reaching the central nervous system.

It would detract from the important point of the paper if emphasis were not placed on the *early* recognition of these cases. So I think we ought to emphasize the importance of getting at them early and recognizing them and treating them energetically as soon as possible.

That the vestibular branch of the eighth nerve is so sensitive to the destructive influence of syphilitic disease has not been my observation. I have felt that it was the cochlear fibers that were more sensitive, and my cases usually have shown this to be so after employing all the tests that are recognized today for determining any present vestibular irritation.

The question is interesting and has been talked about a great deal, as to why in some cases there is a ready response to salvarsan, or any of its allies, and in others there is a deafness which does not respond to increasing doses. We recognize that many of these cases are due to the Herxheimer reaction and will respond to increased doses of mercury, but occasionally we have cases that do not respond to this treatment, and what the true pathology is I do not know. These cases make one hesitate about using great quantities of the remedy.

Poetic Hygiene.—

If thou to health and vigor wouldst attain,
Shun weighty cares—all anger deem profane,
From heavy suppers and much wine abstain.
Nor trivial count it, after pompous fare,
To rise from table and to take the air.
Shun idle, noonday slumber, nor delay
The urgent calls of Nature to obey.

—From the Code of Health of the School of Salerno;
Albert H. Buck, *The Growth of Medicine*.

THE FOUNDATIONS OF VOICE IMPAIRMENT RESULTING FROM TONSILLECTOMY*

ELMER L. KENYON, M.D.
CHICAGO

The following study is based on a careful investigation of the physiology of the soft palate and of the mechanicophysiology importance of the tonsil, on a careful examination of 161 tonsillectomized throats, and on a study of thirty cases of voice or other disturbance resulting from tonsillectomy. The work has demonstrated the great need for accurate knowledge concerning the mechanical effects of tonsillectomy, and also has failed to quiet any feeling of unrest with respect to the effect of the operation on either the speaking or the singing voice. The study tends to prove that by reason of the important physiologic function of the capsule of the tonsil, the operation of tonsillectomy possesses a mechanicophysiology importance much greater than that heretofore realized.

PHYSIOLOGY OF THE SOFT PALATE

Anatomically and physiologically, the faucial region is too complicated for easy or superficial interpretation. Certain anatomicophysiology facts require emphasis:

1. The posterior pillars, namely, the palatopharyngei muscles with their overlying mucous membranes, cannot be considered as mere adjuncts of the soft palate, but must be regarded as actual intrinsic factors of the palatal structure. Their function consists in a musculo-anatomic service in connection with the body of the soft palate. When the levator muscles elevate the body of the velum on phonation, the palatopharyngei muscles cooperate with the levator muscles of the palate closely, to adjust the posterior pillars in the lateral angles of the posterior pharynx, thus closing off the nasopharyngeal isthmus laterally, a service accomplished by the body of the soft palate in the center.

2. The closure of the nasopharyngeal isthmus laterally, however, is not always accomplished wholly by the posterior pillar folds of the palate. In an unknown proportionate number of throats this lateral closure is accomplished by a cooperative action of the posterior pillars and the constrictor muscles which close in at the sides for this purpose. In view of the frequent impairment and destruction of the posterior pillars in tonsillectomy, this lateral action of the constrictors is highly significant.

3. The palatoglossus muscle serves two purposes: first, in cooperation with the palatal elevators, to maintain a proper tension of the palate at any position of elevation, and, second, to lower the palate quickly as required in speech. Fortunately when this muscle is injured in tonsillectomy, as it almost always is, the natural rest position of the palate, with the increased tension of the palatoglossus under the new conditions, both serve quite well to take the place in the speaking voice of the action of the palatoglossus.

4. The soft palate varies considerably in length in respect to the distance to the posterior wall necessary to be covered on phonation. Occasionally the soft palate is developed so short as to prevent it from fully reaching the posterior wall, in which case the person talks with an open nasal voice. Since tonsillectomy often both shortens and stiffens the soft palate, the natural length of this structure may determine whether the voice of a particular tonsillectomized individual shall or shall not be permanently nasalized.

5. All the faucial structures are not only nicely adjusted for the complex and often violent movements of this region, but the tissues are capable of a very considerable extension and of stretching to accomplish the distances to be covered. This fortunate situation repeatedly serves to save the voices of tonsillectomized patients.

PHYSICOMECHANICAL FUNCTION OF THE TONSIL

The mechanical significance of the tonsil (including the capsule) consists in its carefully planned work with reference to the placement and movement of the faucial muscles. To look on the function of the faucial tonsil, including its capsule, as mainly a physiologicchemical function and to pass by its probably much more important physicommechanical function is to ignore such facts as the following:

1. The firm capsule of the tonsil is most intimately and intelligently adjusted to the needs for placement and separation and mutual adjustment of the complex musculature of the region.

2. The extent of surface covered by the capsule is essentially uniform regardless of the amount of lymphatic deposit.

3. The weight of the capsule (as determined by careful studies) is a very considerable proportion of the entire tonsil structure, being with

small tonsils at times even more than half the total.

4. Neither the pharyngeal nor the lingual tonsils possess this elaborate capsule.

5. The tonsil and its capsule form a necessary factor in the formation of a canal-like structure on which the direction, length, manner of action and

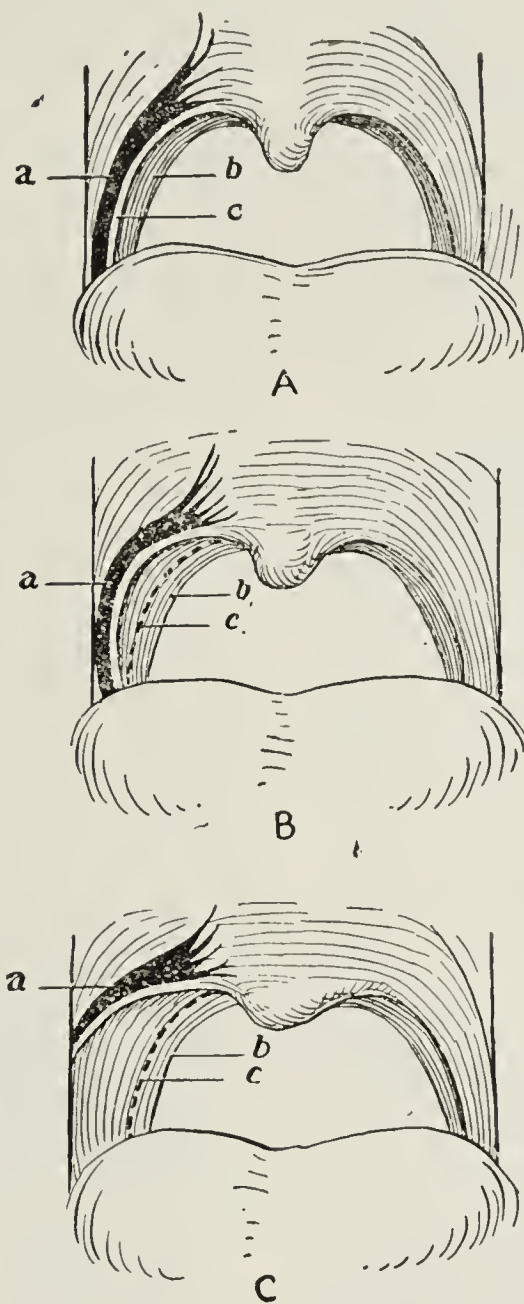


Fig. 1. A, schematic picture of normal anterior pillar: (a) palatoglossus muscle; (b) posterior pillar; (c) edge of anterior pillar; B, anterior pillar has sagged toward outer wall following operation; pulling action on soft palate has begun; a, palatoglossus; b, posterior pillar; c, normal position of edge of soft palate; C, marked retraction of anterior pillar, with half of the structure obliterated; tension on palate now is greater; complete obliteration of the anterior pillar (a still more marked deformity than that shown in C) occurred in 39 per cent. of the cases examined.

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

protection of the palatoglossus positively depend.¹ Removal of the tonsil extracapsularly leaves the fate of the palatoglossus to the merest chance.

6. The tonsil and capsule not only act as an important protective covering and brace to the thin delicate curtain constituting the palatopharyngeus muscle, but also serve to help fix and maintain the relations of this muscle to the lateral wall.

7. The determination of the relationship between superior constrictor, the palatoglossus and the palatopharyngeus muscles and to the adjacent tongue and to the soft palate, is dependent chiefly on the tonsillar capsule. For example, the capsule serves by its close insinuation into the acute angle made by the emergence of the palatoglossus and palatopharyngeus muscles from the palate to prevent mutual interference and injury and adhesion between these muscles.

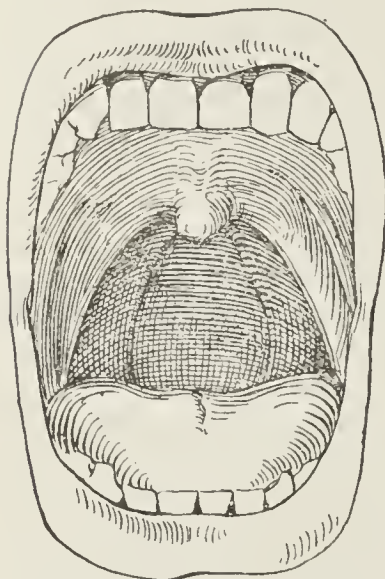


Fig. 2.—How the posterior pillars in some throats hug the posterior wall on phonation, thus closing off the nasopharyngeal opening laterally.

8. Proof of the value of the capsule as a support to the faucial muscles lies in the complete preservation of the anatomic relations following intracapsular operation, as compared with the distortions following extracapsular operation.

The part played by the lymphatic tissue in this function is that of increasing the rigidity of the capsular support, and of serving as a protective cushion. While the exactitude of certain of these relationships is subject to slight physiologic variation, the facts as stated remain essentially constant.

THE INTRAPHARYNGEAL APONEUROSIS AND THE CAPSULE

Undoubtedly the tonsillar capsule serves the very purpose it would have to serve if it were in fact identical with the intrapharyngeal aponeurosis. The question of exact identity of structure is unimportant, but the question as to whether or not it is possible to separate from the capsule, in performing the operation of tonsillectomy, connective tissues capable of serving fairly well the placement and protective purposes of the muscular fascia in this region is highly important. Paterson² declares that the deep connective tissue of the tonsil becomes so closely adherent to the intrapharyngeal fascia that separation is impossible, and "any operation for complete removal of the tonsil must not only go outside the intrapharyngeal fascia, but sometimes take the peripharyngeal aponeurosis as well." Des Camps³ states that "the intrapharyngeal aponeurosis or fascia forms a fibrous wall in the tonsil region, lodging the tonsil and called its capsule." Güttich⁴ says:

In the histologic picture of the supratonsillar fossa no tissue, generally speaking, exists which could be differentiated

as a tonsillar capsule. The tissue back of the tonsil in this region is the fascia pharyngea or buccopharyngea. It is a mistake to remove this tissue, which constitutes a supporting factor of the musculature.

Our recent Fellow and friend, the greatly lamented G. Hudson Makuen, believed that the intrapharyngeal aponeurosis and the tonsillar capsule were distinct structures and operatively separable. This belief he reiterated in a letter to me a few weeks before his unfortunate death. As many of us know, Makuen has at times exhibited tonsillectomized tonsils which clearly showed quite a thick layer of separable connective tissue over a part of the tonsillar surface. The crux in the discussion seems to be not alone that the amount of separable tissue is very variable in different tonsils, but, what is of more importance, the surface of the tonsil is never covered by loose tissue over more than a very limited proportion of its surface. Over especially the lower parts of the palatopharyngeus and the superior constrictor the capsule is thin, dense and intimately adherent both to the lymphatic tissue of the tonsil and to the muscular tissue on which it rests. The looser intrapharyngeal tissue above the tonsillar fossa extends downward and merges into the tonsillar capsule, which extends toward that tissue in this region. It appears to have been this limited extent of loose tissue above on which Makuen rested his argument.

PALATOPHARYNGEUS AND LARYNX

The exact importance of the physiology of the palatopharyngeus muscle in its relation to the thyroid cartilage, and its stretching action on the vocal cords, is at this time not clear. Theoretically its action in determining both intensity and pitch of the voice cannot be gainsaid. But the complexity of the involved conditions leaves much yet to be understood. In view of the rapid and frequent change of position of the palate, the manner of action of this muscle with

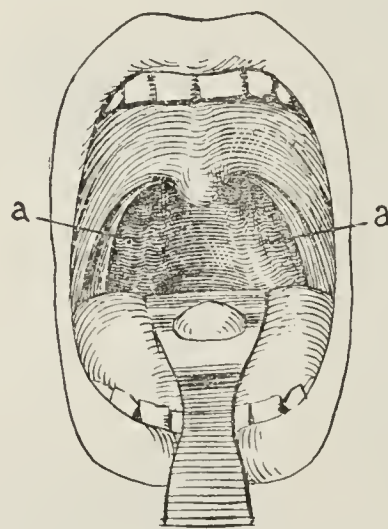


Fig. 3.—How in some throats the constrictor muscles close in at the sides on phonation to shut off the nasopharyngeal opening; a, mucous membrane of pharyngeal wall pushed inward by action of constrictors.

respect to the thyroid cartilage is not easily comprehended. The bearing also of the salpingopharyngeus on its action is not clear. And, finally, the part played by its coadjutors, the stylopharyngeus, the stylohyoid and the hyoglossus make the subject complicated. We may well presume that a muscle so large and so definitely inserted must have a purpose with reference to that insertion, if only to adjust accurately the relations between palatal action and vocal cord action. Observation of the larynx and of its speaking voice in a large number of tonsillectomized patients in

which the palatopharyngeus has been injured in all degrees has failed to show with any sort of regularity impairment in the action of the vocal cords that was visible to the eye or perceptible to the ear. The few cases of seeming physiologic impairment in the action of the vocal cords were in no sense conclusive and may have resulted from other causes. But two possible explanations of this lack of definite impairment in the movement of the larynx resulting from injury to the

1. Kenyon, E. L., and Kradwell, W. T.: A Study of the Physico-mechanical Function of the Faucial Tonsil, *Ann. Ophth., Rhinol. and Laryngol.*, December, 1916.

2. Paterson, D. R.: *Jour. Laryngol., Rhinol. and Otol.*, September, 1913.

3. Des Camps, quoted by D. R. Paterson: *Jour. Laryngol., Rhinol. and Otol.*, September, 1913.

4. Güttich, Alfred: Ueber die Sogenannte Kapsel der Gaumen Mandel, *Ztschr. f. Laryngol., Rhinol. u. ihr Grenzgeb.*, Jan. 25, 1915.

palatal section of the palatopharyngeus are possible: first, that the palatopharyngeus does not seriously affect the action of the vocal cords, at least so far as the speaking voice is concerned, or second, which is more likely, that the muscles which co-work with the palatopharyngeus in its laryngeal action come instinctively into the breach and act as a substitute for the impaired palatal muscle.

STUDY OF TONSILLECTOMIZED THROATS

The following report⁵ on tonsillectomized throats is based on the systematic study of 161 tonsillectomized patients. The patients were of all ages, operated on by the various well known instrumental and technical methods, and by about twenty operators. The surgeons were mostly thoroughly experienced and some were unusually skilful; a small but unknown proportion were interns.⁶

1. Neither palatoglossus nor palatopharyngeus muscles show more than very slight retraction, namely, the faucial region on both sides, including pillars and palate, were left essentially normal; six patients, 4 per cent.

2. Both palatoglossi slightly to moderately retracted, both palatopharyngei only slightly retracted, or normal; two patients, 1 per cent.

These two groups, representing essentially one in every twenty of the patients, include all that showed the clean, free, practically normally appearing and acting fauces, such as operators theoretically attempt to secure. All others were cases presenting very evident, though by no means necessarily serious, deformity.

3. Palatoglossi moderate to marked retraction, functioning in some cases slightly, and in some cases not at all; 150 tonsils, 47 per cent.

4. Palatoglossi completely obliterated, having disappeared into the lateral wall; 122 tonsils, 39 per cent.

5. Palatopharyngeus not perceptibly impaired; 149 tonsils, 49 per cent.

6. Slight to moderate adhesion of palatopharyngeus to lateral wall, and moderate impairment of muscle; 106 tonsils, 45 per cent.

7. Marked to complete adhesion of the palatopharyngeus to the outer wall; decided and in some cases total incapacitation of muscle (with inevitable resulting tension and shortening of palate); forty-seven tonsils, 15 per cent.

As to the palatoglossus, then, in more than 50 per cent. of the cases the muscle had ceased completely to functionate, and in 14 per cent. the muscle seemed quite free from impairment. The palatopharyngeus was almost or completely incapacitated in 15 per cent., and practically not at all impaired in 49 per cent. The amount of tension, retraction, and destruction to the palate was very important, and will be brought out in other connections.

CASES SHOWING FUNCTIONAL IMPAIRMENT

A striking fact disclosed by this study is the great extent and degree of deformity possible without impairment of the speaking voice. Fauces which show very little resemblance to the normal may still disclose no perceptible impairment in this direction. In such cases the palate is apt to be unusually long; or perhaps adhesions have chanced to be favorably placed, or the palate is capable of unusual stretching. Stiffening, and adhesive retraction of the palate, on which depend voice endangerment, occurred most seriously when

adhesion of both pillars happened on the same side, and more especially when both deformities appeared on both sides of the same throat.

The various ways in which the speaking voice becomes nasalized by tonsillectomy may be stated as follows:

1. Through increased tension, adhesive retraction, or destruction of the palate that organ is unable to reach the posterior wall for phonatory purposes.

2. The palate is long enough to reach the posterior wall, but, because of adhesions and tensions, the elevator muscles find the additional load so great that they do not draw back the palate the entire distance.

3. A purely functional imperfection of action of the elevator muscles of the palate (this cause would be hard to prove because of the almost inevitable presence of deformity).

4. Owing to partial or complete destruction of the posterior pillars the closure of the nasopharyngeal isthmus laterally is incomplete, and the constrictors

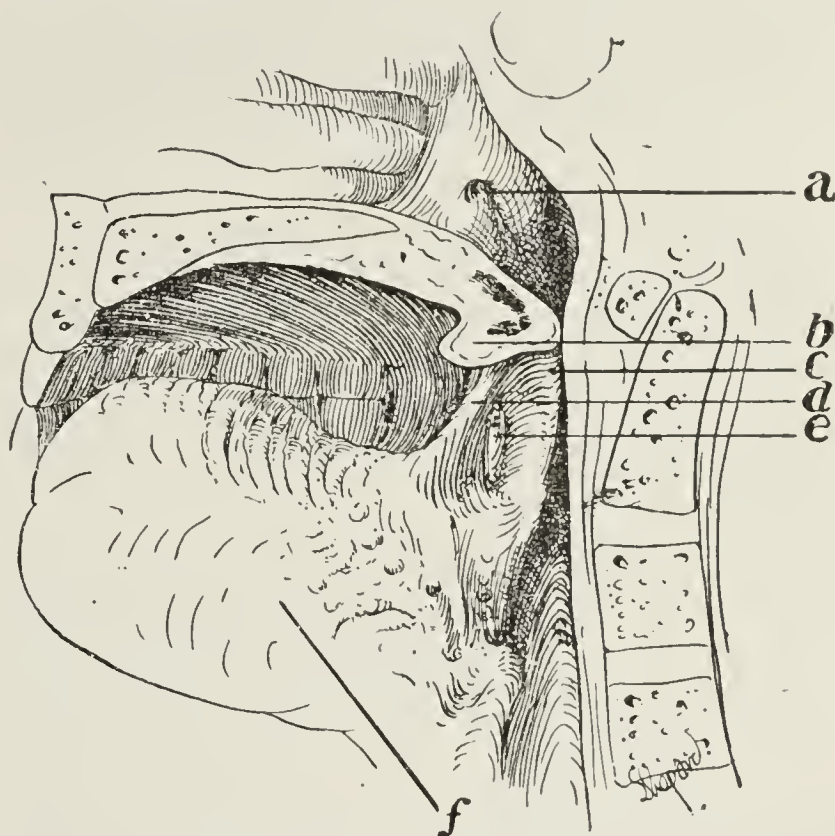


Fig. 4.—Obliquely lateral view of the right side of the throat when the soft palate is retracted in phonation, showing the action of the posterior pillar in closing off the nasopharyngeal opening laterally: *a*, eustachian orifice; *b*, uvula; *c*, posterior pillar; *d*, anterior pillar; *e*, tonsil.

have not compensated for this failure by sufficiently increased action.

The singing voice would probably be impaired in all such cases and in many others similarly deformed, although the adhesions and tensions might be insufficient to impair the speaking voice.

Thirty persons have been under observation for functional impairment of the voice, or throat, which might have a relationship to tonsillectomy. Tabulation of these cases shows:

In seven patients, voice nasalized for not less than eight months with permanent impairment to voice.

In thirteen patients, all children, voice to some extent nasalized. In some of these cases presumably the voice will be permanently impaired; in a large proportion probably the voice will clear up; in a few probably the voice results from childish carelessness.

One nasalized voice in an adult, with considerable but not extreme deformity, cleared up in about four months.

One adult has had a "tired" throat on talking, with difficulty in speaking certain words for two years, and with marked deformity.

5. Included in this report are the forty-three cases previously described by Dr. Kradwell and myself, and 118 cases recently studied. In all, 319 individual tonsils are reported on.

6. Lest this study be open to misinterpretation, it is well to say that the results most serious to the voice are in nearly every instance known not to have been the work of interns. In two or three instances of serious result the particular operator in the institution in which the operation was performed, whether attending surgeon or intern, was not learned.

One patient with "tired" throat recovered.

One patient with "tired" and "dry" throat is much improved after three months with the prospect of recovery.⁷

In one individual, an adult, one side of the tongue is paretic along its entire linear extent, but the voice is normal.

One nasalized voice in an adult seems to be purely functional, although deformity exists.

Four individuals have peculiarities of the voice probably not referable to the operation.⁸

In children the impaired throats seem to show greater capability of readjustment than in adults. The number of slightly open nasal voices in these children is notable; what proportion are due to mere childish carelessness, or to the functional effect of a former closed nasal voice resulting from adenoids, cannot yet be told. But these open nasal voices occur most often where marked operative deformity exists, suggesting an underlying organic basis. The nasalized voices may be recovered by: (a) gradual increased strength of action of the elevator muscles of the palate; (b) further stretching of the palatal tissue; or (c) increased action of the superior constrictors—increased in activity of this muscle seems sometimes to be confined to the side presenting marked loss of function of the posterior pillar.

RESPONSIBILITY FOR DEFORMITY

Whenever the deformities of tonsillectomized throats have come into discussion, they have uniformly been attributed to faulty methods of operating, or to lack of skill, or both. While freely granting the seriousness of bad operating, I unhesitatingly assert that even perfect operating cannot save the throat from deformity and sometimes even from serious deformity. The primary basis of deformity rests on the seriousness of the operation itself. We operate in a field complexly muscular, and when we remove the tonsil extracapsularly, Nature's carefully planned scheme of intermuscular relationship tends to fall to pieces.

Let us inquire regarding the situation in a throat which has been tonsillectomized with ideally perfect methods and skill:

1. The palatoglossus muscle becomes now suspended to an unsupported ledge of mucous membrane which, under the stress of the movements of this region and later under the adhesions and drawing of the inevitable scar tissue, must tend to sag out of its normal course toward the outer wall; here it tends to become adherent, and must often become adherent its entire distance.

2. The superior constrictor, now left unsupported with respect to its normal relationship to the tongue, the palatoglossus and the palatopharyngeus, in the stress of the violence of its natural movements, and later influenced probably by scar tissue formation,

tends to be drawn into a closer bunch of overlapping muscular tissue; adjacent structures are thus pulled into more or less abnormally altered positions. We all are familiar with the manner in which the tonsillar fossa mysteriously closes up after operation.

3. The palatopharyngeus, which is the most important muscular factor in the situation, is perhaps subject to the least inevitable disturbance due to removal of the capsule. And yet, it also must be disturbed in many instances. The delicacy of this thin sheet of muscular tissue is in many cases extreme. Its relationship to the superior constrictor and the entire lateral wall is determined after operation only by its posterior layer of mucous membrane; the muscular tissue lies at its exit from the palate in unprotected close relationship to that of the palatoglossus; the inevitable movement and the later scar tissue tend to dislocate its relationship to the outer wall and to involve it in adhesions with the palatoglossus. And, more than this, owing to the closeness of adhesion of capsule and muscle fiber, the latter is apt to be torn or cut by the most skilful operator and hence the tendency to dislocation encouraged.

Large sized tonsils, with their greater and stronger adhesive attachments, and also tonsils supported by large connecting bands of inflammatory origin, will both tend to increase the degree of inevitable deformity. The exact estimation of this natural or inevitable deformity is, of course, impossible at this time on a large scale. If any operator will carefully follow his delicately operated cases he

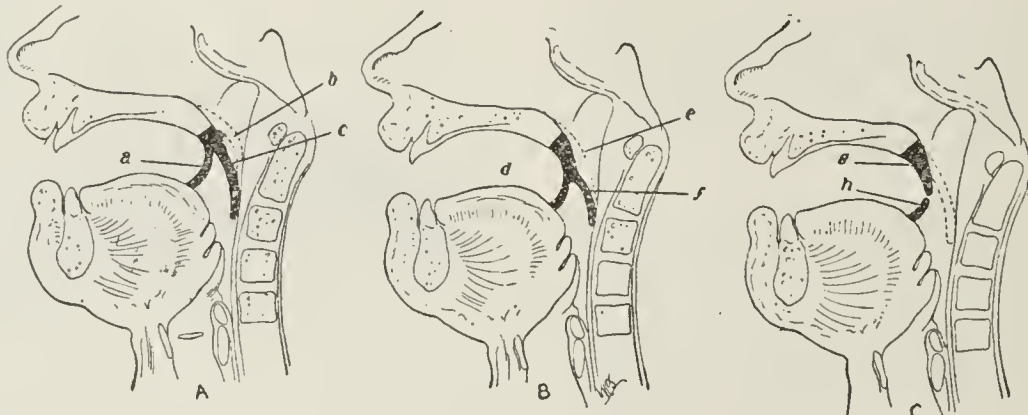


Fig. 5.—Schematic view of the side of the throat near the right lateral wall: A, normal; a, anterior pillar; b, position of posterior pillar when the palate is retracted; c, posterior pillar; B, retraction and adhesion of the anterior pillar holds the posterior forward moderately; C, posterior pillar has been obliterated; the soft palate at the side (g) is now ankylosed at its lower edge tightly to the lateral wall, the palate at the sides now being immobile in the position indicated; h, remnant of obliterated anterior pillar.

may make this estimate for himself.

If now we take into consideration the unavoidable difficulties which from time to time lie in the path of the most skilled operator, difficulties having reference to anesthesia, to vomiting, to anatomic variations, to field-obscuring hemorrhage, to severe bleeding, and to postoperative infection, any of which may unavoidably either interfere with, or else counteract, delicacy of operating and thus become the occasion of additional deformity, we shall understand still better the impossibility of totally preventing serious operative results. Since the house of every operator is made of glass, he may well in fairness and even in self protection respect the fragility of the house of his neighbor. Deformity capable of impairing both the speaking and the singing voice is possible to any operator. It is this uncertainty of operative deformity which renders tonsillectomy on singers always serious.

THE MECHANICS OF VOICE IMPAIRMENT

The exact manner in which the tensions and retractions and destruction operate to injure the voice may be explained thus:

1. The retraction and adhesion to the lateral wall of the remains of the anterior pillar tend to pull the palate away from the posterior pharyngeal wall and to draw its lower edge tense; if this process is bilateral,

7. Since writing this article, the "tiredness" in this throat has returned, and is extremely annoying. The patient is an adult and the operative deformity is slight.

8. Since a number of these voice cases were especially referred to me because of the voice impairment, I cannot draw conclusions even remotely as to their proportionate frequency in tonsillectomy.

both tendencies are greatly augmented. But if, under the circumstances, the posterior pillars remain intact, danger to the speaking voice probably occurs only in case of an unusually short palate.

2. When, however, the posterior pillars also become retracted and adherent to the lateral wall, and the more so if these processes be extreme, their backward pulling force, which constantly tended to counterbalance the effect of the adhesions of the ante-

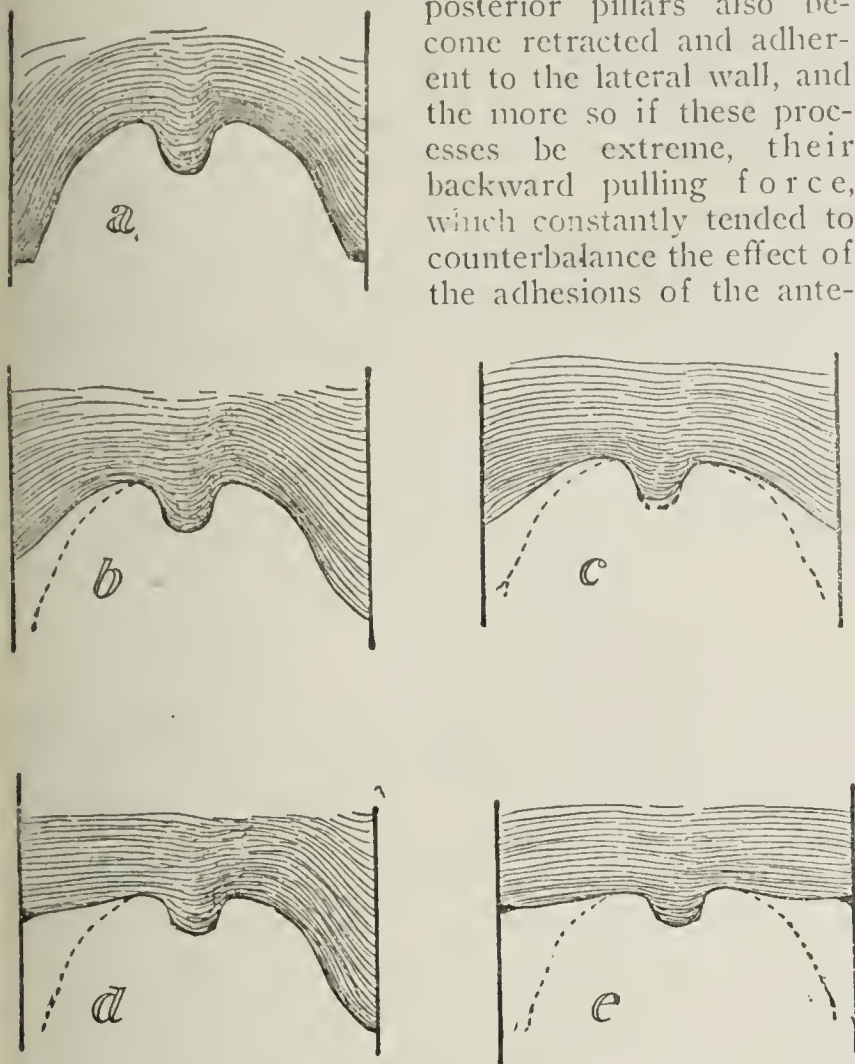


Fig. 6.—Schematic view of posterior pillar: *a*, normal; *b*, partially retracted, on one, and on both sides; *c*, completely retracted, on one, and on both sides; tension and retraction of palate progressively more marked; in order to get the full significance of this manner of deformity one must consider the backward insertion of the normal posterior pillar.

rior pillars just mentioned, becomes thereby released, and the retraction of the palate away from the posterior wall is greater. In addition, the tension of the palatal tissues is augmented, and finally, the lower lateral portions of the palate are destroyed even in extreme cases to the point of complete destruction. In these extreme cases of posterior pillar deformity, the speaking voice and, of course, the more easily impaired singing voice, is especially liable to be endangered. The singing voice is theoretically endangered by tensions, which interfere with the easy subconscious running of the speech machine, long before the speaking voice.

SUMMARY AND CONCLUSIONS

1. In view of the foregoing facts, any sound, conservative conclusion must show that, unless through the exercise of better technic or of greater skill, the deformities from tonsillectomy can be diminished, tonsillectomy is in a situation which if not alarming is at any rate serious. If one case of important functional impairment, for example, of the speaking voice, were known to occur inevitably in each hundred or 200 or even 300 cases of tonsillectomy, our attitude toward the operation would become much more attentive and careful than it is today.

2. In removing the tonsillar capsule we take out an important supportive structure on which the normality of the physiologic action of the soft palate largely depends. Cases in which operation has been per-

formed, as they exist, show a frightful amount and degree of postoperative deformity, dependent in large part on the very principle of the operation.

3. Uncertainty as to operative complications leading to increased deformity is inevitable.

4. Danger to the speaking voice necessarily lurks in the very nature of the operative conditions, and impairment to the speaking voice is inevitable in an as yet unknown percentage of cases.

5. The danger to the singing voice from stiffness and adhesions begins, theoretically, long before that to the speaking voice.

6. The present situation calls for further intelligent efforts applied to technic and delicacy of procedure, and possibly to greater care in lessening postoperative scar tissue, in the hope that the adhesions and tensions may be decreased. In the meantime the dangers to the possibilities of the artistic voice in children must apparently continue. But, until the situation is further cleared up, for the surgeon to go on performing indiscriminately tonsillectomies on the throats of adults with singing voices of great beauty or of great importance to their possessors is for him to take risks which the artist himself would not consent to take did he know clearly the situation.

7. The weakness of the present professional attitude in favor of the exclusive employment of the extracapsular operation lies in the fact that no evidence exists which proves that an operation aiming at a clean complete intracapsular lymphidectomy, namely, complete removal of lymphatic tissue within the capsule, might not prove to be practically as capable of eliminating infective dangers as the present extracapsular operation. And such an operation would not only be free from serious deformity, but would be altogether a less serious operative procedure. The opinion of French⁹ that 80 per cent. of tonsils could as well be operated on without extreme radicalism is probably true, and could probably be verified.

8. In view, then, of the whole situation, and granting for the moment the correctness of the facts herein presented, must not the profession in justice to its scientific aims and mission turn toward the matter of developing a thorough though relatively conservative operation, which preserves undisturbed the tonsillar capsule? If such an experimental attempt should meet with success, as it probably would, the operator would have at his disposal both a conservative and a radical operative procedure, between which in the individual case he could make a rational choice. Such an operation could practically always be employed in singers.

104 South Michigan Avenue.

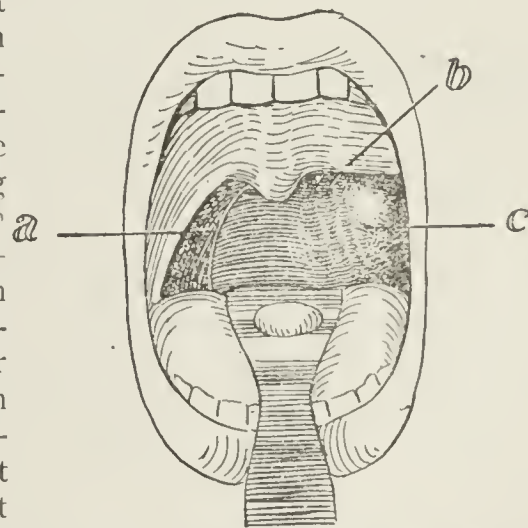


Fig. 7.—On the right side the anterior and posterior pillars are normal; on the left side both the anterior and posterior pillars have been entirely obliterated; *a*, posterior pillar; *b*, deformed edge of soft palate; *c*, lateral action of the constrictor muscles attempting to take the place of the posterior pillar in closing the nasopharyngeal isthmus laterally, the palate being in the retracted position.

9. French, T. R.: Tonsillotomy versus Tonsillectomy, New York Med. Jour., Dec. 5, 1914.

ABSTRACT OF DISCUSSION

DR. I. W. VOORHEES, New York: No one man can ever decide such a momentous question as this, and especially so if he is not a trained vocalist or elocutionist, or if he is not collaborating with vocal experts. I have been frequently surprised to see destruction of the function of the anterior or posterior pillar, with no singing or speaking impairment, while in other cases having a good anatomic, postoperative result, vocal impairment was complained of. The personal equation of the patient seems to enter largely into this question. Every physician deems himself capable of operating on tonsils and adenoids. Is it not surprising that the results of incompetency are not more manifest? If functional impairment were as common as the essayist would have us believe, removal of tonsils and adenoids would long ere this have ceased. The term "nasalized" voice needs definition. A part, at least, of every good tone is resonated through the nose. In true nasalization all of the tone goes through the nose, instead of part through the nose and part through the mouth. When the nasopharynx is held open by a forward-fixed soft palate, this is possible, but in most mutilations the soft palate is pulled upward and backward. Poor results sometimes follow a good operation, and a good functional result may follow a rather poor operation. We must standardize our technic. Too many instruments have been devised for doing the same thing. Laryngologists should get together and prescribe a classic procedure with such modifications as are necessary for unusual types of cases. Then the man who violated these principles in striving to be too original would lay himself open to censure and, perhaps, legal action at the hands of his victims.

DR. WALTER B. SWIFT, Boston: It seems to me that in relation to the soft palate the chief thing to secure is occlusion. If one can operate so that easy occlusion is finally secured, the nasality is eliminated. Of course, the great danger in operating in these resonance chambers is the destruction of quality. Quality in the voice is that part which comes from the emphasis of overtones; not only that, but from the emphasis of tones which, if combined, make beautiful quality. Now, it is the variation in these resonance chambers (the nasal cavities) which destroys this relationship resulting in quality. I think that the acoustic background should be held in mind while doing this operation, especially in singers, because the great danger comes in removing any large mass of tissue, no matter where, that is in the resonance chambers. By that removal the chambers are varied, and thus the overtones which make the quality are destroyed. I would, therefore, sum up as the end and aim of any operation with relation to the speech or singing voice, that the change of cavity and the change of action should be avoided as far as possible; or constrictively put, preserve the cavity relations and functional muscle actions.

DR. H. P. MOSHER, Boston: I believe we have not reached the end of the technic in the tonsil operation. My results have not been satisfactory to me. I feel that another operation must come; that we should, as the essayist said, have two operations to fall back on—a complete operation for sepsis and an incomplete operation when we are dealing with a trained voice; and I make the prediction that in the future somebody will give us a modified technic whereby a part of the capsule is left in the tonsil fossa, probably the superior part.

DR. JACOB BRAUN, New York: Makuen, basing his statements on the work of Patterson, adopted the theory of the layer formation of the tonsil capsule. This I have been able to verify clinically. The capsule is split and when the tonsil is removed should be covered by a very thin layer of areolar tissue, the thicker aponeurotic tissue remaining to line the fossa. By obviating the removal or injury of this thick aponeurotic tissue, which is part of the intrapharyngeal aponeurosis, the palatal muscles and the superior constrictor are not exposed to traumatism, and infection is avoided and the amount of scar tissue very greatly diminished. Thus the resultant contraction and distortion are not as likely to occur. Another factor in avoiding deformities as a result of the operation is the conservation of as much of the mucous mem-

brane of the fossa as possible, removing only as much as actually covers the surface of the tonsil. By doing this one-eighth to three-eighths inch of mucous membrane on the inner surface of the anterior pillar and the anterior surface of the posterior pillar may be conserved, resulting in folded over pillars and retaining the normal contour of the fauces. The requisites, therefore, for a good functional and cosmetic result following tonsillectomy are an untraumatized and uninjured smooth fascial lining in the fossa, the minimum of mucous membrane injured and removed, which result in the least amount of scar tissue formation and contraction.

DR. E. L. KENYON, Chicago: I have seen the layers of extracapsular tissues which Dr. Makuen laid such stress on in the dissecting room and in the excised tonsil, but I have never seen them extending below the middle plane of the tonsil, and I do not believe the amount of loose tissue which could be saved would preserve the throat from deformity.

PERSONAL EXPERIENCE IN THE SURGICAL TREATMENT OF INTESTINAL STASIS*

J. SHELTON HORSLEY, M.D.

RICHMOND, VA.

Since Sir Arbuthnot Lane brought intestinal stasis into prominence, the literature about it has been prolific. It has been approached from many points of view—surgical, medical and pathologic. It is, of course, an old condition masquerading under a new name. Smithies has called attention to the fact that the typical symptoms of intestinal stasis as described by Lane, such as muddy skin, headache, mental depression, lack of appetite, malodorous sweating, and abdominal aches and pains, are often absent in most pronounced cases of constipation, and that marked displacement of the large bowel, as demonstrated by the Roentgen ray, does not always cause constipation. Pathologists generally have not sustained the extreme views of Lane. That the symptoms as described by him do often exist, however, is common experience, but that they are caused by such marked changes in the colon as to demand its entire removal remains to be proved.

Patients that are now classed as stasis cases were formerly condemned and avoided professionally and were labeled "abdominal neurasthenics." The serious treatment of these patients dates from the recognition of bands and of stasis by Lane, and from papers by Stanton, who brought forcibly to the attention of the medical profession the unsatisfactory results of operations for so-called "chronic appendicitis" in which the appendix was removed through a short incision and no other exploration was done. Stasis, whether due to a band, ptosis of the colon, or kinks, may cause the same general complaints; consequently, the operations employed to relieve similar symptoms may be quite different.

All cases of intestinal stasis should be treated by a competent medical man several months at least before surgery is resorted to. If after six months of intelligent medical treatment little or no benefit is obtained, operation should be recommended. This has been the criterion for surgery in the group of cases here reported; each case has been treated medically for several months, usually for several years, before operation was advised.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

The best method of determining the value of any surgical procedure is the careful analysis of a group of cases in which this operation has been employed. No real improvement can be made until this is done, for often one may have the impression that certain operations are satisfactory when accurate statistics will show exactly the reverse. Frequently, unusual results in a patient in whom a surgeon is particularly interested will make, in regard to a whole group of cases, a subconscious impression that may be quite erroneous.

This group of seventy-four cases dates from Feb. 20, 1912, to Jan. 1, 1917. Reports have been received within the last sixty days from all except three. In this series are included all of the Coffey, or hammock, operations, and all short circuiting operations performed within this period of time, except for cancer or tuberculosis; but only a small portion of the cases with bands has been included—only those in which there has been a very decided history of constipation, digestive troubles, and such other symptoms as usually make the clinical picture of intestinal stasis.

Probably no two groups of surgical statistics are analyzed in exactly the same way, and their value, especially when the results are based on the statements of the patients and not on obvious physical examination, as in recurrence of cancer, depends as much on the manner in which the statistics are accumulated as on their interpretation afterward. The report of the final results here largely depends on what the patients think of their condition. This, of course, is not entirely accurate, but in a group of such cases it is the best that can be done. Several, for example, that are classed as "unimproved" apparently are better. In three instances, particularly, the friends and family physician of the patients think they are better, while the patients themselves report no improvement, so they are listed "unimproved." Others, doubtless, feel so much gratitude for the relief they have obtained that they probably make their report more rosy than it should be. After all, these two factors largely offset each other. When the family physician thinks the patient is not improved as much as the patient reports, the physician's statement is preferred.

The cases have been classified as "greatly improved," "improved," or "unimproved." The term "cured" has been avoided chiefly because it might be questioned whether, in view of the comparative newness of the surgical procedures, there may not be a recurrence of the symptoms, though this is hardly probable in any large percentage of cases. The cases that are marked "improved" are those in which a considerable proportion of the symptoms have been relieved or markedly benefited. Naturally these two types blend into one another, but it has been my endeavor conservatively to class as "greatly improved" only those patients who are practically well or have only one or two minor symptoms that have not been benefited. The classification of "unimproved" consists of those in whom there is frankly no improvement or in whom the improvement has been so slight as hardly to justify other classification.

Each patient and each patient's family physician were sent a stock letter requesting a report of the patient's condition and whether the symptoms have been relieved since the operation. Two symptoms particularly inquired about were change in weight and the presence or absence of constipation, as these are less subject to psychic influences than the more

indefinite complaints of nervousness, headache and abdominal pain, and hence they may be considered a fair indication of the patient's real condition.

The replies from the patients and physicians have been tabulated and are on record, but for lack of space only a few will be reproduced. The following two letters are from patients classed as "greatly improved," of whom there are thirty-four:

REPORT OF CASES

CASE 1.—J. L. R., man, aged 28, had been constipated for twenty years, and had gas on the bowels for the past seven years. Recently he had had attacks of diarrhea alternating with constipation, and had suffered from sick headaches. Everything he ate disagreed with him. There was an itching sensation about the rectum which extended to the thighs and between the toes. The operation consisted of removal of the appendix, division of a Lane band, freeing adhesions around the sigmoid, and draining the gallbladder. Twenty-three months after the operation the patient reports as follows: "Gained 50 pounds. Began to take on weight about six months after the operation. Have had no sick headaches and very little constipation. Before the operation I had no appetite and rarely felt well. Now I eat anything but nails with great relish and I do not believe there is a living man who feels better than I do."

CASE 2.—Miss B. P., aged 26, gave a history of having had severe constipation since she had measles four or five years ago. She suffered with indigestion, gas, large lumps in the stomach followed by vomiting, much mucus in the stools, and headache and dizziness for several days at a time. She also had dysmenorrhea. She would take large doses of purgatives with but little effect, the bowels moving about once a week under strong purgatives. The appendix had been removed previously without benefit. The Coffey operation was performed, as the colon was in the pelvis. The patient reports four years and three months after operation: "Gained 60 pounds. Began to gain immediately. Health has been almost perfect since the operation. Occasional spells with bowels. They swell up and cause some pain, but this does not last very long."

From the replies of those patients classed "improved," of whom there are twenty-four, the following letter is typical:

CASE 3.—Mrs. T. J. C., aged 30, gave a history of having been constipated for ten years. She had nausea, occasional vomiting, indigestion and nervousness, and bad headaches all her life. The uterus was everted, the Coffey operation performed, and a retroverted uterus was replaced by the Gilliam operation. Four years after the operation the patient reports: "My general health is considerably improved. Have gained about 10 pounds. This gain began about a year after the operation. Constipation and headache has been improved, but still have spells of both. The constipation is not so bad, but the headache is very severe at times. The spells of headache do not come so often. Still have pains in the groins, but not so severe."

From the "unimproved" class, of which there are nine cases, the following report seems typical:

CASE 4.—Mrs. W. S., aged 41, had been obstinately constipated for thirty years. Medicines failed to give the desired result after about a year. About eighteen years ago there was a fulness in the rectum which has grown worse. For the last eight years the patient had suffered constantly. She used the rectal tube for relief from pressure in the rectum. She had hemorrhoids, and suffered with sick headaches, nausea and vomiting. An appendectomy and a cecosigmoidostomy were performed. The right tube was totally resected, and the left tube partially so. A small cyst was removed from the left ovary. Two years and one month after the operation, the patient reports as follows: "It is with regret that I must say that it [the operation] has proved to be of no benefit whatever. I gained in weight what I lost from the operation."

Constipation has been as great as before. Headache is the same as ever. Am never relieved from awful pressure in the rectum; my nights are bad; I get about one good night's rest in every two weeks. My limbs and arms down to my little fingers feel like they are going to be paralyzed. I have to continue the use of the rectal tube for relief."

In eight instances the ultimate result has been reported by the physician alone, the patient not being heard from. In thirty-four cases the reports have been based on replies from both the family physician and the patients, and in twenty-five on replies from the patients alone. Of the whole series of seventy-four cases, three have not been heard from. Four of the series have died. One died of pneumonia two years and two months after leaving the hospital, and three died while in the hospital. Of these three, one patient died of pneumonia four days after the operation, and another died suddenly of what appeared to be pulmonary embolism twelve days after the operation. She had been feeling well only a few minutes before death. Both of these deaths followed a Coffey operation. There was no postmortem in either case. The third patient had been vomiting occasionally ever since the operation. A few hours before his death the pulse quickly became rapid and feeble and the vomiting frequent. There was little distention, but marked pain.

cases in which operations were performed as follows: appendectomy and division of bands, 22; Coffey or hammock operation, 27; cecosigmoidostomy, 17; Coffey and cecosigmoidostomy, 5, and ileosigmoidostomy, 3.

Many of these patients had been called "neurasthenics." The term "neurasthenia," like malaria, "liver complaint" and rheumatism, often covers a multitude of sins. The more carefully such patients are examined the fewer so-called idiopathic neurasthenias are found. Certainly, in the type classed by some as "abdominal neurasthenics," stasis is a frequent cause. Many of this type have been practically cured by operation for stasis. With one such patient, on whom the Coffey operation was performed, the attending physician was as anxious for relief as the patient was, and a gain of 60 pounds within six months after operation was accompanied by a practical cessation of neurasthenic complaints.

Why, then, are not all neurasthenics with intestinal stasis cured by a surgical operation? For instance, in three of the unimproved patients in this list, such symptoms as mental depression, constant introspection, constipation, headache, emaciation and abdominal aches and pains were present in a marked degree before operation; and while there are apparent bene-

TABLE 1.—OPERATION AND RESULT *

Operations	No. of Cases	Greatly Improved	Improved	Unimproved	Dead	No Report	Youngest Years	Oldest Years	Average Age, Years	Men	Women
Appendectomy and Lane band	22	13	8	0	0	1	18	57	32	7	15
Coffey	27	12	10	2	2	1	21	55	32½	2	25
Cecosigmoidostomy ..	17	6	4	5	1	1	18	41	28½	4	13
Coffey and cecosigmoidostomy	5	3	0	2	0	0	28	48	36	0	5
Ileosigmoidostomy ...	3	0	2	0	1	0	27	34	30½	0	3
Total .....	..	34 (46%)	24 (32.5%)	9 (12%)	4 (5.5%)	3 (4%)	..	..	..	13	61

* All of these patients were white except one, who was a colored man.

He died from what appeared to be some form of "heart failure." In this case, which was one of obstinate stasis with constipation, headache, abdominal and general pains and inability to perform the usual labor, the cecum was anastomosed to the sigmoid. There was some thickening of the ascending colon. The cecum was not unduly large, and there was not sufficient play between the sigmoid and the cecum after the anastomosis had been made. Postmortem examination revealed several loops of ileum wrapped around the point of anastomosis had produced such tension on the line of sutures that a perforation had resulted, evidently a few hours before death, when the bad pulse and other symptoms occurred. This was one of the early cases, and the necessity of having an extremely large and movable cecum and sigmoid for cecosigmoidostomy was not fully appreciated. Since then no cecosigmoidostomy has been done except with a large dilated cecum, extremely movable, and when both the sigmoid and the cecum could be brought well out of a median incision, showing great relaxation of both these segments of the intestine. This is the only death that could reasonably be attributed to the technic, and I think, in view of past experience, that it would be avoided now. If I have a similar case, I shall resect the cecum and the ascending colon.

In the seventy-four cases, there are sixty-one women and thirteen men. They are subdivided into

fits from the operation according to the observations of the physician, friends and relatives of the patients, the patients themselves report their condition as unimproved and they are so classified. It seems possible that as regards cure by relieving the original cause, the situation is somewhat similar to that which obtains in traumatic epilepsy. It is well known that if epilepsy has become firmly established after such a trauma as a depressed fracture of the skull, the correction of the causative lesion does not often cure the epilepsy. If, however, the lesion is corrected after the first one or two convulsions, the chances of complete relief are much greater. There may be some such connection between abdominal neurasthenia and intestinal stasis, for the toxic products evolved by stasis evidently have some effect on the nervous system that is responsible for many of the complaints of the neurasthenic. If this condition is permitted to go too long, such permanent changes may take place in the nerve cells as to prevent a cure, though by the establishment of normal metabolism and the elimination of the toxic products of stasis some improvement takes place.

It is difficult to compare the results if viewed solely according to the type of operation, for, as has been said, similar symptoms were often produced by different pathologic conditions. Stasis can be caused by bands, kinks, ptosis, a cecum mobile, or a combination

of these. Consequently, the type of operation was fitted to the condition found. Cases in which bands exist without ptosis have frequently been classified under the head of "chronic appendicitis." These patients were formerly operated on by a short incision, and the appendix was removed. As Stanton and others have emphasized, often little permanent benefit results from this. It is doubtful if such a condition exists as chronic appendicitis without a distinct history of an acute attack, or without bands, kinks or some other pathologic condition. The removal of the appendix is undoubtedly indicated, but freeing bands and correcting other pathologic conditions are even more necessary. Appendectomy was done in all stasis cases reported here, regardless of the type of operation.

The three ileosigmoidostomies were performed early in the series. In one case, Kellogg's suggestion of an end-to-side implantation of the ileum in the sigmoid in such a manner as to form a valve was carried out, and this patient seemed to be somewhat benefited. She died of pneumonia two years and two months after the operation. Ileosigmoidostomy, however, was soon abandoned, as cecosigmoidostomy

the cecum tends to close, and John G. Clark of Philadelphia and others say that but little if any fecal matter comes through the opening. At least some of the fecal current and some gas should drain into the sigmoid, and this should aid in emptying the cecum, just as a gastro-enterostomy aids in draining a dilated stomach. If the opening closes eventually but has remained patent sufficiently long to cause reduction in the size of the cecum, this improvement may be permanent. In the only cecosigmoidostomy in this series, however, in which, because of a return of symptoms, a roentgenogram was taken several months after operation, the opening appeared to be closed.

While intestinal stasis rarely calls for an extensive resection of the colon—in my own experience I have never seen a case in which I thought this should be done—there are probably instances in which excision of the cecum and ascending colon are indicated, particularly after a failure following cecosigmoidostomy. In two patients an excision of the cecum was advised; but as there had been no benefit from the first operation, it was refused. If it is done, the operation of W. H. Barber,³ that is, preserving the ileocecal valve along with a small amount of adjacent cecum and

TABLE 2.—LENGTH OF TIME SINCE OPERATION

Operation	Result	5¼ to 4 Years	4 to 3 Years	3 to 2 Years	2 to 1 Year	1 Year to 5 Months
Appendectomy and Lane band, 22 cases. Reported 21; no report, 1; dead, 0.	Greatly Improved.....	2	1	5	2	3
	Improved.....	1	0	5	2	0
	Unimproved.....	0	0	0	0	0
Coffey, 27 cases. Reported, 26; no report, 1; dead, 2.	Greatly Improved.....	1	2	3	3	3
	Improved.....	5	0	3	2	0
	Unimproved.....	0	0	0	2	0
Cecosigmoidostomy, 17 cases. Reported, 16; no report, 1; dead, 1.	Greatly Improved.....	0	0	1	4	1
	Improved.....	0	0	1	2	1
	Unimproved.....	0	0	4	1	0
Coffey and cecosigmoidostomy. Reported, 5; no report, 0; dead, 0.	Greatly Improved.....	0	0	0	2	1
	Improved.....	0	0	0	0	0
	Unimproved.....	0	0	2	0	0
Ileosigmoidostomy, 3 cases. Reported, 2; no report, 0; dead, 1.	Greatly Improved.....	0	0	0	0	0
	Improved.....	2	0	0	0	0
	Unimproved.....	0	0	0	0	0

seemed to be far preferable. J. Rilus Eastman¹ has called attention to the value of this operation. Anastomosis between the cecum and the sigmoid not only provides for short circuiting, but has the additional advantages of draining a large cecum and of protecting the ileum from the flora of the large bowel. Several surgeons have reported that after an ileosigmoidostomy, the lower ileum enlarges, thickens, and apparently takes on some of the characteristics of the large bowel. This may be due to the ready access of the bacteria that are abundant in the large intestine, and partly also to the pressure of gas in the colon. By preserving the ileocecal valve, as in cecosigmoidostomy, these changes in the ileum are avoided. In addition, cecosigmoidostomy prevents the accumulation of fecal matter in the blind pouch of the cecum, which is a great objection to the Lane operation of short circuiting (ileosigmoidostomy). James T. Case² reports a patient observed after a cecosigmoidostomy in whom the peristaltic and antiperistaltic currents of feces would produce a vicious circle. It has also been objected that the opening between the sigmoid and

joining this end-to-end to the stump of the ascending or the transverse colon, seems far better than the technic usually employed, namely, lateral anastomosis or end-to-side union without the protection of the ileocecal valve. As I have attempted to show elsewhere, the operation of lateral intestinal anastomosis should be abandoned.

In regard to ptosis, the Coffey, or hammock, operation is most satisfactory. In eight cases, a few sutures were placed in the gastrohepatic ligament, according to the method of Beyea, just before the Coffey operation was done. This held the stomach in position.

The condition of the patient and the amount of time that has elapsed since the operation was performed are classified in Table 2. According to this table, there is apparently no material increase or decrease in benefit with the lapse of time.

On the whole, I have found that cases with distinct bands and kinks without ptosis and without a dilated cecum give very satisfactory results from operation. The Coffey, or hammock, operation for ptosis when there is no dilatation of the cecum is also exceedingly satisfactory. The results from cecosigmoidostomy, though fairly good, have not been so good as in those cases in which only the Coffey operation was done.

1. Eastman, J. Rilus: An Anatomic and Physiologic Method of Short-Circuiting the Colon, THE JOURNAL A. M. A., March 7, 1914, p. 747.
2. Case, J. T.: Roentgen Studies After Gastric and Intestinal Operations, THE JOURNAL A. M. A., Nov. 6, 1915, p. 1628.

3. Barber, W. H.: Interstate Med. Jour., 1917, 24, No. 1.

The number of cases in which only cecosigmoidostomy was done is seventeen, the report showing five patients unimproved, four improved and six greatly improved, while after the Coffey operation alone there were two unimproved, ten improved and twelve greatly improved. This does not necessarily mean that cecosigmoidostomy is less efficient than the Coffey operation, but that the cases in which it was indicated, because of a large distended cecum, are probably more difficult to cure than those in which there is ptosis of the transverse colon with but little change in the cecum. However, I am now restricting the cases in which cecosigmoidostomy is done, and I think that in future many of the same type in which I have previously performed this operation will be more benefited by an excision of the cecum and ascending colon.

Taking the general results, thirty-four patients have been greatly improved, twenty-four improved and nine unimproved. Three of the patients have not been heard from. There are four deaths, three while in the hospital, and only one that could be attributed to the technic of the operation. It is probable that death would not occur in a similar case now. All of these patients had been treated for a number of months, and many of them for several years, by medical measures with practically no benefit before operation was resorted to.

Finally, I have been impressed with the value of cooperation between the physician and the surgeon in this class of patients, particularly in the after-treatment. The regulation of diet, proper methods of personal hygiene, the ingestion of an abundance of water and the administration of liquid petrolatum should be carefully followed. This will be done only under the supervision of the family physician. Before operation, the same measures gave slight if any improvement in this group of cases; but when the pathology was corrected by surgery, they usually produced most gratifying results.

ABSTRACT OF DISCUSSION

DR. JOHN W. DRAPER, New York: I want to show a series of three plates brought to me by Dr. Robert M. Brown who will tell you something further about them. The plates serve to show the truth of what the essayist has said, that frequently following cecosigmoidostomy there is dilatation of the intestines. I have followed Dr. Whipple's work carefully but have failed to corroborate his theory of proteose intoxication in obstruction, and am able to present to you this outline which shows the chemical 'blood picture in duodenal obstruction dogs. The rise in nonprotein nitrogen is immediate and characteristic, as is also the fall in alkaline reserve. One would not expect this sort of reaction in any bacterial condition. It is significant proof that whatever the toxemia is, it is not bacterial. Dr. Horsley spoke of the rôle of the valves. I do not consider the terminal portion of the intestine, where there is normal physiologic delay, as a mere mechanical structure. I believe the ileocecal sphincter is 90 per cent. physiologic and 10 per cent. mechanical or valvular in action. I agree with Dr. Horsley in many of these things, but do not believe that lateral stomata functionate unless the normal lumen is closed just aboral to them. Except by such actual obstruction, it is not easy to divert the course of the intestinal contents.

DR. ROBERT M. BROWN, Saranac Lake, N. Y.: In one of my cases, referred to by Dr. Draper, there was a history of constipation since the patient was a girl. Hydrotherapeutic treatment was given with some improvement at the time, when there was a recurrence and the same symptoms of profound autointoxication, the patient losing ability to attend to her home and to run her affairs, constant, increasing head-

ache, nausea and serious loss of memory. Cecosigmoidostomy was performed by a competent man. Before leaving the hospital the patient said her symptoms were worse than before. When she came to me she had a list of cathartics covering everything in the pharmacopeia. One of the slides showed the patient after having been given a bismuth enema. An hour after the bismuth had been taken it was found in the descending colon. Following it for a hundred hours, part of it dropped out and passed through the rectum each time it came around the cycle. Another picture showed the bismuth enema and where the stomata were situated. Dr. Draper and I operated one year ago as follows: We resected the immensely dilated pelvic colon and reunited the ends. The usual developmental reconstruction of the colon was then done, the ileum being transplanted by lateral anastomosis into the transverse colon, after removal of the grossly diseased cecocolon. The total mass resected was the length and diameter of a man's coat sleeve. Nothing short of resection would have helped this woman, who for years before operation had been in the hands of very competent medical men. Since operation the patient is getting better very day. At present she is taking 5 grains of cascara about twice a week and the bowels are moved normally. While her physical improvement has been over 80 per cent., still more marked has been the mental gain.

THE DIAGNOSIS OF ACUTE PANCREATITIS

WITH A SPECIAL STUDY OF THIRTY-THREE CASES*

WILLIAM LINDER, M.D.

Fellow of the American College of Surgery; Attending Surgeon,
Jewish Hospital

BROOKLYN

In presenting this report of thirty-three cases of acute pancreatitis, gathered almost entirely in the very short period of three and a half years, it is my desire to arouse an interest in this condition and to demonstrate that to think of the possibility of acute pancreatitis in every acute case demanding abdominal surgery is to frequently make a diagnosis. Errors of diagnosis here are mainly those of omission.

There are more cases of the mild or the moderate type than of the severe fulminating type. We wish to call particular attention to the milder types, as very frequently they precede the fulminating syndrome.

While Körte and Barker state that males outnumber females in the ratio of 2:1, in this series 76 per cent. of the patients were females.

The most potent factor in the causation of acute pancreatitis is, no doubt, gallbladder disease, including cholelithiasis. The frequency of association of biliary and pancreatic diseases has been variously estimated by different authors. In this series this was true of approximately 50 per cent. of the cases. This percentage would probably be higher were I to consider that in some of the cases the condition of the patient was so desperate that, on the principle of going in and getting out of the abdomen as quickly as possible, no time was wasted in examining the gallbladder or ducts, or in doing more than establish pancreatic drainage.

What is the explanation of these associated lesions? Here a knowledge of anatomy and the relationship of the gallbladder, the pancreas and their respective ducts, is of prime importance. Infection of the gallbladder continues along the ducts and secondarily infects the pancreas. This is especially the case if a small gall-

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

stone becomes impacted in the papilla of Vater and this results in a damming back of the infected bile into the duct of Wirsung. This has received confirmation at the hands of numerous workers. Other causes of obstruction at the ampulla, such as duodenitis or neoplasm, may also favor the entrance of bile into the pancreatic ducts. Déjerine believes that an infection that at one time can ascend the biliary ducts can at another time attack the pancreatic ducts. Deaver states that in 25 per cent. of cases not secondary to biliary disease, acute pancreatitis may follow appendical or other intra-abdominal infection by lymphatic extension and produce a pancreatic and peripancreatic lymphangitis.

The classification of the different types of lesion, as described by Fitz in 1899, holds good today and cannot be improved on. Acute hemorrhagic, acute gangrenous and acute suppurative pancreatitis are all phases of the same condition and not distinct pathologic entities. In any of these types part or all of the gland may be involved. We shall study the different types in the light of what is revealed on the operating table. It is the living pathology that interests us as surgeons, for should the diagnosis have been missed before the opening of the abdomen, there is no excuse for overlooking the condition when the abdomen is opened.

The symptoms of the onset are due to celiac shock and diaphragmatic irritation by pressure on an enlarged pancreas and hemorrhagic exudate. The later symptoms are those of a peculiar toxemia, the nature of which has not yet been clearly defined. The clinical history of the past condition of the patient will frequently reveal symptoms pointing to a cholecystitis, cholelithiasis, cholangitis or a mild pancreatic attack. Twenty per cent. of the cases give a history of typical biliary colic, 50 per cent. of mild pancreatic attacks, and a large majority give a clinical history simulating gallbladder dyspepsia. We were formerly taught to recognize only the fulminating type.

The onset of a severe attack is intensely dramatic. Like a thunderbolt out of a clear sky, in a robust, obese and apparently healthy individual there is sudden upper abdominal pain, accompanied by vomiting, rapid and marked collapse and shock. Marked constipation and abdominal distention, simulating intestinal obstruction, follow at once. Symptoms of pseudo-ileus progress and there is marked cyanosis and lividity, shallow breathing and marked dyspnea. The pulse is rapid. The pain, which was at first excruciating in character, may, after twenty-four or forty-eight hours, abate. The vomiting, which is persistent during the first twenty-four hours, also lessens, while the hiccups and belching, which are due to diaphragmatic irritation, persist.

In the event of the patient surviving a severe attack, after a period of three or four days symptoms of gangrene or suppuration may supervene. The hyperacute symptoms subside and the phenomena of acute upper abdominal peritonitis appear. Usually there is marked obstipation, the result of toxic ileus; the abdomen is distended; there is tenderness in the epigastrium and left lumbar region with slight rigidity of the left rectus, and a swelling in the epigastrium or the left lumbar region may appear. If suppuration ensues, fever, chills, a high leukocytosis, weakness and emaciation make their appearance.

The moderately severe or the mild types of acute pancreatitis can be diagnosed only by a close study and an analysis of the individual symptoms. I here desire

to reiterate that to think of acute pancreatitis is to frequently make the diagnosis.

While it has frequently been said that there is nothing pathognomonic about any sign or symptom which would lead to a diagnosis of acute pancreatitis, there is no pathognomonic sign or symptom in any abdominal condition. It is the correlation of the syndrome and the analysis of each and every individual symptom that renders the diagnosis comparatively easy in the moderately severe or the mild types.

Pain is the predominant and the persistent symptom and should be spoken of in the comparative degree. It is more severe than in a perforated gastric or duodenal ulcer or a perforated gallbladder, and usually requires a large dose of morphin to afford relief. During the attacks of pain the patient refrains from indulging in the slightest exertion, and this serves to differentiate it from the severe pain of renal colic. At the onset pain is the dominant symptom and continues to grow worse and is constant. It is of a splitting character, often as if the ribs were being pushed apart. At the time of onset the pain is usually located deep in the mid-epigastrium, just above the umbilicus. It often radiates to the back, and the patient complains of a splitting backache. It never radiates to the right shoulder. Vomiting accompanies and follows the pain, recurs at intervals in 80 per cent. of cases at the onset, and the vomited material consists of bile. Vomiting ceases within a short period. As compared with intestinal obstruction, the vomiting is not progressive and is relieved by gastric lavage.

Collapse and shock are due to pressure on the celiac plexus. They vary in intensity and in the severe cases are marked at the onset, as compared with the later appearance of collapse in intestinal obstruction. Shock may be so extreme that the patient may die in a few hours. Shock is very prolonged—more prolonged than in the case of a perforated viscus. The period of shock is usually followed by extreme prostration, nausea and vomiting, weak and rapid pulse, cyanosis and marked systemic depression. These phenomena of shock, when unaccompanied by abdominal findings of a severe perforative peritonitis, are suspicious or diagnostic of acute pancreatitis. Twenty-five per cent. of the cases that are sent to us are referred as cases of intestinal obstruction. The reason for this is the fact that a toxic ileus is very frequently present at the onset of the attack. It can be readily differentiated from mechanical intestinal obstruction by the passage of flatus, absence of increased peristalsis and lack of progressive vomiting. A finding of extreme importance, which, in itself, is very suspicious, is the presence of a peculiar cyanosis and lividity of the face, the abdominal wall and the flanks.

Physical examination reveals a tense and swollen abdomen, due to rapidly increasing distention, especially of the upper abdomen. This is marked in 50 per cent. of the cases and is due to intestinal paresis. Abdominal tenderness is located in the upper abdomen, especially in the midepigastrium. The tenderness is not as great as in a perforated viscus. Rigidity is absent at the onset. It appears early as a transverse resistance in the epigastrium and left rectus muscle. As compared with a perforated viscus it is less marked and rarely of a boardlike character. An abdominal tumor never appears before the third day, and this differentiates it at once from the early appearance of an acutely distended gallbladder. When present, it is due in small part to the swollen pancreas, but mainly

to the exudate about a gangrenous pancreas, it being the expression of a localized peritonitis in the lesser sac. It is felt as an indefinite mass, extremely tender, situated in the midepigastrium above the navel, and because of the overlying stomach and colon, has a dull tympanitic note on percussion. Tenderness in the left costovertebral angle is of extreme diagnostic importance and invariably means involvement of the tail of the pancreas. This sign is important when taken in conjunction with the other signs. An attempt to elicit this sign should be made in all cases of acute pancreatitis. The temperature is also a diagnostic feature, differentiating it from a spreading peritonitis, in that it is normal or subnormal at the onset and only becomes elevated if suppuration or gangrene occur later on. The blood shows a marked leukocytosis and polynucleosis, which persist in the gangrenous cases, even if the temperature remains normal.

Given a case suspicious of acute biliary colic or acute gallbladder disease, it is absolutely essential to consider the possibility of an associated pancreatitis. The pain of acute pancreatitis is greater, of longer duration, spread over a wider area, persists and grows worse, begins and is most severe in the epigastrium and is early associated with collapse, cyanosis, epigastric and left lumbar tenderness, absence of rigidity and absence of early palpable tumefaction.

OPERATIVE FINDINGS

In a given case of acute upper abdominal disease simulating acute gallbladder disease or intestinal obstruction high up, when the abdomen is opened and the abdominal findings, such as palpation of the gallbladder or the absence of an obstructed loop of intestine are negative, you must at once look to the pancreas to explain the syndrome, and here one will find:

1. A peculiar odorless "beef broth" fluid in the peritoneal cavity. This was present in 60 per cent. of our cases.

2. Spots of fat necrosis, which appear as warty, yellowish-white plaques on the mesentery, the omentum or the pancreas. These, when present, are absolutely pathognomonic of acute pancreatitis. Frequently it will be found necessary to expose the pancreas to find fat necrosis. Fat necrosis is explained as follows: Hemorrhage within the gland destroys the acinous epithelium and basal membrane and allows the activated fat-splitting ferment to get into the tissues and split up the fats into fatty acids and glycerin. These fatty acids, when combined with the calcium salts in the blood, result in the deposition of insoluble calcium soaps, which appear as spots of fat necrosis.

3. Marked cyanosis of the small intestine, in the absence of mesenteric thrombosis or mechanical obstruction, is very suspicious and should lead to an investigation of the pancreas.

4. A change in the consistency of the omentum, the loss of its peculiar oily or fatty feel, and the acquisition of a peculiar granular or gritty consistency. This sign was first described by me in 1914 before the Brooklyn Surgical Society.

5. The pancreas is soft, enlarged and thickened, and on exposure shows areas of fat necrosis or dark areas of hemorrhagic fluid beneath its peritoneal covering.

PROGNOSIS

The prognosis depends on the recognition of the mild or the moderately severe type of the disease because

it is then that surgical interference will effectually drain the pancreas and prevent the fatal attack, which is so characteristic of most of the severe cases.

In our first series of sixteen consecutive cases in which we operated up to June, 1915, we had a mortality of 62.5 per cent.

In our second series of fifteen cases since June, 1915, the diagnosis having been made in 75 per cent. of the cases, there was a mortality of 13.6 per cent.

There were two cases in which we did not operate, as the patients were in a moribund condition when admitted and promptly died.

Our mortality statistics show the importance of prompt diagnosis and the timeliness of operative procedures.

OPERATIVE TREATMENT

Operation is indicated in all cases, unless shock is extreme, and very rapid operation is of extreme importance. The condition of the patient will determine when any gallbladder operation otherwise indicated should be done.

The pancreas may be exposed by any one of four routes: (1) through the gastrohepatic omentum (which is preferable); (2) through the transverse mesocolon; (3) through the gastrocolic omentum, and (4) in the late stages, when pointing, through the lumbar region.

Operation consists of multiple punctures of the pancreas with blunt forceps and drainage of the gland with rubber tissue and gauze, as if it were an acute phlegmon. The omentum is closed around the tube.

POSTOPERATIVE TREATMENT

The postoperative course consists of a strict anti-diabetic diet and sodium bicarbonate to reduce the pancreatic secretion. We would strongly advise keeping the patient under supervision for several years owing to the possibility of recurrences of acute attacks and the development of cyst formation or chronic pancreatitis.

889 St. Mark's Avenue.

ABSTRACT OF DISCUSSION

DR. JOHN B. DEEVER, Philadelphia: This is an important paper, read at an important time, when medical men are treating diseases of the gallbladder and holding the patients until the infection has too often gone beyond the gallbladder. This paper should be a warning to medical men. I am sorry this audience is not one of medical men as well as of surgeons. We will in time influence the medical men to be more radical.

Dr. Linder has brought out the fact that the gallbladder holds an important place in diseases of the pancreas. I believe that the most common cause of acute pancreatitis is retro-injection of bile through the duct of Wirsung. I also believe that the duodenal contents are responsible for a percentage of cases of acute pancreatitis. Furthermore, we must consider hematogenous infection. I have seen two cases of circumscribed abscess of the pancreas due to infection of the lower abdomen. The onset of the pancreatic infection was sudden and acute, the patient doing well after the abdominal trouble, when he was suddenly seized with acute pain referable to the epigastrium, with consequent symptoms of pancreatic involvement. I believe gallbladder infection is a common cause of disease of the pancreas. In my experience I meet with four varieties of pancreatitis, the ultra-acute, the acute, the subacute and the chronic. The ultra-acute are those in which the patients usually die. I have seen these patients die while being transported to the operating table, and they die because of the extensive hemorrhage and the liberation of the pancreatic ferments, causing profound

toxemia. The acute cases are amenable to surgical treatment if taken promptly.

I agree with all Dr. Linder has said, with the exception of his remarks on lavage; I do think lavage accomplishes something in acute pancreatitis in the way of temporary relief, but very little in comparison with what it accomplishes in vomiting from other causes.

DR. ERNEST LAPLACE, Philadelphia: In every case of pancreatitis we should know specifically, if possible, whether the infection reaches the pancreas through the blood, the bile or the lymphatics. The nature of the micro-organisms determines the clinical symptoms; hence, there will be various clinical pictures of pancreatitis, as there are of appendicitis. Much difficulty, however, may result in the diagnosis when the condition has produced a mixed infection. The most severe cases are due to streptococcus infection. Hemorrhagic pancreatitis with great effusion of so-called froth and gangrene may result. The pancreas has no capsule and hence great congestion of the pancreas would be followed by an exudation of a secretion which may spread to the whole abdominal cavity and create irritation and partial digestion of the structure. We have met this condition several times, resulting in great thickening of a large area of the intestinal tract, and also resulting in gangrene of the intestine. Drainage of the abdominal cavity should be resorted to as the main therapeutic procedure. Ileus paralyticus may result, simulating intestinal obstruction. Our only hope should be very early interference for the purpose of draining the abdomen, even at the risk of operating before the precise diagnosis is made.

DR. WILLIAM LINDER, Brooklyn: I agree with Dr. Deaver that one gastric lavage will not be sufficient in patients who have developed a toxic ileus. But in patients seen early, there is not much recurrent vomiting. The diagnosis and prognosis will improve with greater experience. In our first series of sixteen patients operated on before June, 1915, we had a mortality of 62.5 per cent. The second series of fifteen patients operated on subsequent to that date gave a mortality of only 13.3 per cent. In all acute abdominal conditions one must think of the possibility of acute pancreatitis. I take issue with Dr. Laplace who says that acute pancreatitis is necessarily a bacterial infection. It is a chemically induced inflammation, and bacteria only secondarily produce suppuration and gangrene. The chemical irritant, which as a rule is dammed-back bile, produces hemorrhage. This destruction of the pancreas liberates trypsin and lipase, which ferments, by their activation, lead to a peculiar toxemia and fat necrosis.

Hookworm and the Soldier.—Stiles (*Public Health Reports*, Aug. 17, 1917) directs attention to the possibilities of hookworm infection as affecting the troops now being recruited and trained. He says that in a newly formed military unit recently mobilized a soldier was about to be disciplined by his commanding officer for shirking his duties, the soldier claiming that he was not well. Stiles was asked to examine and pass an opinion on the man's condition. The diagnosis of hookworm infection was made on the symptoms and it was confirmed microscopically. After treatment the soldier promptly gained 8 pounds. In the cases of ten other soldiers a tentative diagnosis of hookworm disease was made on the symptoms. In a total of 75 military recruits recently examined by Stiles at a government reservation, 47 (63 per cent.) had hookworm infection, 3 *Ascaris lumbricoides*, 1 *Hymenolepis nana*, and 1 a heavy infection with *Strongyloides*; 2 had double infections; 25 examinations were negative. The man with the *Strongyloides* infection was recommended for discharge from the service on the ground that no satisfactory treatment is known for this condition. An ex-cadet from West Point failed by a narrow margin in his midyear examination, and theoretically, Stiles says, his hookworm infection was sufficient to account for his failure and the financial loss in his training sustained by the government. Stiles says examination of recruits for parasites, particularly *Strongyloides*, should not be omitted, and calls attention to the dangers and possible loss on this account.

Special Article

MODE OF INFECTION, MEANS OF PREVENTION AND SPECIFIC TREATMENT OF EPIDEMIC MENINGITIS*

SIMON FLEXNER, M.D.

NEW YORK

NUMBER, DURATION AND TREATMENT OF CARRIERS

(Continued from page 645)

Treatment.—Carriers of the meningococcus are now recognized as the sole source of infection in epidemic meningitis. The carriers may, moreover, consist of persons who have not had meningitis, or be persons suffering or convalescent from the disease. We have seen that, left alone, the meningococcus tends of itself to disappear from carriers; the question has arisen whether the clearing up process can be artificially hastened.

The means employed to promote the disappearance are essentially two: First, artificial immunization of the carriers through inoculation of killed cultures of the meningococcus. It has failed completely. Next, the application of antiseptic chemicals to the nasopharynx by swabbing, douching, spraying and vaporization. With certain of these methods a considerable degree of success has been achieved.

The list of chemicals employed includes potassium permanganate, chlorin water, formalin, iodine, zinc sulphate, and the chloramins. The limitations surrounding local disinfection are imposed by the anatomic conditions which make it difficult or even impracticable to bring all parts of the nasopharyngeal mucosa under contact influence of disinfectants applied by swabs and douches. And yet in some instances, application in this way has been followed by prompt disappearance of the meningococcus. The case is somewhat different with sprays and vapors. Both are or may be inhaled and hence drawn over the entire exposed respiratory mucous membrane. In this process the vapor condenses and is deposited on the membrane, and a similar deposition follows the spraying. The vapor method of applying chloramin and zinc sulphate has been developed by Gordon and Flack,⁹ whose publication should be consulted for details of apparatus and procedure. Their results will be summarized here. In passing, it should be said that they state that when the carriers are not too heavily infected, the clearing up was distinctly accelerated by causing them to sniff up a 1 per cent. solution of chloramin through the nose, expelling it through the mouth. This exercise is to be carried out twice a day and combined with permanganate (0.1 per cent.) gargling.

The disinfectants employed for vaporization were chloramin-T, 2 per cent., and zinc sulphate, 1.2 per cent., in watery solution. One liter of the solution is steam-sprayed into a room of 750 cu. ft. capacity in the course of from fifteen to twenty minutes, during which time the carrier remains there inhaling through

* From the Laboratories of the Rockefeller Institute for Medical Research.

* As the subject matter of this article is of timely importance, the reprints have been prepared in advance of the publication in THE JOURNAL, and can be had by sending a stamped, self-addressed envelope to this office or to the author.

9. Gordon, M. H., and Flack, M.: English Report, p. 77.

the nostrils. A single inhalation is given per day. Chronic carriers, that had previously been under observation from three weeks to seventeen weeks, became permanently clear of meningococcus after inhalations of chloramin varying in number from ten to four. The disappearance, in the majority of instances, took place on the ninth or tenth day. The fewer the number of meningococci present, the more quickly, as a rule, were they suppressed. But even when practically pure cultures were being obtained from the swab, suppression took from seven to ten days. Among fourteen carriers treated in this way, three failed to clear up. The zinc sulphate vapor was more effective in lightly than in heavily contaminated carriers. The former became free in from two to eight days, the latter requiring from eighteen to forty-two days.

The very distinctly encouraging results thus achieved are offset somewhat by the difficulties surrounding the method of applying the sprays. With a view of obviating them and making the application of chloramin in an enduringly active form a simple procedure, Dunham and Dakin¹⁰ have devised and recommended a solution of dichloramin-T in oil applied by means of a hand spray designed for paraffin oil. With such a spray, it has been found possible to render the nasopharynx sterile for aerobic bacteria in a few hours. Subsequently, bacteria reappear, of course, from the dust, etc. Thus far, only a small number of tests on carriers of the meningococcus has been made, but the results are promising. The method of procedure is given below.

1. The nose is cleared with salt solution or with 0.25 per cent. aqueous chloramin-T solution either by spraying or irrigation. The nose should be blown into a handkerchief between applications; and the chloramin-T solution should be used thoroughly as a gargle.

2. When the increased flow of secretion from the nose has subsided, the oil solution of dichloramin-T is applied with an oil atomizer. The oil spray should be repeated at intervals so as to make at least four treatments daily about equally spaced from each other. The spraying should be thorough and the oil carried to all parts of the membrane accessible. The first few applications of the oil sometimes occasion sneezing, but tolerance is soon acquired and subsequent applications cause no inconvenience.

3. The preparation of the dichloramin-T oil embraces three steps. First the solvent eucalyptol (United States Pharmacopeia) is chlorinated. Five hundred c.c. are treated with 15 gm. of potassium chlorate and 50 c.c. of concentrated hydrochloric acid for twelve hours or longer, and then well washed with water and with sodium carbonate solution. The water is drawn off and 15 gm. of dry sodium carbonate are added to the oil and the whole is allowed to stand for twenty-four hours. The oil is filtered off, and dried with a little solid calcium chlorid, when it is ready for use.

Second, the paraffin oil is chlorinated. To 500 c.c. of commercial paraffin oil, 15 gm. of potassium chlorate and 50 c.c. of concentrated hydrochloric acid are added and the mixture is exposed to light, preferably sunlight, for several hours. It is then transferred to a separating funnel and washed successively with water, a solution of sodium carbonate,

and again with water. The opalescent oil is drawn off, solid calcium chlorid added, in small quantity, and about 5 gm. of animal charcoal. On subsequently filtering through paper, a yellowish oil ready for use is obtained.

The third step is the preparation of the oil solution of dichloramin-T for use in the spray. Two-tenths gm. of the dichloramin-T is dissolved in 2 c.c. of the chlorinated eucalyptol without heating. When the solution is complete, 8 c.c. of the chlorinated paraffin oil are added. After mixing, the solution is ready for use. The solution contains 2 per cent. of dichloramin-T. It is relatively unstable, and should be discarded as soon as a distinct precipitate makes its appearance. An opalescence or moderate cloudiness is not evidence of material deterioration. It is a safe rule not to use the completed solution for more than three or four days after its preparation. It should be protected from strong light and is best kept in a cool place. Where large quantities are needed, a stock 10 per cent. solution of dichloramin-T in eucalyptol may be prepared and kept on hand in a cool, dark place for dilution with the paraffin oil, as 1:4, as required. The eucalyptol solution will suffer little deterioration in a month.

Summary.—This would seem to be the proper time and place to bring together and present the essential practical points regarding meningococcus carriers in military establishments. The carrying out of bacteriologic measures for the detection of the carriers on a large scale will permit the release of 70 per cent. or more of the persons swabbed on the basis of a single examination and within a period of forty-eight hours. A second group will also be released after agglutination tests have been made with suspicious micrococci, which will take another day. But where positive carriers have been detected, they should be detained and not permitted to return to their quarters or mingle with their units until subsequent bacteriologic examinations determine them to have become free. These examinations should be two in number and made at intervals of from four to six days, and the release should follow on two successive negative findings. In the case of convalescents, at least two negative cultures, taken at four to six day intervals, should be required before their discharge from hospital is permitted. In the rare instances of long persistence of the meningococcus, such as occur among true chronic carriers, special rulings will need to be made. It is to be hoped that with the perfection of means of chemical disinfection, the whole process of clearing up can be greatly accelerated.

There can be no doubt that, as compared with general indiscriminate quarantine of men in quarters following cases of epidemic meningitis, the detention based on bacteriologic examination not only affords far more protection, but is saving in time, so that in practice the quarantine period is actually shortened.

Finally, the question may be put whether the evidence is conclusive that carrier infection takes place and is frequent. There are two ways in which this question can be answered: First, by quoting incidence rates under camp conditions in which carriers have been sought, found and removed, and where this has not been attempted. While examples are not numerous, the rates are smaller under the former circumstances. Second, by following the cases of epidemic meningitis which arise in the course of the movements

10. Dunham, E. K., and Dakin, H. D.: *Brit. Med. Jour.*, 1917, 1, 682.

of the carrier. This has now been done with soldiers going home on leave, sometimes only for a few days, and who, having infected wife, children, mother or other relatives, return to camp to be discovered to be carriers of the meningococcus.¹¹

BACTERIOLOGIC DIAGNOSIS

Inflammation of the cerebrospinal meninges, or meningitis, is attended by changes in the cerebrospinal fluid which frequently become obvious to the naked eye. A turbid fluid is taken to denote inflammation and, when epidemic meningitis is suspected, to be presumptive evidence of the existence of that disease. But the conclusive indication of the nature of the condition is supplied by the demonstration by the microscope or in cultures of the meningococcus itself.

The meningococcus was designated by its discoverer, *Diplococcus intracellularis-meningitidis*, because of its affinity for the protoplasm of the polynuclear leukocytes present in the inflamed meninges. This name is now little employed because of its inconvenience; but it is also something of a misnomer because the meningococcus not infrequently is present outside the leukocytes in the surrounding fluid. The common experience is to find the micro-organism partly inside, partly outside the cells; but in some instances they are practically all inside, in others practically all outside of the leukocytes.

The criteria at present acceptable as determining the bacteriologic diagnosis of epidemic meningitis are somewhat modified by the experience gained in the last years through frequent lumbar puncture and in connection with the serum treatment.

Common experience has shown that the quality of the cerebrospinal fluid is not decisive, for while the fluid is usually turbid in epidemic meningitis and tends to be clear in tuberculous meningitis, lumbar puncture performed early in the course of the former infection may yield an almost perfectly limpid liquid.

Similar experience has proved also that disparity may exist between the meningococcus occurring in the cerebrospinal fluid and the results of the cultures when the medium is in all respects favorable. At times the micro-organism is found in characteristic form, staining property and position within leukocytes, and yet the cultures remain negative; at other times they are not detected in the microscopic preparation, and yet growth is obtained in the tubes.

Explanation of this disparity presents no especial difficulty. The meningococcus is an acknowledged fragile micro-organism, and is doubtless at times already injured or dead when observed under the microscope; the quantity of the cerebrospinal fluid brought under inspection with the microscope is minimal in comparison with the amount transferred to the cultures. It is not, therefore, surprising that the meningococcus may be missed in the one place and yet come into view in the other.

But the important question which presses relates to the criteria which suffice to establish a given case as being one of epidemic meningitis. It is obvious that if the characteristic micrococcus appears under the microscope or develops in cultures, no doubt need be entertained. Yet, it is desirable although not essential to subject the culture to an agglutination test with the polyvalent serum to exclude all possibility of error, since in rare instances, meningitis is caused or attended

by gram-negative micrococci¹² distinct from the meningococcus. When the case is one which has proved refractory to treatment with a reliable antimeningococcic serum it is still more desirable to perform the agglutination test.

The attitude to assume toward such a given case in which the fluid removed by lumbar puncture is clear, in which meningococcus has not been detected in the centrifuged sediment, and in which cultures are not obtainable, is more difficult to define. And yet it is just this kind of case which becomes immeasurably important with reference both to specific treatment and to prophylaxis. Indeed, acute observation will discover a number of such cases which can be arrested by a timely injection of antimeningococcic serum.

The solution of the diagnostic puzzle is furnished by the presence of the meningococcus in the nasopharynx. In certain instances the symptoms of illness are attended by meningism; other slight signs referable to the nervous system will arise in detained carriers; such persons come at once under grave suspicion and should be treated with the serum without delay. In other instances, the detection of the meningococcus in the nasopharynx, after the symptoms have appeared for the first time, points to the probable nature of the malady. Here also the therapeutic indication would appear to be clear. The procedure outlined is not based on theoretic considerations alone, but on actual experience in which the subsequent events, by making possible the demonstration of the meningococcus in the cerebrospinal fluid of such doubtful cases, proved the correctness of the deduction.

Moreover, the agglutination test has added to the conclusiveness of the diagnosis in the class of case just described. In several instances reported in which the meningococcus could not be grown from the cerebrospinal fluid, but was grown from the nasopharynx, the blood of the patient agglutinated the same type of meningococcus as was found in the nasopharynx, but not other types of the micro-organism.

Finally, all cases definitely diagnosed epidemic meningitis on the basis of bacteriologic examination of the cerebrospinal fluid will yield the meningococcus on proper and prompt examination by cultures of the nasopharynx. It is desirable, therefore, always to swab the nasopharynx at the same time that the lumbar puncture is performed. Even in instances in which the cerebrospinal fluid is turbid, the meningococcus may sometimes escape detection; hence its discovery in the nasopharynx is particularly significant and helpful.

The cerebrospinal fluid is cultured in the sheep serum medium or other suitable medium described. The usual procedure is to plant from 1 to 2 c.c. on the surface of a slanted tube. When facilities are at hand, centrifuged sediment may also be used to spread over the slanted medium. The tubes are at once incubated at 37 C. for from twenty to twenty-four hours. If negative, the fluid may be made to run over the surface again and the tubes incubated for another twenty-four hours. Under circumstances in which very few or no micrococci have been detected in the fluid, a left over portion may be incubated at 37 C. over night and then examined microscopically and planted on the slanted medium. In this manner, negative may be turned into positive results; but especial

11. Flack, M.: English Report, p. 58.

12. Micrococcus crassus, flavus and catarrhalis and the gonococcus have been isolated from the cerebrospinal fluid.

care is required to avoid error through the accidental growth of contaminating micrococci.

SERUM TREATMENT

Preserum Mortality.—The discovery of the bacterial cause of epidemic meningitis and the perfection of lumbar puncture have made it possible to establish accurately the degree of its fatality. The earlier mortality estimates are less trustworthy, since they obviously could not have rested on such certain evidence of the nature of the disease. The recent pandemic afforded, therefore, the first opportunity to determine the actual mortality of epidemic meningitis, as it affected countries and peoples of various nationalities and widely different social custom. Accurate knowledge of the mortality becomes imperative once we undertake to determine the value of the serum treatment.¹³

In the period of 1904-1909, epidemic meningitis prevailed over a wide territory in the United States and Canada, and after an intermission reappeared in the winters of 1911-1913 in the southwestern states, since which time it has prevailed fitfully and sporadically. The representative fatalities recorded in the preserum period are: Greater New York, 73 per cent.; Boston, 69 per cent.; Hartford, 76 per cent.; several cities in Ohio, from 70 to 90 per cent.; Porterville, Calif., 90 per cent.; among 1,500 cases occurring in Texas and Louisiana, 75 per cent. During this period the mortalities in great Britain were: Leith, 74.7 per cent.; Edinburgh, 80 per cent.; Glasgow, 74.8 per cent.; Belfast, 70 per cent. In Germany they were: Breslau, 62.3 per cent.; Brieg, 42.5 per cent. Flatten collected 3,085 cases of this period which gave a mortality of 67 per cent. The mortality in France was placed at 75 per cent., in Belgium, 77.7 per cent., and in Italy, 55.6 per cent. The figures for Asia and Africa are: Palestine, above 80 per cent.; Transvaal, 74 per cent. What is striking in these figures is the little variation in the mortality as the disease attacked the mining districts of Northern Germany or the Transvaal, the industrial population of Ireland and Scotland, the city population of France, the military garrisons of Belgium, and the urban population of the eastern or the suburban population of the southwestern United States. There is, however, one distinction that should be drawn: such few accurate data as are available tend to indicate that the sporadic cases, as diagnosed bacteriologically, are somewhat less fatal than cases arising during an epidemic wave.

Mortality Under Serum Treatment.—The antimeningococcic serum began to be employed in 1906-1907, first locally, and then later more generally. Thus it failed to be used in certain places before the epidemic wave had passed, and in other places, its employment was begun at the middle or height of the epidemic, according to circumstances. Recently it has been administered in many and withheld in some cases occurring in the military garrisons of Great Britain and the other European countries at war. Hence records have sometimes been available to serve as checks or controls over the figures derived from the serum-treated cases. The latter figures do not differ essentially from those stated above for the preserum period.

The antimeningococcic serum prepared at The Rockefeller Institute has been employed at home and

in several foreign countries to which it was sent. In 1,294 instances, the records of the cases, which were returned, were complete enough to permit an analysis to be made. Of the number, 894 patients recovered and 400 died, giving therefore a gross mortality of 30.9 per cent.

The larger number, or 1,211, of records were so detailed that it was found possible to analyze them according to the period of the disease at which the serum injection was begun (Table 1).

TABLE 1.—ANALYSIS OF RECORDS OF MORTALITY UNDER SERUM TREATMENT

Serum Injected	No. of Cases	Recovered	Died	Recovered Per Cent.	Died Per Cent.
From first to third day....	199	163	36	81.9	18.1
From fourth to seventh day.	346	252	94	72.8	27.2
Later than seventh day....	666	423	243	63.5	36.5
	1,211	838	373	69.2	30.8

These results, which are in striking contrast to those given for the period immediately preceding the employment of the serum, should be compared with the tables of mortality constructed in a similar manner by others who had large experience with the serum treatment. Thus in France, Dopter¹⁴ has analyzed 402 and Netter¹⁵ 100 cases. In Germany, Levy¹⁶ has analyzed 165 cases; in Greece, Christomanos has analyzed 186 cases, and recently Flack¹⁷ in England has analyzed forty-three cases occurring among the military forces in the London district.

TABLE 2.—COMPARATIVE MORTALITY REPORTED BY VARIOUS OBSERVERS

	Flexner Per Cent.	Netter Per Cent.	Dopter Per Cent.	Christomanos Per Cent.	Levy Per Cent.	Flack Per Cent.
Treatment began						
Before third day	18.1	7.1	8.2	13.0	13.2	9.09
From fourth to seventh day	27.2	11.1	14.4	25.9	20.4	....
After seventh day	36.5	23.5	24.1	47.0	28.6	50

The accompanying tabulations illustrate the influence exerted on the mortality, and they are supported by quite large numbers of cases observed during 1911, 1912 and 1913 in Texas and Louisiana and abroad. Thus in Texas the total cases reported from cities and countries, exclusive of the city of Dallas, were 1,956. Of them, 562 received no serum: the mortality was 77 per cent.; 1,394 were given one or more injections of the serum: the mortality was 37 per cent. Three cities in Texas gave the following results: Galveston, eighty-three cases treated with serum: mortality, 24 per cent.; Houston, 169 cases treated with serum: mortality, 27 per cent.; Dallas, 624 cases treated with serum: mortality, 26 per cent. The epidemic in Shreveport, La., embraced seventy-four cases not treated with serum, with a mortality of 85 per cent., and 176 cases treated with serum, with a mortality of 30.1 per cent. During this period, Levy in Germany studied an epidemic of which the mortality in cases treated without serum is given at 52.14 per cent., and of 165 cases treated with serum, as 18.18 per cent.

The serum-treated cases are all comparable with each other except in the single instance of those reported by Flack. For while the others represented the prevalence of epidemic meningitis among the gen-

13. Much of the matter which follows here is taken from Flexner, Simon, Jour. Exper. Med., 1913, 17, 553.

14. Dopter, C.: Ann. de l'Inst. Pasteur, 1910, 24, 96.

15. Netter, A., and Debré, R.: Le méningite cérébro-spinale, Paris, 1911.

16. Levy, E.: Klin. Jahrb., 1911, 25, 121.

17. Flack, M.: English Report, p. 45.

eral population, Flack's cases consisted exclusively of adults of the military personnel.

Other Local Methods of Treatment.—The serum treatment has not made its way without opposition and more or less fluctuation of favor. It is very desirable that this fact be emphasized, because the same circumstances which have for a time carried the treatment backward in the past may operate again and suffice to do so in the future—and this notwithstanding the favorable figures given above.

To succeed with the serum, first a potent product must be available; second, it must be applied promptly and in a systematic manner. The chief obstacle to success with the serum has been imperfectly prepared, and hence impotent samples of the serum. The only way to avoid that particular misfortune is for the federal government to establish and enforce standardization. The disappointments and calamities of the English experiences early in the war, fortunately retrieved afterward when potent serum became available, arose from worthless commercial products.

Prior to the introduction of serum therapy, two methods of local treatment had been used.

(a) Frequent evacuation of the cerebrospinal fluid by means of repeated lumbar punctures. The effects following the procedure have been widely discussed, and seem to consist mainly in the relief of pressure, which is often very grateful to the patient. The termination of the disease has not been essentially affected. This is also the view of Netter, Goepfert and others who studied the epidemic at its height during 1904-1910. Indeed, it was during the period of high mortality that the method was chiefly employed in routine treatment. With the failure due to impotent serum, in England in 1915 repeated lumbar puncture was again resorted to. It was strongly recommended in some quarters,¹⁸ and all the benefits desired from the serum were even attributed to its effects.

(b) The injection of chemicals such as lysol and protargol into the meninges. There are experimental reasons for believing that the introduction of chemical antiseptics into the subarachnoid space is capable of doing distinct harm.¹⁹

(To be continued)

18. Foster, M., and Gaskell, J. F.: Cerebrospinal Fever, Cambridge, 1916.

19. Flexner, Simon, and Amoss, H. L.: Jour. Exper. Med., 1915, 23, 683.

Accident Prevention and Welfare Work in a Large Industrial Plant.—The *General Electric Review* describes the organization and work of the medical department of the Schenectady plant of the General Electric Company which was inaugurated in 1907. Complete records have been kept since that time. In the first half of this period there were twelve fatal accidents, an average of 2.4 per year. In the last half, that is, up to and including 1916, the fatalities decreased to an average of 2 per year, while in the last five years the number of employees has increased 25 per cent. From 1907 to 1911 one man out of 6,100 met with a fatal accident, while in the last five years only 1 in 9,000 occurred. In 1916 the fatalities were 1 in 10,000. In the latter year 13,716 examinations were made. Every employee in every department is accepted only through the medical department. An accident in the Schenectady works means every case of injury even though only a scratch, and must have the attention of the medical department to prevent infection. In 1916 there were 13,190 accidents of all degrees of severity, but only 36 were bed cases and only 11 serious enough to require an ambulance call. Out of 21,000 men working with steam, electricity and machinery of all kinds only two were killed.

Military Medicine and Surgery

TRENCH FEVER

PRELIMINARY REPORT

MILTON MANDEL, M.D.

Major, M. R. C., U. S. Army; Medical Director, U. S. Army Base Hospital No. 12.

FRANCE

During the past few months it has been my good fortune to observe several hundred cases of this extremely prevalent, carefully studied, but yet undetermined infection, known as trench fever. The name is really a misnomer. At first it was considered a result of trench life, and traumatic periostitis of the tibiae was thought to be the underlying pathologic process. Today we know that it develops in troops that have not experienced trench work; indeed, it develops sporadically in individuals who have only occasionally visited training camps and convalescent hospitals.

This so-called trench fever is a distinct clinical entity, and may be defined as an acute infectious disease of unknown etiology and self-limited course, characterized clinically by cyclic febrile attacks, intense headache and backache, and pains over the tibiae which are particularly severe at night.

Etiology.—The specific cause has not been determined. Diplococci have occasionally been found in blood cultures; a spirochete has also been described, but neither is constant. The possibility that lice act as the intermediate host is not remote. One attack does not produce immunity.

Symptoms.—After a short incubation, during which period the patient may complain of slight indisposition, the disease is ushered in with a sharp rise of temperature to from 101 to 104 F., which may be preceded by chilly sensations, rarely by a true rigor and occasionally by vomiting, and is followed by headache, usually frontal, intense backache, and continuous and often excruciating pain over the tibia, with nocturnal exacerbations.

The fever is quite characteristic in the individual case. After a sudden rise the temperature reaches normal in the majority of cases in from twenty-four to ninety-six hours. An afebrile period lasting from one to several days, sometimes a week, follows, and this in turn is followed by another febrile exacerbation. This cycle is repeated a number of times, but it has been my experience that in a large percentage of cases the temperature is inclined to remain normal after the third rise. As in other acute febrile diseases, I have met abortive cases in which the temperature reaches normal quickly after the initial rise, and does not again become elevated; also cases with more or less continuous fever, with slight remissions, closely resembling typhoid.

Shin Pains.—Of all symptoms of the disease, the shin pains are the most characteristic. They appear early, are constant, extremely distressing, particularly at night, do not yield to therapy, and often persist for months after all other evidences of the disease have disappeared.

Blood.—As I have stated above, no specific organism has been isolated. Lieut. Marcus Neal, our pathologist, has occasionally been able to grow, by blood

culture, a diplococcus, but not sufficiently often to justify definite conclusions. He has not observed the spirochete described by some British writers. The blood picture, however, is fairly characteristic. During the febrile stage the leukocyte count reaches from 14,000 to 16,000 and drops to about 10,000 in the afebrile period. The large mononuclear lymphocytes are increased to from 15 to 25 per cent., and the polymorphonuclears are proportionately reduced.

Genito-Urinary Tract.—The urinary findings during the febrile stage resemble those found in other acute infections, namely, decreased amount, high specific gravity, frequently albumin, and in severe cases hyaline and coarsely granular casts and red blood cells. With the drop in temperature, there is polyuria. The casts frequently persist long after the albumin has disappeared. True nephritis has not been frequent in my experience.

Other Symptoms.—Sweating occasionally occurs, and herpes urticaria and roseolae are rare. The sensorium is practically always clear. I have never witnessed delirium. Insomnia is common, but is due to the shin pains.

Diagnosis.—The diagnosis is made by recognizing the cardinal symptoms, namely, the typical fever curve, the shin pains, and the increase of the large mononuclear lymphocytes in the blood. Physical examination reveals marked tenderness over the tibiae, with rarely edema of the overlying skin. The spleen is not enlarged, but palpation over the splenic area elicits marked tenderness. Heart, lungs, joints, glands and reflexes reveal no abnormality.

When we consider the prevalence of this disease among the hardened and acclimated troops of our allies, it is fair to presume that our own men will be highly susceptible, unaccustomed as they will be to the work to which they will be subjected, to climate totally unlike that which they have previously experienced, and to sanitary conditions sometimes far from ideal.

THE PREVENTION OF SO-CALLED "SHELL SHOCK"

MORTON PRINCE, M.D.

Professor (Emeritus) of Diseases of the Nervous System, Tufts College
Medical School

BOSTON

"Shell shock" includes such a large proportion of the casualties in trench warfare that the advantage that would accrue from its prevention, if possible, needs no argument. It has been said that it causes the greatest percentage of disabling "casualties" outside of wounds. The exact number of cases probably has never been determined, for the question becomes largely one of diagnosis and classification. The personal equation of the surgeon who makes the diagnosis is a large factor. The neurasthenic type, for instance, is often classified as general exhaustion and breakdown instead of being ascribed to its true cause, shell shock. The plan which I propose for its prevention is based (1) on quite extensive personal studies of cases made at the front and in the base hospitals in France and England, where I became familiar with the disease as it occurs in the present war, and (2) on my general knowledge of traumatic neurosis obtained through many years of professional study and practice.

NATURE OF THE DISEASE

It is now the consensus of opinion that true shell shock, as distinguished from pseudo shell shock, differs in no way from the ordinary traumatic neurosis as observed after railway and other accidents, earthquakes, etc. Trench warfare seems, however, to have developed certain types which are more frequent than in the accidents of civil life, although they also occur there.

Being a traumatic neurosis, it is accordingly nothing but traumatic hysteria. Types vary all the way from neurasthenia to profound paralyses and anesthetics.

Among the cases erroneously classified as shell shock are undoubtedly many of an organic nature, due to actual injuries of the brain and spinal cord resulting from the soldier being violently thrown against some object, or from some other physical trauma. Some perhaps are due to gas poisoning, and it is possible that some may be due to the sudden compression and rarefaction of the air. This, however, has not yet been proved. All such cases should be classified as pseudo shell shock. Much misunderstanding has arisen from confusing them with the hysterical type which undoubtedly comprises the vast majority of cases.

CAUSATION

Causation, from the point of view of prevention, is of the utmost importance. The causative factor is unquestionably psychic, that is, fear acting in a mind already prepared by environmental influences for the final results. This preparedness of the mind to be influenced functionally under certain traumatic conditions, as a mental factor cooperating with the exciting fear factor, is also found in the civil cases. Thus, it has been found that in railroad accidents very few of the employees (generally given as 0.5 per cent.) suffer from traumatic neurosis, while a very large proportion of the passengers exposed do so suffer. Likewise, I believe that traumatic neurosis is rarely observed on board battleships following the explosion of shells, although it is obvious that the traumatic conditions are similar to those obtaining in trench warfare.

Shell shock should be more properly described as "shell fear" or "shell funk."

The theory on which any method of prevention must be based is that there exists among soldiers an anticipatory fear of what will happen when exposed to the explosion of shells, even when they are not physically hit or injured. Anticipatory fear has been created by the environment, that is, by the common belief of their comrades, the attitude of mind, point of view, etc., shared by those with whom the soldiers come in contact, which would include the medical officers as well as the military officers. It has been reported to me, although not directly from one in authority, that cases have occurred in men before they reached the trenches and before they had been under fire, and that these cases were due to anticipatory fear.

The present general belief among soldiers is that shell shock is due to physical injury of the brain, that from the mere concussion of the air produced by a high explosive shell they are likely to be seriously injured in mind and body (loss of memory, dumbness, paralysis, etc.), and furthermore, that when this hysterical state has been produced, they are more or less permanently incapacitated.

In other words, the soldiers' idea is much like that which used to prevail regarding the pathology of

"railway brain," "railway spine," etc., under the dominance of the concussion theory of Ericson.

Even veterans acclimated to shell fire succumb to the fear of being buried alive and so injured. Here we have what is practically "earthquake shock." Many soldiers are consequently in a state of continuous terror during the course of a bombardment by the enemy.

That "fear shock" can be entirely prevented is chimerical; that a large percentage could be prevented is within the bounds of possibility and the attempt is worth trying, especially as it would not require any elaborate organization beyond what already exists.

PLAN FOR PREVENTION

The principle on which any plan is based must be the education of the soldier. This therapeutic education should, however, be based on a preliminary systematic study, by a board of specialists in the psychoneuroses, of (a) the mental attitude of soldiers generally toward shell fire and shell shock; (b) clinical varieties of this psychoneurosis as it occurs in trench warfare; (c) its frequency and disabling incidence, and (d) the state of mind previous to the trauma of those suffering from it.

On the basis of the findings of such a study, first, the regimental surgeon through lectures and clinical demonstrations, the cases in the hospitals being used for material, would be instructed systematically in the symptoms and pathology of the disease and the methods of psychotherapy for its prevention. This instruction is essential because, I believe, few medical men who are not clinical neurologists or psychiatrists would venture to claim any competent knowledge of the psychosis. Psychotherapy is an art requiring specialists for instruction. The surgeons after instruction should have acquired a fair degree of skill in the application of the art.

Second, the soldiers, including officers, could then, in units of, say, 100, in turn be instructed in the nature of the disease through lectures by the regimental surgeons. It would thus be fully explained to the soldier that shell shock is a form of hysteria, that it is due to fear and not to physical trauma, that if not actually hit by a shell, and if no physical injury is sustained, there is little danger and nothing need be feared, etc.

The work of instruction should be done in France in the atmosphere of war.

In this way it is to be expected that an anticipatory attitude of mind of healthy preparedness (instead of fear and mystery) would be formed, and also that fear, when a shell exploded in the neighborhood without maiming the soldier, would be so minimized as not to produce the psychoneurosis.

Of course, the plan is experimental, but it would seem to be unintelligent to accept the present situation as final, and that nothing can be done to avert the casualties resulting from fear. To do so is to accept the theory of fatalism which obtained before preventive medicine came to the fore under modern medical science.

Finally, it may be said that this instruction of the regimental and, later, of certain base hospital surgeons (which should also be undertaken) would be of great value to them in the treatment of the disease. The fear of the disease and of being sent back to the trenches is undoubtedly a factor in the prevention of recovery.

I have no idea that this suggestion I am offering will be adopted. It will require the experiences of this war to prepare the official mind to accept the principles of progressive neurologic and psychiatric sanitation, just as it required the horrors of typhoid epidemics in the Boer War and in our Spanish War to bring about the education of the soldier in first principles and the adoption of methodical scientific sanitation against typhoid and other preventable diseases. Every sort of objection probably will be opposed to such a campaign of education, notwithstanding that the education of the soldier (who, after all, is only one of the public) in such matters is only common sense, and reeducation has become the fundamental principle in modern prophylactic medicine, as well as in the cure of functional nervous disorders. Nevertheless, I venture to bring forward this suggestion as a forerunner of the psychiatric sanitation of the future in all armies.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, SECRETARY.

CONCENTRATED SOLUTION SODIUM HYPOCHLORITE-MULFORD.—A 5 per cent. aqueous solution of sodium hypochlorite, containing chlorine equivalent to 0.2 to 1.0 per cent. sodium hypochlorite (NaOCl).

Actions and Uses.—After dilution, it is used in the irrigation treatment of infected wounds.

Dosage.—One volume of concentrated solution of sodium hypochlorite-Mulford is diluted with nine volumes of water and the amount of boric acid required (stated on the label of each bottle) to render the solution neutral is added.

Concentrated solution of sodium hypochlorite-Mulford should not be used if it is pink.

Manufactured by the H. K. Mulford Company, Philadelphia. No U. S. patent or trademark.

Concentrated solution of sodium hypochlorite-Mulford is prepared by treating a solution of sodium carbonate and sodium bicarbonate with chlorinated lime, filtering and standardizing.

Concentrated solution of sodium hypochlorite-Mulford is a colorless or slightly yellow solution (a pink color denotes decomposition) having the characteristic odor of hypochlorites.

Determination of sodium hypochlorite.—Dilute 10 Cc. concentrated solution of sodium hypochlorite-Mulford to 250 Cc. Place 50 Cc. (representing 2 Cc. of the original solution) in a 300 Cc. Erlenmeyer flask. Add 20 Cc. of potassium iodide test solution, and 2 Cc. of hydrochloric acid, U. S. P. Titrate immediately with tenth-normal sodium thiosulphate solution. The number of Cc. of thiosulphate solution used multiplied by 0.1865 equals weight of NaOCl in 100 Cc. of the concentrated solution.

Determination of free chlorine.—Place 10 Cc. concentrated solution of sodium hypochlorite-Mulford in an Erlenmeyer flask and dilute with 40 Cc. water. Add 20 Cc. of potassium iodide test solution. Titrate immediately with tenth-normal sodium thiosulphate solution. The number of Cc. of thiosulphate solution multiplied by 0.0373 equals amount of free chlorine (in terms of NaOCl) in 100 Cc. of the concentrated solution. When freshly prepared the solution may contain about 0.2 per cent. of Cl (in terms of NaOCl). On long standing this figure gradually increases but the solution may be used with satisfactory results provided the amount of free chlorine does not increase beyond 1.0 per cent.

Determination of required boric acid.—Place 20 Cc. concentrated solution of sodium hypochlorite-Mulford in a flask add excess of potassium iodide and decolorize with tenth-normal sodium thiosulphate solution. Add 0.1 Gm. of powdered phenolphthalein and titrate with a 4 per cent. boric acid solution using the first decided decoloration point as the end reaction. From the figure thus obtained, calculate the percentage of boric acid required for the lot in question. This amount is stamped upon the label of the package.

Origin of Lenses.—The first clear and unmistakable statements from which dates modern knowledge of lenses and their action are found in the works of Roger Bacon.—The Microscope:—Simon Henry Gage.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address "Medic, Chicago"

Subscription price Five dollars per annum in advance

*Contributors, subscribers and readers will find important information
on the second advertising page following the reading matter*

SATURDAY, SEPTEMBER 1, 1917

THE ETIOLOGY OF SCURVY

Scurvy has long been looked on as a disease due to the lack of adequate quantities of some hypothetic antiscorbutic substance in the diet. In the more recent development of the conception of "deficiency diseases" as disorders associated with a paucity or a complete absence of some essential dietary constituent from the ration, attention has become centered on a possible lack of those unidentified components for which Funk introduced the name "vitamins." The experimental demonstration on both animals and man that beriberi and experimental polyneuritis can be caused by the lack of such a food component and can in turn be relieved or cured by the inclusion of the missing vitamin in the diet paved the way for the extension of the vitamin hypothesis as applied to deficiency diseases. Accordingly scurvy, pellagra, rickets and some rarer manifestations have in turn been explained as the outcome of a lack of some specific chemical substance essential for the metabolism of the subject.

The scientific study of the so-called deficiency diseases has been somewhat hampered by the fact that the phenomena observed in man in the respective cases have not been easy to reproduce experimentally in laboratory animals. In the case of the infectious diseases the bacteriologist is usually able to duplicate many of the symptoms, sufficiently at least to solve problems of etiology and pathogenesis, by animal inoculations. The deficiency diseases have proved to be more difficult of initiation in an experimental way. In the case of scurvy, however, the guinea-pig, when fed for a time on peculiar types of food mixtures, has been found to exhibit the characteristic features of the malady. Holst¹ and his co-workers observed that a diet of oats alone or of oats and heated milk or oats and dried cabbage caused scurvy in the guinea-pig, whereas oats and fresh milk or oats and fresh cabbage will adequately nourish this species and maintain the animals in health. It is largely on the basis of these and comparable observations that the theory has been advanced which is current

at present regarding the high susceptibility of the antiscorbutic properties of natural foods to deterioration in a variety of ways. Thus it has come to be taught widely that heating and drying are liable to destroy the vitamins supposed to be concerned in the prevention of scurvy; and by that easy extension from fact to assumption, of which the human mind is often so capable, the deteriorating effect of heat on vitamins in general has been widely proclaimed. For this reason, heated milks, heated vegetables and canned goods of all sorts, including fruits, have been alleged to lose the vitamins they possess, as the result of the technical processes to which they have been submitted.

The assumption of a detrimental effect of heat, such as is used in the ordinary cooking procedures, on the stability of the alleged antiscorbutic vitamin is menaced by recent observations of Jackson and Moore² in Chicago; for they noted—and this has been confirmed by others—that a large proportion of guinea-pigs kept on a diet of oats cannot be protected against scurvy even when fresh, unheated milk is furnished to them. An important step in advance in unraveling the etiology of scurvy has at length been made by McCollum and his colleagues³ at the University of Wisconsin. They argued, in formulating a working assumption for their investigations, that all animals as highly developed as the mammals may be expected to require the same chemical complexes in the diet if growth and well being are to be attained. Accordingly, guinea-pigs, the familiar test animals for the experimental production of scurvy, were fed on rations that had repeatedly been demonstrated to be adequate in every way for the rat. Nevertheless, scorbutic manifestations appeared in many cases in the guinea-pigs. For example, the oat kernel can be made suitable as a nutrient for rats if it is supplemented with appropriate protein, inorganic salts and the fat-soluble vitamin found in butterfat. Yet on such a mixture guinea-pigs are very liable to develop scurvy in its severest types. McCollum ingeniously remarks that if the current explanation is correct which makes scurvy the result of a lack of a specific substance, it becomes necessary to make the further assumption that the guinea-pig and man require this specific substance, since both are subject to the disease, whereas other species, including the rat, do not require this hypothetic complex as a dietary component.

Obviously, as McCollum and Pitz³ point out, there is an alternative explanation. Scurvy may not be a deficiency disease at all in the sense which so many have assumed in the past few years. Without employing any "protective vitamin" in the diet, the Wisconsin investigators have averted scurvy in guinea-pigs,

2. Jackson, L., and Moore, J. J.: Jour. Infec. Dis., 1915, **19**, 478.

3. McCollum, E. V., and Pitz, W.: The "Vitamine" Hypothesis and Deficiency Diseases: A Study of Experimental Scurvy, Jour. Biol. Chem., 1917, **31**, 229.

1. Holst, A., and Frölich, T.: Ztschr. f. Hyg. u. Infektionskr., 1913, **75**, 334.

or cured it when once it was manifest, by attempting to remedy a difficulty which scorbutic animals manifest at necropsy. Usually the cecum, which is very large and delicate in guinea-pigs, is found full of putrefying feces, whereas the lower intestine is empty. It was argued, therefore, that the guinea-pig can thrive only on a diet possessing such physical properties as will lead to the formation of bulky, easily eliminable feces. Diets containing succulent vegetables along with grains serve to keep the animals in good health. Diets, such as oats alone or oats with milk, cause injury primarily because they lead to the formation of pasty feces which the animal is unable to remove from its delicate cecum. An impacted cecum, the seat of putrefaction, may permit injury to the cecal wall sufficient to permit the invasion of the tissues by bacteria; or the animals may be injured by the absorption of toxic products of bacterial origin which possess the property of destroying the walls of the capillaries in those regions in which hemorrhage is characteristically observed in scorbutus. Infection, which has been described as a feature of experimental scurvy, would thus be secondary to development of hemorrhagic areas.

As a matter of fact, by preventing debility of the digestive tract through stretching and contact with irritating and toxic putrefactive products of bacterial origin, McCollum and Pitz have averted and cured scurvy in guinea-pigs. This was accomplished in a variety of ways. The administration of liquid petrolatum was very effective. The use of the laxative phenolphthalein alone produced remedial results and thus served to exclude the possibility that the diets lacked some specific chemical complex of an antiscorbutic character. Orange juice, which is so widely used as an antiscorbutic in infant feeding, has some protective or curative properties in the experimental scurvy of guinea-pigs. Human scurvy is apparently more readily relieved by orange juice, perhaps, McCollum and Pitz remark, because of the greater disability of the guinea-pig in the possession of so large and delicate a cecum. The action of orange juice is ascribed to its laxative influence rather than to any unique vitamin.

Nothing in what has here been reported negatives the supreme importance of dietary factors of the vitamin type. The contention merely is that scurvy is not in reality a deficiency disease in the sense of being caused by the lack of a specific protective substance. We are reminded by the latest investigators that it is not possible to say with confidence at present that human scurvy has the same origin as has the same syndrome in the guinea-pig. However, the undoubted fact, McCollum and Pitz assert, that some infants develop the disease while taking milk, which forms a wholesome food for others, supports the belief that the etiology of the disease is the same in the two species.

THE SUPRARENALS AND SHOCK

Carefully obtained experimental facts often serve the beneficent purpose, in science, of compelling a reconsideration of debatable theories and, sometimes, a new formulation of working hypotheses. Perhaps this will prove to be the case as the outcome of the recent investigations of Bedford and Jackson¹ at the University and Bellevue Hospital Medical College, New York, on the blood in shock. According to these it appears that increased quantities of epinephrin are thrown into the blood during conditions of low blood pressure and shock. This is quite the reverse of what might be expected from the widely current belief that the suprarenal glands are in a state of fatigue during shock.

Various investigators have, in fact, contended for the view that shock is actually the result of suprarenal deficiency. Bedford has remarked that the reports of diminished amounts of chromaffin substance in the glands of individuals exhibiting a depressed circulation are in complete accord with that explanation of shock which holds that the condition is due to a splanchnic dilatation of the blood vessels in the absence of epinephrin, with a consequent fall in blood pressure. Bedford has found, however, that the apparent outpouring of epinephrin in shock is not merely a hasty discharge and depletion of the suprarenals; but since the quantity of epinephric material in the blood actually increases with the prolongation of the period of low blood pressure and shock, there must be an active secretion from the glands.

Attention has already been directed in these columns to the views championed by Cannon and his co-workers which attribute importance to the suprarenal secretion as a reserve for times of special stress.² Years ago Elliott suggested that the chromaffin tissue has the function of compensating for injury of sympathetic fibers, and that after sympathetic impulses fail, their place is taken by the epinephric stimulation of the nerve endings. Bedford¹ interprets his observations in accord with somewhat comparable principles. In shock, he suggests, the suprarenals function as a line of secondary defense against a falling blood pressure. The presence of epinephrin in increasing amounts as shock progresses points, Bedford adds, to an attempt on the part of the circulatory system to redistribute the blood and bring about a peripheral constriction of the arteries wherever possible. In this way the normal pressure may be retained. If this self preservative mechanism is sufficient to offset the unknown factors which are instrumental in causing the fall in pressure, shock does not result fatally.

1. Bedford, E. A., and Jackson, H. C.: The Epinephric Content of the Blood in Conditions of Low Blood Pressure and "Shock," *Proc. Soc. Exper. Biol. and Med.*, 1916, **13**, 85-87. Bedford, E. A.: The Epinephric Content of the Blood in Conditions of Low Blood Pressure and Shock, *Am. Jour. Physiol.*, 1917, **43**, 235-257.

2. The Suprarenals and Vasomotor Tonus, editorial, *THE JOURNAL A. M. A.*, March 7, 1914, p. 778; Newer Views of the Functions of the Adrenals, July 25, 1914, p. 322.

Mann³ has warned against overhasty generalizations associating shock with the endocrine glands. He recalls the recent contention that the discharge of epinephrin from the suprarenals is not indispensable to life or health. It is asserted that even emotional reactions may occur several days after removal of all suprarenal tissue. Mann's tentative statement on the general subject deserves repetition. In all probability, he asserts, some of the endocrine glands, particularly the suprarenals, enter as a factor in the complex condition of shock; but it is quite difficult to determine to what degree they participate as primary active agents in producing the state or how much they are affected by the low blood pressure and the changes incident to the condition itself.

AN INDEX OF THYROID OVERACTIVITY

The human organism manifests a considerable number of phenomena which tend to assume a fairly constant character and form symptoms of ill health when they exhibit deviations from the well recognized normal performance. Uniform temperature and pulse rate under conditions of rest have long been noted as normal features of the bodily functions, and aberrations are daily measured by the clinician as a guide to the character or progress of various types of sickness. Unexpected variations in body weight likewise furnish indications at times of the existence of morbid processes. Last week we called attention to newer modes of measuring that disturbance in acid-base equilibrium which leads to a depletion of the alkali reserve of the organism and is designated as acidosis.⁴

Measurable abnormalities, such as those just cited, are common to numerous diseases. Other symptoms, like nervousness or general lassitude, are often highly significant; but they cannot be expressed in any quantitative or otherwise distinctive manner. It becomes decidedly important, therefore, to find some more accurate and specific indication which will assist in the precise diagnosis, and perhaps the subsequent prognosis, of diseases of the less obvious types. In confirmation of classic studies by Du Bois⁵ on this subject, Means and Aub⁶ of the Massachusetts General Hospital, Boston, have lately shown in *THE JOURNAL* that the intensity of intoxication in exophthalmic goiter finds a measure in the rise of the basal metabolism. This is one of the acquisitions to clinical medicine from the modern investigation of human calorimetry so efficiently prosecuted in this country, notably by F. G. Benedict, Graham Lusk, and their collaborators.

The "basal metabolism" or heat production of an individual at the lowest level of metabolism can now

be determined with considerable accuracy by indirect calculation from the data of the gaseous exchange. The latter become available through determinations with comparatively simple respiration apparatus, such as many clinics now possess as a part of their scientific equipment. The estimations are made in the post-absorptive condition (fourteen or more hours after food) at complete rest, whereby the stimulus to heat production incident to muscular activity or digestive changes is avoided. As few pathologic conditions that are not easily differentiated from hyperthyroidism show a rise in the basal metabolism, this feature serves as one of the most striking and characteristic manifestations of overactivity of the thyroid. Thus a novel index of the intensity of thyroid intoxication has been added to the hitherto recognized symptoms, including tachycardia, nervousness, loss of weight, and tendency to increased sweating.

Using the measure of the basal metabolism in the way here suggested. Means and Aub⁶ have been able to observe the therapeutic efficiency of procedures currently recommended for the amelioration of exophthalmic goiter. Judged by the heat production, rest alone usually causes a marked decrease in toxicity. This may in some cases be supplemented by irradiation with the Roentgen ray. According to the Boston observers, there is a very definite tendency toward recurrence of overactivity after the decrease which commonly follows surgical intervention. They assert that drugs do not materially accelerate the effect of rest. The indications for successful management coincide with the incidental observations of many clinicians, giving added emphasis to the importance of complete rest.

MATERNAL DIET AND MILK PRODUCTION

When a lactating animal is secreting milk, obviously the protein which this fluid contains must be derived, in ultimate analysis, either from the proteins of the diet or from the tissue proteins. This does not mean that food proteins pass directly into the milk; on the contrary, the proteins that are eaten become disintegrated into amino-acids even before they enter the blood stream for distribution in the body. But in the last instance those proteins that are elaborated by the organism depend for their synthesis on a suitable supply of essential amino-acid which must be furnished preformed, whether they come from food or from tissues. If the ration fails to contribute the adequate quota, the body must respond with its own resources; otherwise the supply of milk will fail.

That there is a biologic difference between proteins from various sources has repeatedly been emphasized in *THE JOURNAL*. Not long ago attention was directed to the interesting work of Hart and Humphrey¹ of the Wisconsin Agricultural Experiment Station show-

3. Mann, F. C.: Shock During General Anesthesia, *THE JOURNAL A. M. A.*, Aug. 4, 1917, pp. 371-374.

4. The Newer Conception of Acidosis, Editorial, *THE JOURNAL A. M. A.*, Aug. 25, 1917, p. 646.

5. Du Bois, E. F.: Metabolism in Exophthalmic Goiter, *Arch. Int. Med.*, June, 1916, p. 915.

6. Means, J. H., and Aub, J. C.: A Study of Exophthalmic Goiter From the Point of View of the Basal Metabolism, *THE JOURNAL A. M. A.*, July 7, 1917, p. 33.

1. Hart, E. B., and Humphrey, G. C.: *Jour. Biol. Chem.*, 1915, **21**; 1916, **26**, 457. The Relation of Proteins to Milk Production, editorial, *THE JOURNAL A. M. A.*, Nov. 4, 1916, p. 1374.

ing that the character of the proteins in the ration, as well as their quantity, has a marked effect on the milk protein production of cows. Comparable experience with nursing mothers has now been reported by Hoobler² as the result of observations as similar as possible to those made on dairy cows. Hoobler concludes that the protein in a purely vegetable diet (not including nuts) of the most familiar types is both insufficient and inefficient for the maximum production of milk protein. Vegetarians have introduced nuts very extensively into their special diets in recent years. Hoobler believes that nut protein may be as efficient as animal protein in the elaboration of milk. With this exception, however, he observed that the biologic sources of protein best adapted to milk production are found in animal products; for example, in a mixture of meat, milk and egg protein, with an added quantity of cereal and vegetable protein comprising about one third of the total quantity furnished. Milk protein, in particular, affords the best source for the protection of the maternal tissue and the increase in the mammary secretion.

Never has there been a time when the suggestions that present themselves in the light of the foregoing observations on milk production in woman were more deserving of earnest consideration. The war situation, with the almost inevitable consequence of more or less stringent administration of food supplies, tends to force certain types of nutrients to the front as readily available, and is likely to curtail the use of other long valued foods. Meats will become scarcer, and the supply of milk already is as low as dietary needs and physiologic safety will permit. It will be well, therefore, to bear in mind the specific needs of the pregnant and nursing mothers and to make adequate provision for them at any cost. Furthermore, it is not at all unlikely that the failure of many mothers to supply all the milk that is requisite to promote healthy gains in their young is quite as much a matter of diet as of any other physiologic factor. Hoobler reiterates, what many students of the subject must often have believed, that the "diet of the first three or four weeks of the puerperium is based too much on what might be called sick room specialties, broths, gruels and tidbits of one kind or another which are not sufficient to support an increasing production of milk." The inclusion of at least a certain amount of milk, with its uniquely valuable protein, the salts of lime so much needed in the elaboration of milk and the development of the young, and the presumably indispensable vitamins, is a wise prescription. In general, quoting Hoobler's words, one may state that a generous mixed diet, including nuts, milk, meat, eggs, with cereals, vegetables and fruits, constitutes a diet containing the potential factors for the maximum milk production.

DRIED FOODS IN WAR TIME

The present war has served not only to stimulate science toward new discoveries and direct the arts toward new inventions, but also to bring back into current use some of the "lost arts." Nowhere, perhaps, has this been more conspicuous than in the matter of food conservation. The comparative abundance of edible products in the immediate past, coupled with the liberal supply of the goods that procure such commodities by exchange, resulted in an extravagance and waste that have at length begun to be realized as the needs of an underfed world are being brought to our attention.

Perishable foods are produced in all parts of the globe. Their conservation by storage, canning, sun drying and desiccation has always been practiced; but among these methods, choice has fallen in recent times more and more to the canning process so that the other schemes have been abandoned and all but forgotten in quarters in which our grandmothers once practiced them in the days when modern facilities in the food industries and modes of transportation were not so universally available. The successful storing of fruits and vegetables in city homes has become all but impossible. Houses and apartment buildings are constructed with suitable arrangements for the storage of fuel sufficient usually for the needs of the entire year. Facilities for the storage of food — the human fuel — are never thought of. Heating devices have excluded the cold fruit and vegetable cellar of our boyhood days in all except the rural homes. Similarly there was a time when conservation by drying found widespread application. Some of the common fruits, such as prunes, raisins, figs, dates, apricots and apples, are staples in dried form in the world's markets. They are, however, preserved in dried fashion in the industries rather than in the home.

The government has lately engaged in an extensive propaganda to restore the lost art of food desiccation to its deserved place in the home.¹ Sun drying, drying by artificial heat, or drying by an air blast, such as an electric fan or blower will furnish, are all within the range of possibility even for very small quantities of food. Containers in the form of expensive tins or glass are not required. The problem of room in storage is negligible, and the elimination of water excludes the possibility of freezing, with its incidental damage, and the transportation of a bulk of water. The needed outfits can be simple and inexpensive. Times of plenty and low prices can be made to prepare for days of emergency.

Novelties in diet and in the culinary art inevitably find a wall of prejudice — the inheritance of tradition, habit and custom — that must be overcome. The

2. Hoobler, B. R.: Problems Connected with the Collection and Production of Human Milk, *THE JOURNAL A. M. A.*, Aug. 11, 1917, p. 421.

1. An excellent monograph on this subject may be obtained free from the Division of Publications, U. S. Department of Agriculture. It is entitled: *Drying Fruits and Vegetables in the Home, with Recipes for Cooking*, Farmer's Bull. 841, June, 1917, Washington, D. C.

physician, who plays the rôle of sage in many homes, can do a useful service in helping to dispel the attitude of distrust or dislike for the wholesome foods that old methods, revived in times of war, may prepare for us:

WHY WHEAT?

Wheat is a word to conjure with in these days. The Food Administration is making a strenuous effort to increase the production of this cereal in this country, and likewise to induce such economies in its use among our population as will enable us to share with our allies part of the total supply at a time when there is not wheat enough for all to have the usual amount of wheat flour. The tendency of Americans to concentrate in urban communities has led to a decrease in the per capita production of staple products. Thus the per capita production of wheat in the United States in the period 1906-1914 was 7.7 bushels per annum, a falling off of eight-tenths bushel per capita in comparison with thirty years before. There has also been a falling off in our relative exportation of such staple food products, with a corresponding tendency to home consumption.¹ This country has been becoming less able to feed other countries because it requires a larger proportion of the annual production to feed its own people. The crop of the all-important staple, wheat, in 1914 was unusually large, 891,000,000 bushels, so that the country was provided at the outset of the war with a large exportable surplus. Even better was the crop of 1915, which exceeded a billion bushels; but in 1916 there was a drop to 639,000,000 bushels, barely sufficient for home requirements, while the crop for the present year, in which the United States is more vitally concerned than ever before, is estimated at about 800,000,000 bushels, calculated to leave less than 200,000,000 bushels for exportation unless economies are practiced. There is a wheat shortage the world over.

Why, it may properly be asked, should so much emphasis be placed on wheat, among all the cereal crops? Is there some unique nutritional value in wheat not provided in comparable degree by other more available products? Would the substitution of other cereals to a greater or lesser extent impair the health or comfort of the needy nations? To these questions the physiologist of today must, we think, reply that the demand for wheat represents a psychologic and traditional impulse rather than any nonreplaceable need. Bread has been the "backbone of the diet of man" from time immemorial. Few of the cereals lend themselves satisfactorily to the production of a culinary product having the general texture, flavor and keeping qualities of bread. This is due in large measure to the chemical peculiarities of those proteins

which make up the glutinous part of wheat, barley and rye. The baker at once places corn, oats and rice in a different category. Without some wheat flour, rye and barley flours cannot be used to good advantage in the manufacture of bread, although the mixed flours yield a palatable product. Most natives of our Southern States will insist, however, that corn breads are most acceptable; while to the rice-eating peoples the other cereals are far less palatable.

These indications are sufficient to suggest that a campaign of education might even succeed in altering inherited tastes. Corn, oats and rice have been popularized as breakfast foods in many quarters by the skill of the clever advertiser. Let us therefore examine the more purely physiologic aspects of the wheat question. The proteins of wheat flour consist of glutenin and gliadin in about equal proportions. Osborne and Mendel have shown that the latter is inadequate for the needs of growth, even though the protein is completely digested and well absorbed. Gliadin is comparatively deficient in its yield of the amino-acid lysin. The glutenin doubtless enhances the value of the total proteins of the wheat flour, although they still remain inferior to a mixture such as the total proteins of milk or eggs, for example. In criticizing the prevailing popular view that among cereal grains wheat is of superior nutritive worth, Hart, Halpin and Steenbock² have pointed to numerous experiments on mammals to the contrary. These leave little room for doubt that the wheat grain contains a mildly toxic material. In addition, the Wisconsin investigators just mentioned state that the wheat proteins are of inferior quality and may be responsible for some of the malnutrition that has repeatedly been observed when wheat has been fed excessively. Excessive wheat feeding to cattle or swine ultimately induces pathologic changes in the nervous tissue.³ It has also been ascertained that young chickens tolerate excessive wheat feeding poorly, and then only when the mineral content of the ration is adjusted, the proteins of the wheat improved by the addition of casein, and a more liberal supply of fat-soluble vitamin furnished.

It would be an obvious exaggeration or misstatement to declare that wheat flour is an undesirable nutrient. The experience of generations contradicts this; and science makes no such unwarranted claim except for an exclusive diet in which wheat plays the chief rôle. Properly supplemented, wheat flour, like other cereals, becomes admirably adapted for use as a food. While something may be gained by raising the milling percentage so as to secure a larger extraction of flour from the wheat, the point to be emphasized is that no great physiologic deprivation is entailed by a

1. These statements are based on the statistics in the Columbia War Papers, Series 1, No. 6, Food Preparedness, by Henry R. Seager and Robert E. Chaddock, New York, 1917.

2. Hart, E. B.; Halpin, J. G., and Steenbock, H.: The Behavior of Chickens Restricted to the Wheat or Maize Kernel, II, Jour. Biol. Chem., 1917, **31**, 415. Hart, E. B.; McCollum, E. V.; Steenbock, H., and Humphrey, C. G.: Wisconsin Agric. Expt. Sta., Research Bull., **17**, 1911; Jour. Biol. Chem., 1912-1917.

3. Hart, E. B.; Miller, W. T., and McCollum, E. V.: Jour. Biol. Chem., 1916, **25**, 239.

restriction in the daily intake of wheat flour and a substitution of other more abundant appropriate sources of energy and protein.

It will require more than a few months or even years to dispel the popular belief in the nonreplaceable dietary virtues of wheat and to create a sympathetic attitude toward substitutes in the ration. Stern necessity has presented a situation that calls for relief in the way of retrenchment in the use of wheat. If a low bread ration is to be an inevitable outcome of the war either at home or abroad, let us keep constantly before the public the advice that not all nutrient virtue is limited to wheat bread and to meat. No teaching can be thoroughly successful, however, unless its truths are fully appreciated by those who attempt to inculcate them.

Current Comment

A WORD FOR THE OYSTER

The advent of the season in which oysters return to popularity in the human dietary brings into prominence anew all the problems of hygiene and food value that cluster around these shellfish. The floating of oysters will be subjected to critical examination, particularly with reference to the determination of what shall constitute adulteration. Sometimes oysters are floated in the shell; shucked oysters may be washed with water before they are marketed; and retailers sometimes immerse open oysters in tap water from which they are sold after standing varying lengths of time. An undue content of water acquired in any of these ways is quite as much an adulteration from the standpoint of the actual nutrients present as is the dilution of milk with water. Yet, after all, from the standpoint of health the real menace in the practice of floating oysters lies not primarily in the decrease in food value but rather in the possibility of infection through the use of contaminated water. Shellfish in certain localities sometimes exhibit a greenish color which has been attributed to copper. It is true that oysters may contain this metallic element in measurable quantities. Copper is a component of the colorless blood of many of the invertebrates, just as iron is a part of the hemoglobin of the red blood. Investigations at the New Jersey Experiment Station¹ have shown, however, that various samples of shellfish, which are alike in showing the green color, are unlike in respect to the amount of copper present. The metal may be absent from the colored substance in some cases, and some samples of uncolored shellfish may contain more of the metal than others which are colored. There is, therefore, no reason to believe that the green color is due to copper. At a time when all available forms of animal food must be rendered acceptable as far as possible, it is well to relieve the oyster of any undeserved opprobrium that may have been associated with a much investigated food.

1. Nelson, J.: The Copper Content of Green Oysters, New Jersey Stas. Report, 1915, p. 242.

MOBILE CLINICAL LABORATORIES

An item representative of the application of modern science to the conduct of "military business" is the announcement that the Medical Advisory Committee of the Red Cross War Council has decided to equip five railroad cars for use as laboratories. These laboratories will do emergency work in case of possible outbreak of epidemics in cantonment camps in this country. Each car is to have a staff of five or more experts. The cars will be so stationed that any cantonment can be reached within twenty-four hours on receipt of request from the federal or state authorities. The laboratory is the handmaiden to the practice of scientific medicine. In some conditions the laboratory findings may be of even more importance and of more value than those made by physical or clinical methods. In the recent epidemic of infantile paralysis the medical profession received startling evidence of the increased importance of laboratory investigation. The pathologist, the immunologist, the hygienist and the epidemiologist were drawn into conference on ways and means to combat the disease. In the recognition of the first alarming signs of infectious disease, the laboratory is of primary importance. Of even more importance is the detection by laboratory methods of those healthy carriers of disease who are the chief means of propagating and spreading the contagion. It is this work which will probably occupy, to a great extent, the services of the laboratory cars.

DO THE KIDNEYS CONTAIN SECRETORY NERVES?

The nerves of the kidney are derived from the sympathetic system, and the rich supply is distributed chiefly to the muscular walls of the renal blood vessels. Nerve fibers probably also reach the uriniferous tubules of both the cortex and the medulla of the kidney; and their terminal fibrils are reported to penetrate between and even into the cells of the convoluted tubules themselves. There seems to be no doubt that the plexus of nerves going to the kidneys has a vasomotor function which profoundly influences the work of the glandular structures in the formation of urine. In view of the added histologic picture so suggestive of direct nervous intervention in the secretory work of the kidney, one naturally inquires whether or not secretory fibers exist for these organs. Some time ago Quinby approached this question by the ingenious plan of studying the performance of a kidney which had been removed from the body and subsequently restored to its normal circulation by means of suture of the blood vessels. In this way it is possible to be sure that the kidney is freed from all nerve control, for a time at least. At varying periods after the operation, the function of the reimplanted kidney was studied by comparing it with that of the intact organ. Sooner or later a normal performance in respect to urine formation ensued. As it was repeatedly found possible for a single reimplanted kidney to maintain the normal existence of an animal after removal of the kidney on the opposite side, the evidence pointing toward the existence of specific secretory nerve fibers was ren-

dered dubious if not actually negligible. More recently the same investigator¹ has carried the study a step farther by examining the action of diuretics on reimplanted kidneys. It seemed possible, of course, that diuretics which do not cause increase of general blood pressure may act by stimulation of secretory nerves if we suppose that they exist. As examples of the three familiar types of diuretics, sodium chlorid in hypertonic solution, urea, and caffein or theobromin sodium salicylate were used. A series of observations was first recorded from normal animals, after which the same method was applied to those bearing a reimplanted kidney. It was found that the type of reaction shown by the normal and reimplanted kidney is practically identical for the same diuretic. Here again, Quinby remarks, as in the series of observations already referred to, there is no evidence of abnormality on the part of the reimplanted kidney, its response to diuretics being the same as that of the intact organ. In other words, the reimplanted kidney shows no evidence of loss of any possible secretory nerve influence. The burden of proof of the existence of renal secretory nerves has thus been shifted to the shoulders of those who still maintain that there are such paths of influence to the gland cells.

THE VENEREAL PERIL TO OUR ARMY

The serious havoc wrought among the armies of Europe by venereal diseases—in fact, among all armies not only those of today, but also among those of the past—has only recently been realized. Now it is known that venereal infection is the cause of more sickness among soldiers than any other disease or groups of related diseases. As Colonel Keefer says: "Venereal infections are responsible for an enormous amount of sickness in the army—vastly more than any other cause—and constitute the most important health problem with which we have to deal." This, it must be remembered, relates to the time of peace. Quoting from a special report by Vernon Lyman Kellogg:² "Syphilis and the other venereal diseases are a scourge fostered especially by militarism." The Surgeon-General's Office has already worked out a program for the coordination of the activities available for the control of these diseases. The reading of this program, printed in *THE JOURNAL* last week,³ indicates that the importance of the problem has been thoroughly appreciated and that there need be no anxiety in this regard so far as it relates to our Army. In working out this scheme of action, Surgeon-General Gorgas called to his assistance some of the leading specialists on the subject.⁴ The program, especially

as it relates to prophylactic measures, necessitates the cooperation of the civilian authorities and especially of the civilian physician. Gonorrhea and syphilis are preventable diseases. Ultimately every case of either of these diseases among the men in the Army, if traced back to its origin, will be found to depend on a similar case in the civilian population. Hence, unless the medical officers in the Army camps have the complete cooperation of civilians located in the communities surrounding the camps, it will be impossible for them to carry out the proper measures for limiting these diseases among troops. Here lies the opportunity for the civilian physician to do his "bit" effectively. He should be prepared to recognize these diseases in their early stages, and to see that the patients under his control are properly informed as to the dangers of transmitting the diseases. The principles for the control of syphilis and gonorrhea are no different from those used to control other infectious diseases. They involve the best possible care and attention to patients and the prevention of the spreading of infection from these patients to other persons in the community. The important points to be emphasized are that the civilian physician should satisfy himself that he is thoroughly capable of making an early diagnosis of these cases according to modern methods of diagnosis, and that he should be ready to cooperate with the federal and state authorities in whatever efforts may be made to control and suppress this scourge. County societies of the counties in which the cantonments are located should be especially alive to their responsibilities and opportunities.

THE DISTRIBUTION OF GLUCOSE IN THE TISSUES

In the study of the peculiar fate of sugar in the diabetic organism, much attention has been directed to the altered concentration which glucose attains in the blood, to the conditions under which it is excreted by the kidneys during hyperglycemia, and to the possible alterations in the storage functions of the liver with reference to carbohydrate. Comparatively little has been ascertained about the varying rôle played by the other tissues, notably the muscles which comprise three sevenths of the body weight and thus afford any opportunity for large differences, from a quantitative standpoint. It is a well established fact that the diabetic is unable to burn up sugar as satisfactorily as the healthy subject. It may properly be asked whether there is a possible difference between normal and diabetic organisms in their ability to hold carbohydrate in the form of glucose in their tissues. Earlier observations on this question may be neglected here because the evidence which they afford is conflicting and unreliable. Palmer¹ has reinvestigated the amount of carbohydrate existing as glucose in the tissues of animals under a variety of conditions. At any one time the amount is almost always small. Palmer has found that the concentration of glucose in the tissues varies directly with the degree of hyperglycemia. The largest

1. Quinby, W. C.: The Action of Diuretics on the Denervated Kidney, Proceedings of the American Physiological Society, *Am. Jour. Physiol.*, 1917, **42**, 593.

2. Kellogg, V. L.: Military Selection and Race Deterioration, published by the Carnegie Endowment for International Peace, Oxford, the Clarendon Press, 1916, p. 194.

3. Program of Social Hygiene for Soldiers to Safeguard Their Morals and Health, Outlined by Surgeon-General's Office, *THE JOURNAL A. M. A.*, Aug. 25, 1917, p. 654.

4. The Surgeon-General's Advisory Committee consists of Dr. William Allen Pusey, Chicago, chairman; Dr. Francis R. Hagner, Washington, D. C.; Dr. Grover W. Wende, Buffalo; Dr. S. Pollitzer, New York; and Dr. Henry H. Morton, Brooklyn. This advisory committee has been working directly with Col. F. F. Russell of the Medical Corps of the Army, under whose general directorship the matter comes.

1. Palmer, W. W.: The Concentration of Dextrose in the Tissues of Normal and Diabetic Animals, *Jour. Biol. Chem.*, 1917, **30**, 79.

amount of sugar was found in the liver, and the smallest quantity in the brain, the difference being largely accounted for by difference in vascularity. The concentration of glucose in the tissues is invariably lower than the blood sugar except in the liver, in which the higher concentrations found may be explained by rapid glycogenolysis. In the muscles the amount of glucose is low, varying in normal animals between 0.04 per cent. when the blood sugar is 0.10 per cent., and 0.41 per cent. when the blood sugar reaches 1.05 per cent. after intravenous sugar; while in diabetic animals the muscle sugar falls within the normal limits, even though the hyperglycemia rises as high as 1.43 per cent. Normal animals have a higher concentration of glucose in striated muscle than diabetic animals, when the levels of blood sugar are comparable. Palmer has properly emphasized his finding that diabetic animals present little difference in respect to glucose in muscles. The amounts found, he states, are small, and apparently not influenced by the type of diabetes or sugar administration. In view of the above-mentioned fact that, when comparative blood sugar values are considered, the muscle of the diabetic animal contains less glucose than the normal, Palmer has suggested that diabetic tissues are more impermeable to sugar than normal ones. Corresponding with this, sugar injected into the circulation of diabetic animals does not leave the blood so rapidly as it does in normal animals. But despite the increasing information as to the distribution of the carbohydrate in the body, the major problem of the failure to metabolize the sugar in one organism in contrast with the readiness of its combustion in the other still remains a perplexing puzzle.

BIOCHEMICAL PROCESSES FOR SYNTHETIC CHEMICALS

The enormous expansion of the synthetic chemical industry has furnished a great profusion of new compounds in recent years. Many of these substances have found an application in modern medicine. Indeed, medical practice has come to depend to quite a considerable extent, both in its therapeutic and in its hygienic or prophylactic applications, on synthetic chemicals. It is interesting to bear in mind, therefore, that biologic forces are available for the production of chemical products on a scale that few not specially versed in the subject appreciate. Yeasts, molds and bacteria give rise to a great variety of substances as the result of their metabolism. The yields of some of the compounds are not infrequently considerable. It has been said that no factory can compete with micro-organisms in the economy of production of certain compounds. The use of the biochemical modes of manufacture is still comparatively unexploited. Already many substances of great technical value, such as ethyl alcohol, acetic acid, butyric acid and lactic acid, are prepared by biochemical processes. Currie¹ has recently shown that citric acid can be produced in surprisingly large amounts by the growth of the familiar molds of the *Aspergillus* type on mediums of comparative simplicity, sugar being the most essential

source. It is not far fetched to look forward to the greater development of such fermentation industries whereby many of the substances now prepared by expensive synthetic methods may be more economically manufactured through the intermediation of biochemical processes.

MEDICAL STUDENTS AND THE DRAFT

For the last three weeks THE JOURNAL has been publishing statistics in regard to the relation of medical students to the draft, based on replies obtained direct from the students themselves. According to the replies obtained, it was estimated that 8,983 (85.9 per cent.) of all students were registered and that of these 2,551 (28.4 per cent.) would be included in the first call. As stated last week, it was believed the latter estimate was too low. At the time our first questionnaire was sent out it was too early to obtain absolute facts as to what students were actually called or whether they were accepted or rejected. On August 23, therefore, as the examinations by exemption boards were about completed, we sent a second questionnaire to 2,500 of the students who, following the previous questionnaire, had been included in the first or second calls. This second questionnaire asked whether the student had actually appeared before an exemption board and whether he had been accepted or rejected. Owing to the shortness of time since the questionnaire was sent out, not all replies have been received; an analysis of the returns, however, supports our previous figures or, if anything, indicates that our previous estimates as to the number of medical students conscripted were too low. We hope to be able to give the final figures next week.

CARBON DIOXID AND THE REGULATION OF RESPIRATION

The nature of the mechanism which regulates respiration has come to be understood of late more intelligently than it possibly could have been so long as the chemical aspects of the process were not taken into account. The respiratory center is now recognized as being singularly responsive to seemingly slight variations in the composition of the blood that comes to it. A small increase in the discharge of acid catabolites, notably carbonic acid, into the circulation as the result of muscle work or other forms of cellular activity promptly starts the breathing apparatus functioning more vigorously. For some time it has been assumed, partly on the basis of supposedly valid scientific evidence, that the stimulation of respiration in this way is attributable to changes in the hydrogen ion concentration of the blood quite independent of how these are brought about. According, however, to the newest researches at the Johns Hopkins University by Hooker, Wilson and Connett,¹ carbonic acid, the most abundant and conspicuous of the waste products of metabolism, exerts a specific influence on the respiratory center independent of its effect on the hydrogen ion concentration or true acidity of the fluid perfusing

1. Currie, J. N.: The Citric Acid Fermentation of *Aspergillus Niger*, Jour. Biol. Chem., 1917, **31**, 15.

1. Hooker, D. R.; Wilson, D. W., and Connett, Helene: The Perfusion of the Mammalian Medulla: The Effect of Carbon Dioxide and Other Substances on the Respiratory and Cardio-Vascular Centers, Am. Jour. Physiol., 1917, **43**, 351.

it. For example, blood with a comparatively high tension of carbon dioxid causes a greater stimulation of the respiratory center than does blood with a lower tension of carbon dioxid, but with the same acidity measured in terms of the hydrogen ion concentration. The discovery of this special sensitiveness or reactivity of the respiratory mechanism to one of the products with the elimination of which it is so prominently concerned is not without great interest. Precisely how the unique response is accomplished remains to be unraveled. The carbon dioxid as such may stimulate the respiratory center; or the irritability of the center may be altered by variations in the concentration of carbon dioxid. Perhaps, as the Baltimore investigators suggest, the hydrogen ion concentration of the environment of the respiratory center is its effective stimulus, but the irritability is influenced by other factors. The normal irritability might accordingly be the resultant of a number of effects, including, as Hooker, Wilson and Connett imply, those produced by carbon dioxid, oxygen and various ions as well as changes in metabolic activity, the nature of which is not understood.

Medical Mobilization and the War

Red Cross Commission to Serbia

The War Council of the American Red Cross announces the sending of a commission to Serbia to begin relief work to help the population in its struggle against privation and disease. Two hundred thousand dollars has been appropriated to buy medical and other supplies for use among the refugees on the Macedonian front. The commission is headed by Mr. C. A. Severance, a lawyer of St. Paul, and as deputy commissioners there will go Dr. S. Burrage, sanitarian, formerly of the Massachusetts Institute of Technology; Dr. Frederick T. Lloyd, Boston; Dr. Eugene A. Crockett, Boston; Mr. Francis Jager of the University of Minnesota, and Mr. Edwin D. Haskell of Minneapolis. Two other members of the commission are W. A. Stewart of New York, and L. D. Wishard of Pasadena, Calif.

Total Personnel of Army Medical Department

The strength of the enlisted force connected with the Medical Department of the Army is stated to be over 60,000 at this time. It is divided as follows: Regular Army, 25,096; enlisted Reserve Corps, 15,002; sanitary troops of the National Guard now in the National Army, 20,000. Orders have been issued for the assignment of six noncommissioned officers and 120 privates, first class, or privates to each National Guard cantonment for duty at the base hospitals connected therewith; including one noncommissioned officer and fifteen privates, first class, or privates previously sent. Each cantonment will have available for duty, seven noncommissioned officers and 135 privates. One hundred enlisted men will be assigned to each base hospital connected with the National Guard cantonments. Orders directing these assignments are now being prepared.

Department of Military Orthopedics

The Surgeon-General of the Army announces the organization of a new department for military orthopedics. It is stated that from 30 to 40 per cent. of the casualties of the present war require special orthopedic methods and that from 70 to 75 per cent. of these patients when treated by these methods can be restored to military usefulness.

Major Elliott G. Brackett, M. R. C., U. S. Army, Boston, has been appointed director of military orthopedics, with headquarters at the Surgeon-General's Office. Major David Silver, M. R. C., U. S. Army, Pittsburgh, has been appointed assistant director. Major Joel E. Goldthwait, M. R. C., Boston, has been appointed director of military orthopedics for the expeditionary forces, and Major Robert B. Osgood, Boston, now serving with Base Hospital No. 5, and Capt.

Nathaniel Allison, St. Louis, now serving with Base Hospital No. 21, will be transferred from their present positions to act as assistant directors abroad. Major Osgood will be temporarily assigned to Col. Robert Jones of the British forces. To assist these directors an advisory orthopedic board has been created and is made up as follows: Drs. Robert W. Lovett, Boston; Albert H. Freiberg, Cincinnati; G. Gwilym Davis, Philadelphia; F. H. Albee, New York, and John L. Porter, Chicago.

Payment of Medical Officers

Numerous physicians have written to THE JOURNAL asking when the pay of officers commissioned in the Medical Officers' Reserve Corps begins. An officer in the Medical Reserve Corps not on active duty receives no pay. Officers on the active list receive pay and allowances monthly on accounts certified by themselves according to prescribed forms. The pay begins with the time that the officer reports for active duty. Pay vouchers are made out monthly on form 336 W. D. and it is customary to send them to the Quartermaster on the 20th of the same month covered by the vouchers. The vouchers are made in duplicate, but only one voucher is signed. Mileage vouchers are made on form 337 W. D. and submitted in duplicate, one copy being signed. The original order of assignment to duty or certified copy with endorsements should accompany the mileage account. Officers are entitled to mileage from the place of appointment to their first station, the usual sum being 7 cents a mile; this covers all expenses as well as the actual railroad fare.

Early Medical Care of Recruits for the National Army

The men of the National Army will be prepared along the most modern hygienic methods for active duty. As soon as each recruit arrives at the cantonment, he will be required to take a bath and will then be given a new complete physical examination. Each recruit will be vaccinated for typhoid, paratyphoid and smallpox. Recommendations will then be made to the company commanders for special forms of exercise to remedy slight physical defects. The early weeks will also be utilized for setting up drills and preliminary schooling of the soldiers so that the men will become fit for the regular training which follows.

Division Surgeons Announced

The following members of the Medical Corps have been announced as division surgeons and ordered to report to the commanding officers at the various camps and cantonments specified: Lieut.-Cols. Charles E. Marrow, Camp Lee, Petersburg, Va., Eastern Department; M. A. W. Shockley, Camp Devens, Ayer, Mass., Northeastern Department; Thomas L. Rhoads, Camp Meade, Annapolis Junction, Md., Eastern Department; Charles R. Reynolds, Camp Upton, Yaphank, Long Island, N. Y., Eastern Department; Jay R. Shook, Camp Dodge, Des Moines, Iowa, Central Department; George M. Ekwurzel, Camp Dix, Wrightstown, N. J., Eastern Department; Conrad E. Koerper, Camp Gordon, Atlanta, Ga., Southeastern Department; John H. Allen, Camp Taylor, Louisville, Ky., Central Department; Wallace De Witt, Camp Sherman, Chillicothe, Ohio, Central Department; Robert M. Thornburgh, Camp Pike, Little Rock, Ark., Southeastern Department; Paul S. Halloran, Camp Travis, Fort Sam Houston, Texas, Southern Department; Kent Nelson, Camp Jackson, Columbia, S. C.; Southeastern Department; Peter C. Field, Camp Lewis, American Lake, Wash., Western Department; Cosam J. Bartlett, Camp Custer, Battle Creek, Mich., Central Department, and James M. Phalen, Camp Grant, Rockford, Ill., Central Department. Major Charles C. Billingslea, Camp Funston, was assigned to Fort Riley, Kan., Central Department, but has since died.

Red Cross Ambulance Companies in France

Forty-five ambulance companies organized by the American Red Cross have been mustered into the Army Medical Corps. These companies were all organized by Red Cross chapters. Each consists of 124 men, a captain, 40 lieutenants, 2 first-class sergeants, 11 sergeants, 6 corporals, 1 mechanic, 3 cooks and 96 privates. Four ambulance companies are assigned to service with each Army division.

Eleven of the companies are at Allentown, Pa., in training for service in France. These companies are: Pasadena Company, Capt. Charles D. Lockwood; University of California Company, Capt. Alvin Powell; Washington (D. C.) Company,

Capt. Ryan Devereaux; Fordham University Company, Capt. Joseph Donnelly; University of New York Company, Capt. Chester F. S. Whitney; Columbia University Company, Capt. William H. Rockwell; Battle Creek Company, Capt. James T. Case; University of Washington Company, Capt. David C. Hall; Boston Company, Capt. E. A. Cunningham; Portland (Me.) Company, Capt. Ernest B. Folsom, and the Columbia (S. C.) Company, Capt. Marion H. Wyman.

The two Atlanta (Ga.) companies, under Capt. Leo. P. Daly and Capt. Walpole C. Brewer, have been assigned to Fort McPherson. The Greensboro (N. C.) Company, under Capt. Charles S. Lawrence, is at Fort Oglethorpe. The Summit (N. J.) Company, under Capt. William H. Lawrence, is in camp at Butler, N. J. The San Antonio (Texas) Company, under Capt. Homer T. Wilson, at the request of the governor of Texas, is with the Texas National Guard on the border.

The other companies are to be assigned with the National Army at the various cantonments. There are the University of Chicago Company, Elbert Clark, captain; Cleveland Company, Dr. Harold O. Ruh, captain; Detroit Company, Charles Barton, captain; Northwestern University Company, Stephen V. Balderston, captain; Pittsfield Company, Robert J. Carpenter, captain; University of Oregon Company, John E. Kuykendall, captain; Grand Rapids Company, Thomas D. Gordon, captain; Fredonia (Kan.) Company, Edgar C. Duncan, captain; Indianapolis Company, Mason B. Light, captain; Portland (Ore.) Company, Ernest H. Streit, captain; Flint (Mich.) Company, Walter H. Winchester, captain; Charleston (W. Va.) Company, Timothy L. Barber, captain; Kansas City (Mo.) Company, Ernest W. Cavaness, captain; Rutland (Vt.) Company, William Stickney, captain; Detroit Company, Griffith A. Thomas, captain; Salt Lake City Company, Hugh B. Sprague, captain; Denver Company, Thomas M. Hopkins, captain; Greenville (S. C.) Company, James E. Daniel, captain; Hudson County (N. J.) Company, Frederick J. Quigley, captain; Houston (Texas) Company, Claude C. Cody, captain; Minneapolis Company, Ralph T. Knight, captain; Vicksburg Company, E. F. Howard, captain; Fort Worth (Texas) Company, Dr. Will S. Horn, captain; Lock Haven (Pa.) Company, George D. Green, captain; Michigan Company of Flint, Dr. F. A. Roberts, captain; Raleigh (N. C.) Company, Charles L. Scott, captain; Topeka Company, C. H. Lerrigo, captain; Memphis (Mich.) Company, Walter R. T. Sharpe, captain, and the Omalia (Neb.) Company, A. A. Linquist, captain.

Pediatric Expeditionary Force

At the head of a group of specialists in infant welfare which has been sent to France by the American Red Cross is Dr. William P. Lucas, professor of pediatrics in the University of California.

The total deaths in France in 1916 were about 1,100,000. Births numbered only 312,000. The net loss in population was 788,000, or nearly 2 per cent. of the whole. In Paris, where 48,917 babies were born in the year ending Aug. 1, 1914, only 26,179 were born in the second year of the war, ending Aug. 1, 1916.

With Dr. Lucas in the unit, which was financed by Mrs. William Lowell Putnam of Boston, are Dr. J. Morris Slemons of the Yale Medical School; Dr. Julius Parker Sedgwick, physiologic chemist, professor at the University of Minnesota; Dr. John C. Baldwin, Pittsburgh; Dr. Clain F. Gelston, Dr. Lucas' assistant at the University of California; Dr. N. O. Pearce, Cloverton, Minn., and the following experts in sociology and child welfare work: Mrs. J. Morris Slemons, Mrs. William P. Lucas, Miss Elizabeth Ashe and Miss Rosamond Gilder, daughter of the poet.

These specialists will make a general survey of the situation and study the work already being done, and will practice without compensation. It is intended to carry on a general education campaign among French mothers in the interest of better prenatal hygiene and scientific feeding and care of the babies.

Medical Supplies for Russia

In response to an urgent request from Dr. Frank Billings, head of the Red Cross Commission to Russia, the American Red Cross is sending a large quantity of medical and surgical supplies to meet the urgent needs of the Russian military hospitals. This supplements an earlier consignment which was forwarded for immediate use when the commission sailed to investigate the Russian situation. The commission carried with it \$200,000 worth of such material, including

among other supplies over 50 microscopes and 45,000 slides; 4,600 clinical thermometers, 288 operating knives, 23,000 lengths of catgut, 1,700 ice caps, 175,000 morphin sulphate tablets and 200,000 antiseptic tablets.

In the new consignment, for which the War Council appropriated \$160,000, there are 180,000 tablets of quinin sulphate, 1,000 pounds of chloroform, 10,000 tablets each of atropin and strychnin for hypodermic injection, 50,000 doses of antityphoid vaccine, also tetanus antitoxin and diphtheria, smallpox, cholera and plague vaccine, 10,000 pounds of soap, 25 dozen hot water bottles, 10,000 pounds of gauze dressings and pads, 10,000 bandages and rolls, 1,000 blankets and 6 dozen stethoscopes, and various laboratory supplies.

Among the other items in the shipment are these: 5,000 c.c. of digitalis, 1,000 cocain tablets, twenty collapsible operating tables, 14,400 needles, 200 pounds of rubber tubing, 20,000 pounds of absorbent cotton, and 5,000 safety pins.

Henry P. Horn, formerly a vice president of the New York, New Haven and Hartford Railroad, a member of the commission, is cooperating with the American Railroad Commission previously sent to Russia in securing the quickest possible handling of these and the other relief shipments which will follow as they are called for by Dr. Billings. He has worked out a plan for identifying Red Cross consignments so that Russian railway men will facilitate their movement, and in spite of the congestion of the railroads it is hoped that these supplies will be in the hands of surgeons and nurses in the Russian army hospitals in a short time.

Physicians Recommended for Commission in the Medical Reserve Corps

During the week ending Aug. 25, 1917, 415 physicians were recommended for commission in the Medical Reserve Corps, the proportion being 10 majors, 72 captains and 333 lieutenants.

Books for War Prisoners

The British have what is known as the British Prisoners of War Book Scheme which aims to provide British prisoners with books of all kinds. According to the *Lancet* the demand for technical and scientific books is very great. They are hard to get as contributions, as their owners usually need them, and second hand books of sufficiently late date are almost unobtainable. The committee has been compelled to make large purchases of new books, and funds are asked. It is said that the donors will recognize that gifts for this purpose not only serve to save the prisoners from mental starvation, but increase their value as commercial and professional assets after the war. Offers of books or gifts of money (the former with lists) should be sent to Mr. A. T. Davies, C. B., Prisoners of War Board of Education, Victoria and Albert Museum, South Kensington, S. W. 7, England.

Cancellation of Leases for Reserve Officers

The Chicago Rotary Club is making a special effort to aid physicians who have been called to active duty in disposing of any leases which they may have and which would continue during their period of service. Some corporations from which physicians rent have refused to cancel leases. In its announcement, the Rotary Club says:

"It seems to the Chicago Rotary Club that when physicians are so much needed in the United States Army, every effort should be made to relieve them of contracts rightfully binding in times of peace, but which might better be waived in times of national peril.

We all know that the physician giving up an established practice to enlist makes perhaps the biggest sacrifice of us all, because his business depends absolutely on personal contact. The day he leaves, his business ceases. But his lease goes on. Yet our country is calling for more physicians, and many patriotic doctors everywhere are trying to arrange their affairs to go.

It is possible to create a strong public opinion favoring the canceling of leases in such cases. If advisable, the matter can be carried for consideration to Congress. But first, the Physicians' Lease Committee wants figures and facts. We are sending this letter to 20,000 physicians scattered all over the United States."

Physicians who may be personally interested or who have knowledge of other physicians who have joined the Medical Reserve Corps and are having difficulty in securing the cancellation of leases, will render aid to this movement by addressing Mr. R. R. Denny, Chairman of Lease Committee, Chicago Rotary Club, 359 East Ohio Street. But it is not leases alone; it is the fact that the mortgage on their homes is coming due this fall or next year, that is causing anxiety to some Medical Reserve Officers.

Report of Lord Charnwood on Criticisms of the Medical Service of the British Expeditionary Forces in France

July 5, 1916, Lord Charnwood made a report to Sir Alfred Keogh, director-general of the British Medical Services, concerning certain criticisms made in the House of Lords on the arrangements of the medical service for the care of the wounded and sick of the expeditionary force in France. At the request of the director-general, Lord Charnwood spent the time from June 19 to 29, 1916, in France. He visited, inspected and studied the organization and working of the whole hospital and medical service from casualty clearing stations to base and general hospitals and other institutions. He was given the freest opportunity and aid in inquiring into every phase of the situation from persons of every rank and degree of authority, from wounded privates to officers of the various grades. An effort was made particularly to question and get the point of view of those making definite criticisms of the service. In addition to the inquiry regarding the workings of the medical service proper, he investigated, in a number of instances, the sanitary arrangements and the efficiency of the sanitary service.

Preliminary to giving the results of his investigation he describes the features of the system of dressing and clearing stations, ambulances, base, general and other hospitals, and the apportionment of the service rendered by each, most of which is familiar in a general way to our readers.

The criticisms on which the investigation was undertaken were of two classes: It had been alleged that through defects of organization or of energy the wounded and sick were not cared for as they should have been. It was emphatically asserted that the provision for the wounded and sick was splendidly effective, but that it was conducted without due economy of personal services, and therefore resulted in the unnecessary withdrawal from England of men who could ill be spared. The latter criticism, it was said, was more widespread, but that so far as it took a hostile form it was based on the same arguments. To the criticism that the system of evacuating and caring for the wounded in the various stations and hospitals had been devised for the South African War and was not adaptable to present conditions, Lord Charnwood says that no one would be able to say that this was so without having gone over the ground and eliciting the experience of a number of officers engaged in the work. This Lord Charnwood did, and his conclusion is that the existing system provides admirably for present needs and is speedily adaptable to future needs. It is a subject of a very peculiar kind, and he found the officers concerned in it experts with peculiar experience and resourcefulness in carrying it out. An objection was made by one critic that the system of base hospitals should be much nearer the front, to which wounded men should be brought direct from the advanced dressing stations by motors over any available road without reference to the movements of reinforcements, munition or food trains. This criticism was dictated, it is said, by the special interest of the critic (who was not a surgeon) in grave abdominal wounds; but as these wounds constitute only one in forty-two of wounds occurring, and as practice in regard to them had recently changed materially, the criticism had not sufficient basis and was barren of practical suggestion. Lord Charnwood suggests that this and much similar criticism proceeds from a wrong standpoint.

In regard to delay in removing the wounded from the field or the trenches into the hands of a competent surgeon, it is found that instead of delay the inquiry showed extreme rapidity, in some instances amounting to only five hours, which the report finds is more rapid than would be the case of a person wounded in an English village. The impression among the surgeons was found to be that any such delay was not serious or avoidable.

The criticism that the field ambulances were unnecessary and that the wounded should be moved directly from the advanced dressing stations to the casualty clearing hospitals without stopping at the intervening field ambulances, thus setting free "thirty doctors in each division for other and more useful work," is regarded as "quite idle." The advanced dressing stations are manned from the field ambulances, and in case of the abolishment of the latter, the former would have to be more heavily manned; the criticism is also based on a misconception of the sort of work done by the field ambulances. Casualty clearing stations are sometimes cut off from the advanced dressing stations by barrage fire. The opinion is expressed that the field ambulances must be kept in constant readiness and training for a difficult, exacting and important duty, and to whatever extent it may be possible

to economize in the matter of particular field ambulances at particular times, any effort to supplant them by "scratch teams" as occasion requires would certainly be foolish. The report goes on to say in regard to field ambulances in reserve:

The suggestion which I have just tried to answer is somewhat amended by saying merely that the field ambulances of divisions in reserve are superfluous. I think probably that at some past time in the war before either the demand for doctors had become urgent or the enormous organization which had to be built up had reached its present high degree of development, there were many doctors in the field ambulance suffering from insufficiency of work. I can only say with certainty that this was not so when I visited France. Divisions or brigades were not apt to be at rest for long. The officer commanding the field ambulance which I happened to see attached to a unit in reserve explained to me the value which for the sake of the efficiency of his field ambulance he ascribed to this comparative rest. It was, he said, most important to him for the purpose of overhauling the equipment. I was informed on the highest military authority that it was impossible even to regard any single division as presumably to remain in reserve for the next ten days. This would not necessarily preclude the sort of economy in men to which I am about to refer, but it seems to show that every field ambulance should be permanently in such a state that it can be raised to a fully effective condition at a moment's notice. . . . The medical service with our forces in France is a single service in which the constant endeavor is made to place the available man at the spot where he is wanted.

On the question as to whether or not unnecessary numbers of physicians are employed, it is said in the report:

I observe that field ambulances when in full employment are obviously and admittedly not overstaffed, and that the war has now plainly entered on a stage when no responsible critic from outside would dare suggest that a single field ambulance should be kept unready for action. As to casualty clearing stations, I have never met with a suggestion that they are overstaffed. It has, however, been suggested that the various units used for the purpose of conveyance are overstaffed with medical men. In the case of hospital ships, hospital trains and hospital barges this has not, I think, been seriously urged.

On the point that three medical officers to each motor ambulance convoy is excessive, it is admitted that they are in a position of constant waiting for emergencies which for many days together may not arise; but the total number of officers in this service does not amount to one for every division of the expeditionary force, and no one would wish to abandon this arrangement.

The number of physicians for a base hospital with a given number of beds as laid down in the regulations before the war, based on the experience of former wars, is found not to be sufficient, as the admissions are liable to increase with an enormous rush and the number of serious and difficult cases to the total admissions rises enormously at such times. During the rushes which had actually taken place, the work had been very severe indeed. An effort to economize the services of surgeons was made by sending surgeons to the casualty clearing stations in the beginning of rushes and back to the base hospitals later at the height of the rush in those hospitals.

The complaint that the time of physicians is wasted in doing clerical work is answered by saying that it is necessary to send case records when the men are evacuated or sent back to England, and the making of these records can be properly done only by medical men and is of great importance. The need for economy with reference to surgeons is admitted, because the demand for them is likely to grow; but the remedy is not in the reorganization of the medical profession abroad, but by the organization of the civil profession at home with reference to the military need, especially in the industrial centers where the number of doctors was too few before the war. But any attempt to increase the supply at home by curtailing the supply to the army would fail to meet the need just when the need is most felt.

The criticism had been made that the administration was at fault in "applying good men to relatively unskilled work," and "in putting incapable men to important work in certain cases." While it is admitted that this might have occurred in some instances, it is believed that such a state of affairs would not continue for long, and no complaint of this sort was heard by Lord Charnwood in France. As applied to the casualty clearing stations, which were mentioned in this connection, this work is so strenuous as to require the service of younger men, but each station had two skilled consultants under whom operations were performed by the younger surgeons.

We quote in full Paragraphs 32 and 33 of the report because of their immediate interest:

32. *Important Work and Incapable Men.*—It may fairly be presumed that in the early days of this huge organization formed in deadly haste, many things have had to be done by men of less capacity when somewhere in the neighborhood there were men of greater capacity. This of course is not a ground of complaint against the administration. It

is wholly denied that important work has ever, even in the earliest stages, been allowed to be undertaken by men who did not possess some guarantee of reasonable competence to perform it. I got the impression that the administration had been especially apprehensive of the risk that important operations should be lightly and hastily undertaken by men not fully qualified both to perform them and to judge of their necessity. Indeed, I strongly suspect that a good deal of grumbling which at one time seems to have made itself heard among the medical profession arose from the fact of this bias on the part of the administration. To almost all laymen capable of judging, a leaning in this direction will seem wise and beneficent. It has doubtless saved many arms and legs. As things are, there can certainly be no ground whatever for the suggestion that an operation is liable to be performed by a man not selected for such work on sufficient grounds. Such doubt as has been expressed in this country as to the qualifications of the staff by whom important operations are performed relates not to the base hospitals but to the casualty clearing stations. Now every single casualty clearing station has two surgeons, surgical specialists, who either possess the qualifications of *fellowship* (a high qualification) of the College of Surgeons or one of the three kingdoms, or (in exceptional cases) have been selected upon the advice of consultants of the first rank upon proof, given during the war, of their high capacity. And the care taken in selecting these men is not limited to an initial inspection of their previous record. The whole system is supervised in a manner to which I will refer later. In regard to the casualty clearing stations, it is to be noted that the field of choice is necessarily restricted to young men capable of bearing a heavy strain of work. The arrangements for operation in the casualty clearing stations are such that the younger surgeons do their work with the advice and help of the two specialists constantly at hand. In regard to the casualty clearing stations, one remark of the chief consultant surgeon is perhaps more reassuring than any detail that can be given as to their careful organization, fit though this is to compare with that of most hospitals at home—this statement to me of the care taken in selecting men and in effecting constant improvement concludes, "I hope I shall never think the casualty clearing stations perfect."

33. *Subordination of Skilled Civilians to R. A. M. C.*—It has occasionally been mentioned to me as a ground for complaint or at least surprise that able men drawn from civil practice have had to work under officers who had previously served in the R. A. M. C., but who were professionally their inferiors. The number of the original R. A. M. C. are very small in comparison to the whole number of doctors now in the service—not amounting, I think, to 1 to 10. With the exception of a few who have gained special distinction as surgeons (and some of the men whose distinction in this respect has been most widely recognized during the war are old R. A. M. C. men) this small number is almost entirely absorbed in administrative duties. The commandant of a field ambulance, a casualty clearing station or a base hospital, though not always, is one of these men, and the higher positions of command are entirely filled by them. Now surgeons and physicians, often of higher skill as surgeons and physicians, are subordinate to such officers in the sense in which the surgeons and physicians of the London Hospital or King's College Hospital are subordinate to Lord Knutsford or Lord Hamleden, though no doubt with this difference that the administrative heads of a military hospital in war are more constantly seen and felt than those of a civil hospital in peace time. The administrative duties of these officers are difficult duties for which they have been especially trained; in the case of the younger men by a careful course of preparation, in the case of the elder by experience in war, and they are duties for which an ordinary civil surgeon or physician, however capable, is little better prepared than many laymen might be. No one could read the report of the commandant of a field ambulance after a severe engagement without seeing that his task demanded highly trained faculties of organization and command of a sort which the experience of a civil practitioner does not call forth at all. This is equally true of the work of the director of medical services with an army and of his staff, and it is true in a different way and probably sometimes in a less degree of the officers in command of all units of the army medical organization. It would be extremely disparaging to the medical officers drawn from civil practice to suppose that they did not as a rule recognize this fully and gladly, and as a matter of fact I have been struck by the testimony which came to me in various ways and from different quarters as to the excellent spirit with which this large number of civilian practitioners have fallen into line in this great organization. But I should like to say a word as to the manner in which the old members of the R. A. M. C. discharge the kind of duties which have necessarily fallen chiefly to them. It would be merely impertinent of me to praise those of the superior officers whom it has been my great pleasure to meet, but I may be allowed to say that the energy, resourcefulness and unfailing cheerfulness with which young officers of the R. A. M. C. may be seen filling most difficult and arduous posts in advanced dressing stations, field ambulances and casualty clearing stations entitle their services to a very high place in the regard and affection of their country.

Contrary to the criticism that there was not a proper interest in the after-results of injuries, it was said that the hospitals at Boulogne and Etaples were "alive with interest" in such subjects by men of high reputation in the various subjects. Dentists and oculists are now provided for. The equipment of casualty clearing stations and field ambulances was found, in accordance with the report of Sir Frederick Treves, to be complete, and there was no complaint on this account on the part of the surgeons on account of equipment and the readiness with which additional equipment was supplied.

With regard to the eminent consultants from civil practice brought to France to exercise a certain power of inspection and supervision over staff officers more immediately concerned with the treatment of patients and to give advice to the administration when required, the report, while approving the work of these eminent men, is not in favor of giving these consultants direct executive control, such as is exercised by administrative chiefs, or issuing authoritative instructions or pronouncements on the advice of these consultants generally or the majority of them on controversial questions of treatment.

The right scientific temper is found to prevail among the medical forces, a proper degree of discipline exists, and red tape is at a minimum with reference to the matter of the suppression of individual initiative. Special stress is laid on the statement that the impression should not be gained from the report that there is prevalent a hostile attitude toward the work of the army medical authorities. There had been some grumbling and some continued criticism on the part of individuals actuated by misguided zeal or in a few rare instances by sheer malignity. It was proper, therefore, that the public should be properly enlightened with reference to the true character of the criticism, involving, as it did, personal attacks on several officers, which were ill judged and very cruel. It is said that all criticism "will be astray which does not recognize in the service splendid achievement and the achievement of a splendid spirit."

Impressions of an Italian Medical Prisoner of War

The *Riforma Medica* publishes an interview with Dr. M. Mauro who has just been repatriated after two years of imprisonment in Austria, having been captured early in the war. He said "The thing that impressed me most of all was that the Austrian operating stations and ambulances are so far back from the firing line. None were nearer than 2 or 3 kilometers while the Italian posts are within a few hundred meters. This explains the small number of Austrian medical officers that the Italians have captured. There is a great scarcity of physicians in the Austrian armies, even though the age limit has been raised to 55 and lowered to a very youthful age. Owing to this scarcity, the military authorities guard their medical officers from capture with special care, thinking that the welfare of the wounded in the long run is best served by the long transportation back to the distant field stations. . . ." On account of the scarcity of medical officers even old dentists serve as physicians. Practically every man of the military age is serving with the army, no physical disability being recognized, as some place is found for every one to serve in some way. The only selection is for the men sent to the firing line. I have seen men in service with enormous hernias, with dilatation of the stomach, and especially with manifest tuberculosis. I recall one Austrian officer with tuberculosis of the larynx and tubercle bacilli in his sputum who yet was sent to the front, and one sentinel who had committed suicide and cavities were found in both lungs. Instead of leave of absence for convalescence or rest, the men are given a change of occupation, being sent to serve in some prisoners' camp or administrative office. "The conditions at our first prison camp, at Lubiana, were deplorable. The food was scant and poor and the Italian prisoners in our charge suffered in health. At that time the Red Cross had not organized its marvellous services, and the families of prisoners were able only with the greatest difficulty to send them any aid. A jail served as the hospital, but when we were transferred to Mauthausen, that wooden city near the Danube, we found hospital barracks equipped for 1,200 surgical beds and 2,000 medical and two isolation hospitals, with a special hospital for the troops guarding the prison camp. The first year the medical service was attended to by seven Italian and five Austrian physicians but the second year there were twenty-five Italian physicians. The beds were rarely empty, prisoners being sent here for treatment from other camps, and they comprised nearly every nationality. The hospitals were well equipped and the arrangements for sterilization and disinfection were excellent, but there was a deplorable lack of food, of drugs and of dressings. We physicians could point out the prisoners we thought should be given the preference for exchange or respite from being sent out to work, but our suggestions were seldom heeded. It happened several times that the men we proposed for exchange but who had been rejected by the control board, died within a few days from their tuberculosis or other affection." Mauro pays tribute to the beautiful example of fraternity in the humanitarian service presented by the Aus-

trian physicians in the camp, the chief surgeon in particular. He also pays tribute to the Italian attendants in the hospitals who without any previous experience became skilful and displayed such devotion that their service compares favorably with the largest hospitals anywhere. Mauro tended a total of 8,000 sick or wounded, and performed 800 operations. He says further, "There were many cases of severe malaria in prisoners from Albania and a few cases of typhus and cerebrospinal meningitis in the camp, but they never started epidemics. Many cases of rapidly fatal tuberculosis developed at both prison camps fostered by the exertions, the cold and the lack of food. None of the Italian physicians had any serious illness, and there was very little sickness among the Italian prisoners, testifying to their solid fiber. After the Red Cross had organized its service through the mediation of Switzerland, supplies of food and money arrived to supplement the scant ration of bean or carrot soup supplied by the Austrians, and thus the danger of inanition in the hospitals was warded off. The Naples branch of the Red Cross sent to Mauthausen not only food and comforts but also drugs and dressing materials in amounts enough for several months, and the Genoa branch sent money. The Austrians furnished for the entire 1,200 beds of the surgical department only 10 liters of fresh milk a day. A so-called milk powder was supplied but none of the sick could tolerate it. The broth was usually made with vegetables; a small ration of meat was extremely rarely allowed. The donations of the Red Cross made it possible to purchase additional supplies from Switzerland and from Italy. But it was exasperating for us physicians to be treated as prisoners and denied the slightest liberty. A change for the better in the conditions of the prison camp seemed to dawn with the death of the old emperor, the rations were less scanty and the air of the camp less depressing."

Orders to Officers of the Medical Corps

Lieut. Col. Carl R. Darnall, M. C., to duty with Surgeon General of Army.

Capt. Harry S. Purnell, M. C., to Fort McHenry, Md., and assume command of General Hospital No. 2, to be established.

First Lieut. Henry F. Lincoln, M. C., to duty as provisional regimental surgeon of 1st Regiment of Heavy Field Artillery to be organized in Maine.

Col. Weston P. Chamberlain, M. C., to Washington for duty.

Par. 50, S. O. 187, Aug. 13, War Dept., announces the promotions in the Medical Corps. To be colonels from May 15, 1917, from and including Henry D. Snyder to and including Clarence J. Manly. To be lieutenant-colonels from May 15, 1917, from David Baker to Fred W. Palmer, inclusive. To be majors from May 15, 1917, from May W. Bryan to Roy C. Heflebower, inclusive.

First Lieut. Olof I. Sohlberg, M. C., to Ambulance Co. No. 1, Minnesota, St. Paul, for duty.

Col. James D. Glennan, M. C., from duty at the U. S. Soldiers' Home and report in person to Surgeon General of the Army for duty in his office.

Major A. J. Wilson, M. C., to duty at Fort Thomas, Ky.

Orders to Officers of the Sanitary Corps

First Lieut. Frederick M. Schaefer, San. Corps, to duty at medical supply depot, Philadelphia.

First Lieut. J. M. Corson, San. Corps, to Camp Custer, Battle Creek, Mich., as supply officer of division and property officer of base hospital at that camp.

First Lieut. R. A. Lagrinder to Camp Lee, Petersburg, Va., as supply officer of division and property officer of base hospital at that camp.

First Lieut. H. J. Fiestel report to commanding general port of embarkation, Pier 45, for duty.

Capt. Gilbert J. Hurty, San. Corps, to duty, Atlanta, Ga.

First Lieut. Samuel Siegel, San. Corps, to duty Army Field Medical Supply Depot, Washington.

Orders to Contract Surgeons

Contract Surg. E. A. Albers report for examination of troops of national guard at Kansas City for tuberculosis.

Contract Surg. F. R. Burke to Boston for duty as a member of board of tuberculosis examiners.

Orders to Officers of the Medical Reserve Corps

ALABAMA

To Camp Cody, Deming, N. M., Lieut. Llewellyn H. Ledbetter, Good Water.

To Camp McClellan, Anniston, Ala., Capt. J. W. Hooper, Roanoka; Lieuts. T. M. Barnett, Dothan; W. M. Blair, Gantt; W. W. Burns, Selma; R. C. Evans, Sheffield.

To Fort Oglethorpe for a course of instruction, Lieuts. Modie E. Cunningham, William C. Dabney, Edgar W. Daly, Birmingham; J. Glenn Gilchrist, Brantley; Daniel B. Faust, Clayton; George W. Kiehnhoff, Daphne; Gilmer H. Moore, Opelika; Clanton R. Athey, Ramer; French H. Craddock, Sylacauga.

ARIZONA

To Hachita, N. M., Major George P. Stallman, Douglas.

ARKANSAS

To Camp Bowie, Fort Worth, Tex., Lieuts. W. K. Smith, Hot Springs; Robert E. B. Bledsoe, E. W. Prothro, Little Rock.

To Fort Oglethorpe for a course of instruction, Lieuts. William L. McLain, Argenta; Dewell Gann, Jr., Benton; David W. Goldstein, Ft. Smith; Luther M. Lile, Jonesboro; Guy A. McCormack, Little Rock; Arch S. Chapman, Mammoth Spring; Edward R. Cotham, Monticello; John B. Wells, Scott; James F. Poe, Shirley.

To Fort Riley for a course of instruction, Lieut. John W. Elder, Alicia.

To Kingsville, Texas, Major John M. Hewitt, Fort Logan H. Roots.

CALIFORNIA

To Camp Fremont, Palo Alto, Cal., Capts. R. Cadwallader, W. B. Deas, San Francisco; Lieuts. H. S. Keyes, Los Angeles; E. C. Houston, San Francisco.

To Camp John H. Beacom, Calexico, Cal., for duty, Capt. Alexander Patterson, San Francisco.

To Camp Kearney, Linda Vista, Cal., Lieuts. W. P. Milliken, Oakland; H. J. Willey, Porterville; J. M. Moss, T. E. Tillman, San Francisco.

To Camp Lewis, American Lake, Wash., for duty with Provisional Ambulance Co. B., Lieut. Raymond Babcock, Willits.

To Chicago for duty, Lieut. Jay M. Read, San Francisco.

To Fort Baker, Calif., for duty, Lieut. Louis Jean Ernest Gougnet, Chicago.

To Fort Ontario, N. Y., with Hospital Unit N., Lieut. Edwards H. William, Los Angeles.

To Presidio of S. F. with Provisional Ambulance Co. C. for duty, Lieuts. George M. Hubbell, Los Gatos; Pleasant A. Taylor, San Francisco; with Provisional Sanitary Train, Capts. Gustav J. Bergener, San Francisco; Sidney E. D. Pinninger, Tracy; Lieuts. John L. Beard, Martinez; Luther M. Leisenring, Placerville; Glover B. Wilcox, San Francisco; Lafayette J. Wilson, Sebastopol.

To report by telegraph to the commanding general Western Dept., for duty, Lieut. Edward H. Diehl, Artesia.

COLORADO

To Fort Benjamin Harrison for a course of instruction, Lieut. Earl W. Kemble, Golden.

To Fort Riley for a course of instruction, Capt. John S. Fox, Silverton.

To Presidio of S. F., with Provisional Sanitary Train, Lieut. Frank N. Stiles, Grand Junction.

CONNECTICUT

To Fort Benjamin Harrison for a course of instruction, Lieut. Philip W. Place, New Haven.

To Fort Riley for a course of instruction, Capt. Arthur B. Landry, Hartford.

To Rockford, Ill., Camp Grant for duty, Lieut. Harold S. Arnold, New Haven.

DELAWARE

To Fort Oglethorpe for a course of instruction, Lieuts. Joseph Bringhurst, Harrington; Joseph M. Barsky, Wilmington.

DISTRICT OF COLUMBIA

To Fort Benjamin Harrison for a course of instruction, Lieut. Timothy J. Sullivan, Washington.

To Fort Des Moines, Iowa, for duty, Lieut. Arthur L. Curtis, Washington.

To Fort Oglethorpe for duty, Lieuts. Arthur G. Compton, for a course of instruction, William H. Littlepage, John B. Piggott, Washington.

To Washington, Capt. Edwin R. Hodge, Washington.

FLORIDA

To Camp Wheeler, Macon, Ga., Lieuts. H. F. Horne, A. C. Koon, Jacksonville; A. M. Ames, Pensacola.

To Fort Monroe, Va., for duty, Lieut. William G. McKay, Jacksonville.

To Fort Oglethorpe for a course of instruction, Capts. Edward G. Birge, Herbert O. Black, Jacksonville; Lieuts. Heber P. Newman, Bartow; George W. Dupree, Blue Creek; Jonathan S. Coker, Gardner; Albert E. Acker and Gaston Day, Jacksonville; Harry C. Galey, Key West; John M. Whitfield, Malone; Wallace P. Crigler, Ocala; Daniel M. Adams, Panama City; John T. Bradshaw, San Antonio; Bennett A. Burks, Titusville; George S. McClellan, Wellborn; Kenneth McC. Davis, Westbay.

To Santa Fe, N. M., Major Frank E. Artaud, Key West.

GEORGIA

To Camp Hancock, Augusta, Capt. Montague L. Boyd, Atlanta.

To Camp Shelby, Hattiesburg, Miss., Lieut. J. H. Johnson, Columbus.

To Fort Benjamin Harrison for course of instruction, Lieut. Henry Grady Banister, Gainesville.

To Fort Des Moines, Iowa, for duty, Lieut. John H. Williams, Pelham.

To Fort Oglethorpe for a course of instruction, Capt. Melton D. Council, Macon; Lieuts. Harold I. Reynolds, Athens; James T. Calhoun and Welburn A. Upchurch, Atlanta; John W. Oden, Blackshear; John H. Terrell, Jr., Canon; Ira C. H. Garst, Carrollton; Jesse M. Anderson, Columbus; James W. Anderson, Gray; Charles C. Middleton, Savannah; Lucius P. Farmer, Spread; Rufus E. Graham, Stillmore; Thomas E. Blackburn, Swainsboro; Horace E. Crow, Talmo.

To Syracuse, N. Y., with infantry brigade to complete the medical personnel, Lieut. William G. Herrington, Nunez.

IDAHO

To Fort D. A. Russell, Wyo., for duty, Capt. Edward E. Maxey, Boise.

To Fort Riley for a course of instruction, Lieut. Burrell O. Railston, Rathdrum.

ILLINOIS

To Chicago, Lieut. Alford E. Budde, North Chicago. For duty in the office of the department surgeon, as head of tuberculosis examining board, Lieut. Walter W. Hamburger, Chicago.

To Fort Benjamin Harrison for instruction, Capt. Otis Hackett Johnson, Quincy.

To Fort Des Moines for duty, Lieut. George L. Samuels, Alton.

To Fort Oglethorpe, Lieuts. Ira W. Ellis, Murphysboro, and James Emmons, Pinkstaff.

To Fort Riley for instruction, Lieuts. Willard P. Earney, Argyle; Charles W. Monro, Arthur; Rollen W. Harrod, Avon; Harry I. Stevens, Ashley; Frank O. Kunz, Beardstown; Carl F. Lewis, Brussels; Louis D. Hughes, Carbondale; Andrew J. Aird, Cartersville; Capt. Francis M. Edwards, Centralia; Capts. Russell E. Adkins, Walter H. Allport, William B. McCauley; Lieuts. Oliver E. Alyea, W. F. Bartlett, Harry B. Bernhardt, Jesse F. Boone, Lewis L. Brodsky, Edward A. Brucker, Alexander W. Burke, Charles W. Colebaugh, John W. Cornell, Vernon M. Jared, John M. Krasa, Lewis H. Lippemann, Albert Martin, William C. Meacham, Herbert V. Mellinger, Earl B. Miller, Ellis Van Order Moulton, Edward T. Robinson, Lambert W. Rosenbaum, Jerome F. Strauss, John F. West and Eugene P. Wright, Chicago; August C. Armbruster, Collinsville; John G. Dwyer, Cullom; Knud Hartnack, Downers Grove; Joseph C. Kaczowski, Dunning; Walter W. Boyne, East St. Louis; Norton W. Bowman, Flora; Hugh Q. Allison, Grayville; Edward W. Cummins, Charles M. Fuson, Douglas A. Lehman, Robert B. Nyberg, Harrisburg; Lester W. Baker, Herrin; Capt. Robert R. B. Jacks, Highwood; Lieuts. Harlan W. Brink, Hopedale; Reuben A. Moffett, Ladd; Capt. William E. Chapman, Leland; Lieuts. Gustave A. Floreth, Mount Olive; Charles K. Barclay, New Lenox; David A. Morgan, Nilwood; Albert L. Alderson, Pana; Clifford C. Wehn, Penfield; John L. Aleshire, Plainville; Ralph McReynolds, Quincy; Arthur D. Jackson, River Forest; Daniel E. Egan, St. Charles; John B. Hazel, Jr., Staunton; George J. Powers, Streator; Archie S. Horn and Roy H. Wilson, Tampico; Paul R. Allyn and Walter H. Allyn, Waverly, and Frank W. Blatchford, Winnetka.

To Fort Sheridan, Lieut. Charles D. Eldred, Chicago.

To Rockford, to Camp Grant for duty, Lieut. Edwin F. Hirsch, Chicago.

To Syracuse, N. Y., with infantry brigade to complete the medical personnel, Lieuts. Bernard P. Conway, Chicago, and Samuel R. Magill, Loami.

INDIANA

To Fort Benjamin Harrison for a course of instruction, Lieuts. Henry Harvey, Boswell; Miles Frederick Daubenheyer, Butlerville; Carl L. Souders, Columbia City; Wilcox G. Thorne, Columbus; O. A. Tucker, Daleville; Samuel R. Laubscher, Evansville; Harry C. Odell, Farmersburg; Walgo Clay Farnham and Elmer C. Singer, Fort Wayne; Brant E. Lemmon, Greencastle; John Clay Glackman, Hatfield; Ray H. Thomas and Joseph F. Ward, Indianapolis; John C. Webster, Lafayette; James L. Walker, La Fontaine; Noah Webster Clark, Roseville; Charles E. Stone, Shoals; Lyman Ambrose Burnside, Terre Haute; Malcolm Brown Fyfe, Wheatfield.

To Fort Des Moines, Iowa, for duty, Lieut. Joseph H. Ward, Indianapolis.

To Fort Oglethorpe for a course of instruction, Lieuts. Wallace Curtis Dyer, Evansville; James A. Sims, Pineville.

To Fort Riley for a course of instruction, Capt. George W. Newell, Peru; Lieuts. Smith A. Quimby, Indianapolis; Lawrence J. Quillin, Warsaw.

IOWA

To Fort Des Moines for duty laboratory work at Camp Dodge, Lieut. D. J. Glomset, Des Moines.

To Fort Benjamin Harrison for instruction, Lieut. Aaron Clyde Conway, Marshalltown.

To Fort Oglethorpe for a course of instruction, Capt. Charles L. Marston, Macon City; Lieut. Samuel J. Lewis, Columbus City.

To Fort Riley for a course of instruction, Capts. George C. Skinner, Cedar Rapids; LeRoy A. Wescott, Cherokee; Edwin A. Merritt, Council Bluffs; James W. Osborn, Des Moines; Clarence Van Eppe, Iowa City; Arthur A. Pace, Toledo; Fordyce H. McCabe, Wellman; Lieuts. Paul F. Guernsey, Bloomfield; Roy C. Alt, Cedar Rapids; Leo C. Kuhn, Chariton; Clifford L. Bartlett, Clinton; Harry L. Bridgman, Columbia; Frederick H. Lamb, Davenport; Alfred S. Price, Des Moines; William S. Binford, Dixon; John R. Christensen, Eagle Grove; Walter E. Anthony, Ottumwa; Garner F. Parker, Pocahontas; William H. Clary, Prescott; J. Willard Caldwell, Steamboat Rock; Otis P. Morgenthaler, Templeton; Sylvanus W. Corbin, Willerton.

KANSAS

To Fort Oglethorpe for a course of instruction, Lieuts. Eugene J. Broderick, Dodge City; Felix Cohen, Kansas City.

To Fort Riley for instruction, Capt. James Clyde Butler, Stafford; Lieuts. Ralph C. Henderson, Erie; Turlion A. Hood, Garnett; Walter N. Mundell, Hutchison; Shirley F. Boyce, Iuka; James B. Donnell, Kinsley; Arthur Kuisely, Liberal; Hugh B. Hawthorne, Palmer; Clyde L. Appleby, Peabody; Charles S. Adams St. John; Charles M. Fitzpatrick, Salina; James A. Hampton Webb, Strafford; George K. Purves, Wichita.

To Syracuse, N. Y., with infantry brigade to complete the medical personnel, Lieut. Ralph H. Hertzler, Newton.

KENTUCKY

To Camp Fremont, Palo Alto, Calif., Lieut. R. M. Jones, Louisville.

To Fort Benjamin Harrison for a course of instruction, Lieut. Albert Earle Holmes, Louisville.

To Fort Oglethorpe for a course of instruction, Capts. Orrin LeR. Smith, Lexington; Richard Woods Ogilvie, Princeton; Charles M. Gower, Trenton; Lieuts. Albert C. Bond and Smithfield Keffer, Ashland; Ernest E. Archer, Auxier; Frank I. Buckner, Campbellsville; John P. Wheeler, Carrollton; Stanley E. Straube, Edgerton; E. C. Brandon, Elizabethtown; Henry T. Alexander, Fulton; William A. Weldon, Hardyville; Lon B. Morcimen, Irvington; Logan Felts, Lewisburg; Julian T. McClymonds, Lexington; Charles W. Stroup, Ludlow; Marshall A. Moore, McVeigh; Adam G. Osborne, Myra; William W. Anderson, Newport; William E. Ray, Staub.

To Fort Riley for instruction, Lieut. Walter L. Coolidge, Louisville.

To Fort Thomas, Lieut. J. B. Robards, Harrodsburg.

To report to Major B. Dewey, San. Corps, Medical Supply Department, New York City, Lieut. F. L. Eisman, Louisville.

LOUISIANA

To Camp Beauregard, Alexandria, La., Lieuts. T. B. Cracroft, Kelly; R. P. Evans, Newellton; A. A. Landry, Plaquemine; A. T. Palmer, Yelgar.

To Fort Oglethorpe for a course of instruction, Capt. Dalton H. Trepagnier, Burrwood; Daniel O. Willis, Leesville; Nicholas K. Edrington and Solon R. Humphries, New Orleans; James C. Sartor, Rayville.

To Fort Sam Houston, Camp Kelly, South San Antonio, duty with Thirty-Third Aero Squadron, Lieut. O. B. Kiel, New Orleans.

To Syracuse, N. Y., with infantry brigade to complete the medical personnel, Lieuts. Marvin Cappel, Alexandria; Jack T. Cappel, New Orleans; Claude A. Martin, Welsh.

MAINE

To Allentown, Pa., for duty, Lieut. Frank H. Jordan, South Portland.

To Fort Benjamin Harrison for instruction, Capt. Lester Adams, Bangor; Lieuts. Leon S. Lippincott, Brunswick; James McFayden, Milo.

To Fort Riley for instruction, Capt. Arthur U. Desjardins, Waterville; Lieut. Frank W. Merritt, Jay.

MARYLAND

To Camp Doniphan, Fort Sill, Okla., Lieut. P. R. Brown, Baltimore.

To Camp Sheridan, Montgomery, Ala., Lieut. Eugene H. Hayward, Baltimore.

To Camp Wadsworth, Spartanburg, S. C., Capt. Thomas B. Conrad, Chevy Chase.

To Fort Benjamin Harrison for instruction, Lieut. Thomas B. Johnson, Frederick.

To Fort Oglethorpe for a course of instruction, Major George A. Stewart; Lieuts. Everett LeC. Cook, Charles M. Harmon, Charles L. Joslin, Baltimore; Frank M. Wilson, Cumberland; Philip J. Bean, Jarboesville; Edward C. J. Miller, Kitzmiller; Ira M. Zimmerman, Williamsport.

To Fort Riley for instruction, Lieut. Walter C. Burket, Baltimore.

MASSACHUSETTS

To Cambridge, to Harvard for duty, Lieut. Raymond P. Parker, Winthrop.

To Fort Benjamin Harrison for instruction, Capt. Willard Stephen Parker; Lieuts. Henry Manning Emmons and John Hammond Anderson, Boston; Joseph Simpson, Essex; Wilfrid T. LaFortune, Fitchburg; Charles Francis Canedy, Greenfield; Oscar L. Spencer, Lynn; John J. Kelly, Marlboro; Edward S. Ward, North Attleboro; Harry A. Schneider, Pittsfield; Charles Henry Davis, S. Hamilton and John F. Streeter, Springfield; Andres J. McGraw, Taunton; Roland S. Newton, Westboro, and Victor Anthony Aimone, Winchester.

MEXICO

To Camp Cody, Deming, N. M., Lieut. Charles C. Cooke, Vera Cruz.

MICHIGAN

To Army Medical School, Washington, D. C., for instruction, Lieut. Henry Cook, Flint.

To Fort Benjamin Harrison for instruction, Capts. Hugh McDowell Beebe, Ann Arbor; James H. McCall and Robert Albert Carl Wollenberg, Detroit; Edwin James Evans, Greeland; Matthew Kollig, Saginaw; Lieuts. Esli T. Morden, Adrian; Howard Morton Holcombe, Ann Arbor; Ralph Ernest Dawson, Blanchard; Sheldon B. Young, Caseville; Robert E. Hayes, Channing; Allan M. Wilkinson, Charlevoix; Wilber Aaron Griffith, Coldwater; Clarence Herbert Belknap, Edmund William Bolio, Ralph Hugh Bookmyer, Edward Kanter, Curenus B. Lockwood, Robert M. Martin, Robert C. Moehlig, Harold L. Morris, Grover C. Pemherthy, William L. Sherman and Harold Wilson, Detroit; Raymond M. Schulte, Dollar Bay; Victor Henry de Somoskeoy, Flint; Wells C. Reid, Grand Blanc; Burt Francis Green, Hillsdale; Ray R. McCrum, Lansing; Arthur J. Warren, Mount Clemens; Ira Arthur Abrahamson, Negaunee; George P. Sackrider, Owosso; Lester F. Kennedy, Pontiac;

Fred P. Nevius, Posen; John Lindsay Conover, Rapid River; Walter Alexander DeFoe, Saginaw, and Joseph L. Murphy, Taunton.

To Fort Oglethorpe, Lieut. Warren E. Anderson, Jackson.

To Fort Snelling, Minn., for duty with Forty-First Infantry as surgeon, Capt. Warren P. Morill, Benton Harbor.

To Report by Telegraph to Commanding General, Southern Department for duty, Capt. Frank S. Love, West Branch.

To Washington, Lieut. Warren L. Babcock, Detroit.

The resignation of Lieut. William R. Manlove, Grand Rapids, is accepted.

MINNESOTA

To Deming, N. M., Lieut. Gilbert J. Thomas, Minneapolis.

To Fort Riley for instruction, Capt. Edward A. Meyerding, St. Paul; Lieuts. Ronald L. Laney, Brown Valley; Roderick F. McHugh, Collaine; Ralph B. Bettman, Rochester; Frank A. Plum, Rochester, and Harry E. Canfield, Willmar.

To Fort Sheridan for duty, Lieut. George D. Rice, St. Cloud.

MISSISSIPPI

To Camp Cody, Deming, N. M., Lieut. Little B. Neal, Jackson.

To Camp Shelby, Hattiesburg, Miss., Capt. H. L. Noel, Lexington; Lieuts. A. T. Graham, Eastman, and H. P. Boswell, New Albany.

To Fort Benjamin Harrison for instruction, Lieut. Paul Zollicaffer Browne, Jackson.

To Fort Des Moines for duty, Lieut. James A. Owen, Natchez.

To Fort Oglethorpe for a course of instruction, Capt. Walter R. McKinley, Columbus; John T. Barbee, Ripley; Lieuts. Judge James, Ackermore; James Q. Fountain, Bay St. Louis; Rufus E. Priest, Buena Vista; Thomas J. Bush, Clarksdale; William J. Lusk, Cliftonville; George H. Spivey, Hollandale; William G. Byrd, Isola; William S. Cranford, John F. Scarborough and Charles P. Clark, Laurel; Rufus E. Applewhite, Magnolia; Robert M. Leigh and Osee Fulton Kean, Meridian; Grover C. Denson, Oak Vale; Emile Q. Withers, Jr., Okalona; William H. Strahan, Polar Creek; Solomon R. Boykin, Puckett; Shelby C. Spencer, Shannon, and George C. Jones, Yazoo City.

MISSOURI

To Camp Kearney, Linda Vista, Calif., Capt. R. Smart, Crane.

To Camp Shelby, Hattiesburg, Miss., Lieut. F. M. Cook, St. Louis.

To Camp Sheridan, Montgomery, Ala., Capt. Ernest G. Mark, Kansas City.

To Camp Wheeler, Macon, Ga., Lieut. W. S. Armour, Kansas City.

To Fort Oglethorpe, Lieuts. Albert L. Evans, Bonne Terre, and Devilla D. Edmons, Kansas City.

To Fort Riley for instruction, Capt. Edward H. Clark, Kansas City; Walton F. Fry and Waldemar Ude, St. Louis; Clive S. McGinnis, Sedalia; Lieuts. Fred C. Albright, Bronaugh Paul R. Williams, Cape Girardeau; Buell F. Menefee, Jonesburg; William F. Culbertson, Zachariah G. Jones, Ward H. Leonard and Harvey E. McCarthy, Kansas City; Hilen K. Wallace, St. Joseph; Joseph T. Axline, Fred LeG. Gibbs, Edward E. Heiple, Martin F. Kouri and Arthur J. Zimlick, St. Louis, and Samuel D. Avery, Troy.

To Presidio of San Francisco for duty with Provisional Sanitary Train, Capt. Frank D. Dickson, Kansas City.

MONTANA

To Fort Benjamin Harrison for instruction, Lieut. Edwin James Greer, Great Falls.

To Fort Riley for instruction, Lieut. Lindsay W. Baskett, Big Timber.

NEBRASKA

To Fort Benjamin Harrison, Lieut. James M. Woodard, Aurora.

To Fort Riley for instruction, Capt. Charles H. Campbell, Columbus; John Buis, Pender; Frank S. Nicholson, St. Paul; Lieuts. Edgar Cline, Auburn; Charles E. Legg, Champion; William O. Akers, Florence; Lothar F. Egen and Charles F. Shook, Omaha; William H. Crawford, Rushville, and Charles P. Brenn, Western.

NEW HAMPSHIRE

To Fort Benjamin Harrison, Lieuts. Leopold T. Togus, Hookset; Winfred Oren Brown, Littleton, and John B. Warden, Whitefield.

Honorably discharged, Lieut. William M. Robb, Keene.

NEW JERSEY

To Allentown, Pa., for duty, Capt. George H. Lathrope, Morristown.

To Camp Hancock, Augusta, Ga., Lieut. Livingstone L. Lewis, Hoboken.

To Camp Wadsworth, Spartanburg, S. C., Lieut. George W. Vannatta, East Orange.

To Fort Benjamin Harrison for instruction, Lieuts. Max E. Stern, Jersey City; Benjamin D. Ruben, Trenton.

To Fort McPherson, Lieut. William L. Vroom, Ridgewood.

To Fort Oglethorpe for a course of instruction, Capt. George C. Albee, South Orange; Lieuts. David Berner and Samuel L. Salasin, Atlantic City; John W. Boggs, Atlantic Highlands; Millard F. Sewall, Bridgeton; Philip DuB. Bunting, Elizabeth; Harvey S. Brown, Freehold; Frank Bortone, Jersey City; Ralph R. Charlesworth, Millville; Maurice S. Avidan, Robert Buermann, Ernest Gennell, James E. McCormick, Raymond J. Mullin and Frank W. Pinneo, Newark; Anthony Gruessner, New Brunswick; Charles S. Smith, Orange; William A. Brady, Union Hill; William T. Callery, Weehawken.

To Fort Ontario, N. Y., in connection with Hospital Unit N., Capt. Arthur F. Thompson, East Orange; Lieut. Maxwell G. Keeler, Weehawken.

To Fort Riley for instruction, Lieuts. John T. Rose, Asbury Park; Charles S. Brady, Union Hill.

To Washington, Walter Reed Hospital, Lieut. Charles N. Harper, Trenton.

NEW MEXICO

To Fort Benjamin Harrison for a course of instruction, Lieut. James A. Van Horne, Roswell.

To Fort Riley for a course of instruction, Lieut. John W. Tinder, Roswell.

NEW YORK

To Army Medical School, Washington, D. C., for instruction, Lieuts. Burke C. Hamilton, Goshen; Ralph E. Costanzo, New York.

To Camp Beauregard, Alexandria, La., Lieut. D. O. Sherman, Brooklyn.

To Camp Green, Charlotte, N. C., Lieut. W. M. Scruggs, New York.

To Camp Hancock, Augusta, Ga., for duty, Lieut. Joseph G. Yocum, New York.

To Camp Sevier, Greenville, S. C., Lieut. J. L. Bryson, New York.

To Fort Adams, R. I., for duty with Provisional C. A., Lieut. John K. Johnston, Madison Barrack.

To Fort Benjamin Harrison, for instruction, Capt. George Francis Wilklow, Allenville; Herbert Cerda de Vilarrestan Cornwall, Harold M. Hays, Gustave Randolph Manning, New York; Eugene Francis Connally, Troy; Stephen Warner Perry, Warwick; Lieuts. Forest R. Mildrew, Auburn; Hubert Emile Chauvin, Brentwood; James Hayes Blakeney, William G. Phillips, Jr., Brooklyn; Geoffrey Charles Henry Burns, Central Islip; Walter L. Weeden, Clifton Springs; Harvey Columbus Hardegree, Flushing; George John Geisler, Hempstead; Victor Gabriel Bourke, Livingston Manor; George Augustine Green, Mechanicsville; John Francis Holden, New Rochelle; Valentine Collamer Baker, Edward Martin Bernecker, Edward Guilford Cary, Henry Arthur Cassebeer, James Joseph Fitzgerald, Maximilian Frick, Lewis Greenberg, Samuel Greenfield, Albert O. Jimenis, Lipman M. Kahn, John J. Lancer, Philip J. Lipsett, Henry M. Moore, William A. Murphy, Joseph E. Raia, Joseph Schapiro, New York; Raymond Samuel Barry, John Lewis Bishop, Francis J. Talbot, Niagara Falls; Clarence Albert Greenleaf, Olean; Leo J. Ward, Ossining; Rupert Vincent Gibbons, Oyster Bay; Leon James Barber, Benjamin Harrison Dike, Paul M. Parker, Rochester; George Warren Beebe, St. Johnsville; George Byron Brown, Saratoga Springs; Garrett Marcellus Clowe, Waldron A. Stearns, Claude W. Walker, Schenectady; Charles A. Joy, Sonyea; William B. McKeon, Troy; John Elywn Cochrane, Valatie; Watson A. Lawrence, Valhalla; Robert E. Plunkett, Whitehall; Lowill T. Genung, Worcester; Benjamin Harrison Betts, Yonkers.

To Fort Ethan Allen, Vt., for duty, Lieut. Leo G. Weishaar, Mount Vernon.

To Fort Oglethorpe, for a course of instruction, Capt. Harry R. Stone, Lieuts. William V. Healey, New York; Frank W. Schwartz, Springvalley.

To Fort Ontario, N. Y., for duty with hospital Unit N., Major Ralph A. Stewart, Capt. Milton Bodenheimer, Lieut. Donald E. Brace, New York.

To Fort Slocum, N. Y., for duty, Lieuts. Benjamin F. Van Duzee, Holland; William C. McKnight, New York.

To Fort Royal, Va., Capt. G. Draper, New York.

To New York, General Hospital No. 1, Lieut. Norman E. Titus, New York.

To Syracuse, N. Y., for duty, Capt. Archer D. Babcock, Syracuse.

To Takoma Park, D. C., for duty, Capt. Erastus Corning, Albany.

To Washington, D. C., for duty, Major Warfield T. Longcope, Lieuts. Linsly R. Williams, to Walter Reed Hospital, Wilbur W. Stearns, New York.

NORTH CAROLINA

To Camp Green, Charlotte, N. C., Capt. J. H. Way, Waynesville; Lieuts. S. H. Lyle, Franklin; G. Wilkes, New River; H. Robinson, Reidsville.

To Camp Sheridan, Montgomery, Ala., Capt. Everett A. Lockett, Winston Salem; Lieut. Julius N. Hill, Murphy.

To Camp Wadsworth, Spartanburg, S. C., Major John T. Burrus, High Point; Marvin L. Smoot, Fayetteville.

To Fort Oglethorpe, for a course of instruction, Lieut. Jasper N. Anderson, Albemarle; Percival R. Bennett, Bryson City; L. Dowe Floyd, Cerro Gordo; Herbert P. Moseley, Farmville; Edmund J. Bryson, Fontana; Darius C. Absher, Henderson; Frederick O. Swindell, Kittrell, Laurie J. Arnold, Lillington; William D. McLelland, Mooresville; Noah B. Adams, Murphy; Daniel F. Patchin, Roanoke Rapids; James A. Dimmette, Wallburg; Baird U. Brooks, West Durham.

NORTH DAKOTA

To Fort Riley, for instruction, Capt. Bernard S. Nickerson, Mandan; Lieuts. Julius O. Arnson, Bismarck; Orville N. Meland, Grand Forks; William Ginsberg, Omemee.

OHIO

To Camp MacArthur, Waco, Texas, Lieut. James W. Henry, Berlin Cross Roads.

To Columbus Barracks, Ohio, Lieut. John A. Rhiel, Maivern.

To Fort Benjamin Harrison, for instruction, Lieut. Otho J. Powell, Ashland; Emmett Lorenzo Hooper, Athens; Arthur J. McCracken, Bellefontaine; John Tipton Gibbons, Celina; Martin H. Urner, Charles H. Weintz, Henry L. Woodward, Cincinnati; Abraham Benjamin Grossman, Ignatius Edward Jasinski, Daniel M. MacDonald, Norman P. McGay, Emil E. Wolf, Cleveland; Wilmer E. Griffith, Hamilton; Julius Ralph Bolles, Holgate; John R. Johnson, Lima; Jacob Meyers Heyde, Loudonville; Wayne P. Macklem, Mansfield; Lee Edward Casey, Minerva; John Redman Claypool, Carroll Durham Conrad, Mount Vernon; William Harris Ambrose, New Petersburg; George P. Tyler, Jr., Ripley; Timothy G. Sellew, Watertown; Theodore J. Kasinski, Youngstown.

To Fort Oglethorpe, for instruction, Lieut. Albert B. Martin, Blanchester.

OKLAHOMA

To Camp Doniphan, Fort Sill, Okla., Capt. Benjamin H. Brown, Muskogee; Lieuts. W. P. Sims, Drumright; J. A. Walker, Fleetwood; D. S. Lee, Guymon; N. W. Campbell, Poteau.

To Camp MacArthur, Waco, Texas, Lieuts. Robert E. Calhoun, Hallett; Sims D. Beville, Poteau.

PENNSYLVANIA

To Army Medical School, Washington, D. C., for instruction, Lieuts. John J. Caffrey, Harry C. Fish, William P. Mull, Philadelphia, and Burns S. Chaffee, Pittsburgh.

To Camp Hancock, Augusta, Ga., Lieuts. George M. Laws and Thomas L. O'Drain, Philadelphia.

To Camp MacArthur, Waco, Texas, Capt. Henry K. Gaskill, Philadelphia.

To Camp Sheridan, Montgomery, Ala., Lieut. Floyd D. Lohr, Derry.

To Camp Wadsworth, Spartanburg, S. C., Capt. Stillwell C. Burns, Philadelphia.

To Columbus Barracks, Ohio, Lieut. Lauren C. Thomas, Latrobe.

To Fort Benjamin Harrison, for instruction, Capt. Ernest Marsters Vaughan, Raycersford; Lieuts. Richard J. Miller, Robert D. Scott, Philadelphia; John H. Murray, Punxsutawney, and John C. Lee, Rummerville.

To Fort Des Moines, for duty, Frank E. Boston, Philadelphia.

To Fort Ethan Allen, Vt., Lieut. Samuel McClary, Philadelphia.

To Fort Oglethorpe, for instruction, Capt. William C. Heisey, McKeesport; Sydney K. Fenollosa, Pittsburgh; Peter H. Dale, State College; Lieuts. Walter E. Lange, Allentown; David Kaufman, Altoona; Frank L. Baum, Athol; Clarence F. Bernatz, Braddock; Frank L. Knox, Claysville; Lever F. Stewart, Clearfield; Alvin Z. Stoner, Cumberland Valley; Almon C. Hazlett, Dunmore; John E. Belding, Joseph E. Dudenhofer, Carl B. Lininger, Joseph A. Stackhouse, Erie; George L. Brown, Fort Hunter; Harry Gallagher, Glen Olden; Hugh B. Barclay, Greensburg; William D. Cleland, Harlansburg; Robert H. Eshleman, George B. Kunkel, Clark S. Long, Harrisburg; Joseph C. Kochezynski, Hazleton; Harry J. Treshler, Homestead; Jacob J. Schwegler, Kennett Square; Raymond C. Fagley, Kulpmont; Joseph J. Bellas, Lansford; Alfred D. Strickler, Lebanon; Charles M. McCoy, Lewistown; Nathaniel G. Shafritz, Mont Alto; Frederick B. Allen, North Wales; John J. Bendick, Olyphant; Chester LeR. Barry, Oxford; Joseph J. Austr, James H. Baldwin, Frank D. Baumann, Franklin D. Benedict, Albert P. Berg, Charles A. Bigler, Jr., Lawrence L. Blackburn, Benjamin Bowman, Clarence D. Bradley, John W. Bransfield, Frank A. Bridgett, Alexander J. P. Conlen, Joseph R. Criswell, William H. Crowley, Arthur M. Dannenberg, Richard S. Davis, Amos K. DeBell, Jacob L. Engle, Donald R. Ferguson, Charles B. Hollis, Clarence W. Judd, I. Warner Knight, William J. MacMurtrie, Samuel McClary, James W. McMonagle, Richard L. McNeer, Stirling W. Moorhead, John P. O'Brien, Albert Pilkington, William C. T. Poulson, George M. Purves, Percy H. Shaw, James E. Talley, Morris C. Thrush, Harry E. Ungerleider, Philadelphia; Samuel J. Marks, Philipsburg; Clarence J. Buck, Wallace Bulford, Edward Graver, Benjamin Weiner, Pittsburgh; James E. Dwyer, Polk; Samuel A. Leinbach, Quakerstown, Walter M. Bertolet, John G. Knauer, Addison M. Rothrock, Reading; Samuel B. Gray, Scottsdale; Harvey B. Cornell, William J. L. Davis, William J. O'Malley, Frank R. Wheelock, Scranton; Leo T. Mullahey, Shenandoah; Jesse L. McCracken, Smithfield; James A. Buchana, Strickersville; Samuel A. Baltz, Uniontown; Henry A. Rothrock, Westchester; Augustine J. Mulligan, White Haven; Francis L. Alexaitis, John W. Cressler, William J. Doyle, Wilmer C. Dreibelbies, Cyrus Jacobosky, Thomas V. McLaughlin, Leo C. Mundy, Robert H. Murdock, Wilkes-Barre, and Benjamin H. Patterson, Wilkesburg.

To Fort Slocum, N. Y., Lieut. Frank N. Greene, Philadelphia.

To Governors Island, N. Y., for duty, Capt. James T. Madden, Pittston.

To Rockford, Ill., to Camp Grant for duty, Lieut. Allen H. Moore, Philadelphia.

To Spartanburg, S. C., for duty, Capt. Sigmund L. Gans, Philadelphia.

To Syracuse, N. Y., with infantry brigade to complete the medical personnel, Lieut. Melbourne J. Pond, Warren.

PHILIPPINE ISLANDS

Honorably discharged, Capt. George B. Angle, Manila.

RHODE ISLAND

To Camp Kearney, Linda Vista, Calif., Lieut. J. G. Norman, Providence.

To Fort Ethan Allen, Vt., for duty, Lieut. Richard Metcalf, Providence.

To Fort Ontario, N. Y., with Hospital Unit N., Lieut. Robert H. Whitmarsh, Providence.

SOUTH CAROLINA

To Camp Sevier, Greenville, S. C., Capt. C. B. Earle, Greenville; Lieuts. A. B. Weathersbee, Belton; E. W. Pressly, Clqver; C. B. Geiger, Manning.

To Fort Oglethorpe, for instruction, Lieuts. Fitzhugh P. Salley, Buffalo; John C. Wieters, Charleston; John R. Claussen, Claussen; Lindsay Peters, Columbia; James A. Norton, Conway; Oscar A. Alexander, Andrew T. Baird, Darlington; William J. Burdell, Lugoff; Dalmar R. Blakeley, Mauldin; Frank D. Mower, Newberry; William B. Ackerman, Walterboro.

SOUTH DAKOTA

To Fort Riley, for instruction, Lieuts. Frederick O. Kaps, Britton; Glenn V. Sigler, Highmore.

TENNESSEE

To Camp Bowie, Fort Worth, Texas, Lieut. W. Hibbets, Nashville.

To Camp Logan, Houston, Texas, Capt. J. M. Ballew, Memphis.

To Fort Oglethorpe, for instruction, Lieuts. Joseph P. Delaney, Arrington, David T. Austin, Bogota; Victor H. Miller, Bolivar; Nicholas Ardan, Bristol; Benjamin C. Arnold, Jackson; Llewellyn M. Dykes, Johnson City; Ludlow Lambain, Knoxville; Edgar S. Turner, LaFollette; Sam W. Donaldson, Maryville; Clarence A. Bell, Kinsey M. Buck, Max Kaplan, Lawrence L. Keller, Memphis; William R. Arrants, Thurman B. Civan, Nashville; Robert L. Dossett, Tullahoma; Daniel L. Haggerty, Unionville; Thomas W. Rhodes, Whiteville.

To Fort Riley for instruction, Lieut. Benjamin G. Allen, Chattanooga.

TEXAS

To Ambulance Company No. 12, Capt. Paul N. Bowman, San Antonio.

To Camp Bowie, Fort Worth, Texas, Lieut. G. A. Deason, Henderson.

To Camp Cody, Deming, N. M., Capt. Thomas C. Brooks, Bay City; Joseph S. Jones, Galveston; Ernest H. Hamilton, Kilgore.

To Camp Hancock, Augusta, Ga., Lieut. Knight W. Field, Dallas.

To Camp Logan, Houston, Texas, Capt. G. A. McBride, Harlingen; Lieuts. J. E. Cooke, Mart; W. P. Barton, Overton.

To Camp MacArthur, Waco, Texas, Lieuts. Robert M. Prather, Beeville; Harry D. Nifong, Britton.

To Camp Wadsworth, Spartanburg, S. C., Lieut. Robert L. Dinwiddie, San Antonio.

To Fort Benjamin Harrison, for instruction, Lieut. Lewis William Fetzer, Dallas.

To Fort Bliss, Major Frederick H. Mills, Fort Bliss.

To Fort Riley for instruction, Lieut. Thomas M. Greenwood, Buff Dale.

To Fort Sam Houston, Camp Kelly, South San Antonio, for assignment to Thirty-Fifth Aero Squadron, Lieuts. Charles H. Brownlee, Burnet; Thirty-Fourth Aero Squadron, Edwin R. Townsend, Fredericksburg; Thirty-Seventh Aero Squadron, Herbert L. McNeil, Galveston.

To report by telegraph to commanding general, Southern Department, for duty, Lieuts. Jesse H. Lander, Beeville; Young J. Mulkey, Clifford C. Parrish, Fort Worth; Talmage O. Wooley, Germantown; William O. Williams, Houston; Lucian Nicholson, Paris.

UTAH

To Fort Douglas, Utah, for duty, Capt. William F. Beer, Salt Lake City.

VERMONT

To Fort Benjamin Harrison, for instruction, Lieuts. Charles E. Libbey, Danville; Frank Leslie Gilbert, Grofton; George Lucian Bates, Morrisville.

To Fort Riley, for instruction, Lieut. Frederick E. Clark, Burlington.

VIRGINIA

To Fort Oglethorpe, for a course of instruction, Capt. Howard Fletcher, Fairfax; Lieuts. Bernard Barrow, Barrows Store; William S. Wiley, Bristol; Erik T. Sandberg, Cardinal; Samuel T. Elliott, Danville; Urbane F. Bass, Fredericksburg; Charles A. Young, Gore; James S. Burger, Hopewell; Benjamin B. Dutton, Lot; Otis T. Amory, Newport News; Oliver F. Blankingship, James G. Boisseau, Richmond.

To Fort Riley, for instruction, Lieut. William H. Howard, Hampton.

To Rockford, Ill., Camp Grant, for duty, Lieut. David A. Haller, Pocahontas.

WASHINGTON

To Camp Wheeler, Macon, Ga., Lieut. H. L. Upshaw, Tacoma.

To Fort George Wright, Wash., for duty, Lieut. Nathaniel E. Roberts, Olympia.

To Fort Riley, for instruction, Lieut. John W. Adams, Waterville.

To report by telegraph to the commanding general, Western Department, for assignment to duty, Capt. Herbert C. Liesser, Vancouver; Lieut. John A. Mapes, Index.

To Vancouver Barracks, Wash., for duty, Capt. Herbert C. Leisser, Vancouver.

WEST VIRGINIA

To Fort Benjamin Harrison, for instruction, Capt. John Budd Thompson, Spencer.

To Fort Oglethorpe, for instruction, Lieuts. Atlee Mairs, Charleston; Charles F. McHood, Alderson; John J. Goodwill, Coopers; George F. Grisinger, Gamoca; Dennis J. Cronin, Huntington; Grover C. Roberson, Hurricane; Conrad F. Sayre, Mason; Meriwether L. Anderson, Richmond, and Emerson Megrail, Wheeling.

WISCONSIN

To Fort Riley, for instruction, Capt. Clarendon J. Comos, Oshkosh, and Frederick C. Huff, Sturgeon Bay; Lieuts. Sylvester J. Driessel, Barton; Albert A. Axley, Butternut; Henry B. Beeson, Cornell; Frank J. Hager, Denmark; Louis J. Bennett, Fort Atkinson; William A. Joseph, Hancock; Royal C. Rodecker, Holcombe; Harry J. Burns, Hudson; Frank O. Brunkhorst, Kewaunee; Norman O. Nelson, Madison; Edgar B. Elvis, Medford; Irving Van Vliet Grannis, Menomonie; Gerhard A. Bading, Max Bornstein, and Albert G. Jenner, Milwaukee; John C. Johnson, Ogdensburg; Marlin C. Crane, Osseo; Herbert T. Barnes, Pewaukee; Paul H. Fowler, Plaine; Edgar W. Bedford, Sheboygan; Richard W. A. Dehmel, South Germantown; Edward P. Evans, South Milwaukee; George I. Badeaux, Spooner; Wayne F. Cowan, Stevens Point; Harry A. Keenan, Stoughton; Walter A. McEachern, Superior; Neal S. Simons, Taylor; George R. Baker, Tomahawk; John E. Boland, Two Rivers; Harry E. MacLaughlin, Waupaca; George LeR. Converse, Webster; James C. Tyvand, Whitehall; Charles C. Rowley, Winnebago.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ILLINOIS

Whooping Cough.—The health commissioner of Winnetka reports that there have been forty-six cases of whooping cough in that suburb, with two deaths.

Infantile Paralysis.—During the week ending August 18, sixteen cases of infantile paralysis were reported to the state department of health, seven of which were outside of Chicago.

Personal.—Dr. Howard T. Child, Kankakee, has been elected pathologist to the State Hospital for the Insane, Norristown, Pa.—Dr. Cyrus H. Anderson, McLeansboro, recently appointed superintendent of the Anna State Hospital, has sold his newspaper, the *Leader*.—Major Herman H. Tuttle, M. C., Ill. N. G., Springfield, has been appointed sanitary inspector of Camp Logan, Houston, Texas.—Drs. Frank P. Norbury, Springfield, and Edwin C. Hayes, Urbana, have been appointed members of the state board of public welfare commissioners.

Chicago

Personal.—Dr. Emil C. Dudley has been appointed a member of the state board of public welfare commissioners.—Dr. John L. Porter has been appointed a member of the commission on military orthopedics.

Graduate Lectures.—Major G. Seelig, professor of surgery in the St. Louis University, recently delivered a lecture on "Shock," and Dr. Bennet M. Allen, professor of zoology in the University of Kansas, an address on "Experiments on the Glands of Internal Secretion in Amphibian Larvae" before the faculty and students of the graduate summer quarter in medicine of the University of Illinois.

New Appointments at Northwestern.—Northwestern University Medical School announces the following faculty appointments for 1917-1918: Drs. Frederick G. Harris, professor of dermatology and syphilology, succeeding Prof. Joseph Zeisler, who becomes professor emeritus of dermatology; Frank C. Becht, professor of pharmacology, succeeding Prof. Hugh McGuigan; John Ridlon, honorary professor of orthopedic surgery; John L. Porter, professor of orthopedic surgery; Herbert A. Potts, professor of oral surgery; Frank E. Simpson, adjunct clinical professor of dermatology; Charles P. Caldwell, adjunct clinical professor of medicine; Edward L. Moorhead, adjunct clinical professor of surgery.

INDIANA

New Medical School in Indiana.—A letter from the secretary of the University of Notre Dame, Notre Dame, indicates that that university has established a department of medicine which will offer only the first two years of the medical course. Two years of college work are to be required for admission, which, followed by two years of medical work, completes the course for the degree of bachelor of science in medicine.

MARYLAND

Notice from Health Department to Parents.—A bulletin has been issued by the health department requesting parents and guardians to have every child of school age suffering from diseased tonsils, adenoids or defective eyesight treated before entering school in order to prevent an epidemic of infectious diseases.

Personal.—Dr. Alexander D. McConachie, Baltimore, is at his home, convalescent after an operation for appendicitis, performed August 1.—Dr. Henry Barton Jacobs, Baltimore, has been elected governor of the Newport Reading Room for a term of three years.—Drs. William Robert Johnson and Robert William Johnson, Baltimore, twin brothers, received commissions in the Medical Reserve Corps recently.

MISSOURI

Personal.—Dr. Jesse L. Eaton, Bismarck, division surgeon of the Missouri Pacific and Illinois Southern railroads, has been appointed superintendent of State Hospital No. 4, Farmington, and assumed control of the institution, August 1.

Correction.—In THE JOURNAL, August 18, there appeared a notice of the death of Dr. Marcus B. Austin, Brunswick, Mo. The information was derived from a local newspaper, and was premature, as Dr. Austin writes that, although he has been ill with septicemia, he is very much alive and has no present intention of dying.

Health Committee Named.—The chairman of the Missouri Council of Defense has announced the appointment of the following committee on public health: Drs. Raymond C. Shaffer, St. Louis, dean of Washington University Medical School; Guy L. Noyes, Columbia, dean of the University of Missouri Medical School; George H. Jones, Jefferson City, secretary of the state board of health; William T. Coughlin, St. Louis, and Herman E. Pearse, Kansas City.

St. Louis

Personal.—Dr. John S. Young, a member of the Harvard Surgical Unit, who was reported to have been killed, replies, contradicting the rumor of his death, which he says is "Quite wrong."—Drs. John W. Stewart and Herbert S. Langsdorf have been appointed resident surgeons at the City Hospital.—Dr. Harry T. Evans has been appointed house physician for the Missouri State Sanatorium, Mount Vernon.

NEW YORK

New Convalescent Home.—A tract of 550 acres between Peekskill and Oscawanna in Westchester County has been purchased as a site for the Valeria Home for Convalescents, which was founded by the late Jacob Langeloth.

Medical Director Assumes Control.—Dr. Roy L. Leak, superintendent of the Syracuse City Psychopathic Hospital, and professor of medical jurisprudence in the medical department of Syracuse University, has succeeded Dr. William C. Sandy, Jr., resigned, as medical director of the South Carolina State Hospital for the Insane, Columbia.

Compulsory Hospital Law Passed.—The committee on the prevention of Tuberculosis of the New York State Charities Aid Association has been successful in securing an amendment of the county tuberculosis hospital law, whereby the erection of hospitals is mandatory in counties of 35,000 population or more. The new law affects twenty counties, eight of which had previously taken action leading to the establishment of a hospital, but had not yet let contracts; of these, two have already signed contracts for the erection of a hospital. Of the twelve remaining counties which had taken no previous action, eleven have since taken definite steps such as appointment of committees to secure sites, advertising for bids, etc.

New York City

Imprisoned for Draft Plot.—Dr. Samuel J. Bernfeld, a member of Exemption Board No. 99, charged with conspiracy to obstruct the draft laws, is reported to have entered a plea of guilty, and to have been sentenced to two years' imprisonment in the Federal Penitentiary, Atlanta, Ga. The specific charge against the defendant was the acceptance of a bribe from a registrant to exempt him.

School for Crippled and Blind.—New York is to have a Red Cross institute for teaching crippled and blind men to be self-supporting. Jeremiah Milbank has contributed \$50,000 for the promotion of this undertaking, and Edward T. Devine of the New York School of Philanthropy has gone to France to study the method of teaching the blind and cripples in the reeducational schools of France.

Rockefeller Releases Funds for Emergency War Work.—Recently it was announced that Mr. John D. Rockefeller had withdrawn the stipulation with reference to the administration of the Rockefeller Foundation, by which he reserved the right to indicate how a portion of the income should be spent. He has now gone a step further, and has decided that in addition to giving the income from the \$100,000,000 given the foundation for emergency war work, \$10,000,000 of the principal may be drawn on. Already appropriations aggregating \$6,426,872 have been made from this draft on the foundation's investments, including \$5,000,000 given the Red Cross. The appropriations announced include the Young Men's Christian Association, \$100,000 for the same purpose; building and equipping the demonstration war hospital, \$300,000, and \$100,000 for the Belgian Relief Commission. The International Health Board received \$100,000 for combating tuberculosis in France, in connection with the French government, while lesser sums have been given for Assyrian and Armenian relief, for the preparation and distribution of serums to be used in the war.

hospital special research in war medicine, and other needs growing out of the war.

NORTH DAKOTA

New State Board.—Drs. Albert W. Skelsey, Fargo; Joseph C. Suter, Grafton, and Alexander J. McCannel, Minot, have been appointed members of the State Board of Medical Examiners.

Personal.—Dr. Gustave L. Rudell has been appointed local surgeon of the Minneapolis, St. Paul and Sault Ste. Marie Railway at Plaza.—Dr. Peter A. Nestos, Minot, has succeeded Dr. Alexander J. McCannel as local surgeon of the Minneapolis, St. Paul and Sault Ste. Marie Railway.

OHIO

Whooping Cough.—The health commissioner of Cleveland announces that there are 1,000 cases of whooping cough in the city and that thirteen deaths have been caused by the disease since February 1.

Physicians' Building Planned.—A sixteen-story building is to be erected at Cleveland which will cost \$750,000, and will be used exclusively by physicians and dentists, and dealers in medical and dental supplies.

Cancer Committee Appointed.—The following have been named as a state committee to investigate cancer, and to institute measures whereby the mortality from this cause may be reduced: Drs. Andre Crotti, Columbus; Julius H. Jacobson, Toledo, and Charles E. Holzer, Gallipolis.

The Tuberculosis Conflict.—The Cleveland City Council has been asked for an immediate appropriation of \$500,000 to provide a hospital for patients with advanced cases of tuberculosis with accommodation for 350 patients, accommodation for 200 additional patients in the incipient stage, and a nurses' home at the Warrensville Sanatorium.

Personal.—Dr. William K. Ruble, Martinsville, who was recently elected treasurer of Clinton County, has moved to Wilmington.—Dr. John J. McShane, secretary of the board of health of Akron, has resigned to accept a position with the Illinois State Board of Health.—Dr. E. Benjamin Gillette has succeeded Major Dale Wilson as police and fire surgeon of Toledo.—Dr. Claude C. Craig, Urbana, announces that on account of his health he will retire from the practice of medicine.

Hospital Notes.—Differences between the authorities of St. Elizabeth's Hospital, Dayton, and the medical staff of the institution have resulted in the elimination of the maternity ward of the hospital.—The Fountain Park Sanatorium which is under construction in Champaign County will be ready for occupancy this month. The building will have cost, when completed, about \$10,000.—Dr. Wilford White, Ravenna, states that on account of ill health he contemplates the permanent closure of the White Hospital.—The Inter-County Tuberculosis Hospital, Chillicothe, which is being built by Fayette, Ross, Pike, Vinton, Pickaway, Clinton and Jackson counties, is now completed and ready for occupancy.

Postgraduate Course at Dayton.—The Second Councilor District branch of the Ohio State Medical Association will hold a medical chautauqua at Dayton, September 24-28. On each day lectures will be given from 9 o'clock until 4, with the exception of one hour which is set apart for lunch. Among the lecturers will be Drs. Charles Emerson, Indianapolis, who will speak on "Internal Medicine and Nervous Diseases"; Dr. Martin H. Fischer, Cincinnati, on "Physiology and Focal Infections"; Dr. Alfred S. Warthin, Ann Arbor, Mich., on "Pathology"; Dr. Isaac A. Abt, Chicago, on "Pediatrics"; Dr. Rudolph W. Holmes, Chicago, on "Obstetrics"; Dr. Edward Carl Rosenow, Rochester, Minn., on "Focal Infections in Relation to Systemic Diseases," and Dr. Carl A. Hamann, Cleveland, on "Surgery."

PENNSYLVANIA

Medical Corps Changes.—The following officers have been commissioned: Lieut.-Col. William E. Keller, Lackawanna County, July 17, assigned to duty with the division; Charles H. Furnee, Armstrong County, assigned Sixteenth Infantry.

Infantile Paralysis.—There have been reported to the state health department from New Castle thirty-four cases of infantile paralysis in a little more than a month. Moving picture theaters have been closed, and children have been prohibited from attending church and Sunday-school services. Thus far nine deaths from the disease have been reported.

Personal.—Dr. David L. Simon, Pittsburgh, has been appointed chief police and fire surgeon, succeeding Dr. D. E. Sable, who is on duty as major in the First Field Artillery. The salary of Dr. Richard G. Burns, acting director of the Pittsburgh Department of Health, has been increased to \$7,000.—Dr. John J. Coffman, Scotland, is convalescent after a serious illness.—Dr. Samuel G. Dixon, state health commissioner, Pittsburgh, is under treatment at the White Pine Sanatorium, Chambersburg.

Philadelphia

New Red Cross Hospital.—The superintendent of the Medico-Chirurgical Hospital announces that the present staff of the hospital will be retained in its entirety as the staff of the First General Red Cross Hospital. The hospital building will be left intact until the end of the war.

Prevention of Tuberculosis.—Capt. Milton H. Fussell and Lieuts. David Riesman and Augustus A. Eshner, M. R. C., U. S. Army, have been appointed a board to investigate the conditions which may develop tuberculosis among officers of men among the National Army. They are making systematic surveys of the various mobilization and cantonment camps.

Personal.—The following physicians of Philadelphia have responded to the call of the Surgeon-General for men skilled in the treatment of the eye: Dr. George E. de Schweinitz, who has been commissioned a major in the Medical Reserve Corps; Drs. Benjamin F. Baer, Thomas B. Holloway, William T. Shoemaker, John G. Clark, Albert Pilkington, John R. Forst and L. Webster Fox.

Women's Medical College to Train for Service.—The Women's Medical College of Pennsylvania has arranged three special lecture courses to equip those who wish to serve their country. For the women who plan reconstructive work in the devastated villages of Europe, there will be thirty lectures weekly throughout the college year. This is a course on personal and public hygiene. Also there will be a course in laboratory technic to prepare for routine work in war hospitals, and a course in nutrition and dietetics.

Graduate Physicians Only Appointed.—At the meeting, August 7, of the South Philadelphia Branch of the Philadelphia County Medical Society, resolutions were adopted taking exception to the appointment of an osteopath as a member of the draft exemption board; recommending that only regularly graduated physicians be appointed on the draft board, and referring the matter for immediate approval to the county medical society, with the request that the governor of the state be notified of the attitude of the profession in this regard.

Hospital Units Ready.—Four of the six hospital units being formed in this city for active service have their personnel and equipment all complete, and are ready to sail at any time. These are the Jefferson, known as Base Hospital Unit No. 38, comprising twenty-two doctors, two dentists, sixty-five nurses, 152 enlisted men and five civilian employees; Red Cross Hospital Unit A of the Presbyterian Hospital, comprising twelve staff physicians, twenty nurses and fifty aids; the Episcopal Hospital, Base Unit No. 34, comprising twenty-five staff members, five stenographers, sixty-five nurses and 148 enlisted men, and that of the University of Pennsylvania. Besides these, the Hahnemann Hospital Unit and the Naval Hospital Unit of the Methodist Episcopal Church will be complete in the next few days.

CANADA

Legislation for Roentgenography.—The Medical Council of Ontario has initiated a movement to secure legislation to prevent unqualified men from doing roentgenographic work.

Free Distribution of Antitoxin.—Dr. Maurice M. Seymour, Regina, commissioner of public health for the Province of Saskatchewan, announces that on and after September 1, free distribution of diphtheria antitoxin will be made in that province by the provincial bureau of public health.

Sick and Wounded in Canadian Hospitals.—August 17, there were 8,811 soldiers receiving treatment in Canada; 7,032 in convalescent homes, 1,104 in sanatoriums for the treatment of tuberculosis, and 675 in other institutions. The returned soldiers are classified as those fit for general service; those fit for service abroad but not for general service; those fit for service in Canada; those temporarily unfit for service, and those awaiting discharge or reclassification.

The Bruce Report.—In spite of repeated requests in the Canadian House of Commons, the report of Col. Herbert A. Bruce, Toronto, in reply to the Bapst report, has not yet

been presented in that body. It is understood that many of the recommendations made by Dr. Bruce have since been adopted by the Canadian military authorities; and the delay in presenting the report is due to the fact that it had been forwarded to the Acting High Commissioner in London, and has not yet been returned.

Personal.—Capt. Roland Young, M.D., Oshawa, Ont., has returned after two years' service overseas. Dr. Young was in a hospital in Malta with the Royal Army Medical Corps, and lately had been in charge of an internment camp of Turks near Cairo, Egypt.—The Military Cross has been awarded the following members of the Canadian Army Medical Corps, recently: Capt. Hugh Hart, Douglas B. Kennedy, Ronald H. MacDonald, Saskatoon, Robert J. Manson and Arthur C. Armstrong.—The *Croix de Guerre* has been awarded by the French government to Lieut. W. E. Ord, R. A. M. C.

Venereal Disease Problem.—The Toronto Board of Health is going to grapple with this problem so far as it concerns the city of Toronto. It is not likely that notification will be required, as legislation would need to be sought for such power from the provincial legislature, but it may be expected that there will be some arrangement brought about between the medical officer of health and the practitioners of the city. A sign of good omen is the interest manifested in repeated editorials on the subject from time to time appearing in the public press. A few months ago the whole subject was gone into thoroughly by the public health section of the Academy of Medicine, and a resolution adopted calling on the provincial board of health to carry on an educational campaign, and for the government to lend financial assistance to the extent of \$10,000 for the equipment and maintenance of district laboratories in various parts of the province.

New Officers.—The New Brunswick Medical Society annual meeting was held the latter part of July in St. John: Dr. Frederick H. Wetmore, Hampton, president; Dr. George G. Melvin, St. John, second vice president, and Dr. Stephen H. McDonald, St. John, corresponding secretary.—The Medical Society of Nova Scotia annual meeting was held in July at Halifax: president, Dr. Jordan W. Smith, Liverpool; secretary-treasurer, Dr. James R. Corston, Halifax, reelected. The next annual meeting will be held in Liverpool.—The Canadian Medical Association annual meeting was held in Montreal: president, Dr. James McKenty, Winnipeg, Man. Winnipeg was decided on as the place of meeting in 1918.—The Prince Edward Island Medical Society annual meeting was held in Summerside in July: president, Dr. Edwin T. Tanton, Summerside, and secretary, Dr. Ira J. Yeo, Charlottetown, reelected.

GENERAL

Exposition of the Chemical Industries.—The third National Exposition of Chemical Industries will be held in Grand Central Palace, New York, during the week of September 24. The exposition will cover all the ramifications of chemical industry.

Bequests and Donations.—The following bequests and donations have recently been announced:

St. Mary's Free Hospital for Children, New York, \$2,000, by the will of Mrs. Laura F. Hearn.

Flagler Hospital, St. Augustine, Fla., \$125,000, by the will of Mrs. Robert Worth Bingham, to rebuild the hospital, which was destroyed by fire last year.

Orthopedic Hospital, Philadelphia, \$30,000, by the will of Lillie G. Newton.

Malaria and Hookworm.—Surg. French Simpson, U. S. P. H. S., has been ordered to Columbia, S. C., to take charge of the campaign against malaria.—Dr. Charles Wardell Stiles, U. S. P. H. S., has discovered forty-seven cases of hookworm in seventy-five recruits mobilized for war service, and these findings have caused the United States Public Health Service to recommend the prompt examination for hookworm of all units of the National Guard and National Army, especially those from the South.

Missouri Valley Physicians to Meet.—The thirtieth annual meeting of the Medical Society of the Missouri Valley will be held in Lincoln, Neb., September 20 and 21, with headquarters at the Hotel Lincoln. Dr. Charles R. Woodson, St. Joseph, Mo., is president of the association, and Dr. Charles Wood Fassett, Kansas City, Mo., secretary. The arrangements are in the hands of the Lancaster County Medical Society, with Dr. Karl S. Hohlen as chairman. The principal topic for the meeting is announced as "How Can a Medical Man Best Serve His Country?"

Mississippi Valley Association Meeting.—The forty-third annual meeting of the Mississippi Valley Medical Association will be held in Toledo, October 9-11, under the presidency of Dr. Channing W. Barrett, Chicago. The Hotel Secor has been selected as headquarters, and Dr. Willard J. Stone, Toledo, is chairman of the committee of arrangements. The oration in surgery will be delivered by Dr. Joseph C. Bloodgood, Baltimore, and on the last day a joint session will be held with the Inter-State Association of Anesthetists. The principal symposiums will be on Surgery of the War; Otology and Ophthalmology; Goiter and Syphilis.

Federal Child Labor Law Becomes Effective.—The Federal Child Labor Law becomes effective, September 1, after which date no child under 14 may be employed in any factory, mill, workshop or cannery in the United States, the products of which are to be shipped in interstate commerce, and no child under 16 years of age may be employed in a mine or quarry. The working day of children between 14 and 16 years of age must not be longer than eight hours, and they may not be employed between 7 p. m. and 6 a. m. The Children's Bureau of the Department of Labor is actively undertaking the coordination of this new federal law with those of the various states.

Civil Service Examinations.—The following examinations are announced by the United States Civil Service Commission:

September 18: Inspector, Child Labor Division; salary, \$1,800 to \$2,400; duties, to keep informed as to the employment of children in all industries, to make inspections of factories, mills, mines, workshops, etc.; to supervise the work of assistant inspectors, and to aid in the enforcement of the law.

September 18: Assistant Director, Child Labor Division; salary, \$2,400 to \$2,820; applicants should be familiar with the general problems of child protection and factory inspection, and should have administrative ability.

September 18: Experts in Child Welfare; salary, \$1,800 to \$2,400; duties, the planning, supervising and writing of reports on special studies of the various aspects of child welfare, such as infant mortality, the birth rate, orphanages, desertion, juvenile court, dangerous occupations, accidents and diseases of children, employment, and legislation affecting children.

September 18: Assistants in the Prevention of Infant Mortality (women); salary, \$1,800 to \$2,400; applicants must be graduates from a school of nursing; duties, to assist in conducting investigations into the causes of infant, child, and maternal mortality, and into community measures for their prevention, and to make reports on these subjects, with recommendations for improvement.

September 18: Experts in the Prevention of Infant Mortality; salary, \$2,400 to \$3,600; applicants must be graduates of a medical school of recognized standing, and must have at least three years' specialization in hygiene and diseases of childhood or in the prevention of infant and child mortality; the duties are to plan and conduct investigations into the causes of infant, child, and maternal mortality; into the methods of their prevention, and into dangerous and injurious occupations and other matters relating to the health of children.

September 19-20: Special Agents and Research Assistants; salary, \$1,200 to \$1,680; duties, the collection in the field of data for use in the preparation of reports.

Applications should be made to the Civil Service Commission, Washington, D. C., or a local civil service board, stating the title of the examination desired, and these applications should be filed with the commission at Washington, prior to the hour of closing business on the date stated above.

FOREIGN

Deaths in the Profession Abroad.—The cable brings word of the death of two prominent chemists in Germany last week, **Adolf von Baeyer**, a giant of chemical synthesis, professor of chemistry at the University of Munich, raised to the hereditary nobility with the title of "Excellency" some years ago. Also **Eduard Buchner**, professor of chemistry at the University of Würzburg, and chief of the Chemical Institute. He has been serving at the front with the rank of major, and succumbed to wounds.—**H. Taborda**, an eminent medicolegal authority in Argentina, director of the *Revista del Circulo Medico Argentino* and founder of the international organization of university students of Latin America.—**H. Gallay**, inspector of the French colonial troops.—**H. F. H. Newington**, president of the Medico-Psychological Association of Great Britain and Ireland, aged 70.—**T. B. Darling** of Edinburgh. Recent casualty lists contain the names of Capt. **G. S. Pirie** of Cape Town; Major **W. D. Kirkland** of Australia; Lieut.-Col. **J. H. Horton**, aged 46, who had served in Africa, in India and with the British Red Cross in the Balkan War of 1912. He had charge of an Indian field ambulance in France since the beginning of the war; Capt. **R. H. Bharucha** of India; Capt. **R. H. Drennan** of Ireland; Capt. **G. D. East** and Capt. **A. C. Edwards** of England.

PARIS LETTER

PARIS, Aug. 2, 1917.

The War

IMMEDIATE SURGICAL TREATMENT OF PULMONARY WOUNDS

At one of the recent meetings of the Société de chirurgie de Paris, Dr. Barnsby reported four new cases of primary thoracotomy in the treatment of pulmonary wounds caused by the bursting of shells, all of which cases resulted in recovery. Dr. Lefèvre operated in two of the cases and Dr. Barnsby in the other two. In all four cases the operations were performed under ether anesthesia on a closed thorax and were undertaken with a view to the direct treatment of the pulmonary wound by the extraction of the projectiles and the costal splinters, the suturing of the lung and the cleansing of the pleura. In three of the cases there was a large enclosed fragment, covered by a strip of flesh. In one case the projectile had penetrated the right side of the chest after the manner of a seton and had pierced the right lung, producing a hemorrhage, on which account the lung was resected and sutured. The projectile also ripped up the diaphragm for a length of 12 cm. and introduced costal splinters and particles of clothing into the lung and the pleural cavity. In all these cases one side of the chest was evacuated and in two cases the suturing of the lung was accomplished (in one case after resection). In two of these cases particles of clothing and free splinters embedded in the lungs or in the pleura were removed. In all cases a cleansing of the pleura under ether and a primary suture without drainage were effected.

Barnsby emphasizes the following points: 1. The simplicity of ether anesthesia, for which the tolerance of patients with chest wounds is excellent. 2. The extraordinary ease with which the severely wounded endure thoracotomy, and the possibility of working more deliberately in thoracotomy as compared with laparotomy, as is shown by the curves of maximal and minimal tension. In the first case (a difficult thorax case), the maximal tension decreased at the end of the ether anesthesia, rose again shortly, and became stable in spite of the pneumothorax, the traction on the lung and the cleansing of the pleura under ether. In the second case (a simple abdominal case), all the steps taken in the course of the operation—the incision of the peritoneum, traction on the stomach or the intestine, and lavage of the peritoneum under ether—produce an abrupt effect on the maximal and minimal tension. 3. The advantage of anterolateral thoracotomy (according to Duval) with ample permanent or temporary resection of the fourth rib which permits one to see everything and to suture a lung quickly and well. 4. The frequency of free costal splinters embedded in the lungs or the pleura. 5. The desirability of primary suturing if one operates within six hours and everything is in good shape and the pulmonary wound is correctly repaired. 6. That an advantage might lie in favor of draining the pleura if one operates after twelve hours or more, and if it is impossible to make a taut suture of the lung and more especially of the wall, which occurs frequently in the case of broken ribs, accompanied by extensive destruction of the pleura and the parietal muscles. The purpose of pleural drainage would be to avoid complications, benign, it is true, as compared with the operation itself, but nevertheless troublesome, such as repeated punctures of the pleural collections which may be still frequent, and the drainage made necessary by secondary purulent pleurisy.

To sum up, primary thoracotomy for the immediate treatment of pulmonary wounds is an excellent operation, which, in certain cases, makes it possible to save the lives of men otherwise doomed to certain death. Besides an open thorax, as regards which there is common agreement, it constitutes the operation of choice if it is a question of applying it also to serious wounds within a closed thorax. By this is meant men with chest wounds, especially those who have been hit by large shell splinters, who reach the first-aid stations suffering from shock, with a pale facies, a strong dyspnea, a bad pulse, those whose tension is low and sinks lower during the hour following their arrival—those who, in a word, most frequently die if one refrains from operating. Intervention, to be sure, will not save them all, but it will enable us to lower the percentage of mortality.

SPECIAL DISPENSATION TO STUDENTS KEPT BACK BY THE WAR

The minister of public instruction recently signed a decree abolishing, for the duration of the war, certain regulations in regard to grades and credits, which will inure to the benefit of students who have been kept back in their studies owing to the exigency of war. This decree applies exclusively to

the entrance requirements for admission to the colleges and institutions of higher learning, and to special exemptions granted with reference to prerequisite scholarship in connection with studies pursued in these institutions.

AMERICAN SANITARY AID IN THE FIGHT AGAINST TUBERCULOSIS

A few days ago, there arrived in Bordeaux an American sanitary mission, chairman of which is Dr. Livingstone Ferrand, president of the University of Colorado. Associated with Dr. Ferrand are Dr. Miller of the University of Columbia; Dr. Fox, sociologist and chairman of the State Charities Aid Association of New York, and Mr. Place, secretary of the mission.

Toward the middle of 1915, the report was spread in the United States that tuberculosis was making frightful ravages in France, not only in the army, but among the civil population as well. Accordingly, the American government sent to France last winter a commission of inquiry, whose duty it should be to inquire into the matter. The truth of the report was soon verified. Under these circumstances, the government of the United States, with the cooperation of the Rockefeller Foundation, decided to aid the French authorities in their fight against the devastating scourge by placing at their disposal men who had had experience with the anti-tuberculosis methods employed with such great success in America, as shown by the following statement made by Dr. Livingstone Ferrand: "During the last twenty-five years the mortality due to tuberculosis has diminished in America by 50 per cent., owing to the therapeutic and preventive measures that have been adopted."

The mission will visit without delay those of our hospitals in which tuberculous patients are cared for, and will aid in the introduction and application of the methods which have been developed in the United States.

LONDON LETTER

LONDON, Aug. 7, 1917.

The Annual Meeting of the British Medical Association

The eighty-fifth annual meeting of the British Medical Association has been held in London. In consequence of the war, no scientific papers were read and only political subjects were discussed. The resolution of the Central Medical War Committee approving of the principle of mobilization of the medical profession apart from any question of general mobilization of the whole community, so that every individual whose name is on the National Register shall be held bound to give such service as he is competent to give when required to do so by the government, was passed with the proviso, "provided such mobilization be carried out on a scheme approved by the profession under the discretion of an accredited representative." This proviso was adopted after rejection of an amendment by the Liverpool branch disapproving of any attempt to control the liberties of the profession differently from those of members of other professions.

A Ministry of Health

At the request of the government, the council of the British Medical Association submitted the following scheme for the creation of the Ministry of Health: "That a ministry of health should be created to take over from existing government departments such duties as are concerned with the health of the community, and to deal with those duties only; that the administrative functions of the ministry should be carried out by a board presided over by a minister of cabinet rank; that the country be divided into suitable administrative areas under local administrative health centers consisting of representatives (a) of the rating authorities; (b) of the education authorities; (c) of the persons contributing to a scheme of health insurance (including employers of labor); (d) the medical profession; (e) public hospitals; (f) dentists; (g) pharmacists, and (h) nurses; that the principal medical officers of each center should be two, of equal status, one representing the clinical side (chief clinical officer) and the other the preventive side of medicine (medical officer of health); that for each area, hospitals, clinics or treatment centers should be recognized or established at which persons entitled to treatment under the public scheme should be able to obtain institutional, consultative or specialist services on the recommendation of their medical attendant." The meeting passed a resolution by an overwhelming majority in favor of the appointment of a ministry of health. The president, Sir Clifford Allbutt, was reelected president for the coming year, and the hope was expressed that next year the meeting might be held at Cambridge, where the association

might have the pleasure of hearing one of his polished and scholarly addresses as well as an address or two in medicine and surgery, though meetings of the sections were out of the question.

The Health of London: Marked Freedom from Diseases

The report of the medical officer of health of the London County Council (Dr. W. H. Hamer) for the year 1916, which has just been issued, shows that the health of London during the year compares favorably with that of 1915. The general condition as regards nutrition of the mass of the people has probably rarely, if ever, been better, and there has been freedom beyond the most sanguine anticipations from most of the war diseases. Much of this has been due to the war restrictions on communication and traffic, especially with countries abroad. The termination of the war will favor the spread of infectious diseases, and the need of the maintenance of the sanitary service, which is at present much depleted, is becoming increasingly apparent as the months pass by. The deaths of infants under 1 year of age in London during 1916 numbered 8,864, or 89 per thousand births (as compared with the rate of 112 in 1915), the lowest infant mortality rate ever recorded in the county. The reduction in the number of deaths from suffocation, and perhaps in less degree from prematurity, may be a result of the restriction of the sale of intoxicants. There was evidence of introduction of pediculosis and scabies by returned soldiers, but typhus did not obtain any footing. Smallpox was imported from time to time, but there was no serious prevalence. There were 461 cases of typhoid fever reported, as compared with 607 in 1915, but the figures are not strictly comparable, as the practice relating to inclusion of military cases was not the same as in the two preceding years. The great decline of recent years in prevalence of typhoid fever has proceeded practically *pari passu* with the abandonment of the consumption of shellfish and fish from polluted sources, and, with removal of laying, etc., to a distance from sewer outfalls. There were 915 civilian deaths from influenza, as compared with 1,058 in 1915; 5,593 deaths from bronchitis, as compared with 7,058 in 1915, and 5,222 deaths from pneumonia, as against 7,133 in 1915. Nine cases of human anthrax occurred, all of which were traceable to the handling of hides or fiber for brushes. It appears desirable that more stringent regulations governing the importation of hair should be made.

The Increase in the Price of Drugs

The steady rise in the prices of drugs continues almost without interruption, and extraordinary figures have now been reached. Phenacetin now costs more than thirty times the price of three years ago, cocaine six times, caffeine four times, aspirin six times, phenol (carbolic acid) four times, and cod liver oil six times. According to the *Lancet*, the greatly increased cost of drugs in South Africa, consequent on the war, is becoming a matter of moment to the hospitals and the military authorities. A large quantity of quinin has been used to combat malarial fever in the campaign in German East Africa, and the price of quinin has advanced enormously. Great difficulty is experienced in South Africa in obtaining requisite supplies of such an essential as phenol. The cost of drugs at Pretoria Hospital, where there is a large amount of military work, has advanced from \$10,000 to \$25,000 a year; at the Johannesburg General Hospital the increase has been \$15,000.

The War and the Pharmacopeia

In consequence of the shortage of sugar and of glycerin (because of its use in the manufacture of explosives), the General Medical Council has withdrawn from the pharmacopeia the following: all confections except confection of pepper, confection of rose, and glycerin preparations; all mixtures except chalk mixture, compound iron mixture, and castor oil mixture; all syrups except simple syrup, chloral syrup, syrup of codein phosphate, syrup of iron iodid, syrup of iron phosphate with quinin and strychnin, and syrup of glucose; all lozenges except lozenges of krameria and cocaine, lozenges of morphin, and lozenges of morphin and ipecacuanha; also effervescent caffeine citrate, compound decoction of aloes, liquid extract of cotton-root bark; liniment of potassium iodid with soap; saccharated solution of lime, effervescing Epsom salt, borax and honey, compound powder of almonds, compound liquorice powder, compound tragacanth powder, effervescing sodium citrotartrate, glycerin suppositories, compound tincture of cardamom, tincture of kino, tincture of wild cherry, compound tincture of rhubarb, compound tincture of senna, and iodine ointment. It is thus open to pharmacists to modify these preparations.

Marriages

LIEUT. MATHEW CHARLES HUNTER, M. C., Ohio N. G., Lewisburg, Ohio, to Miss Catherine Foody of Columbus, Ohio, at London, Ohio, August 6.

LIEUT. NORMAN ALBERTUS TIMMONS, M. R. C., U. S. Army, South Bethlehem, Pa., to Miss Rozella Dively of Bedford, Pa., at Bethlehem, August 13.

LIEUT. JAMES FRANCIS KELLY, M. R. C., U. S. Army, Dawson, Neb., to Miss Henriette Frances Wadsworth of Omaha, July 2.

CAPT. WILLIAM JOSEPH COLEMAN, Md. N. G., Baltimore, to Miss Laura S. Chapline, also of Baltimore, recently.

JOHN HUNTER PEAK, M.D., to Miss Emily H. Myers, both of Louisville, Ky., at Cincinnati, August 8.

HAROLD ALBERT ELKINS, M.D., Hardin, Mo., to Miss Esther Jane Orr of Mt. Carmel, Ill., August 15.

MANFORD O. OPPEGAARD, M.D., Minneapolis, to Miss Hazel Miner of Flandereau, S. D., August 11.

EVERETT SPERRY BARR, M.D., Amelia, Va., to Miss Alpha Rasor of Biltmore, N. C., August 6.

WILLIAM C. SCHIELE, M.D., Galena, Ill., to Miss Anna Reifsteck of Hanover, August 15.

JACOB RICHARD PIERCE, M.D., to Miss Vesta Mae Kirby, both of Debo, Wyo., June 25.

ISADORE EMIL KOHN, M.D., to Miss Dolly Newman, both of Chicago, recently.

Deaths

Frank Leon Waldorf, M.D., East Syracuse, N. Y.; University of Syracuse, N. Y., 1910; aged 30; a Fellow of the American Medical Association, and a specialist in clinical pathology; health officer of Eastwood; pathologist, bacteriologist and director of laboratories at the Hospital of the Good Shepherd, Syracuse; pathologist to the Syracuse Hospital for Women and Children; instructor in laboratory diagnosis in his alma mater; died at the Hospital of the Good Shepherd, Syracuse, August 14, from septicemia, due to a necropsy wound of the finger received July 18.

Abner Esgar Foltz, M.D., Ashland, Ohio; University of Wooster, Cleveland, 1868; aged 77; a life member of the Ohio State Medical Association, and president of the Summit County Medical Society in 1892; a veteran of the Civil War; designer of the clinical chart at present commonly in use, and of the optician's chart; died at his home, August 15, from cerebral hemorrhage.

Henry Freeman Walker, M.D., New York; College of Physicians and Surgeons in the City of New York, 1866; aged 79; a Fellow of the American Medical Association, and a member of the New York Academy of Medicine; Consulting physician to St. Luke's Hospital; died at his summer home in Pittsford, Vt., August 12, from heart disease.

Raleigh Claude Farquhar, M.D., California, Pa.; Jefferson Medical College, 1903; aged 38; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of Pennsylvania; a member of the staff of the Memorial Hospital, Monongahela; died in St. Francis Hospital, Pittsburgh, August 11, from nephritis.

Hosea Ellsworth Walker, M.D., Rosebank, N. Y.; Bellevue Hospital Medical College, 1892; aged 52; a member of the Medical Society of the State of New York, and for many years a practitioner of Staten Island; visiting physician to St. Vincent's Hospital, Manhattan; died at his home in Fort Wadsworth, Staten Island, August 16.

William L. Jerkins, M.D., Moultrie, Ga.; Atlanta (Ga.) Medical College, 1893; aged 46; formerly a Fellow of the American Medical Association; a member of the Medical Association of Georgia, and once president of the Colquitt County Medical Society; a specialist in diseases of the eye and ear; died at his home, August 8.

A. M. Curtis, M.D., Waco, Texas; Atlanta (Ga.) Medical College, 1875; aged 65; a member of the State Medical Association of Texas; vice president of the National City Bank, Waco, Texas Life Insurance Company, and Texas Saving-Loan Company; owner of the Curtis' Sanitarium, Waco; died in that institution, August 10.

James Clark Earle, M.D., Olean, N. Y.; University of Buffalo, N. Y., 1887; aged 51; at one time chief surgeon of the Northern Division of the Pennsylvania System, and a member of the city council; died at his home, August 7.

Thomas Edward Callahan, M.D., Saguache, Colo.; Maryland Medical College, Baltimore, 1904; aged 43; a member of the Colorado State Medical Society; was shot and instantly killed in a fight in a saloon at Ortiz, N. M., August 11.

Jesse Barr Webb, M.D., Lodi, Va.; University of the South, Sewanee, Tenn., 1907; aged 39; formerly a member of the Medical Society of Virginia; died suddenly, about August 7, while making a professional call in Abingdon, Va.

Arthur J. Daykin, M.D., Wadsworth, Ohio; Western Reserve University, Cleveland, 1889; aged 50; a lecturer in his alma mater, and for many years a practitioner of Cleveland; died at his home, August 3, from pneumonia.

Edward Anderson, M.D., Rockville, Md.; University of Maryland, Baltimore, 1875; aged 76; a Fellow of the American Medical Association, and physician to the Montgomery County Alms House; died at his home, August 15.

Henry K. Neill, M.D., Richfield, Utah; University of Glasgow, Scotland, 1880; aged 61; formerly a member of the Utah State Medical Association, also a druggist; died at his home, August 6, from malignant disease.

Isidore Hermanigilde Chicoine, M.D., Lynn, Mass.; Harvard Medical School, 1894; aged 52; a member of the Massachusetts Medical Society; a member of the staff of the Lynn Hospital; died recently at his home.

Thomas A. Chappell, M.D., Jacksonville, Fla.; Savannah (Ga.) Medical College, 1869; aged 72; a Confederate veteran; died at St. Luke's Hospital, Jacksonville, July 27, from cerebral hemorrhage.

Kate S. Trainor Kavanaugh, M.D., Minneapolis; Hahnemann Medical College, Chicago, 1891; aged 63; a member of the Minnesota State Medical Association; died at her home, August 16.

Wilson Saffin, M.D., Cincinnati; Medical College of Ohio, Cincinnati, 1880; aged 58; formerly a Fellow of the American Medical Association; died at his home, August 19.

Isaac A. Roseberry, Independence, Ind. (license, Indiana, 1897); aged 84; village physician of Independence since 1855; died at his home, August 2, from cerebral hemorrhage.

William M. Beaver, Colby, Kan. (license, Kansas, 1901); aged 72; formerly a member of the Kansas Medical Society; a practitioner since 1869; died at his home, August 8.

Walter Scott Mason, M.D., Cedar Point, Kan.; Rush Medical College, 1880; aged 67; died on his ranch, south of Cedar Point, Kan., August 7, from cerebral hemorrhage.

Scott T. Lameroux, Indianapolis (license, Indiana, 1901); aged 70; died in the hospital of the Indiana State Soldiers' Home, Lafayette, June 7, from facial erysipelas.

John Thomas Hiatt, M.D., Asheville, N. C.; Atlantic College of Physicians and Surgeons, Atlanta, Ga., 1901; aged 50; died at his home, May 29, from nephritis.

John West Oldshue, M.D., Pittsburgh; Philadelphia University of Medicine and Surgery, 1881; aged 69; died in St. Francis' Hospital, Pittsburgh, August 9.

William Thomas Batterson, M.D., Springfield, Ohio; University of Michigan, Ann Arbor, 1880; aged 60; died in the City Hospital, Springfield, August 10.

Charles David De Frantz, M.D., Denver; Meharry Medical College, Nashville, Tenn., 1905; aged 41; a colored practitioner; died at his home, July 26.

David Henry Stern, M.D., Chicago; Eclectic Medical College of the State of New York, 1892; aged 71; died at his home in Chicago, August 24.

Caleb Barker, Jr., M.D., New Rochelle, N. Y.; New York Homeopathic Medical College, New York, 1901; aged 39; died at his home, August 1.

Elbert Clarence Drake, M.D., Brooklyn; New York University, New York, 1876; aged 70; died at his home, August 2, from nephritis.

Thomas L. Anderson, McAlester, Okla. (license, Oklahoma, 1908); aged 39; a colored practitioner; died at his home, August 3.

Warren A. Maxfield, M.D., Hudsonville, Mich.; Rush Medical College, 1896; died at his home, July 31.

Richard Sobey, Chicago (license, Illinois, 1895); died at his home, July 31.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

CHAMLEY IS STILL LOOSE

S. R. Chamley—sometimes he spells his name "Chamlee"—is a resident of Los Angeles. Chamley is the "cancer cure" quack who frightens impressionable women into the belief that "any lump in woman's breast is cancer." He has been swindling the sick for years. In December, 1909, while living at St. Louis, but also operating from Los Angeles, a fraud-order was issued against him under his various names applying both to his St. Louis and to his Los Angeles offices. Then Chamley changed the name of his concern to "St. Louis Sanitarium," using a postoffice box; in January, 1910, the fraud-order was extended to cover this new name. Chamley transferred his swindle to Oakland, Calif., and some weeks later the fraud-order was still further extended to cover the Oakland address. He opened offices in St. Louis and Los Angeles under still another name—the "United Specialists Cancer Cure Company"—and the federal authorities in February, 1910, denied these the use of the mails.

In March, 1910, the fraud-orders were revoked in so far as they affected Chamley's personal names, the quack having agreed to go out of the "cancer cure" business and having filed an affidavit to this effect with the federal authorities. His oath, as might have been expected, was as worthless as his business is villainous. THE JOURNAL in August, 1915, called attention to the fact that Chamley was sending out letters to physicians offering to sell for \$20 full instructions that would enable physicians to carry out the same cruel swindles that he himself had waxed rich on. Also he was boldly advertising his fraudulent cancer cure in over a hundred newspapers. About the same time Chamley was indicted by a grand jury at San Francisco for obtaining property under false pretenses. From the newspaper reports it seems that he frightened a woman into believing she had cancer and then obtained a promissory note for \$2,000 for an "operation" which he persuaded the woman he would have to perform. After the victim had paid \$1,500 on the note, the quack, it appears, told her she must be operated on again and he demanded more money. Two women who acted as nurses for Chamley are said to have testified before the grand jury that Chamley admitted that he knew the woman had no cancer but that he meant to get all the money he could.

The federal officials again took action and still another fraud-order was issued against Chamley. At that time Judge W. H. Lamar, solicitor for the Post Office Department, in his memorandum to the Postmaster-General, scathingly summarized the case against Chamley thus:

"It may be said that the business of Dr. Chamley, contemplating as it does the extortion of money for a worthless and often harmful 'treatment' through a deliberate propaganda of terror among impressionable women by means of the cancer advertisements and other literature referred to above, is one of the most vicious which has ever been before this office, and constitutes a more sinister parasite on the community than the dread disease which Dr. Chamley offers to 'cure.'"

This was in April, 1916. In April, 1917, Chamley was fined \$100 and given a suspended sentence of 100 days in the city jail for practicing medicine without a license. We are now in possession of a circular letter, signed S. R. Chamley and addressed to homeopaths and eclectics. We quote the first four paragraphs of the letter:

"I find your name in the Directory as a Homeopath or Eclectic and want to inform you that I have opened a little HOMEOPATHIC AND ECLECTIC CANCER COLLEGE (never for alapaths) [sic!]. I want to beg you to attend or at least visit us so that I may show you the need of more cancer specialists.

"I charge only \$20.00 for a course of instructions, demonstrations and clinics, including the book containing all the formulas for killing

and curing cancers with what we claim is the best ESCHAROTIC ever discovered. It is the nearest painless and most efficient.

"If you will advertise in a way that will teach and warn the people to not neglect lumps and sores, I will come to your office, start your advertising and pay for it myself out of my own money to the amount of \$50.00 and stay in your office and teach you, if you give me all that comes in from cancer patients.

"At the end of two, three or four weeks, I quit and leave you to pay your own advertising and make all you can. I would visit you again when I could. I am traveling this way nearly all the time in Southern California but will give a course of lectures here in the college all of October as I want to be in the Billy Sunday meetings nights. You need to stay only two or three days."

The rest of the letter is largely devoted to flings at the Post Office Department and at other officials that have been responsible for curbing Chamley's damnable activities. One paragraph, however, stands out in bold capitals:

"I WANT THREE OR FOUR HOMEOPATHIC OR ECLECTIC PHYSICIANS TO START OTHER OFFICES FOR ME BUT THEY MUST BE GRAY, FINE APPEARING BUSINESS MEN."

It will be noticed that Chamley insists on three essentials for those who would start offices to perpetuate his wretched business: First, that the men must be either "homeopathic or eclectic physicians"; a proper rebuke for this implied insult may safely be left to the decent representatives of these two schools. Second, that the men "must be gray"; this of course, is to enable them to put up the proper "front" and to convey the idea that they have grown venerable in the practice of their "specialty." The third is that they must be "business men," which means, in the vocabulary of the quack, that they will have no foolish professional prejudices against frightening women who have some simple, benign tumor into the belief that they have carcinoma and, having thus frightened them, will not be above robbing them of all the money they are able to get their hands on. For the purpose of still further defeating the ends of justice Chamley warns those to whom he writes that they should not address mail to him but to "Homeopathic Cancer College, 751 S. Main St., Los Angeles."

Chamley is a versatile and long-lived scoundrel. We have in our files copies of much of the evidence taken when Chamley was under investigation in St. Louis in 1909. The damning facts there brought out make a well-nigh unbelievable story of cupidity, ignorance and cruelty. Yet in all the years that Chamley has been able to pursue his villainous trade he seems, by some means or another, to have kept out of the penitentiary. Why, we do not know. Common justice and a decent regard for the public safety alike would seem to demand that he be sent there.

SOME MISCELLANEOUS NOSTRUMS

Bon-Opto.—This "eye medicine," put on the market by the Valmas Drug Company, Detroit, is sold under the claim that it will "Make Weak Eyes Strong" and that it "Strengthens Eyesight 50 Per Cent. in One Week's Time in Many Instances." The testimonial type of advertising is, of course, employed. A man, "almost blind," used Bon-Opto and now "can read everything"; a woman to whom "the trees across the street" were for several years but "a dim green blur," was able to "count the fluttering leaves" after using Bon-Opto! Physicians—"prominent," of course—whose initials are unfortunately omitted, are quoted as testifying enthusiastically regarding the virtues of Bon-Opto. Two of these noted individuals are quoted at length in a French-Canadian paper. One of them is "Le Dr Beck, un spécialiste pour la vue, de New-York" while another is "Le Dr. Judkins, médecin de Massachusetts, autrefois chef de chimique au Union General Hospital, Boston, Mass., anciennement chirurgien interne à la New-England Eye and Ear Infirmary de Portland, Maine, et auteur médical." Then in the papers in the United States there are testimonials from Drs. Smith, Connor and Lewis whose initials, curiously enough, the Valmas Drug Co. also fails to give. In soliciting druggists to carry their nostrum, the Bon-Opto concern perpetrates a joke that is as impudent as it is humorous. In a letter addressed to the druggist they give what purports to be the ingredients of the nostrum but carefully abstain from giving

any quantities so that the alleged formula is meaningless. The opening paragraph of one of these letters reads:

"Conscientious, careful druggists who refuse to recommend any remedy unless they know what is in it will appreciate the following formula of Bon-Opto for the eyes and the fact that we make no secret of it but print it on every package:

Chloretone
Zinc Sulphate
Sodium Chloride

Boric Acid
Menthe Poivree
Camphre de Menthe"

Just what "*Menthe Poivree*" and "*Camphre de Menthe*" are is not disclosed but they may be counted on to add to the mystery which must envelope the average "patent medicine" if it is to become a commercial success. Yet the Bon-Opto concern has the effrontery to say in its letter: "As a qualified druggist you will immediately recognize its great therapeutic value"! In the newspaper advertisements the public is assured: "Bon-Opto is not a patent medicine or secret remedy." The facts are Bon-Opto is a secret remedy and is just as much a "patent medicine" as "Peruna" or "Paine's Celery Compound." In fact, the latter nostrums, thanks to the requirements of the federal law, give the quantitative formula of at least one of their ingredients, which is more than can be said for Bon-Opto. The state chemists of New Hampshire in their bulletin for 1917 state that Bon-Opto contains:

Sodium Chlorid (common salt)	39.52
Zinc Sulphate (white vitriol)	6.83
Boric Acid	39.69
Menthol	a small amount

Wilson's Wa-Hoo Bitters.—Charles Kent Wilson of Toledo, Ohio, who did business under the trade name Old Indian Medicine Company, Battle Creek, Mich., and Toledo, Ohio,

26-CENT BOX WILSON'S PILE OINTMENT 15 CENTS DURING SALE

WA-HOO BITTERS

The Great Blood and Nerve Medicine

A POSITIVE KIDNEY AND BLADDER CURE

We are Advertising Large \$1.00 Bottles for 25 Cents

This Preparation contains the following Ingredients:

Sarsaparilla, Prickly Ash, Yellow Dock, "Wa-Hoo," Rhubarb, Wild Cherry, Sassafras and Dandelion

It is prepared with great care and skill. It deserves your consideration, and if, upon a fair trial, it does not give satisfaction, we will gladly refund the price paid for it. It will clear your complexion, brighten your eye, and fill your being with snap and vigor. It is a Pure Vegetable Compound, free from all mineral poisons. It cures all bilious derangements and cleanses the blood of impurities.

It Restores Weakened Constitutions, tones the nerves, creates appetite, and is a positive cure for Rheumatism, Blood Disorders, Stomach Troubles, Liver and Kidney Complaints, Sick Headache, Malaria, Pimples, Boils, Dyspepsia, Constipation, Catarrh of the Stomach, Nervousness, Skin Diseases, Salt Rheum and Neuralgia. Female Weakness and Irregularities promptly relieved and permanently cured.

To introduce and advertise this Great Remedy, we will sell for a few days at 25 Cents

MANUFACTURED BY

Old Indian Medicine Co., Battle Creek, Mich., Toledo, O.

manufactured and sold "C. K. Wilson's Original Wa-Hoo Bitters." This was sold as a "Great Blood and Nerve Tonic" and as an unfailing specific for partial paralysis, St. Vitus' Dance and all forms of weakness, as well as an effective remedy for malaria, catarrh of the stomach, salt rheum, scrofula and neuralgia. The chemists of the Bureau reported that the product was a watery solution (slightly sweetened) of Epsom salt, salicylic acid and a laxative plant drug with indications of sassafras, gentian and prickly ash. The therapeutic claims were declared recklessly and wantonly false and fraudulent. Wilson pleaded guilty and was fined \$25 and costs.—[*Notice of Judgment No. 4523.*]

Italian "Index Medicus."—The bacteriologic laboratory of the Italian Public Health Service has just published the first annual volume of the "Annuario bibliografico italiano delle scienze mediche ed affini." It contains in alphabetical sequence the titles of all the works on medical and allied subjects that appeared in Italian periodicals in 1916. It thus covers 100 journals, nearly all medical, with some of more general scope, but with articles that bear on medical topics. It forms a small volume of 382 pages. Professor Gosio is in charge of the undertaking, as well as of the bacteriologic laboratory.

Correspondence

"PATRIOTISM RAMPANT"

To the Editor:—Referring to your comment (*THE JOURNAL*, Aug. 18, 1917, p. 570) criticizing the Michigan State Board of Registration in Medicine for its action concerning German as an entrance requirement—an expression which has already received the approbation of the *Detroit Abend Post*—permit me to refer to the dictum of the German philosopher, Eucken, who, with characteristic Prussian arrogance, has declared that the spread of German Kultur is necessary to the "spiritual preservation of mankind." Action on the part of other boards in the United States similar to that of the Michigan state board might furnish an interesting test case as to whether it is practically indispensable.

Personally, I am inclined to concur in the long ago quoted opinion of Osler to the effect that international science has been annihilated for this generation through the justification on the part of the doctors of letters of Germany of the abominations of the kaiser and his assistant assassins. Truth may lie between the extremes of Eucken and Osler, but this country has apparently already had quite enough of the activities of Münsterberg (who, though dead, yet speaketh), Dernburg, and the Borussen Gesellschaft.

In dealing with the dissension- and disloyalty-breeding German element in this country, sentimental considerations need not obtain. Expediency should govern. Concerning the debatable question of the expediency of a particular act I desire to speak out plainly my own conviction that the time has come to set a back-fire. Kindliness and tolerance should be reciprocal and this is impossible because the American-Kaiserite and the one hundred per cent. American have nothing in common.

C. B. BURR, M.D., Flint, Mich.

THE RUSSELL EMULSION AND THE RUSSELL PREPARED GREEN BONE

To the Editor:—In the issue of *THE JOURNAL* of the American Medical Association of June 23, 1917, under the heading, "The Propaganda for Reform," you publish certain data, said to be a "Report of the Council on Pharmacy and Chemistry," relating to products manufactured by us. We did not request you to report on these products or to admit them to "New and Nonofficial Remedies." Please state, therefore, your authority for so doing.

STANDARD EMULSION COMPANY, New York.

[COMMENT.—The "certain data" referred to above is a report of the Council on Pharmacy and Chemistry on the "Russell Emulsion" and the "Russell Prepared Green Bone." The report criticized the absurdity of the claims made for these products and declared that the products themselves were inadmissible to New and Nonofficial Remedies. *THE JOURNAL* nowhere stated, either directly or by inference, that the Standard Emulsion Company had requested that a report be made on its products or that they be admitted to New and Nonofficial Remedies. Those of our readers who may have overlooked this article can obtain a reprint of it by sending a 2-cent stamp and a request for the reprint.—ED.]

IMMEDIATE ACTION BY CONSCRIPTED MEDICAL STUDENTS

To the Editor:—The exemption of medical students until the completion of their course has become a question of national importance, and at the same time the probability of such exemption has become so slight as to be almost negligible. Something must be done by the student body itself, and that must be done quickly.

Without question the authorities have thus far shown themselves rather near-sighted in regard to this question. Just as a near-sighted person can best perceive an object properly when that object is brought close to his eyes, so would our authorities best see this question in its true light, if it were

persistently and very closely brought to their attention. My suggestion is this:

Let not the conscripted students wait passively for action from Washington. Let each one immediately file claim for discharge at his district board on industrial grounds (Forms 161 and 161a, modified for the purpose of medical students). These claims will probably be denied. Then let each one immediately file an appeal to the President of the United States.

Several thousand such appeals directly to the President must, without question, have the effect of stimulating the required action favorably. It must be remembered that most medical schools begin not later than October 1. Delayed action, even if favorable, will result in much confusion and derangement.

ISADORE SANDOCK, South Bend, Ind.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

WORKS ON MEDICAL GERMAN

To the Editor:—Will you give me the name of a small, compact work on medical German? I have a considerable number of patients of German origin, many of whom speak but little English, while, on the other hand, I speak practically no German. What I want is a pocket size German vocabulary reference work of the most commonly used medical words, so that in odd moments I may increase my German vocabulary and thus be enabled to better understand the ailments of my patients.

— —, M.D., Bismarck, N. D.

ANSWER.—

Lewis: Medical Vademecum in German and English, Philadelphia, P. Blakiston's Sons & Co., \$5. (Twenty-five clinical lectures; German and English in parallel columns.)
Deutsch: Medical German, New York, J. H. Vail & Co., \$1.75.
Lewin: German-English Medical Dialoguc, published by Klinkhardt, Leipzig.

THE PRONE POSITION

To the Editor:—Dr. L. J. Ladinski (*THE JOURNAL*, Aug. 25, 1917, p. 634) says he places his patients in the "prone" position when about to operate for ectopic gestation. May I inquire why? I never knew of this posture being used.

H. D. FAIR, M.D., Muncie, Ind.

ANSWER.—This misuse of the word "prone" should have been corrected by our manuscript editors but was not. This usage is a common error. It would be rather difficult to operate on the abdomen with the patient in the prone position unless the operator was under the table. "Prone" means "lying face downward; stretched at full length on the belly" as the Century Dictionary puts it.

Health Department to Treat Drug Habitues.—Plans have been perfected by Health Commissioner Emerson of New York City whereby drug addicts wishing to be cured of their habit may apply to the department of health for treatment in one of the city institutions. Any local health board may receive the voluntary application of such addicts and many commit them to a hospital for treatment. Other city departments have assured the health department of their cooperation. The commissioner of corrections has placed several hundred beds in the Corrective Hospital at the disposal of the department of health for this purpose. Similar cooperation will be afforded by the department of charities, Bellevue and Allied hospitals, and the board of inebriety. The department of health will also examine and, if necessary, will prescribe or dispense narcotic drugs to addicts appealing to the department, provided such prescriptions or administration is necessary to protect their lives and the public safety. In no instance, however, will the department administer such drugs excepting in an emergency pending the admission of such drug addicts to an institution or pending their treatment by a physician.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALASKA: Juneau, Sept. 4. Sec., Dr. S. P. Dawes, Juneau.
ARIZONA: Phoenix, Oct. 2-3. Sec., Dr. John Wix Thomas, 306 Goodrich Bldg., Phoenix.
CALIFORNIA: Los Angeles, Oct. 9-13. Secretary, Dr. Charles B. Pinkham, State Capitol, Sacramento.
COLORADO: Denver, Oct. 2. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.
DISTRICT OF COLUMBIA: Washington, Oct. 9-11. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington, D. C.
GEORGIA: Atlanta, Oct. 9-11. Sec., Dr. C. T. Nolan, Marietta, Ga.
HAWAII: Honolulu, Sept. 10-13. Chairman, R. W. Benz, 1141 Alakea St., Honolulu.
IDAHO: Pocatello, Oct. 2. Sec., Dr. Charles A. Dettman, Burke.
ILLINOIS: Chicago, Oct. 9-11. Superintendent of Registration, Mr. F. C. Dodds, Springfield.
IOWA: Des Moines, Oct. 9-11. Sec., Dr. G. H. Sumner, State House, Des Moines.
MASSACHUSETTS: Boston, Sept. 11-13. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.
MICHIGAN: Lansing, Oct. 9-11. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.
MINNESOTA: Minneapolis, Oct. 2-5. Sec., Dr. Thomas S. McDavitt, Lowry Bldg., St. Paul.
MONTANA: Helena, Oct. 2. Sec., Dr. William C. Riddell, Power Bldg., Helena.
NATIONAL BOARD OF MEDICAL EXAMINERS: Chicago, Oct. 10-18. Sec., Dr. J. S. Rodman, 2106 Walnut St., Philadelphia.
NEW JERSEY: Trenton, Oct. 16-17. Sec., Dr. Alexander MacAlister, 438 E. State St., Trenton.
NEW MEXICO: Santa Fe, Oct. 8. Sec., Dr. R. K. McClanahan, East Las Vegas.
NEW YORK: Albany, Buffalo, New York City and Syracuse, Oct. 2-5. Chief, Examinations Division, Harlan S. Horner, State Education Bldg., Albany.
OKLAHOMA: Oklahoma City, Oct. 9-10. Sec., Dr. Ralph V. Smith, 502 Daniel Bldg., Tulsa.
PORTO RICO: San Juan, Oct. 2. Sec., Dr. M. Quevedo Baez, San Juan.
RHODE ISLAND: Providence, Oct. 4-5. Sec., Dr. Byron O. Richards, State House, Providence.
UTAH: Salt Lake City, Oct. 1-2. Sec., Dr. G. F. Harding, Templeton Bldg., Salt Lake City.

Medicolegal

Annulment of Marriage for Fraudulently Concealed Epilepsy

(*McGill vs. McGill* (N. Y.), 163 N. Y. Supp. 462)

A special term of the Supreme Court of New York, Onondaga County, holds that the plaintiff was entitled to the marriage annulment which he sought on the ground that he was induced to enter into the marriage contract by the defendant's concealing from him that she was an epileptic, and in leading him to believe, through statements to that effect, that she was in good health. The court says the parties were married, March 9, 1912. The plaintiff testified that the first time he knew that his wife had epilepsy was Dec. 12, 1912, when he was so informed by a physician; that after that time he did not cohabit with the defendant; that he continued to live with her and slept in the same room, as there were only two rooms in the apartments, and he continued to care for her until she went to the Craig Colony, April 15, 1915. It was true that there were rumors that the defendant was subject to epileptic seizures, but the plaintiff was assured by her that this was not so, and the evidence of the conversations had with her and her aunt, with whom she lived, and a visit to a physician, all pointed to the conclusion that it was the defendant's purpose, in which she succeeded, to deceive the plaintiff as to her actual condition; that after the marriage she had, from time to time, attacks which probably were epileptic seizures, and he procured at different places at which they resided and at different times the best medical advice that he could afford, and that to him was attainable; and that none of these men, until December, told him that she was subject to epileptic seizures. The plaintiff testified on cross-examination that prior to that time he thought the convulsions which the defendant had were hysterical. With reference to what occurred after the marriage to call his attention to the disease from which his wife was suffering, the court must not be too strict in extending the doctrine of constructive notice

to the case of a lover zealously courting the woman of his choice, or to an anxious husband earnestly seeking to ascertain the cause of his wife's illness and to cure it. With reference to the claim that he cohabited with his wife after the discovery in December, 1912, that she had epileptic seizures, no question of construction was involved, for the court has no hesitation in finding that he did not cohabit with her at all. He cared for her as well as his circumstances permitted, and procured, as soon as he could, her commitment to a proper institution for treatment. He was under no legal duty to abandon her, but was under the legal duty of caring for her until such a time as that duty should be terminated by the action of a court of equity. In arriving at the conclusion that a court of equity should annul the marriage, the court has in mind that fortunately there were no children. The court believes that the safeguards the law has thrown around the marriage relation do not demand that this unfortunate defendant should be permitted, by her misfortune and misrepresentations and concealments, to drag down the life of the plaintiff, which was full of promise, especially when such a union, at best, would be childless, and, at worst, would produce a progeny of potential epileptics, over whose lives heredity would cast its dark shadow, which would extend even across the lives of their descendants.

Negligent Anchoring of Drainage Tube

(*Talley vs. Whitlock* (Ala.), 73 So. R. 976)

The Supreme Court of Alabama affirms a judgment in favor of plaintiff Whitlock, and denies defendant Talley a rehearing, in this action for the alleged negligent anchoring of a drainage tube placed in an incision made in the plaintiff's chest wall. The court says that the averment of negligence in the one count of the complaint on which the trial was had was that the defendant was a practicing physician and surgeon and as such undertook to perform a surgical operation on the plaintiff and to leave in the wound or cut made by said surgical operation a drainage tube, and that the defendant so negligently or unskillfully conducted himself in that regard that as a proximate consequence of said negligence said drainage tube became or was misplaced in the plaintiff's body and remained so misplaced for a long time, etc. It is held that the complaint was not subject to demurrer for the generality of its averment of negligence. It has been repeatedly ruled by this court that, where the facts stated in the complaint are sufficient to show the duty, and that the defendant negligently failed to do or perform this duty, it is not necessary to define the quo modo (the way) or to specify the particular acts of diligence that should have been employed in the performance of such duty. A civil action for malpractice against a physician and surgeon may be sustained, on proof of a failure to exercise such reasonable and ordinary care, diligence, and skill in respect to the duty so assumed and undertaken as physician and surgeon, such care and skill as physicians and surgeons in the same general neighborhood, pursuing the same general line of practice, ordinarily employ and exercise in a like case. But there is no rule of responsibility which requires of the physician or surgeon infallibility in the diagnosis or treatment of disease. Statements by the surgeon who subsequently removed the tube and by another surgeon who assisted him, as to the condition of the tube when taken from plaintiff's body, as that there was no attachment to the tube and no sign of any hole, etc., were admissible in evidence. The observed data were for the jury's consideration. Nor was there any error in a charge the effect of which, under the evidence, was to instruct the jury that, even though the defendant may have used the best method of anchoring the drainage tube in the first instance, yet he would be responsible for his negligent failure to exercise the reasonable and ordinary care, skill and diligence required of surgeons in the same general neighborhood, in doing the same service, that is, placing the drainage tube, as well as anchoring it, after the "best method." If the method of anchoring the tube was the best, but the defendant was negligent in the execution of that method, he would nevertheless be liable under the averment of negligence of the court,

where, after showing his duty as operating surgeon, it was averred that "the defendant so negligently and unskilfully conducted himself in that regard that, as a proximate consequence of said negligence, said drainage tube became or was misplaced in the plaintiff's body," etc. The defendant might have put the tube in the proper place and yet negligently secured it therein. The defendant asked that the jury be instructed that if it believed from the evidence that the drainage tube was misplaced in the wound or cut while the same was being dressed by the resident physician at the hospital, or after the plaintiff was removed from the hospital, a verdict should be returned for the defendant. This instruction was properly refused, for the reason that it predicated the alleged misplacement to the resident physician at the hospital, and pretermitted inquiry of the proper placement and securing of the tube in the first instance by the defendant. The subsequent act of another was no defense for any negligence chargeable to the defendant, unless that act of that other was the sole proximate cause of the injury complained of.

Coastwise Vessels Not Required to Have Physicians

(*The City of St. Louis (U. S.)*, 238 Fed. R. 381)

The United States District Court, Southern District of New York, says that the party by whom this suit was brought fell from an upper berth and sprained her ankle. The injury was treated by the ship's steward. It was contended that, while there is no federal statute requiring a coastwise vessel to have a physician or surgeon on board, it still would be required, under the obligations resting on it as a common carrier under the common law, to carry a physician. In support of this contention, authorities were quoted to the effect that the rule may be stated to be that a carrier is bound to exercise the strictest vigilance in receiving a passenger, conveying him to his destination, and setting him down safely. The gist of an action against a carrier of passengers for injuries sustained is the breach of the duty imposed on it by law to carry safely, so far as human skill and foresight can go, the persons it undertakes to carry. But these authorities had no application to the issue in this case. They clearly refer only to the degree of care as against physical injuries, and do not impose a duty to provide medical skill in the event injuries are sustained. The party by whom this suit was brought, if she could recover, could do so only on the ground of negligent conduct on the part of the steward in treating the injured member. However, he acted in a reasonably prudent manner, applied standard remedies, and, so far as disclosure was made by the evidence, did all that a reasonably prudent man could have done under the circumstances. He was not a physician, but he did, on behalf of the ship, render such first aid as was necessary to any person injured. Hence the suit is dismissed.

Society Proceedings

COMING MEETINGS

Amer. Acad. of Ophthal. and Oto-Laryng., Pittsburgh, Oct. 29-30.
Am. Assn. Obstetricians and Gynecologists, Newark, N. J., Sept. 17-19.
American Association of Railway Surgeons, Chicago, Oct. 17-19.
American Electro-Therapeutic Association, Atlantic City, Sept. 11-13.
American Roentgen Ray Society, New York, Sept. 20-22.
Colorado State Medical Society, Colorado Springs, Sept. 25-27.
Delaware State Medical Society, Middletown, Oct. 8-9.
Indiana State Medical Association, Evansville, Sept. 26-28.
Kentucky State Medical Association, Louisville, Oct. 16-18.
Medical Association of the Southwest, Kansas City, Oct. 15-17.
Michigan State Medical Society, Battle Creek, Sept. 4-6.
Minnesota State Medical Association, St. Paul, Oct. 10-12.
Mississippi Valley Medical Association, Toledo, O., Oct. 9-11.
Missouri Valley Medical Society, Lincoln, Neb., Sept. 20-21.
Nevada State Medical Association, Reno, Oct. 18-19.
New Mexico Medical Society, Las Cruces, Oct. 4-6.
Pennsylvania State Medical Society, Pittsburgh, Sept. 24-27.
Utah State Medical Association, Salt Lake City, Sept. 12-13.
Vermont State Medical Society, Barre, Oct. 11-12.
Virginia State Medical Society, Roanoke, Oct. 23-26.
West Virginia State Medical Association, Fairmont, Oct. 2-4.
Wisconsin State Medical Society, Milwaukee, Oct. 3-5.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Insanity, Baltimore

July, LXXIV, No. 1

- 1 Recent Trends in Psychiatry. C. G. Wagner, Bingham, N. Y.—p. 1.
- 2 Nature and Function of Neuroglia. C. Ricksher, Kankakee, Ill.—p. 15.
- 3 *Relationship Between Syphilis of Nervous System and Psychoses. Analysis of Cases Showing Divergence in Clinical and Serologic Pictures. L. G. Lowrey, Boston.—p. 25.
- 4 *Diagnostic Value of Spinal Fluid and Wassermann Tests in Psychiatry. E. W. Fell, Elgin, Ill.—p. 41.
- 5 Paranoid Types in Syphilitic Disease of Central Nervous System. E. M. Auer, Indianapolis.—p. 53.
- 6 Ephebic Psychosis. A. B. Evarts, Washington, D. C.—p. 61.
- 7 Criminal Insane and Insane Criminals. P. E. Bowers, Michigan City, Ind.—p. 77.
- 8 Cranial Asymmetry. H. M. Adler, Chicago.—p. 89.

3. Relationship Between Syphilis of Nervous System and Psychoses.—Of about 2,500 cases examined in the last three years, Lowrey finds eleven sufficiently unusual to be reported. Of these, four had clinical pictures of dementia praecox; one of constitutional inferiority, and one imbecility; two organic and three paresis. In two cases of dementia praecox, the serology of neurosyphilis was found early; in the other two, only after many years; in all four it was not expected. One patient has tabetic symptoms, the others no symptoms of neurosyphilis. The patient with tabetic symptoms also exhibits catatonic symptoms. One "hysterical" or "constitutionally inferior" person developed secondary syphilis five years before death. A year before death, the serology of neurosyphilis was demonstrated. Necropsy confirmed this. No clinical symptoms. An "imbecile" developed genuine paresis in the hospital. Necropsy and serology typical. An "organic" case without signs of paresis gives the serology of it. A case, clinically Huntington's chorea, gives the serology of paresis, without clinical signs of it. One case, clinically paresis at first, seems now like dementia praecox. Serology positive. One case, clinically paresis, has run an extremely long, stationary course. Wassermann negative in blood and fluid; other tests positive. One case, clinically and serologically paresis, has as the most prominent symptom, and the only one at the present time, auditory hallucinations. Lowrey says that these are cases with (a) neurosyphilis in unusual causal relationships or (b) coincident psychoses and symptomless neurosyphilis. He advises that diagnoses should be based on both clinical and laboratory findings.

4. Diagnostic Value of Spinal Fluid and Wassermann Tests in Psychiatry.—At Elgin State Hospital, 500 patients in whom paresis was for one reason or another suspected, have been given serum and fluid Wassermann tests, globulin tests and cell counts. Of these 215 were syphilitic psychoses and 285 nonsyphilitic psychoses. The gold chlorid test was not used. In cases of taboparesis and cerebrospinal syphilis the findings were less constant than in paresis. In paresis the tests failed in establishing the existence of paresis as follows: globulin increase 2 per cent., pleocytosis 10.5 per cent., serum Wassermann 7 per cent., fluid Wassermann 4 per cent. In the nonsyphilitic psychoses the tests were positive as follows: globulin increase 5.5 per cent., pleocytosis 3.5 per cent., serum Wassermann 9.5 per cent., fluid Wassermann none. Cell and globulin increase in nonsyphilitic psychoses was found especially in organic cases where a differentiation was important. There is abundant evidence that positive fluid findings may occur without paresis in the primary and secondary stages, and it is probable that they occur without the mental symptoms of paresis in the "prepsychotic" stage. It is not argued by Fell that a positive spinal fluid Wassermann is of itself conclusive evidence of paresis, nor that a negative test excludes paresis, but it is so constantly positive in the one and negative in the other that it is of the greatest value, in a case where a differentiation must be made, in distinguishing between a syphilitic and a nonsyphilitic psychosis. Fell found that the extent of the parietic process cannot be deter-

mined with any degree of accuracy by laboratory tests; it can only be said in a general way that globulin and cell increase seem more marked in the more rapid cases. The distinction between a paretic process and a tertiary syphilitic process, or the extent to which each is present, cannot be determined in the laboratory. The gold chlorid test is of some help in this direction but the therapeutic test is the only one of much value. The diagnosis of the combination of paresis with a functional psychosis should be made with extreme caution. In making a diagnosis of recovery in a case of paresis which has cleared mentally the following conditions should be considered: 1. A functional psychosis in the primary or secondary stages of syphilis. 2. A functional psychosis in the "prepsychotic" stage of paresis. 3. A remission in paresis. The first two occur quite infrequently, the last very frequently, the spinal fluid findings remaining positive.

American Journal of Medical Sciences, Philadelphia

August, CLIV, No. 2

- 9 *Etiology of Sprue. B. K. Ashford.—p. 157.
- 10 *Toxins and Serologic Reactions in Sprue. C. Michel, San Juan.—p. 177.
- 11 *Disinfection of Drinking Water. H. D. Dakin and E. K. Dunham, New York.—p. 181.
- 12 Indications for and Dangers of Tonsillectomy. G. B. Wood, Philadelphia.—p. 188.
- 13 Achylia Gastrica. M. H. Gross and I. W. Held, New York.—p. 196.
- 14 Indications for Blood Transfusion. G. M. Dorrance, Philadelphia.—p. 216.
- 15 *Diabetes Insipidus; Report of Case. J. H. Barach, Pittsburgh.—p. 220.
- 16 *Metastasis of Tumors. D. Symmers, Bronxville, N. Y.—p. 225.
- 17 *Differential Diagnosis of Mediastinal Conditions. A. McN. Blair, Southern Pines, N. C.—p. 240.
- 18 Significance of Ureteral Tubercle Bacilluria. E. Beer, New York.—p. 251.
- 19 *Albuminuria and Hematuria Following the Administration of Hexamethylenamin. J. R. Wiseman.—p. 264.
- 20 Tuberculous Peritonitis. B. Z. Cashman, Pittsburgh.—p. 269.

9. **Etiology of Sprue.**—The object of this paper is to demonstrate that the species of *Monilia* first described by Ashford in March, 1915, is the determining etiologic factor in sprue, and to suggest that this species be recognized as *Monilia psilosis*, Ashford, 1914. A summary is given of a study of 100 persons examined clinically, mycologically and serologically for sprue. Sixty-seven were suffering from or had suffered from clinical sprue, and one was either a carrier or had mild sprue. Thirty-two were healthy or were suffering from other diseases than sprue. In sixty-one of the sixty-eight sprue cases *Monilia psilosis* was isolated. Of the seven in which it was not found, four had been cured for at least one or two years and gave only a 50 per cent. Wassermann positive for *Monilia psilosis*. The other three were mild chronic cases, one with a + (25 per cent.) Wassermann and the other two with a + reaction. Seventy-one persons gave a positive deviation of the complement with an antigen of *Monilia psilosis*, all but one of the cases of clinical sprue and four not sprue—a case of pellagra, a case of nervous dyspepsia, a case of bacillary enterocolitis and one a healthy boy with an ulcer of the leg.

10. **Toxins and Serologic Reactions in Sprue.**—Out of over 400 tests made, including various diseases, all cases which were diagnosed clinical sprue and from which the *Monilia psilosis* was isolated from the tongue and feces, the complement-fixation test was positive. The other *Monilia* antigens used have faintly positive results only in severe cases of sprue. In these tests the results with other *Monilia* antigen was about 15 per cent. positive, while the reaction with the *psilosis* antigen was 100 per cent. positive. This reaction varies with the condition of the patient. In cases of chronic or latent sprue, and in cases which had recovered, the reaction tends to become negative. In cases which had clinical syphilis and sprue, the fixation test for both these diseases was positive. Guinea-pig serum of an animal which had been inoculated with a killed culture of *Monilia psilosis* gave a strong positive reaction. The serum from animals which had been inoculated with live cultures or killed cultures of *Monilia psilosis* gave the same results as the serum of patients that have sprue, and from which the *Monilia psilosis* had been

isolated from tongue and feces. In view of these results and with Ashford's clinical and mycological work Michel says it is strongly evident that the *Monilia psilosis* of Ashford is the etiologic factor in sprue.

11. Abstracted in THE JOURNAL, June 30, 1917, p. 2008.

15. **Diabetes Insipidus.**—Barach reports a case of diabetes insipidus with kidneys capable of eliminating a normal amount of solids in the twenty-four hours. In response to ingestion of added amounts of salt and urea the kidneys show ability to eliminate these substances promptly and to concentrate urine. In response to the ingestion of a gram of glucose the urine showed a trace of sugar and a diuresis followed. Phenolsulphonephthalein elimination was normal. There were evidences in this case suggesting that the abnormally large liquid exchange was not limited to the kidneys, but that the spinal fluid and saliva were likewise secreted in abnormally large amounts. It was demonstrated that although the kidneys and salivary glands were already performing an inordinate amount of work, as far as excretion of water is concerned they were not functioning to their maximum capacity. Pilocarpin produced a sialorrhea and diuresis after each dose on several days. Circumstances did not permit any attempt at determining the part played by the internal secretions in this case, nor was it possible to make any observations toward determining the part played by the glossopharyngeal nerve in the polydipsia.

16. **Metastasis of Tumors.**—Among 5,155 necropsies at Bellevue Hospital in the past ten years there were 298 malignant tumors; 264, or 89 per cent., were of the epithelial or mesothelial variety, and 34, or 11 per cent., were sarcomatous or endotheliomatous. Two hundred and twenty, or 74 per cent., had gone to the stage of metastasis; in 19 instances, or 7 per cent., there was indirect invasion of neighboring tissues without attendant metastases in remote parts, and in 59 cases, or 19 per cent., the growths remained localized as follows: epithelioma of the urinary bladder 7, of the tongue 4, of the cheek and bronchus 1 each, of the esophagus 7, carcinoma of the stomach 10, of the sigmoid 6, of the cecum 5, of the uterus 3, of the rectum, pancreas and liver 2 each, of the bile ducts and breast 1 each, sarcoma of the lung and osteosarcoma of the vertebrae 1 each, hypernephroma of the kidney 3, and of the suprarenal 1. The primary growths were distributed thus: epithelioma of the esophagus 23, of the urinary bladder 12, of the tongue 5, of the branchial clefts, bronchi, skin and larynx 2 each, of the pharynx and penis 1 each, carcinoma of the stomach 84, of the gallbladder 16, of the prostate 12, of the bile ducts 6, of the cecum 10, of the duodenum 3, of the pancreas 10, of the uterus 11, of a salivary gland and the jejunum 1 each, of unknown origin 2; hypernephroma of kidney 12, of suprarenals 3; lymphosarcoma of the retroperitoneal nodes 4, of the anterior mediastinal nodes 3, of the posterior mediastinal nodes 2, of the cervical nodes 2, of the gastro-intestinal lymphoid structures 2, of general distribution 1; sarcoma of the breast 1, of the retroperitoneal nodes and periosteum 2 each; of the humerus cervical nodes, sole of foot, thigh, mesenteric nodes, lung and kidney 1 each; osteosarcoma of right leg, left leg, vertebrae 1 each; multiple myelogenous sarcoma 2, melanoma 1. Of the 298 tumors the lymph nodes were metastasized 131 times, or in 44 per cent.; the liver 102, or in 34 per cent.; the pleura and lungs 73, or in 25 per cent.; the bones in 35, or 17 per cent.; the vertebrae, ribs, calvarium, sternum, femur, humerus, and pelvis being involved in the order named; the suprarenals were metastasized 23 times, or in 8 per cent.; the kidney 17 times, or in 5.7 per cent.; the spleen 16 times, or in 5.3 per cent.; there was neoplastic invasion of large veins in 13 cases, or in 4.7 per cent.; the pancreas was metastasized 13 times, or in 4.7 per cent.; the heart muscle 9 and the skeletal muscles 3 times, or in 4 per cent.; the ovary, mesentery, pericardium, and dura mater 7 times each, or in 2 per cent.; the small intestine, stomach and scalp 3 times each, and the testicle and esophagus once each.

17. **Differential Diagnosis of Mediastinal Conditions.**—The uniform method of checking all physical examinations of the chest in doubtful cases with the fluoroscope or Roentgen-ray plates is commended by Blair as the only means which will

lead to more accurate and early diagnosis of mediastinal conditions.

19. Albuminuria and Hematuria Following Administration of Hexamethylenamin.—A study of Wiseman's cases shows that the most important cause of albuminuria or hematuria following the administration of hexamethylenamin is abnormally high urinary acidity. In four out of the five reported cases the acidity was above 100 in terms of decinormal sodium hydrate, and in one case it reached 140. It is therefore necessary to carefully determine the urinary acidity of all patients who are taking hexamethylenamin. If the acidity becomes too slow or disappears entirely the drug is inefficient, whereas with a high degree of acidity, irritative symptoms are likely to appear. High dilution of the urine impairs the formaldehyd action; concentration of the urine increases formaldehyd activity, but favors unpleasant results.

Boston Medical and Surgical Journal

August 9, CLXXVII, No. 6

- 21 Country Doctor and Hospital. N. W. Faxon, Stoughton.—p. 167.
- 22 *Study of Urines of Picric Acid Workers. F. O. West, Woburn.—p. 171.
- 23 Epidemic of Dysentery at Boston State Hospital, Due to Member of Paratyphoid-Enteritidis Group. M. E. Morse and G. Tryon, Boston.—p. 173. (To be continued.)
- 24 Year's Work with Wassermann Test, in Boston Health Department Laboratory, with Especial Reference to Doubtful Reactions. F. H. Slack, P. Castleman and K. R. Bailey, Boston.—p. 180.

22. Study of Urines of Picric Acid Workers.—The result of West's investigation tends to show that picric acid may be manufactured without great hazard to the employee, provided the work is carried on under proper conditions and the men are subjected to rigid medical supervision. Of eighty-six urines examined for the presence of albumin, three gave the "slightest possible trace" at the end of employment, whereas it was not detected at the outset. Nevertheless, these three men had never been affected by any of the substances they were handling; while many men not given the test had been repeatedly treated, one of this latter class having nearly died from the effects of fume poisoning. In addition to the examination for albumin, fifty-seven of these urines were tested for the presence of picric acid, and three were positive.

Cleveland Medical Journal

August, XVI, No. 8

- 25 Diagnosis and Treatment of Congenital Pyloric Stenosis. C. G. Grulee and D. D. Lewis, Chicago.—p. 527.
- 26 *Electric Hypothesis of Exhaustion. G. W. Crile, Cleveland.—p. 540.
- 27 Incipient Scurvy. D. J. M. Miller, Atlantic City, N. J.—p. 541.
- 28 Medical Examination and Aviation Corps. W. B. Chamberlin, Cleveland.—p. 545.
- 29 Headache of Ocular Origin. W. E. Bruner, Cleveland.—p. 549.
- 30 Removal of Watermelon Seed from Trachea of Eighteen Months Old Child. W. B. Chamberlin, Cleveland.—p. 553.

26. Electric Hypothesis of Exhaustion.—The following theory is propounded by Crile: Exhaustion from any cause is the state in which electric energy is not present; is not being generated; or, if generated, is prevented from being utilized. Thus, if the skin is widely excised; if viscera are widely exposed; if burns destroy the epidermis—the electric energy of the body cannot be utilized, as with the destruction of nonconducting epidermis, the electric energy is dissipated before it can be used, and exhaustion results. For a similar reason, exhaustion in greater or less degree results from immersion in a warm, moist atmosphere, or in water, the electricity of the body being conducted away from the body more rapidly than it can be fabricated. If the stored electric energy is discharged or drained by extreme or prolonged exertion, by emotion, by infection, or by prolonged consciousness—deprivation of sleep—then exhaustion results. If the acid-eliminating organs, the lungs, the liver and the kidneys, are interfered with by injury or disease, then the generation of electric energy is interfered with and polarization—exhaustion—results.

Illinois Medical Journal, Chicago

August, XXXII, No. 2

- 31 More Common Surgical Emergencies in Urogenital Tract and Their Management. F. Kreissl, Chicago.—p. 77.
- 32 Specificity and Nonspecificity of Vaccines. D. J. Davis, Chicago.—p. 84.

- 33 Vaccines for Prophylaxis. G. F. Ruediger, LaSalle.—p. 87.
- 34 Vaccine Therapy in Typhoid Fever. S. R. Slaymaker, Chicago.—p. 92.
- 35 Vaccines in Pertussis. H. W. Cheney, Chicago.—p. 94.
- 36 Timeliness in Application of Radium. A. Woelfel, Chicago.—p. 97.
- 37 Roentgen Diagnosis of Syphilitic Lesions. E. S. Blaine, Chicago.—p. 100.
- 38 Fractures of Pelvis and Resulting Injuries to Urethra and Bladder. H. C. Mitchell, Carbondale.—p. 104.
- 39 Operation for Cystocele by Abdominal Route. W. L. Gray, Champaign.—p. 108.
- 40 Role of Prostate in Acute Gonorrheal Infections. B. D. Baird, Galesburg.—p. 109.
- 41 Physician and Proof of Death or Disability for Insurance Company. C. U. Collins, Peoria.—p. 111.
- 42 Cesarean Section. H. M. Orr, LaSalle.—p. 116.
- 43 One Step Further in Treatment of Acidosis in Children. H. C. Blankmeyer, Springfield.—p. 119.
- 44 "Lest We Forget," or Dr. Crawford W. Long, the First Anesthetist. C. H. Johnson, Champaign.—p. 122.
- 45 Etiologic Study of Acute Arthritis. W. R. Rainey, East St. Louis.—p. 129.

Medical Record, New York

August 11, XCII, No. 6

- 46 Neurotization of Paralyzed Muscles by Implantation of Motor Nerves. J. C. A. Gerster and W. C. Cunningham, New York.—p. 223.
- 47 Etiology and Treatment of Hemorrhoids. J. R. Pennington, Chicago.—p. 225.
- 48 Hay Fever and Its Relation to One Hundred of Most Common Plants, Trees and Grasses. W. Scheppegegrell, New Orleans.—p. 230.
- 49 Case of Bilateral Cystic Degeneration of Kidneys. L. Wender, Corozal, Canal Zone.—p. 236.
- 50 Use of Small Doses of Pituitary Extract for Inducing and Shortening Labor at Term. A. Stein, New York, and H. Dover, Ottawa, Canada.—p. 238.
- 51 Auricular Education of Deaf Children. J. D. Wright, New York.—p. 241.

Michigan State Medical Society Journal, Grand Rapids

August, XVI, No. 8

- 52 Differential Diagnosis Between Functional and Organic Cardiac Murmurs. C. H. Johnston, Grand Rapids.—p. 337.
- 53 Rural Surgery. J. A. Reeder, Clare.—p. 342.
- 54 Paraffin Treatment of Burns. O. H. Cox, Sault Ste. Marie.—p. 344.
- 55 Brain Lesions—Report of Cases. L. P. Parkhurst, Grand Rapids.—p. 347.
- 56 Case of Bullet Wound of Penis, Abdominal Wall and Stomach. C. A. Van Dusen, Ogden Center.—p. 352.
- 57 *Role of Streptococcus in Recent Epidemic of Acute Respiratory Infections. H. H. Cummings, Ann Arbor.—p. 354.
- 58 Indications and Contraindications in Treatment of Hare Lip and Cleft Palate. R. H. Baker, Ann Arbor.—p. 365.
- 59 Correlation of Roentgenographic and Surgical Findings in Sixty-Two Operated Cases. J. G. Van Zwaluwenburg, Ann Arbor.—p. 370.
- 60 Case of Typhoid Spine. W. H. Gordon, Ann Arbor.—p. 378.

57. Role of Streptococcus in Recent Epidemic of Acute Respiratory Infections.—The total number of cases of acute rhinitis, pharyngitis and tonsillitis treated by the University of Michigan Health Service during four years was 7,056. Of this number 172 cases developed a middle ear infection or a percentage of 2.4. Mastoiditis developed in fourteen and ten of these came to operation. Two of these cases were found to have sinus thrombosis. In the series of 1,600 cases of tonsillitis, thirty-four, or 2 per cent., developed joint complications involving most frequently the ankles and elbows. Three cases occurred in patients having a streptococcus tonsillitis associated with a scarlet rash. Two of these cases proved fatal. Acute polyarthritis was observed in twelve of the thirty-four cases. Experience has firmly fixed in the author's mind the idea that acute flareups of chronic tonsillitis usually precede the arthritis involvement. The frequency with which recurring attacks of rheumatoid symptoms in students having chronic tonsillitis occur, and the absolute disappearance after tonsillectomy, strengthens belief that these are manifestations of streptococcic activity in the joints and muscular system. Of the thirty-four arthritis cases, eight, or 23 per cent., developed cardiac complications. Following throat infections without arthritic complications the following lesions have been diagnosed: mitral insufficiency, fifty-three cases; aortic insufficiency, eleven cases; mitral stenosis, four cases; aortic stenosis, four cases. Brain and nervous system complications, such as meningitis and neuritis have not been met, however, delirium and extreme alertness and irritability

have been observed in many cases during the acute stage. In four fatal septicemias this marked irritability has been the first indication of invasion of the blood stream. Cummings considers it a very valuable prognostic sign. Pulmonary complications have been few; only seven cases of broncho-pneumonia developed after these acute respiratory infections. Two students had pulmonary hemorrhages during this epidemic. Tubercle bacilli were found in the hemorrhagic sputum although subsequent physical examination and Roentgen examination failed to disclose the area involved. Among 1,600 cases of tonsillitis thirty cases of nephritis were observed, or 1.8 per cent. Two of this number were of the acute hemorrhagic type. Acute parenchymatous nephritis was the more common. Two students died from appendicitis and peritonitis of streptococcic origin.

New Jersey Medical Society Journal, Orange

August, XIV, No. 8

- 61 Postoperative Treatment.—A. J. Ochsner, Chicago.—p. 297.
- 62 Relation of Appendicitis to Certain Cases of Cyclic Vomiting; Report of Six Cases. M. Runyon, South Orange.—p. 303.
- 63 State's Insane. B. D. Evans, Morris Plains.—p. 308.
- 64 Weak-Foot; Its Stages and Treatment. C. R. Keppler, Newark.—p. 313.

Psychiatric Bulletin, Utica, N. Y.

April, II, No. 2

- 65 *Decline of Alcohol as Cause of Insanity. H. M. Pollock.—p. 103.

65. **Decline of Alcohol as Cause of Insanity.**—The evidence herein presented by Pollock of the general decline of alcohol as a cause of insanity in New York state shows that the alcoholic cases annually admitted since 1909 have decreased both relatively and absolutely, and intemperance as a contributing factor in causing mental disease has gradually diminished.

Southern Medical Journal, Birmingham, Ala.

August, X, No. 8

- 66 Etiology of Poliomyelitis. H. Greeley, Brooklyn.—p. 621.
- 67 Minor Complaints of Children. S. S. Adams, Washington, D. C.—p. 624.
- 68 Treatment of Average Case of Tuberculosis. J. J. Lloyd, Catawba Sanatorium, Va.—p. 628.
- 69 *Emetin Hydrochlorid: Its Intravenous Administration. J. W. Larimore, St. Louis, Mo.—p. 633.
- 70 Chronic Degenerative Diseases: Their Prevalence, Causes and Prevention. J. P. Munroe, Charlotte, N. C.—p. 637.
- 71 Malaria Survey: Impounded Waters, Biting of *A. Punctipennis* on Porches, Distance of Flight of *A. Quadrimaculatus*. J. A. LePrince and T. H. D. Griffiths, Washington, D. C.—p. 642.
- 72 What South is Doing for Control of Cancer. C. E. Lakeman, New York.—p. 644.
- 73 Urgent Need of Hospital Facilities for Tuberculous Negroes. M. F. Sloan, Towson, Md.—p. 654.
- 74 Protean Manifestations of Appendicitis. F. G. DuBose, Selma, Ala.—p. 663.
- 75 Wrist-Drop from Traumatic Adhesions about Nerve Trunks; Report of Two Cases. C. S. Venable, San Antonio, Tex.—p. 664.
- 76 Surgical Physiology of Spleen. E. G. Jones, Atlanta, Ga.—p. 665.
- 77 Torsion of Fallopian Tube Resulting from Small Ovarian Cyst. J. W. Holland, Baltimore.—p. 670.
- 78 Malaria as Factor in Military Efficiency. F. L. Hoffman, Newark, N. J.—p. 676.
- 79 First Aid to Injured; With Particular Reference to American Red Cross. O. M. Marchmann, Dallas, Tex.—p. 680.
- 80 Author's Muscle Shortening Operation. H. H. Briggs, Asheville, N. C.—p. 686.
- 81 Chancre of Bulbar Conjunctiva. E. W. Carpenter, Greenville, S. C.—p. 695.

69. **Emetin Hydrochlorid: Its Intravenous Administration.**—Larimore has used emetin intravenously in the treatment of amebic dysentery during the past year, using 1 grain at each injection. The injections were given quickly and in one milliliter of fluid. In one nonendamebic case in which the drug was used for a therapeutic test there was after twenty-four hours a severe attack of vomiting and diarrhea. This could not necessarily be ascribed to the injection. This case had a hypertension of 180 millimeters and an occasional intermittent pulse. The symptoms, however, were apparently gastro-intestinal rather than circulatory, unless perhaps there was a circulatory element in the vomiting. After several injections there was noted in a few cases an arterial hypotension. A few cases gave no subjective reaction until after several doses, suggesting an accumulative action. The results obtained in eleven cases cited were such as to indicate that the treatment is safe as well as satisfactory.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

May, XL, No. 1

- 1 *Experimental Toxi-infection of Central Nervous System. D. Orr and R. Rows.—p. 1
- 2 *Dissociation of Visual Perceptions Due to Occipital Injuries, with Especial Reference to Appreciation of Movement. G. Riddoch.—p. 15.
- 3 *Progressive Atrophy of Globus Pallidus. J. R. Hunt.—p. 58.

1. **Experimental Toxi-Infection of Central Nervous System.**—This communication is a continuation of experimental work on the action of the bacterial poisons on the nervous system. The present research has been directed toward the brain. A capsule containing a culture of the *Staphylococcus aureus* was placed in contact with the common carotid artery in the neck. The experiments have given positive results so far. They help to explain the pathogenesis of certain obscure lesions of the central nervous system found in man. Hyaline thrombosis was found to be a constant result in the cords examined when the capsules were placed in the abdominal cavity, and the same morbid change is found in the vessels of the brain when the capsule is placed against the carotid sheath. The lesions present are the direct result of this thrombotic change, and vary in kind with the degree to which the local vascular supply is interfered with. Orr and Rows examined three brains and observed two types of lesion. 1. Coagulation necrosis of the nerve cells in the cornu ammonis, in the cerebral cortex, and in the amygdaloid nucleus. 2. Softening in the stratum moleculare of the cornu ammonis. They also found that there is a difference in the two vascular systems which subserve the grey and white matter respectively. The evidence of this is seen in the histologic difference between the cortical and subcortical lesions. The former are diffuse and consist in necrosis of the nerve-cell units; the latter—in the cornu ammonis—involve a circumscribed locality and are typical of infarction. The two types of lesion observed by the authors illustrate how the two factors, degree and situation, can produce dissimilar pathologic results, although the pathogenesis is the same; and applying this to clinical neurology, it becomes apparent that certain nervous syndromes, though widely different in symptomatology, are pathogenetically one and the same disease. The difference in symptomatology is in large measure due to the anatomical site of the lesion; but the degree to which the nerve structures are involved is an equally important factor. Toxic hyaline thrombosis of capillaries or even larger vessels can contribute very largely in the production of nervous lesions of different degree.

2. **Dissociation of Visual Perception Due to Occipital Injuries.**—Reviewing the results of examination of cases showing visual defects from occipital injuries, Riddoch summarizes his work as follows: (A) With regard to the appreciation of movement when an object is oscillated in the so-called blind field. (1) That movement should be given a place among the stimuli which are recognized as originating visual perception. (2) That light and movement are the first stimuli to be appreciated in a recovering visual field. And since the appreciation of both returns *pari passu*, and since the field for light cannot be recorded on a chart, while that for movement can, the fields for movement, charted at intervals, give the earliest indications of recovering vision. (3) That the presence of dissociation between the fields for appreciation of movement and recognition of an object afford a valuable aid in prognosis. In cases in which movement is perceived in the affected field, there will be some return of vision; on the other hand, where no movement is perceived after an interval of some months has elapsed the affected field will probably be permanently blind. (4) That recovery for the appreciation of movement begins at the periphery of the field, and extends inward toward central vision. (B) That the types of visual dissociation exhibited are analogous to the dissociations of general somatic sense impressions described by Head and his co-workers as occurring from

cerebral injuries. (C) That in certain of the cases a consideration of the probable damage to the brain along with the charts of the visual fields yields facts which support the contentions of Holmes and Lister on cortical representation of the retina. (1) That macular vision has its center in the posterior part of the visual area. (2) That the macula, like the rest of the retina, is not represented bilaterally in the cortex. (3) That the cortical center of the peripheral zones of the retina is in the anterior part of the area striata. (4) That the superior quadrants of each retina are represented in the upper, and the inferior quadrants in the lower parts of each visual area.

3. See THE JOURNAL, June 17, 1916, p. 2034.

British Medical Journal, London

July 28, II, No. 2952

- 4 Tropical Medicine and Hygiene. P. Manson.—p. 103.
- 5 India and Medical Progress. R. McCarrison.—p. 109.
- 6 *Treatment of Scabies by Chlorin Gas. G. H. Clark and H. S. Raper.—p. 113.
- 7 Anaphylactic Shock After Injection of Serum Intravenously. C. A. Patrick.—p. 114.
- 8 Grave Diabetes Mellitus with Pulmonary Tuberculosis Following Mumps. F. B. Gillespy and H. S. Holden.—p. 115.

6. **Treatment of Scabies by Chlorin Gas.**—Seventy-four cases of scabies were exposed by Clark and Raper to a concentration of one to two parts of chlorin per thousand of air (by volume), the service gas helmet being worn as a protection. The exposures were of five minutes' duration and occurred on successive days. Usually four exposures were given, but in some instances this number was exceeded. The patients had a hot bath before their first treatment and wore ordinary hospital clothing. At the first exposure the bedding was placed in the "gassing" chamber. The officers wore a box respirator as protector, and were exposed to a concentration between two and three parts of chlorin per thousand of air. The exposure lasted twenty minutes. A bath was taken on the morning of the first day of treatment and not again, except in one case, until the day after the last exposure of gas. The number of exposures given and the intervals between them were varied in order to find out the best conditions of treatment. A few of the patients were given four exposures on successive days, and then, after two days' interval, two more exposures on successive days. Others received two exposures on the first two days, then, after two days' interval, two further exposures on successive days. Three of the officers were given two exposures on the first two days, and then, after three days' interval, one more exposure only. On the first day of treatment the officers' underclothing, sleeping garments, and gloves were exposed to the gas, and clean bed linen was ordered the same night. The clothing was exposed for twenty minutes. The treatment of both officers and men was carried out in rooms with about a thousand cubic feet of air space. Chlorin was delivered into this from a cylinder, and it was found, after very little practice, that an approximation to the concentration desired could easily be obtained. Nearly sixty noncommissioned officers and men were treated under somewhat unsatisfactory conditions. Of the whole number, not more than 25 per cent. were cured. Many of the cases not definitely cured showed much improvement. Of fourteen officers treated, eleven were cured and three much improved. One feature of the treatment which was noted in officers, noncommissioned officers, and men was the production of a very irritable condition of the skin, especially about the scrotum and axillae, in some of the cases. It was most marked in cases which may be termed chronic, and which had been treated by sulphur in one form or another for varying periods without cure, and also more noticeable in the cases which were given more than four exposures.

Journal of Laryngology, Rhinology and Otology, London

July, XXXII, No. 7

- 9 Clinical Records from Provincial Hospital. N. Maclay. (To be continued).—p. 210.
- 10 Abscess of Nasal Septum of Six Years' Duration. J. B. Horgan.—p. 215.

Lancet, London

July 28, II, No. 4900

- 11 Fatigue and Alcohol. A. F. S. Kent.—p. 107.
- 12 Fallacies of Relying Solely on Agglutination Tests for Diagnosis of Typhoid in Antityphoid Inoculated Individuals, with Special Reference to Use of Dreyer's Method. R. P. Garrow.—p. 112.
- 13 Technic of Condenser Testing in Nerve Injuries. F. Herniman-Johnson.—p. 117.
- 14 War Nephritis. F. C. Davies and R. P. Weldon.—p. 118.
- 15 Extension Splint for Ambulatory Treatment of Fractures of Femur. N. B. Taylor.—p. 120.
- 16 Case of Second Cesarean Section in Same Patient. H. M. Dowler.—p. 122.
- 17 Rupture of Tubo-Uterine Gestation; Excision of Sac. W. G. Nash.—p. 122.
- 18 "Needle Wing Grip" for Intramuscular Injections. C. F. White.—p. 124.

August 4, II, No. 4201

- 19 Meat Inspection, with Special Reference to Developments of Recent Years. W. J. Howarth.—p. 147.
- 20 *Microscopic Histology of Malaria as Occurring in Salonika Force in 1916. L. S. Dudgeon and C. Clarke.—p. 153.
- 21 *Treatment of Tuberculous Eyes by Local Application of Tuberculin. H. A. Ellis and H. M. Gay.—p. 156.
- 22 Drainage of Infected Hemothorax. A. Cox.—p. 159.
- 23 Case of Hemiplegia Following Pleural Effusion. G. deB. Turtle.—p. 161.
- 24 Cases of Poisoning by Sodium Nitrite and Boric Acid. H. Sinigara.—p. 162.
- 25 Malaria Acquired in England. A. C. D. Firth.—p. 162.

20. **Microscopic Histology of Malaria.**—Investigations were undertaken by Dudgeon and Clarke for the purpose of ascertaining the cause of death in some of the rapidly fatal cases of malaria, also whether the lesions produced were more severe than those already recorded, and the observed frequency of cardiovascular phenomena. These observations include the investigations of the cerebrum, cerebellum, medulla, heart muscle, suprarenal glands, liver, spleen, kidneys, and intestinal tract from patients who died in coma, those who died quite suddenly, and those who died with general malarial toxemia. Examination of the heart muscle in six cases of malaria showed fatty degeneration in each instance. Blocking of the capillaries with infected red cells is present in most instances. The microscopic changes in the suprarenals are very numerous. The most constant alteration from the normal histology is the diminution in the lipid substances which give such a characteristic appearance to the normal gland. The chromaffin substance in the medulla is also greatly reduced in amount. In many of the suprarenals the deep cortical pigment is found to be abundant. Malarial pigment is present in each specimen. It is found free, lying in the suprarenal cells, in spider cells from the connective tissue framework which bounds the glandular tissue, and in large mononuclear cells in the sinuses. Necrosis of the cortical and medullary tissue is especially well marked in those cases in which there is thrombosis of blood vessels. Small parasites and spores are found in most of the glands, but they are far more numerous in some cases than in others; while in one instance crescents were present, although few in number. The cerebrum, medulla, pons and cerebellum were examined from three cases. In each case the patients died in coma. The capillaries are engorged with blood, as also the arterioles, while many of the blood vessels are thrombosed and the thrombi are composed of agglutinated red cells, partially hemolyzed red cells, and blood pigment. This pigment is taken up by the endothelial cells which are found lying free in the lumina of the vessels. In the spleen there was congestion in all cases, free hemorrhages in some, while in several instances necrosis of the splenic pulp occurred. This necrosis affects chiefly the pulp, but there is some necrosis of the Malpighian corpuscles in a few instances, while in the case of blackwater fever the necrosis of the Malpighian corpuscles is the most striking feature. The areas of necrosis contain black pigment. Thrombosis of the capillaries and arterioles in many cases is a striking feature. In the liver the deposit of pigment is present in every case. Fatty change is present, but it is only in a few cases that the fat droplets are abundant. Necrosis of liver tissue in isolated areas is of common occurrence. Parasites are found in the red cells in the sinuses and in the blood vessels, while the vessels in a section of the liver which shows thrombosis

contain numerous infected red cells in the thrombi, and also a few crescents. Changes in the kidney are similar to those of the other viscera.

21. Treatment of Tuberculous Eyes by Local Application of Tuberculin.—The treatment employed by Ellis and Gay consists in instilling tuberculin into the conjunctival sac directly, in various dilutions of increasing strength. The eye thus gradually acquires a permanently raised resistance to the tuberculin poison, and so becomes no longer sensitive to local tuberculin reactions, as the result of congestive conditions produced by strain or irritation. During the treatment the eye is kept uncovered, being only protected by a shade when photophobia is present. All cases have been treated with bovine tuberculin, ordinary P. T. O. being used in tenths.

Archives Médicales Belges, Paris

June, LXX, No. 6, pp. 481-576

- 26 The Physiologic Bases of Shock. D. Baruch.—p. 481.
- 27 Occupational Guidance and Reeducation of War Cripples. C. Dam.—p. 493.
- 28 *Venereal Diseases in the Army. J. Gaudy.—p. 509.
- 29 General Principles for Treatment of War Fractures. M. Stassen and J. Voncken.—p. 515. (Continuation.)
- 30 Medical Questions Relating to Belgian Military Refugees in Holland. R. Wybauw.—p. 569.

28. Venereal Disease in the Army.—Gaudy remarks that venereal diseases have spread in an appalling manner since the outbreak of hostilities. He says: "This has been observed in previous wars, but the conditions of the present war impart a character of peculiar gravity to these diseases. Today it is not two armies that are fighting, but two groups of entire nations are arrayed in battle against each other, and it is these whole nations that are feeling the effects of the evil. Among the venereal diseases syphilis represents about 20 per cent. In all classes of society the general level of morality has been lowered since the war began, and venal or lustful prostitution has developed in notable proportions." He cites Balzer's statement that up to the end of February, 1915, 30,000 cases of venereal disease had been declared among the German troops occupying Belgium. "In Italy, the Milan hospitals in eleven months had 4,861 inmates with venereal disease, and Thibierge estimates that in the French armies between 4,000 and 5,000 contract syphilis each month, that is, 50,000 or 60,000 a year, a total for the three years of war of 150,000 or 200,000 new syphilitics." In the Belgian army few statistics are available, but one service in ten months had 1,500 venereal cases, including 317 of syphilis, all but ninety-two recently acquired.

Before the war, the civil courts in estimating the incapacity for industrial labor entailed by syphilis figured it at from 15 to 25 per cent. This applies to military service as well. We know also the neurasthenia so often engendered by chronic gonorrhea. From the military standpoint therefore the venereally affected can render but a mediocre service on account of the depressing effect exerted by this kind of disease on the spirits as well as on the physical organism. Gaudy urges that while the men are under military discipline their syphilis should be combated with the utmost energy and measures taken to reduce the evil to the minimum. Italy has taken the most radical measures, aiming to reduce to the minimum the sources of contamination and to enforce thorough treatment. Uncontrolled prostitution is strictly checked, especially in the war zone, and the open houses there are kept under rigorous supervision and no civilians admitted. Official dispensaries and hospitals for venereal diseases have been installed at numerous points and compulsory courses of treatment are given to soldiers and civilians alike. "This latter is a most fortunate innovation." In France there are some similar institutions but they are not numerous, and they are left to the initiative of the army medical officer and have not been generalized. In the Belgian army, the infirmary of each division has a consulting post for venereology but there is no uniform plan, and only a few dispensaries have been established back of the war zone. But even with this, they are more numerous than in the British army which has only one for each army. "Progress can come only by multiplying

and unifying the antivenereal institutions and enlightening the men." The number of infections in the war zone proper is comparatively small, and Gaudy does not think it wise or desirable to suggest the creation of public houses in the war zone like those of the Italian army, or those organized back of the German armies, and by the Japanese on the campaign in Manchuria.

Archives Mensuelles d'Obstétrique et de Gynécologie, Paris

July 15, VI, No. 4-5-6, pp. 97-192

- 31 *Modifications in the Antitryptic Power of the Blood Serum in Pregnant Women. G. Ecalle.—p. 97.
- 32 *Fat and Lipoid Content of the Serum of Pregnant Women. G. Ecalle.—p. 128.
- 33 *The Reactions Resulting from the High Fat and Lipoid Content of the Serum of Pregnant Women.—G. Ecalle.—p. 139.
- 34 *Sudden Death a Day or So After an Apparently Successful Operation. A. Brindeau.—p. 159.
- 35 Advantages of Erodium Cicutarium as Means to Arrest Uterine Hemorrhage. J. A. von Dongen (Amsterdam).—p. 169.

31. The Antitryptic Power of the Serum of Pregnant Women.—Ecalle devotes over thirty pages to his study of the serum of pregnant and nonpregnant women in respect to its power of checking the digestion of albumin by trypsin. This power is augmented in pregnant women but does not reach an appreciable degree until the fourth or sixth month; it then keeps high and for two weeks after delivery, and is highest in case of pregnancy intoxication. The index outside of pregnancy averages about 46. In the first two months of pregnancy it may be normal or rise to 50; by the third or fifth month it averages 65, and in the four last months, 77. In two pregnant women at the sixth month the index was 85 and 90. There is too little constancy in these findings for the antitryptic power alone to serve as the basis for assumption of a pregnancy. He explains it as the antibody reaction to the penetration into the maternal blood of tryptic ferments from the placenta.

32. Fats and Lipoids in the Serum of Pregnant Women.—The cholesterin in the serum showed likewise a gradual increase as the pregnancy advanced.

33. Reactions from the High Lipoid Content of the Serum in Pregnant Women.—Ecalle has not studied the Neumann and Hermann reaction in the serum of pregnant women but, judging from analogy, does not think it can be of much diagnostic value. The same can be said of the activation of cobra venom by the serum of pregnant women. This reaction he has studied extensively, and found it progressively more and more pronounced in pregnant women. It seems to be caused merely by the increased proportion of lecithin in the serum of the pregnant, and hence is not specific to pregnancy. At the same time, this reaction is so distinct and it appears so early—by the beginning of the third month—that it may aid in the diagnosis of pregnancy in dubious cases. Before heeding the findings, however, we must exclude tuberculosis, cancer and most infectious diseases and affections of the nervous system. In short, his final conclusion is that notwithstanding their great biologic interest, this and the other reactions studied do not have much practical import.

34. Sudden Postoperative Fatalities.—Brindeau refers to the sudden death a day or two after an apparently successful operation, when the patient seems to have entirely recovered from the shock. Such fatalities have been ascribed to the anesthetic, to insufficiency of kidneys or liver, to embolism, pleural adhesions, myocarditis, meningeal hemorrhage or acute sepsis. Even when necropsy was possible, the true cause of death was often left a mystery. Of late, literature has been accumulating on suprarenal insufficiency as responsible for these postoperative fatalities. With chronic suprarenal disease, it is easy to understand that the anesthetic might break down the already damaged suprarenals beyond recuperation. He reports in detail a case of this kind, the woman of 36, apparently healthy, came to the clinic for suture of an old laceration of the perineum. The minor operation was borne apparently perfectly but the woman died suddenly in the night and necropsy disclosed chronic tuberculous disease in both suprarenals which had evidently entailed acute insufficiency under the chloroform. One supra-

renal weighed 16 and the other 7 gm.; both were almost completely destroyed by the tuberculosis. Savariaud has reported a case in which a child of 8 died the sixth day after general anesthesia and both suprarenals were found the seat of a large hematoma. The liver in these cases also shows signs of having suffered, and the thyroid and the pituitary were always congested, but these changes are like those that have been encountered from the action of chloroform alone.

If the patient had been examined for suprarenal insufficiency before the operation, testing for white dermographism, the suprarenal white line, and for unduly low blood pressure, it might have been possible to have been forewarned as to danger from the suprarenals. Brindeau's patient had a very dark complexion—so very dark that he asked her nationality. She said she had always had this pigmentation. The suprarenal lesions in such cases might be discernible only with the microscope. In one case on record the suprarenal fatality followed a fall, the shock of the trauma alone, without any anesthetic, being sufficient to upset the precarious suprarenal balance. The young girl had been supposedly healthy but both suprarenals were in cheesy degeneration. This was the finding also in the case of an apparently healthy woman who died suddenly a day or so after a normal childbirth; also in a fatality following an operation for an anal fistula. Anesthetics modify the fat in the suprarenals, and when there is reason to suspect suprarenal insufficiency, the operation should be done under local anesthesia. If this is not possible, epinephrin should be given systematically before and after the intervention.

Lyon Médical

July, CXXVI, No. 7, pp. 301-348

36 Experiences with Malaria in Morocco. de Teyssier.—p. 301.

37 *Treatment of Acute Gonorrhea in the Army. Carle.—p. 339.

37. **Treatment of Acute Gonorrhea in the Army.**—Carle relates that his analysis of over 2,000 personal cases converted him four years ago to the superiority of antiseptic over expectant treatment, and his extensive experience since with acute gonorrhea in the army has only confirmed him in this opinion. The large number of men to be treated and the necessity for strict surveillance not to allow men to be detained away from their duties any longer than is strictly necessary, the lack of assistance, and the necessity for using staple drugs, demand a technic that is direct, immediate, intensive, simple, rapid and easy to control. This he accomplishes with an injection of a 25 per thousand solution of potassium permanganate three times a day. Copious rinsing out of the urethra, under the circumstances, invites complications, as the technic and the surveillance are liable to be defective. In about twelve days he commences the irrigation of urethra and bladder with a 10 per thousand solution of the permanganate. At this stage, the irrigations can be entrusted to a trained attendant. This is done in the morning, and at noon and night an injection is given of a 1 per thousand solution of silver nitrate, rapidly increasing the strength to 2 or 3 per thousand. The injection is retained each time for five or six minutes, and this second part of the treatment is kept up for fifteen or twenty days at least. He is convinced that the relapses in two thirds of the cases are due to treatment being discontinued too soon. He mentions a number of minor technical points for the carrying out of the treatment thus outlined.

Paris Médical, Paris

July 14, VII, No. 28, pp. 45-60

38 *Measurement and Record of Joint Impotence. L. Binet.—p. 46.

39 Hypertrophy of Diseased Muscle with Parallel Hypertrophy of Skeleton. H. Claude and J. Lhermitte.—p. 49.

40 *Suprarenal Hemorrhage in Course of Anthrax. H. Roger.—p. 51.

41 Case of Vesiculobullous Dermatitis with Multiple Manifestations in Visible Mucosa. N. Fiessinger and R. Rendu.—p. 54.

42 *Heating Cabinet for the Severely Wounded in Shock. (Projet de "Cellule Chauffante"). H. Feuillade and G. Blechmann.—p. 58.

38. **Measurement and Record of Functional Joint Disability.**—Binet gives illustrated descriptions of a number of devices which permit accurate records of the range of excursions of the knee, shoulder, and other joints. The patient stands in

front of a screen or rests the part on a horizontal screen which is marked off with radiating lines representing angles of ten degrees difference. As he raises his arm or flexes his elbow a photograph is taken showing the extreme excursions possible, the extreme range being shown on the same plate, both with passive and active movements. A series of uniform photographs of this kind shows the progress of the case and the outlook.

40. **Suprarenal Hemorrhage in the Course of Anthrax.**—Roger comments on the comparative frequency of involvement of the suprarenals in the camp diseases, including dysentery, malaria and gas gangrene, and reports a case of anthrax septicemia in which cardiovascular disturbances were pronounced from the first. The young man suffered from intense pain in the epigastrium, with profuse vomiting and final hematemesis, evidently due to elimination of the microbes or their toxins by the gastro-intestinal mucosa. The extremely low blood pressure and imperceptible pulse were explained by the necropsy findings of edema of the anterior mediastinum, compressing the pericardium, and destruction of the left suprarenal by a recent hemorrhage.

42. **Hot Cabinet for the Severely Wounded.**—In order to economize time, space and efforts, Feuillade has the men in shock from severe wounds placed in the small operating room connected with a No. 2 Bessonneau tent. The arrangements for heating this small operating room are excellent, and it can be kept very hot and hold four wounded men. The benefit from the heat is remarkable, materially abbreviating the period of shock. In order to give up this room for this purpose, an extra operating room has to be installed in connection with the tent, but during warm weather no heating appliance is required for this. The advantages of this *cellule chauffante* have been demonstrated so conclusively by his experience that the principle will probably be adopted for all the advanced operating posts, he says.

Presse Médicale, Paris

July 12, XXV, No. 39, pp. 401-408

43 *Fourth Disease. (Maladie de Dukes.) A. Lesage.—p. 401.

44 *Specific Action of Tin on Staphylococci. A. Fromin.—p. 402.

45 Streptococcus Associations in Typhus. D. Danielopolu.—p. 403.

46 *Necessity for Supervising the Use of the Foot After Recovery from War Wounds. L. Imbert.—p. 405.

43. **Fourth Disease.**—Lesage replies to those who doubt the existence of Dukes' disease as a separate morbid entity, saying that he has encountered cases of eruptive disease which most certainly were not measles and were not scarlet fever. He describes sixteen features of these cases including the absence of pruritus, of eye and throat disturbances, the incubation of fourteen or fifteen days, and the short duration of the disease, not over a week. Throughout, there was nothing to suggest scarlet fever, except the apparently scarlatinal eruption.

44. **Specific Action of Tin on the Staphylococcus.**—Fromin here reiterates his former statements in regard to the curative action of the salts of tin injected into animals inoculated with staphylococci. It is common knowledge in certain parts of the country that tin-platers never have furuncles. Addition of metallic tin to a culture medium on which *Mycoderma aceti* is growing, does not check the proliferation of the microbe, but there is no further production of acetic acid. These and a number of experimental facts related led him to use a mixture of metallic tin and tin oxid in treatment of staphylococcus infections, and he reports gratifying results even in old rebellious furunculitis. Recent experiences with war wounds infected with staphylococci have shown also encouraging results. The tin was taken internally and the wound dressed with a 5 or 10 per thousand solution of tin protochlorid in water with glycerin.

46. **Reeducation in the Use of the Foot after War Wounds.**—Imbert warns anew that efforts must be made to ward off talipes equinus and other deformity when the men wounded in the legs begin to walk. While the man is confined to bed, the foot may get into a settled deformed attitude although the foot itself was not involved in the war wound. He has seen men with fractured femur which healed perfectly but the

men had to use crutches on account of the talipes equinus that had been allowed to develop and reach a crippling stage. It may not be possible always to avoid it, but it certainly need not be so common nor reach such a stage. Pronounced talipes equinus is worse than amputation, he thinks, as the man is condemned to crutches for good. The use of crutches further aggravates the talipes, and a compensating bending of the knee further cripples the man. Imbert refuses to allow crutches for longer than a week at most. If the man needs them because the fracture is not solid, he belongs in bed a while longer or in a cast. The proper use of the foot will correct the talipes equinus in these cases, and the man must be shown how to use the foot properly. He must be made to take his first steps with the sound foot first. The tendency is always the reverse. By starting out with the sound leg first, the tibiotarsal articulation gradually loosens up. He gets the men to walking as soon as the callus is solid, by two months at latest.

Progrès Médical, Paris

July 7, XXXII, No. 27, pp. 225-232

- 47 *The Oscillometer in Estimation of Circulation After Obstruction of Arteries. P. Balard.—p. 225. Conclusion.
- 48 Advantages of Mencièr's Iodoform-Balsam Spray Treatment of Wounds During an Offensive Movement. Creignou.—p. 226.
- 49 Epinephrin Treatment of Hemorrhages and Congestions. A. Satre.—p. 229.

July 14, No. 28, pp. 233-240

- 50 *Tuberculosis of the Respiratory Apparatus and the War. R. Morichau-Beauchant.—p. 233.
- 51 *Herpes with Malaria. C. Garin and C. Descos.—p. 236.

47. **The Oscillometric Index of the Circulation in an Artery.**—Balard expatiates on the value for diagnosis and prognosis of the largest swing of the oscillometer in testing the circulation through an artery. This is the index used for comparison with other arteries, and it is proving very instructive in examining the wounded, especially for estimating the degree of obstruction of an artery in a wounded leg. The oscillometer (Pachon's), he reaffirms, is the ultrasensitive criterion of the persistence or disappearance of the circulation. More than this, with it the development of collateral circulation can be watched and followed, thus permitting judgment as to the efficacy of the different measures applied. This index is further a reliable guide as to the line where amputation can be safely done, comparing the corresponding index on both legs.

50. **Pulmonary Tuberculosis and the War.**—Beauchant says that he has examined 1,206 cases of verified tuberculosis during a recent seven-months' period. This included 258 of a progressive type of the disease and 948 in a stationary phase. He has made a special study of the influence of the campaign on preexisting tuberculous affections, and has been surprised at the satisfactory service rendered by two out of every three with a history before the war of pleurisy with effusion, hemoptysis, bronchitis with emaciation or severe derangement of the general health. Among the 302 in this category, 118 had gone through with their military duties without let-up, and most of them had been at the front from the beginning of hostilities. That is, 39 per cent. had rendered satisfactory service; 25 per cent. had also given good service but had had to drop out for a time once; 24 per cent. had been sent back two or more times, and 28 per cent. had been in the hospital again and again. These satisfactory results were realized with comparatively little damage for the men themselves. In only 10 per cent. the disease had developed into a progressive type. In the others it seemed to tend toward sclerosis, and the possibility of a complete arrest can be considered. The progressing cases were among those who had given the best service, and the flaring-up came late in the campaign. In all others the disease was nearly if not quite stationary, including 161 cases of the fibrous form, fifty-nine of the pleural and forty-eight of the attenuated form.

Primary pleurisy was the most frequent form in which tuberculosis developed apparently for the first time in the soldiers on active service. There were 210 cases of a rapidly progressive type, while the primary fibrous form was observed in 159 cases and the attenuated form in 113. In two cases

there was hemoptysis after antityphoid vaccination, and a typical tuberculous pneumonia developed, but the outlook now seems rather inclined to be favorable. In only three cases did the inhalation of drift gas seem to be the starting point for a progressing tuberculosis with bacilli in the sputum. A trauma to the chest is liable to rouse a slumbering tuberculous process. He declares that all soldiers with progressive pulmonary tuberculosis should be sent to a sanatorium or dismissed permanently, and that every recent manifestation of tuberculosis calls for more or less prolonged repose in the home zone. One cannot be too prudent with pleurisy with effusion. To send such patients back to the front after only a month or two of convalescence is liable to entail the worst consequences. He is convinced that many of the men with progressive lesions owe them to their being sent back to the front after too brief interval for convalescence and recuperation. In his experience, pleurisy with effusion seemed the most menacing precursor of progressive pulmonary tuberculosis, and he is tempted to urge temporary discharge from military duties of all such cases. The best plan would be to collect all these pleurisy, hemoptysis and similar cases in special sanatoriums where graduated out-of-door work would aid them in recovering strength and enable them in time to take their place in the ranks again. At present too often the men pass from the hospital straight back into the trenches.

51. **Herpes in Malarial Fever.**—Garin and Descos state that among 246 men with malaria, 121 had herpes and ninety-eight developed it after each malarial attack. All had it more than once. A peculiar feature was that the herpes recurred invariably at the same point, usually the lips, but three times on the ear, five times on the tongue and on the scalp, scrotum, lids and brow, once each.

Correspondenz-Blatt für Schweizer Aerzte, Basel

July 14, XLVII, No. 28, pp. 881-912

- 52 *Influenza Meningitis. W. Tobler.—p. 881.
- 53 Research on the Psychology and Physiology of Vision. E. Berger.—p. 892.
- 54 Psychotherapy for Traumatic Amnesia. (Assoziationsexperiment, freies Assoziieren und Hypnose im Dienst der Hebung einer Amnesie.) H. Rorschach.—p. 898.

52. **Influenza Meningitis.**—Tobler reports a case of meningitis in a 5-months' babe in which the influenza bacillus seemed to be the causal germ. The necropsy findings indicated that the meninges had become infected through the cribriform plate of the ethmoid bone from the nose. The peritoneum had become secondarily involved by way of the blood. The child had been rendered less resistant by inherited syphilis. There was no contagion from this case.

Gazzetta degli Ospedali e delle Cliniche, Milan

June 10, XXXVIII, No. 46, pp. 673-688

- 55 *Salicylic Ionic Medication for Facial Paralysis. M. Fiorini.—p. 680.
- 56 *Nervous Symptoms of Vascular Origin. G. B. Queirolo.—p. 682.
- 57 *Loss of Teeth as Affecting Military Service. E. Villa.—p. 687.

55. **Salicylic Ionic Medication for Facial Paralysis.**—Fiorini refers exclusively to facial paralysis of rheumatismal origin. This yields promptly if treatment is begun during the first week. He applies it by means of a mask, according to Bergonié's technic, sheets of tin foil (*stagno*) being fitted outside a cotton mask modeled over the face with uniform pressure on the side affected. The cotton is impregnated with a hot 3.4 per cent. solution of sodium salicylate. The tin foil electrodes are light and permit uniform pressure. The negative is applied over the ear, the other at the neck. It is very important to protect with rubber tissue any scratches or other solution of continuity on the face. The sittings are from forty-five to twenty minutes long, decreasing the length with increasing current energy. He gives them every second or third day. Little benefit was apparent in his cases until after the third or fourth sitting. The cure was generally complete with from seven to fifteen sittings. A patient with his mask in place is shown in an illustration.

56. **Nervous Disturbances of Vascular Origin.**—Queirolo mentions in particular under this heading the contracture

which develops slowly and progressively without the muscles involved becoming paralyzed. The anatomic basis for the contracture is a diffuse sclerosis of vascular origin affecting the white substance of the spinal cord. The most common form of such disturbances is a paraparesis ranging from slight weakness, with more or less stiffness of the muscles, to severe contracture. The legs may be strong but cannot be used properly on account of tonic contractions, or there may be complete spastic paraplegia. The arms are less frequently affected, but tremor is common. The gravity of the disturbances and their appearance at a comparatively early age, are special features. The tendon reflexes, especially the knee-jerk, become exaggerated early. The responses of the muscles to electric tests are not modified, but there may be less tendency to exhaustion in ergograph tests. Two typical cases are described to show the set of symptoms characteristic of these arteriosclerotic changes in the spinal cord, especially dizziness, disturbances in gait resembling those of locomotor ataxia, pains in the lumbar region, paresthesia of the legs and a sensation as if walking on cotton. There is no tendency to paralysis, the trouble in walking being due to spastic phenomena and incoordination almost complete unless the movements are controlled with the eye. The tendon reflexes are exaggerated, the others normal, the Babinski negative. In one man of 54 there were signs of advanced arteriosclerosis but otherwise conditions were approximately normal. In another man of the same age the gait had gradually become uncertain, incoordinated, spastic, with exaggerated tendon reflexes and negative Babinski, but there was also headache with tremor of the arms, and peripheral arteriosclerosis was marked. The Wassermann test was repeatedly negative. In other cases, vertigo was the predominant symptom although weakness of the legs was pronounced. In one case there was such stiffness of the muscles throughout and especially in the face, that the aspect resembled that of Parkinson's disease. There was no tremor in repose or during voluntary movements, but when gesticulating, a tremor like that of paralysis agitans was evident. In another patient of 59 the tremor gradually became the predominant symptom. He describes other types and transitional forms, emphasizing the differential points that distinguish them from the common affections which they may closely resemble but which differ from them in prognosis and treatment.

57. Loss of Teeth as Exempting from Military Service.—Chiavaro, from the standpoint of a dentist, urges that loss of teeth should not cause the rejection of a recruit, as false teeth can remedy this. In France 200,000 men have been rendered fit for duty by providing prostheses. Villa on the other hand reiterates that first class health is a most important element in the making of a good soldier. Men with false teeth who want to escape military duty can break their prosthesis to suit their convenience. He advises rejection of men with extensive caries of the teeth but not of men who have lost their teeth. If they can chew their daily bread with their gums at their homes, they can chew it equally well in camp.

Pediatrics, Naples

July, XXV, No. 7, pp. 385-448

- 58 *Cirrhosis of the Liver, Probably from Inherited Syphilis, in Two Children. O. Cozzolino.—p. 385.
59 *Ascites from Liver-Heart Disease in Child Under Three. C. Martelli.—p. 401.
60 *Physiologic Drop in Weight of the Newly Born. A. Borrino.—p. 413.

58. Cirrhosis of the Liver in Two Children with Inherited Syphilis.—Cozzolino had the children long under observation and completed his study of the cases with necropsy. They were girls of 3 and 5 and both presented the typical picture of venous cirrhosis of the liver, with profuse and returning ascites requiring frequent tapping. The Wassermann reaction was faintly positive in only one, and no spirochetes could be detected in the liver of either, although the changes in the liver were typical of syphilis except for the absence of gummatous lesions. There was no marked history of syphilis in either family, but he is confident of the syphilitic origin of the liver trouble, and compares the cases in detail with others in the literature.

59. Liver-Myocardium Ascitic Syndrome.—Martelli gives an illustrated description of a case of ascites in a child of 2 which differed in its origin from the usual types of ascitic affections. There was no peripheral edema, and the primary element in the trouble was manifestly the congenitally large and congested liver. This condition was aggravated by weakness of the myocardium, either congenital or acquired from infectious causes, etc. The liver grows more and more congested with obstruction of the portal circulation, and ascites follows from transudation. This clinical picture from lost compensation between the liver and heart may resemble the group of similar affections with polyserositis, but from the etiologic, pathogenic and anatomic standpoints they have little in common. Exact differentiation is important, besides its scientific value, as treatment differs for the two groups. In the group here described, the indications are for means to overcome the congestion of the liver and to strengthen the heart, and reduce the peripheral obstacles to its action. By these means we may be able to tide the patient along until the liver-abdomen plethora can be overcome and conditions right themselves throughout.

60. The Physiologic Reduction in Weight of the Newly Born.—Borrino has had the infants weighed systematically at once after birth and again at regular intervals, and tabulates the findings in 1,110 infants at the Turin maternity during three recent years. There was always a physiologic loss, totaling from 100 to 300 gm., reaching its height the second or third day. It has no connection with the form of the feeding or degree of development, but only with the weight of the child. He has become convinced that this loss of weight is due to the great elimination of water from the lungs and skin owing to the changed conditions of existence. The extent of this insensible perspiration and what is lost in the breath upsets temporarily the production and the regulation of heat. In the majority of breast-fed infants the weight rises again the third or fourth day, reaching the birth level by the end of the week in about 50 per cent. With proper physiologic conditions, the child regains its weight at birth during the second week at latest. If this does not occur; if the weight is regained only irregularly or tardily, the physician should be on the alert at once to prevent the child's getting into a state of undernourishment.

Policlinico, Rome

July 15, XXIV, No. 29, pp. 901-924

- 61 Suggestions for Better Organization of Surgical Service in the Field. R. Alessandri.—p. 901.
62 *Thread or Filiform Drainage in Mastitis. V. A. di Sant' Agnese.—p. 905.
63 Present Status of Reflex Nervous Disturbances. G. Dragotti.—p. 907.
64 *Paraffin-Tar Mixture for Treatment of Burns and Frostbites. A. Paraspori.—p. 912.
July, Medical Section No. 7, pp. 269-308
65 *Lumbar Puncture in Treatment of Essential Headache. G. Mingazzini.—p. 269.
66 Chronic Asphyxia of the Hands Associated with Scleroderma. G. Fumarola.—p. 299.
67 Paradoxical Extension and Flexion of the Hands and Fingers Under Unipolar Faradic Stimulation of the Forearm. C. Pastine.—p. 307.

62. Filiform Drainage in Puerperal Mastitis.—Di Sant' Agnese has found Chaput's method of draining with thread, wire or a very fine bougie a great improvement over other methods. The thread is drawn entirely through the abscess, using as many threads as needed, and the drainage proceeds incessantly and effectually, the minute openings in sound tissue not filling up, as they are free from dead space, while they do not favor introduction of air, are not painful and do not bleed. Chaput's experience has been extensive and highly favorable with all kinds of lesions, and di Sant' Agnese reports likewise extremely satisfactory results, especially in two cases of mastitis. In the first case he passed silver wire, about 0.5 mm. in diameter, through the entire extent of the abscess and a second wire was introduced later. The dressings were constantly soaked in pus and were changed twice a day. Relief was prompt and healing soon followed, without the damage from an incision, and the woman was able to nurse her child early. The other breast became affected a week or two later, and a bronze wire was passed through the

lesion, with similar prompt recovery. In the first breast an infiltration persisted after suppuration had ceased, and the wire was left in place for nineteen days on this account. In the other breast this persisting infiltration was disregarded, and the wire was withdrawn the ninth day, with equally prompt complete recovery. In the second case he used silk-worm gut, and regards this as better for the purpose. An extremely long needle had to be used as the distance through the breast was so great. He used a mattress needle in one case.

64. **Paraffin-Tar Mixture for Dressing Burns and Frost-bites.**—Parasporo states that in the thirty cases of this kind in which he has applied a mixture of paraffin and pine tar, all pain subsided at once and the micro-organisms seemed to find the region unfavorable for their proliferation, while the progress of the cases seemed to indicate a mechanical and chemical stimulation of the proliferation of the epithelium. He used paraffin with a melting point at 54 or 57 C., with from 1 to 3 per cent. vegetable tar.

65. **Lumbar Puncture in Treatment of Essential Headache.**—Mingazzini has been applying lumbar puncture in treatment of what he calls persisting hemicrania, the headache keeping up for months and years without interruption or with only brief respite. He excluded all cases suspicious of tuberculosis, syphilis, chronic nephritis, epilepsy and chronic alcohol or tobacco poisoning, and also incipient brain tumors, examining the fundus of the eyes in case of doubt. He also excluded patients with symptoms indicating diffuse pressure on the brain or cerebral neurasthenia. All the patients treated with lumbar puncture have been under observation for months up to two or three years. All but six of the forty-seven patients were women. The spinal fluid always seemed to be normal. A definite cure was realized in twenty-four, about 50 per cent. of the total. Notable improvement followed in fifteen others while no benefit was apparent in eight cases. One woman of 60 had suffered from the headaches from youth and they had become a daily torment during the last six months. She was completely cured by the lumbar puncture, while a woman of 22 whose headaches dated from typhoid two years before was not improved. In the cases showing no benefit, the fluid was always under low pressure while in the improved cases the pressure was almost always above normal. The amount of fluid withdrawn did not seem to influence the outcome, as only 5 or 10 c.c. had been drawn in some of the improved cases while up to 15, 20 or 30 c.c. had been taken in some of the unimproved. Repetition of the puncture did not help when the first did not benefit. The age at the onset of the trouble seems to have great influence as the cured and improved cases dated from the period between the tenth and twentieth years. The unbenefited were those in whom the headache had come on after the age of 20 and it had become permanent during some debilitating illness or lactation or was associated with other neuroses, epilepsy, trigeminal neuralgia or sequels of encephalitis. Another decisive factor was the length of the interval since the headache had passed into a practically continuous phase. The cases in which this phase had lasted a year or more were less tractable. Mingazzini also calls attention to the fact that the headache was aggravated for only from one to four days after the puncture in the cases in which a cure followed. In the others it lasted longer.

Analysis of all his cases has convinced him that the curable hemicrania is the result of loss of normal balance between the glands with an internal secretion during the period of puberty. The functional balance is disturbed, including the mechanism regulating production of cerebrospinal fluid. A vicious circle is set up, the fluid being secreted in abnormal amounts and this keeping the plexus in an irritable state, with exacerbations at periods of hyperemia. By cutting out the factor of the abnormal amount of the fluid, the other conditions are given a chance to right themselves.

Prensa Medica Argentina, Buenos Aires

June 30, IV, No. 3, pp. 25-40

- 68 Congenital Dental Cysts; Three Cases. O. Copello.—p. 25.
69 Retrocecal Appendicitis Abscesses in Three Children. R. A. Rivarola.—p. 28.

- 70 *Juxtapapillary Retinochoroiditis. M. I. Puiggari.—p. 30.
71 Pernicious Anemia. J. J. Moyano.—p. 32.

70. **Juxtapapillary Retinochoroiditis.**—Puiggari gives an illustrated description of three cases of the absolute and stationary scotoma of the special type to which E. Jensen called attention in 1908 as corresponding to a small infiltration in the fundus of the eye, close to the papilla. The patients are young people, and the infiltration finally subsides, but it leaves a whitish atrophied area. The Wassermann reaction has always been negative in these patients, and they were healthy, free from any signs of tuberculosis at the time or later. These facts and the benign character of the affection seem to exclude both syphilis and tuberculosis as causal factors.

Revista de Medicina y Cirugia, Havana

July 25, XXII, No. 14, pp. 347-372.

- 72 Extraction of Foreign Body in Bronchus by Low Bronchoscopy. E. F. Soto.—p. 347.
73 Case of Inguinal Cystocele. E. Stincer.—p. 353.

Semana Medica, Buenos Aires

May 31, XXIV, No. 22, pp. 615-642

- 74 *Vaginal Operations for Suppuration in Tubes and Ovaries. A. Chueco.—p. 618.
75 Pathologic Histology of Muscles in Severe Myopathy. J. C. Navarro and C. A. Correias.—p. 628.
76 History of Public Health Service in Argentina. E. R. Coni.—p. 631. Continuation.
77 Quantitative Determination of Oxidases and the Oxidasogenous Unit. L. Goldemberg.—p. 640.

74. **The Vaginal Route for Operations on Suppurating Tubes and Ovaries.**—Chueco is chief of the operative gynecologic department of a Buenos Aires hospital, and he pleads for the more general use of the vaginal route in removing pus tubes and ovaries in suitable cases. The adnexa must be capable of being reduced and brought out to the surface, and this can be determined beforehand. When conditions permit of the vaginal route, the advantages are overwhelming, not the least being that the lesion is attacked logically, from the most virulent focus first, working upward to the sound intestines, while by the laparotomy route, the sound parts have to be entered first and the operator works down to the most virulent region. Another advantage of the vaginal route is that—the abdominal walls not being incised—there is no special stiffening or retraction of the walls, squeezing parts below and fostering adhesions. All this is obviated by the vaginal route, and when this simple and harmless surgical intervention is supplemented by serum and vaccine therapy, we come near to realizing the ideal for the patient. It is far from ideal for the operator, however, as it is much easier for him to work through an abdominal incision. The patient gains however immeasurably, and with practice the vaginal operator soon finds himself master of the technic. The greatest difficulty is hemostasis, but that this can be mastered is evident from the mortality of zero per cent. and zero per thousand in comparison with the 6 or 8 per cent. mortality in laparotomies for virulent suppurating processes in the adnexa. Working from below, the wall of new tissue, which Nature has thrown up to protect the peritoneum from the lesions below, can be left unmolested. In his hundreds of cases there was never a trace of peritonitis, even when the pyosalpinx was so large that it had to be punctured to evacuate some of the contents before it could be "exteriorized." He does not try to remove with the adnexa the wall of new tissues above; these are soon absorbed after the source of the irritation has been taken out. He uses silk in ligating, leaving the ends long to project from the vulva. This aids in draining and allows the silk to be pulled out when no longer needed. When clamps are used, he leaves them for five days, renewing the gauze around them every day.

Siglo Medico, Madrid

July 14, LXIV, No. 3318, pp. 505-524

- 78 Nontuberculous Suppuration in the Kidneys. S. P. Pascual.—p. 506. To be continued.
79 *Insufficiency of the Kidneys in Connection with Hemoptysis. Pisanis.—p. 508.

- 80 Difficulties in Treating Syphilis of the Nervous System. Sicilia.—p. 510.
81 Present Status of Dietetic Treatment of Diabetes. N. Santos—p. 520. Commenced in No. 3316, p. 479.

79. **Hemoptysis from Insufficiency of the Kidneys.**—Pasanis' patient was a robust farmer of 36 who had been healthy until a year before, when he had had what seemed to be an acute nephritis for three weeks and during convalescence there was a profuse hemoptysis. He was put on a special diet and his life regulated as for treatment of pulmonary tuberculosis, the assumed cause of his hemoptysis, but notwithstanding the greatest care the hemoptysis returned a month later. He was then sent to Pasanis for more exact differentiation, but the latter could find nothing to justify the assumption of tuberculosis. Hemorrhages in the course of nephritis are not so very uncommon, and although the urine seemed to be normal at the time of his examination he assumed a renal basis for the hemoptysis. Consequently he placed the patient on an antinephritic diet and regulated his life to spare the kidneys, prescribing merely calcium chlorid, 0.25 gm. a day, fractioned. The patient has been in excellent health during the four years since to date, with no further suggestion of hemoptysis.

Grèce Médicale, Athens

XIX, No. 5-6, pp. 9-12

- 82 *Pathogenesis of Paralysis Agitans. (Maladie de Parkinson.) C. T. Manthos.—p. 9.
83 *Examining the Iris with Strong Light Brings on Epileptic Seizure. C. T. Manthos.—p. 10.

82. **Paralysis Agitans.**—Manthos remarks that recent experiences and deductions have apparently demonstrated that the normal parathyroids are regulators of neuromuscular functioning. Roussy and Alguier found the parathyroids pathologic in several cases of paralysis agitans, and Manthos reports that the parathyroids were much enlarged in a case of typical Parkinson's disease in a woman of 55.

83. **Provocative Test for Epilepsy.**—Manthos was examining the eye of a medical student subject to epileptic seizures about once in three months. As the powerful reflected light fell on the retina, a typical epileptic seizure followed immediately. The irritation of the retina from the light probably brought on the seizure.

Russkiy Vrach, Petrograd

XVI, No. 11, pp. 241-264

- 84 Gas Gangrene. N. M. Volkovitch.—p. 241.
85 Treatment of Wounds of the Spinal Cord. V. E. Dzerzhinsky.—p. 247.
86 *Muscle Plastic Operations After Wounds of the Face. A. M. Nikolsky.—p. 252.
87 *War Wounds of the Skull and Its Contents. S. I. Liukomovitch. p. 254. Conclusion.

86. **Muscle Plastic Reconstruction of the Face after War Wounds.**—In the case described and illustrated, the temporal muscle was used to pad the disfiguring depression in the cheek.

87. **Wounds of the Skull.**—Liukomovitch concludes his long analysis of a year's experience with wounds of the skull and brain with a number of recommendations. He denounces as absolutely disastrous any attempt to send back from the front those who have been recently operated on for a skull wound. The danger with a skull wound is from infection much more than from the seriousness of the traumatic injury if it does not prove immediately fatal.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

June 9, I, No. 23, pp. 1859-1922

- 88 *Mortality from Tuberculosis During Mobilization Period in the Netherlands. B. H. Sajat.—p. 1860.
89 *Blue Sclerotics in Connection with Other Anomalies. N. Voorhoeve.—p. 1873.
90 Case of Autochthonous Lepa. J. Broers.—p. 1881.
91 Medical Impressions of America. C. W. F. Winckel.—p. 1896. Continuation.

88. **Tuberculosis Mortality During the War.**—Although Holland is not involved in the war, yet its military forces have been mobilized throughout, and Sajat's statistics show

that the mortality from tuberculosis has increased in the cities from 154.4 per hundred thousand inhabitants in 1913 to 179.5 in 1916. Even a stationary mortality is equivalent to decided loss as the tuberculosis mortality had previously shown a steady decline for a number of years. The call to the colors has brought dozens of young men, who had been getting scarcely any exercise in their lives, into conditions calling for much exercise, and while this is a benefit for many, in others, and especially those with latent tuberculosis, it may lead to the flaring up of the disease. The mortality from tuberculosis has not increased materially among young men in the cities, but it has shown a great increase among the women between 20 and 30, at least in the working classes. He ascribes this directly to the higher cost of living and consequent insufficient food while the man of the family is absent with the troops. The mother keeps the poorest and the smallest portions of the food for herself, giving the best to feed the children. There is also much unemployment. He says that the measures to repress the spread of tuberculosis have hitherto been altogether too dilettante. Much has been done, but it is still, "Oh, so far from complete!" Money is raised by flower-tag days, but only enough to send a few patients to the sanatoriums, and nothing can be done for the hundreds of others who need it. The tuberculous wage-earner has to keep at work to support his family; the tuberculous mother of the family toils to keep the husband and children fed and clothed. The increasing mortality shows that the number of sources of infection for tuberculosis is constantly growing larger. The campaign against it should no longer be left to private initiative, he declares.

89. **Familial Blue Sclerotics and Other Anomalies.**—Voorhoeve describes a family of father and two daughters who had multiple fractures of different bones, blue sclerotics and other anomalies, and the man was able to supply data in regard to several generations of his family showing that these anomalies were inherited. Voorhoeve gives the family tree of one branch of the family, containing fifty-nine members, forty of whom he was able to examine personally. The total data include 244 members of the family, through several generations. It is possible to trace through these generations the evolution of the defects which culminate in the fragility of the bones, the blue sclerotics and other anomalies in the mesenchyma organs. Hemophilia was the first anomaly of which there is record in the family. The inferiority of the blood and blood vessels was not manifested in the hemophilia alone, but congenital heart defects were comparatively common. The bones did not display any tendency to fracture in the early generations, but cleft palate and rachischisis showed that the skeleton was abnormal. Blue sclerotics were noticeable in the early as well as the late generations. The whole family history indicates as the explanation of the anomalies an inherited inferiority of the mesenchyma. In four members of the last generation examined, labyrinthine deafness was pronounced. This seems to conflict with the mesenchyma theory unless we assume that the organ of Corti was affected only secondarily to some anomaly in the stria vascularis which is of mesenchymal origin. In any event, he thinks that this assumption of inferiority of one of the great differentiated groups into which the embryonal cells develop, gives a good working hypothesis, and renders particularly interesting and perhaps important the collection of hereditary data along these lines, bearing the diverging lines of embryonal development in mind.

Norsk Magazin for Laegevidenskaben, Christiania

July, LXXVIII, No. 7, pp. 769-888

- 92 *Acute Leukemia. K. Nicolaysen.—p. 769.
93 *The Venous Murmur. K. Utheim.—p. 802.
94 *Free Graft from Peritoneum to Close Perforated Gastric Ulcer. A. Raabe.—p. 814.
95 *Progressive Bulbar Paralysis and Spinal Atrophy Consecutive to Poliomyelitis. L. Sommerfelt.—p. 823.
96 *Retropharyngeal Pituitary Tumor. F. Leegaard.—p. 829.
97 *Progressive Multiple Ossifying Myositis. C. Johannessen.—p. 839.

92. **Acute Leukemia.**—Nicolaysen analyzes three recent cases of acute leukemia in his experience. One was in a boy of 15 and developed after a diphtheria-like throat affection.

The boy had been previously healthy except for pneumonia at one time and a fractured leg. After a brief period of a hemorrhagic tendency, suggesting scurvy, severe anemia followed with enlargement of the spleen—the blood typical of myelogenous leukemia—fatal in a month or two after the first sign of trouble. Fully 33 per cent. of all the nucleated blood corpuscles were megaloblasts and normoblasts. Holst found streptococcus infection in three cases of acute leukemia, and Harbitz the staphylococcus and the pyocyaneus in two cases respectively. The second case here described was in a previously healthy young woman; the hemorrhagic tendency developed acutely in the course of a suppurative process in the jaw, with progressive anemia and death the third month. In neither of these cases could any germ be cultivated from the blood. Both developed during the month of April, 1916. Roentgen exposures were applied without benefit in the second case. The third patient was a boy of 17 who entered the hospital six months later than the others. He had been previously robust and said he had never been sick except for a briefly transient period of "poor blood" for which he had taken iron, the summer before. He died five days after he entered the hospital with the diagnosis of leukemia. The first symptoms, pallor and lassitude, had been noticed less than a month before. The glands soon became enlarged and the blood findings typical of acute lymphatic leukemia. Dyspnea, somnolency, edema, polydipsia and polyuria were marked symptoms toward the last. The pituitary body was found of normal size and shape, and the spleen was not so large as in the other cases, while the glands and the thymus were much larger. This seems to be a differentiating point for lymphatic leukemia, as also the protrusion of the eyeballs and the restriction of the hemorrhagic tendency to the intracranial region. A gram-positive diplococcus was found in all the organ sections but the blood was not examined during life. Nicolaysen thinks there need be no difficulty in distinguishing between acute myelogenous and acute lymphatic leukemia, as the clinical picture differs and the Pappenheim stain shows such differences in the blood picture, as he illustrates with colored plates. The indol-phenol reaction is not very reliable, and is of use only in dubious cases. This is based on the blue reaction when a solution of dimethylparaphenyldiamin and a solution of alpha naphthol act on the protoplasm in cells of myelogenous origin (W. H. Schultze).

93. Venous Murmur.—Utheim refers to the sound heard on auscultation of the triangular fossa between the sternal and the clavicular attachments of the sternocleidomastoid muscle. Laennec called it the song of the arteries. Utheim explains the mechanism for the sound, and states that it is practically constant in children under 10 but grows less frequent with advancing age. It does not seem to have any connection with anemia.

94. Gastric Ulcer Perforation Patched with Flap from Peritoneum.—Raabe's patient was a man of 45 with stomach disturbance for about three years when symptoms of perforation compelled operative treatment. The perforation was quite large, in the middle of the lesser curvature, and as the omentum was too short to draw up over it, he covered the opening with a piece, 4 by 4 cm., cut from the reflection of the peritoneum between the falciform ligament and the parietal peritoneum. The edges of the perforation were freshened with phenol and the vicinity painted with iodine, and the flap was sutured as solidly as possible over the opening. For three weeks the man was fed exclusively with nutrient enemata, an evacuating enema being given daily after the fourth day. The patient thrived remarkably and by the sixth week could eat ordinary food.

95. Poliomyelitis with Bulbar Paralysis.—Sommerfelt here gives the necropsy findings in one of the cases published by him last year and summarized in these columns June 23, 1917, p. 1952. Nothing was found to throw light on the combination of progressive bulbar paralysis and progressive spinal muscular atrophy in the man who at one time had had poliomyelitis.

96. Tumor of Pituitary Tissue in the Retropharynx.—Leegaard's patient was a workman of 23, mostly healthy,

until in 1912 he began to cough and experience difficulty in swallowing, with pains in the throat and difficulty in breathing. The large retropharyngeal tumor was easily removed in several pieces, without bleeding. It was evidently a pituitary adenoma, growing from the anterior lobe of the pituitary body, the pharynx hypophysis, as it is called. But there were no symptoms at any time suggesting any anomaly in pituitary functioning. This confirms the general assumption that the pharynx hypophysis does not possess a physiologic function.

97. Multiple Progressive Ossifying Myositis.—Johannessen gives an illustrated description of a case of this rare affection in an apparently well developed child of 2 with normal mucosa but a discharge from both ears. She screams if she is touched, but otherwise sits quietly, the head bent forward, watching with interest what goes on around but following objects only with her eyes, not moving her head. She presents a typical example of this affection which usually commences with edema and tenderness of certain muscles, with slight fever. Then follows a more solid infiltration and finally bone formation. The infiltrations skip about abruptly from one muscle group to another, and the temperature shows little change. There do not seem to be any data on record as to the length of the interval between the infiltration and the bone formation, but in this case there was tumefaction in the superior serratus in November, 1916, and by the following January the Roentgen rays disclosed bone tissue in the muscle at this point. In one case on record the disease progressed after a pause of twenty-three years. In the only case of the kind reported in Norwegian literature, the trouble began at the age of 2 and the girl died suddenly about 12. She had been unable to feed herself for years, as she could not move her arms, but was able to take a few steps and could read and sing although she had never been able to go to school. The various theories that have been advanced to explain this affection ascribe it to a bony diathesis, a trophoneurosis, inflammatory processes in the muscles or defective differentiation of the mesenchyma. This latter assumption is sustained to a certain extent by the almost invariably accompanying microdactylia. The latest and most comprehensive study of the affection was published by Goto in 1913, who repeatedly examined scraps of tissue from a boy of 4 as he grew up with the affection. In Johannessen's case, potassium iodid, thyroid treatment and other measures were systematically applied, but no benefit is mentioned. The child had a good appetite and slept well, with the natural functions in good order, but she fell when she tried to get about, and the part bruised would swell up instantaneously as large as half an apple.

Ugeskrift for Læger, Copenhagen

June 21, LXXIX, No. 25, pp. 997-1038

98 *Lumbar Puncture Fluid Constantly Sterile with Severe Otogenous Meningitis. G. V. T. Borries.—p. 997.

99 Sulphur in Treatment of Scabies. (Erfaringer over Fnatbehandling med Ung. hepatis sulphuris.) Ehlers.—p. 1005.

100 Present Status of the War Bread Question. V. Scheel.—p. 1008.

98. Sterile Lumbar Puncture Fluid with Otogenous Meningitis.—Borries discusses how it is possible for otogenous meningitis to develop and run its course to a fatal termination with the cerebrospinal fluid sterile throughout. He tabulates the findings in eight such cases. The infection occurred by way of the tympanum and mastoid bone in nearly all; in only one was it traceable to the labyrinth. But in all there was an abscess or sinus phlebitis, subdural suppuration. It is evident that purulent internal pachymeningitis may induce meningitis with which the cerebrospinal fluid may be constantly sterile and approximately normal otherwise, confirming the possible mildness of otogenous meningitis. The danger lies in the concomitant purulent internal pachymeningitis. To be fully instructive, lumbar puncture must be repeated often as the findings are liable to veer from positive to negative and vice versa at any time. Finding the fluid sterile when symptoms of meningitis are pronounced should warn to seek for purulent pachymeningitis or circumscribed suppuration and thus it gives the clue for diagnosis and treatment.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXIX, No. 10

CHICAGO, ILLINOIS

SEPTEMBER 8, 1917

THE NONSPECIFIC CHARACTER OF VACCINE THERAPY*

JOSEPH L. MILLER, M.D.

CHICAGO

Wright's conception of the value of vaccine therapy was based on the accuracy of the opsonic index. When later the opsonic index was shown to be an unreliable guide, and since the immunologists had no better method for determining immune body formation, it was necessary in case vaccine therapy was to be continued that the clinician draw his own conclusions regarding the value of this method of treatment. Interpretation of results passed now from the hands of the laboratory worker to the clinician.

The application of any therapeutic measure to this group of diseases is fraught with considerable difficulties. Spontaneous recovery is the rule; the duration and intensity of the infection is so variable that it is extremely difficult to draw accurate conclusions regarding the value of any special line of treatment. In order to justify statements regarding curative agents, a large number of carefully selected controls must be studied, and then only when the difference in results are striking should we be justified in concluding that the course of the disease had been modified.

Typhoid fever is the only acute infection, treated with vaccines, in which a large series of cases with suitable controls has been reported. A study, however, of the accumulated statistics of typhoid does not lead to the conclusion that vaccines when given subcutaneously have materially modified the course of the infection. We are disappointed when we search the literature for beneficial results from vaccine therapy in colon bacilli infection, acute or chronic rheumatism, bacillary dysentery, whooping cough, gonococcal infections, and dermatologic conditions, such as acne and furunculosis. Furthermore, a review of the literature fails to reveal any striking evidence that vaccines when given subcutaneously have definitely modified the course of any acute infection; much less has it been demonstrated that the results were due to the specific character of the vaccines. It has only been in the last two years that extensive comparative studies have been made regarding the value of specific and nonspecific vaccine therapy. As a result of these studies it now appears possible to draw conclusions on this point.

It may be said that the first well defined and unquestionable results obtained by vaccine therapy were those¹

recently obtained by Ichikawa and independently by Kraus and Mazza,² and Penna in the treatment of typhoid by the intravenous use of typhoid vaccine. Kraus used a polyvalent vaccine of ether-killed organisms and Ichikawa a sensitized vaccine. These investigators, by giving a dosage of from 200 to 300 million, were able to terminate, usually after a single injection, about 20 per cent. of their cases by crisis. About 20 per cent. more terminated by rapid lysis, the temperature reaching normal in from three to five days. An additional 20 per cent. showed a favorable modification in the temperature curve with apparent but not striking shortening of the course of the disease. The remaining 40 per cent., with the exception of the temporary drop in temperature following the chill which occurs after the injection, were not affected by the treatment. Occasionally when a single injection failed to give results, definite improvement may follow a second injection. Rarely, however, if two injections fail to give results is there likely to be improvement after further treatment.

Ichikawa and Kraus very early determined that the reaction was not specific, as the former discovered that the typhoid vaccine worked equally well in paratyphoid, and the latter that similar good results could be obtained in typhoid with a colon vaccine, the important factor being that the vaccine be given intravenously. This intravenous vaccine in typhoid not only marked the beginning of striking results from vaccines, but also raised the question of the specificity of the reaction. Much earlier than this, however, the literature contained considerable evidence that the reaction was certainly not entirely specific in character.

In 1893, Fraenkel³ treated fifty-seven typhoid patients with subcutaneous injections of killed typhoid bacilli. He reported that the course of the disease was favorably modified and in a few cases terminated by rapid lysis.

Rumpf,⁴ an associate of Fraenkel's, repeated the treatment in another series, using, however, the *Bacillus pyocyaneus* with equally favorable outcome. While Rumpf's results were disputed, in the light of recent observations they were probably correct.

Von Wagner⁵ in 1909, having observed that patients with general paresis frequently showed marked temporary improvement after a course of fever, treated a number of patients by exciting a febrile reaction with tuberculin. He employed large doses, 0.5 c.c., every second day until from seven to twelve injections had

2. Kraus and Mazza: Zur Frage der Vakzinetherapie des Typhus abdominalis, München. med. Wchnschr., 1914, **61**, 1967.

3. Fraenkel: Ueber Spezifische Behandlung des Abdominal Typhus, Deutsch. med. Wchnschr., 1893, **19**, 958.

4. Rumpf: Die Behandlung des Typhus abdominalis mit Abgetöteten Kulturen des Bacillus Pyocyaneus, Deutsch. med. Wchnschr., 1893, **19**, 561.

5. Von Wagner: Ueber die Behandlung der progressive Paralyse, Wien. med. Wchnschr., 1909, **59**, 2125.

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Ichikawa: Abortive Treatment of Typhoid and Paratyphoid, Seiki-Kwai Med. Jour., 1913, **33**, 73.

been given, and reported definite temporary improvement, which he considered too constant to be accounted for by the spontaneous improvement often noted in this disease.

Vaughan,⁶ several years ago in his studies on immunity, observed that it was possible to produce in animals a transitory immunity to the colon bacillus by using peptone or egg albumin, and that this immunity was apparently equal to that following immunization with colon bacilli. He also noted that animals immunized to the *Bacillus subtilis* and *Bacillus prodigiosus* possessed a certain degree of immunity to typhoid and cholera.

Schmidt,⁷ in 1910, called attention to the increased resistance of the body to a variety of common infections following any form of vaccine therapy.

Herescu and Shoninger,⁸ in 1913, in their efforts to show the close morphologic relation between the gonococcus and meningococcus, reported favorable results in gonorrheal complications, as arthritis and ophthalmia, from the use of meningococcus serum.

Returning to the observations that have been made on the nonspecific character of vaccines since Kraus' work in 1914, it will be seen that in the short period of three years there has developed an extensive literature. Lüdke,⁹ after verifying Kraus' results with colon vaccine, experimented in typhoid with a 4 per cent. solution of deuterio-albumose given intravenously. He obtained results which compared favorably with those obtained with typhoid vaccine. This marked a step in advance, showing that not only were the vaccines not specific but also that similar results could be obtained by using a foreign protein of nonbacterial origin. More recently, Saxl¹⁰ has successfully treated typhoid by using intramuscular injections of sterilized milk. Mittlander¹¹ has treated 300 cases of typhoid by the intravenous injection of 1 c.c. of 20 per cent. caffein and 10 per cent. camphor. He does not state how these drugs were given, but presumably intravenously, as within fifteen minutes the patients had a chill with marked temperature elevations. He reports frequent termination by lysis or crisis. The chill reported may have been due to impure physiologic sodium chlorid solution, but more likely to the caffein and camphor. There is considerable evidence to show that not only foreign protein but also other agents that will excite a chill may bring about a sudden immunity. Janeway¹² refers to the rapid termination by lysis of typhoid in a patient in whom a chill followed a transfusion for hemorrhage.

Various foreign proteins are now being used in this country in the treatment of a variety of acute infections, largely owing to the stimulating work of Jobling and Petersen,¹³ chiefly typhoid vaccine and proteose. In Germany, sterilized milk and sodium nucleinate are chiefly used. Next to typhoid the condition which has received the greatest attention has been the arthritides.

For this condition, Müller and Thanner¹⁴ and Schmidt¹⁵ have used intramuscular injections of sterilized milk; Smith¹⁶ and Luthlein,¹⁷ normal horse serum; Culver,¹⁸ colon meningococcus and gonococcus vaccines; Müller and Weiss,¹⁹ tuberculin. Colloidal substances, like collargol,²⁰ have also been used successfully; Lusk²¹ and I have treated 130 cases of arthritis, using chiefly typhoid vaccine, results of which will be detailed later.

A less extensive series of a variety of other infections have been reported. Kraus treated eight patients with puerperal sepsis with colon vaccine, and reports beneficial results in seven. Ziembowski²² has injected milk with good results in sepsis and tuberculosis, especially of the bones. Schmidt has treated typhus, Müller and Thanner conjunctivitis and iritis, and Friedlander²³ trachoma with milk. Engman and McGarry²⁴ have used typhoid vaccine successfully in lupus and psoriasis. This probably explains the good results obtained in psoriasis with autoserums, as after coagulation the serum becomes a foreign protein. Strouse and Frank²⁵ have treated hay-fever with staphylococcus vaccine, and report results equal to those obtained by the use of pollen.

Our observations have been confined chiefly to the application of foreign protein therapy to the acute, subacute and chronic arthritides. During the past year and a half we have treated at the Cook County Hospital 175 cases. This included streptococcus and neisserian types. In our first series of twenty-five, the patients after entering the hospital were kept at rest in bed for a few days before receiving any treatment in order to determine what benefit might be derived from this procedure alone. We have used typhoid vaccine almost exclusively as a foreign protein, and in a few cases, proteose and chicken serum; the latter two were used in a sufficient number of cases to show that the results are apparently the same as with the typhoid vaccine. The vaccine at first was prepared from Rawling's strain, but later from a culture obtained from a virulent typhoid. Commercial vaccines are unreliable on account of the variable amount required to give the desired reaction. With the freshly prepared vaccine the dosage has ranged from 40 to 150 million. When beginning the use of a fresh supply of vaccine, its toxicity was determined by beginning with a small dose of 40 million and then increasing until the amount required to give the desired reaction was ascertained. This precaution is advisable, as the toxicity of the vaccine may be quite variable. With few exceptions the vaccine has been given intravenously. Following

14. Müller and Thanner: Ueber parenterale Eiweiss Injektion, Med. Klin., 1916, **12**, 1120.

15. Schmidt, R.: Ueber Proteinkörpertherapie und über parenterale Zufuhr von Milch, Med. Klin., 1916, **12**, 171.

16. Smith, L.: Value of Anaphylaxis in the Treatment of Gonorrheal Complications, THE JOURNAL A. M. A., June 3, 1916, p. 1758.

17. Luthlein, F.: Zur Kenntnis der Wirkung der Vakzins, Wien. klin. Wchnschr., 1916, **29**, 253.

18. Culver: Verhandl. d. deutsch. Gesellsch. f. Urol., 1913, **4**, 102; THE JOURNAL A. M. A., Feb. 3, 1917, p. 362.

19. Müller, R., and Weiss, A.: Fieber Behandlung gonorrhoische Komplikationen, Wien. klin. Wchnschr., 1916, **29**, 249.

20. Wick: Behandlung des Gelenkrheumatismus mit Einspritzung von Kollargol ins Blut, München. med. Wchnschr., 1916, **63**, 350.

21. Miller, J. L., and Lusk, F. B.: Use of Foreign Protein in the Treatment of Arthritis, THE JOURNAL A. M. A., June 3, 1916, p. 1756; Dec. 30, 1916, p. 2010.

22. Ziembowski, D.: Ueber den therapeutischen Wert parenteraler Milch Zufuhr, Med. Klin., 1916, **12**, 1174.

23. Friedlander: Therapeutische Erfahrungen bei parenteraler Injektion von Protein Körpern und ihren Spaltzproduktion in die Augenhilke, Wien. klin. Wchnschr., 1916, **29**, 1321.

24. Engman, M. F., and McGarry, R. A.: Treatment of Certain Diseases of the Skin by Intravenous Injection with Foreign Protein, THE JOURNAL A. M. A., Dec. 9, 1916, p. 1741.

25. Strouse, S., and Frank, I.: Pollen Extracts and Vaccines in Hay-Fever, THE JOURNAL A. M. A., March 4, 1916, p. 712.

6. Vaughan, V. C.: Protein Split Products in Relation to Immunity and Disease, 1913.

7. Schmidt, R.: Med. Klin., 1910, No. 43.

8. Herescu, P.: Ueber die Behandlung der lokalen und allgemeinen Komplikationen der Gonorrhoe durch Autimeningokokken Seruminjektion, Verhandl. d. deutsch. Gesellsch. f. Urol., 1913, **4**, 102.

9. Lüdke: Behandlung abdominal Typhus mit intravenösen Injektionen von Albumosen, München. med. Wchnschr., 1915, **62**, 321.

10. Saxl, P.: Ueber die Einwirkung pyrogenes Substanzen und Fieber, abstr., München. med. Wchnschr., 1916, **63**, 571.

11. Mitlander: Budapest Letter, THE JOURNAL A. M. A., April 22, 1916, p. 1320.

12. Janeway, T. C.: Tr. Cong. Am. Phys. and Surg., 1916, **10**, 142.

13. Jobling, J. W., and Petersen, William: The Nonspecific Factors in the Treatment of Disease, THE JOURNAL A. M. A., June 3, 1916, p. 1753.

the injection the patient within a few minutes to one hour has a chill, usually quite severe, with marked rise in temperature, 104 to 105 F.

Rarely does the rise in temperature persist for more than a few hours, although in one instance a high fever persisted for two days. In several cases a second chill has occurred from six to twelve hours after the injection. The patient suffers only the inconvenience that would come from a rise in temperature of this degree. At times there is nausea and severe headache, the former transient, the latter rarely persisting more than twenty-four hours. Not infrequently an extensive herpes may develop after the typhoid, colon or gonococcus vaccine, and with somewhat greater frequency after a meningococcus vaccine. In acute arthritis it is not unusual to note a most remarkable improvement in the joint symptom by the time the patient is through sweating. Immediately after the injection there is usually a slight leukocytosis which, during the chill, drops to normal or much below. We have observed a leukopenia reaching 1,800 per cubic millimeter in one instance following a violent reaction. The leukopenia is due to a reduction in the polymorphonuclear cells. This period of leukopenia is brief and possibly does not always occur, although we have never failed to detect it when counts were made at frequent intervals. It is followed by a rapidly developing leukocytosis of the polymorphonuclear type, which reached its maximum in four to twelve hours, gradually returning to normal in from twenty-four to forty-eight hours. This leukocytosis may reach 100,000 or more, but as a rule runs from 15,000 to 20,000. We have never observed a marked eosinophilia, as has been noted in anaphylactic reactions, nor have we seen any evidence of bronchial spasm, which is a constant accompaniment of severe anaphylactic shock. The blood pressure at the time of the chill is usually moderately elevated, on the average to from 10 to 15 points, although in one instance a rise of 40 mm. was noted. This rise in pressure is probably due to muscular contractions. Immediately after the chill there is a rapid and decided drop, reaching its maximum about six hours after the injection and then gradually returning to normal. A fall of 40 mm. is not uncommon. Systolic and diastolic pressure are about equally depressed, so that the pulse pressure remains the same at all periods of the reaction. When patients have received repeated injections, not infrequently the reaction after such successive injection becomes less marked.

That such violent reactions are not free from danger must be apparent. In our service at the Cook County Hospital we have treated 200 patients without any grave consequences with the exception of one case, an acute arthritis in an alcoholic, who following the injection developed delirium tremens and died about fifty-two hours after the injection. In three other patients, all alcoholics, marked delirium developed soon after the injection, in one instance continuing for thirty hours. Dyspnea and cyanosis were noted in a few cases. The urine never showed more than a transitory albuminuria. This absence of unfavorable consequences was probably due to certain precautions acquired by experience. Each new supply of vaccine was carefully tested out in order to determine a safe dosage. Patients with hypertension, marked valvular lesions or myocardial changes were not injected. When the infection was very acute, as shown by the temperature, the dosage of vaccine was reduced. After

our experience with the delirium tremens patient, marked alcoholics were not treated.

The literature contains reports of several fatalities, all apparently in typhoid patients. Sladek and Kotlowski²⁶ report one, and Eggerth²⁷ one—both from intestinal hemorrhage. Biedl²⁸ reports two deaths in typhoid from uncontrollable epistaxis. Föckler²⁹ noted an epileptiform convulsion after the intravenous injection of an immune serum for gonorrhea in a gonorrheal case, and Arnold and Hölzel³⁰ observed acute dilatation of the heart, with recovery after the use of the same agent. Weichart³¹ calls attention to the development of a proteinogenous cachexia in animals after the prolonged use of foreign protein.

We have quite complete records of ninety-three cases of acute arthritis treated by intravenous foreign protein, with few exceptions in the form of typhoid vaccine. Of this series, eighty patients were either relieved of their pain and soreness or greatly benefited by from one to four injections given daily. Six showed only moderate improvement, and seven were not benefited, although receiving repeated treatments, in two cases eleven and thirteen injections, respectively. In the majority of these there was no marked recurrence. However, mild recurrences after apparent recovery are common, this taking place within twenty-four hours to ten days or more. One patient with acute arthritis had six severe recurrences, although each time he was entirely relieved of pain and soreness after a single injection. It would appear that these recurrences are due to reinfection of the joints, as not infrequently they appeared in joints not previously involved. Apparently the effect of the treatment is confined to the infection in the joint, the primary focus escaping. When an acute endocarditis was present as a complication, this was apparently unmodified by the treatment. However, those who have treated gonorrheal arthritis report definite improvement in the urethral discharge, prostatitis, epididymitis, etc. In one case with a complicating iritis, this disappeared after a single injection. Müller and Weiss call attention to the difficulty of completely clearing up a gonorrheal infection by this method of treatment, as even in the midst of the treatment new complications may arise. In order to determine whether repeated daily injections, continued for from four to six days, would lessen the frequency of recurrences, a number of patients in spite of the marked improvement following a single injection were given daily or every second day, further injections until a total of from four to six had been given. Recurrences were noted less frequently when the treatment was given in this manner, but could not by any means be entirely avoided. Kinsella³² has shown that the sterilization of the blood in streptococcus endocarditis, after a chill excited by transfusion with defibrinated blood or impure salt solution, was of short duration, namely, twenty-four hours. Evidently in his cases the primary source of the blood infection was not eradi-

26. Sladek and Kotlowski: Zur Vakzine Therapie des Typhus abdominalis, Wien. klin. Wchnschr., 1915, 28, 389.

27. Eggerth: Ueber die Behandlung des Typhus abdominalis mit Typhus Vakzine, Wien. klin. Wchnschr., 1915, 28, 209.

28. Biedl, A.: Therapeutische Verwendung von Typhus Impfstoffen beim Menschen, Prag. med. Wchnschr., 1915, 40, 53.

29. Föckler: Zur Vakzinebehandlung der Gonorrhea, Dermat. Wchnschr., 1912, 55, 1395.

30. Arnold, A., and Hölzel, H.: Ueber den Wert intravenöser Arthigenin Injektionen bei Gonorrhoeischen Prozessen, München. med. Wchnschr., 1914, 61, 1967.

31. Weichart, W.: Beiträge zur Proteinkörpertherapie, Wien. klin. Wchnschr., 1916, 29, 1611.

32. Kinsella, R. A.: Bacteriologic Studies in Subacute Streptococcus Endocarditis, Arch. Int. Med., March, 1917, 19, 367.

cated. One of our patients with a subacute arthritis had been little benefited by foreign protein injection and had also proved resistant to salicylates. This patient developed a lobar pneumonia during which his arthritis permanently disappeared. Another patient with a gonorrheal arthritis had been treated with proteoses, typhoid and gonorrheal vaccine, with but little benefit. In the hospital he developed a tonsillar abscess, with temperature of 102 F., and within a few days the arthritis had disappeared. The behavior of the acute arthritides to foreign protein is not unlike that of profuse sweats observed after large doses of salicylate, as after either of these means marked amelioration of symptoms may be observed. Frequently, however, in spite of continuance of the treatment, recurrences will take place, or, in case the treatment is discontinued, acute joint soreness soon redevelops.

Thirty-three of our acute arthritides patients had been under active salicylate treatment, before receiving the foreign protein, without benefit. All but four of these were promptly, at least temporarily, greatly benefited by the typhoid vaccine.

Eighteen patients with subacute arthritis received the treatment. Fourteen of these were definitely benefited. Recurrences here were common, but in conjunction with the protein, an effort was made to clear up any foci of infection. Four weeks after the treatment several of these patients had not suffered from a relapse.

Twenty-eight patients with chronic arthritis received the treatment. Only those were treated in whom there was definite evidence of acute recurrence of the infection. Definite temporary improvement was quite frequently observed, and in a few cases, one of two years' duration, the patients received such benefit that they were able to return to work. The results on the whole were sufficiently suggestive to warrant a continuance of the treatment in selected cases.

The chief difficulty in this form of therapy is the violence of the reaction. An important question is the relation of this reaction to the beneficial action of the foreign protein. It has been our experience that when an injection was not followed by a chill, although there might be a marked leukocytosis, no definite beneficial results have been observed. Very large doses of protein intramuscularly also failed to produce the definite immediate results observed after the intravenous use. This does not exclude, however, the possibility that the disease was modified or that in case the injections had been continued for a period of time improvement may have resulted. Others have reported the same experience. Müller and Weiss report that in gonorrheal complications the proprietary immune serum for gonorrhea used by Fochler, when given in doses of 0.1 c.c. intravenously, will bring about marked amelioration of symptoms, while 0.5 c.c. intramuscularly has little if any effect. The German observers who have used milk intramuscularly report good results with moderate reaction. The reaction, however, is much more marked than that observed when vaccines in large doses are given in the same manner. Müller and Weiss, after the intramuscular injection of milk, report a temperature of from 103 to 104 F. Friedlander, who used this treatment in trachoma, reports that he did not observe a temperature above 101 F. and in many patients in whom good results were obtained, the temperature was only a little above normal. It is, however, the consensus of opinion that marked temperature reactions are associated with

good results. The various observers have all laid stress on this point and many consider the fever as the essential factor in the curative action. The Germans are now referring to this method of treatment as febrile therapy, believing that any agent that will cause a rise in temperature may give results.

The nature of the reaction responsible for this suddenly developing immunity has not been determined and it may be due solely to the temperature reaction and the various agencies of immunity excited by it. It is too early to state whether or not this method of treatment will become a permanent therapeutic measure. The results so far obtained would make it appear that it cannot be entirely discarded.

The chief objection to its continuance is the danger of grave or fatal reaction. Its careless administration must be carefully guarded against. This form of therapy must be considered as still in the experimental stage, and should not be generally applied without first a careful consideration of the dangers associated with it. If used, the toxicity of the particular vaccine must be determined, and the patient carefully examined especially for cardiovascular pathologic conditions. Failure to observe proper precaution may place this treatment in unwarranted disrepute. If the results now observed could be obtained without the violent febrile reaction, it would seem that this method of treating acute arthritis is superior to salicylate or other means at present employed.

122 South Michigan Avenue.

ABSTRACT OF DISCUSSION

DR. JACOB DINER, New York: I do not quite understand whether the essayist refers to intravenous vaccine therapy or vaccine therapy at large. These are two different factors. In relation to the intravenous method we are justified in speaking of nonspecificity. I can understand the nonspecificity of vaccines intravenously, but when given otherwise we are confronted with a different proposition and I do not doubt that here different proteins will bring about different results. No doubt vaccines have a better field in prophylaxis and in chronic diseases than in the acute diseases. I should like to ask whether Dr. Miller refers to stock or autogenous vaccines in arthritis, and if autogenous, from what source he obtains the organism? The dose of vaccines is also important. The majority of physicians go by the label on the package. The importance of graded doses in the individual case cannot be too much emphasized.

DR. JOHN F. ANDERSON, New Brunswick, N. J.: I should like to ask if Dr. Miller uses protein such as egg white, or the protein prepared from some of the cereals.

DR. ABRAHAM G. SHORTLE, Albuquerque, N. M.: I should like to ask if Dr. Miller has had any anaphylactic reaction on two, three or four doses. As the first gentleman said, it would seem to me that the use of vaccines in the skin and intravenously are two different matters. In using vaccines intradermally for a number of years I have been convinced that there is a certain specific action in the mixed infections of tuberculosis. It is not as satisfactory as we wish, but in observing numerous cases there is a certain percentage in which we find the sputum and temperature decrease and the mixed germs decrease, and I think there is some truth in the statement attributed to Dr. J. B. Murphy, "that no one ever dies of tuberculosis." I take it that he meant that they die of secondary infections. We feel that vaccines have done good in a certain proportion of the mixed infections, though as in all treatments for tuberculosis the good is not nearly so marked as we would like.

DR. RUSSELL L. CECIL, New York: During the past winter I treated about forty patients with acute arthritis in the wards at Bellevue Hospital with intravenous injections of vaccines. In thirty-three cases of acute arthritis I think probably 90

per cent. were cases of rheumatic fever. The others were cases of toxic arthritis. There were seven cases of gonorrheal arthritis. The vaccine used was typhoid vaccine, except in the gonorrheal cases, in which I used the New York Board of Health gonococcus vaccine. I found that the latter, just as the former, produced a chill and rise of temperature. Of the thirty-three cases of acute arthritis which were not gonorrheal I think thirteen patients recovered completely without any help from salicylates. In the other cases of acute arthritis we felt it was necessary to supplement the vaccine treatment with salicylates. Nearly all of the patients were improved by the vaccines but they showed a tendency to relapse. Many patients were relieved of their joint symptoms but complained of pain in the back and neck, and we gave salicylates to relieve this. All the gonorrheal patients were treated with gonococcus vaccine except two who received typhoid vaccine. They all improved slowly, without any apparent influence from the vaccine.

DR. TORALD SOLLMANN, Cleveland: I should like to emphasize a point which has been made in a way, but which may be overlooked; namely, that the term "vaccine therapy" is apt to be misleading. Apparently we are not dealing with immunity reactions, but with a pharmacologic reaction, the use of the vaccine being merely a method of producing this reaction. It will be interesting to learn whether similar reactions and similar cures cannot be secured by nonprotein pyretic agents. The change in the disorder occurs as a response to the abnormal temperature, and is distinct from an ordinary vaccine reaction.

DR. FRED I. LACKENBACH, San Francisco: I would take advantage of Dr. Miller's paper to clear up confusion in the previous discussion in regard to the antipneumococcic serum. It appears that certain groups of pneumococci will not be influenced by serum prepared from other groups. For instance, a pneumococcus infection caused by Group III will not be influenced by antipneumococcus serum which represents only Group I. This serum is an animal fluid; it is a blood serum and not a vaccine. One must determine the type of pneumococcus and then obtain the proper serum. The whole subject of specific and nonspecific immunization is extremely perplexing.

DR. WALTON F. DUTTON, Tulsa, Okla.: Just so sure as we have a prophylactic vaccine for typhoid, the time is not far distant when we will be able to isolate the particular strain which causes typhoid in a patient. Rarely are two cases of typhoid alike, and we know that at all times they are caused by different strains of bacteria. The cure of typhoid by use of autogenous vaccines is not far off. It is just as nearly possible to cure typhoid by the use of the specific protein as by the nonspecific.

DR. R. G. TORREY, Philadelphia: Has Dr. Miller any data regarding the influence of these injections on the development of cardiac disease? In acute rheumatism the joint involvement is negligible as regards danger of permanent change, and the question of particular interest, although the point about which we hear little, is the question of cardiac damage. Last summer, with my residents, Drs. Francis and House, I treated a series of twenty-nine patients with acute and chronic arthritis, either by injections of bacterial preparations, or the intravenous injection of formaldehyd solution, which gives a similar constitutional reaction. In the acute cases the effect on the arthritis and acute symptoms was favorable beyond our expectations, but we have not yet been able to draw any conclusions as to the influence of this mode of treatment on the development of disease of the heart.

DR. CLEON W. SYMONDS, New York: I should like to ask if Dr. Miller does not think that the results he gets from these vaccines are not due entirely to the temperature produced by the reaction as in the tonsillitis and pneumonia cases to which he referred? Also whether he desires to get a high reaction and whether his results are in proportion to the amount of elevation of temperature he gets with the injections?

DR. W. W. TOMPKINS, Charleston, W. Va.: I should like to ask if in these cases of arthritis Dr. Miller permits his patients to be up and around? A man may have arthritis of the elbow or wrist and in a sense can be comfortable,

whereas if he had a corresponding degree of arthritis in the ankle or knee he would almost be compelled for his own comfort to go to bed. The question has been asked in regard to the relative degree of the cases which are complicated with heart disease. Does it not devolve on the physician to see and emphasize and insist on these patients going to bed, thereby protecting themselves?

DR. W. A. WOMER, New Castle, Pa.: I should like to relate our experience with the use of vaccines with respect to the nonspecificity or use of them in pneumonia, typhoid fever and arthritis. We find the various strains of vaccines vary as to the effect on the patient, and it does not make any difference in regard to the temperature, as some with high temperatures have poor results, and some with low temperatures, good results. I have tried streptococcus, pyocyaneus, colon and staphylococcus, etc., and find some of the vaccines useless, while others will produce a reaction.

DR. JOSEPH L. MILLER, Chicago: In regard to the question whether vaccine given intracutaneously might act differently than when given intravenously, this may be true, but we consider it only a difference in the rapidity of absorption. We have tried to see whether we can bring about good results by large doses of vaccines intramuscularly and are still working on it. It is true that German investigators are using milk intramuscularly with good results, and in studying their records we find they report benefit in patients with mild reactions. The general opinion is, however, that a good reaction is essential. There is evidence in the literature regarding the nonspecificity of vaccine when used subcutaneously. Fraenkel, in 1903, used large doses of killed typhoid bacilli in treating a series of typhoid fever patients and reported good results, one or two of his cases terminating by crisis. His assistant repeated this test on other series, using *Bacillus pyocyaneus* and reported clinically good results. The question of the reaction, which Dr. Sollmann has mentioned, is interesting. I believe the term "protein therapy" is not correct. The Germans use the term "febrile therapy" for anything which produces a rise in temperature may accomplish the same purpose. Mention was made by one speaker as to getting results where the reaction was mild. Our experience has been that a good reaction is essential in order to obtain striking results. As to vegetable protein, we used a pollen protein in some cases of arthritis but there was a great deal of difficulty in getting the right dosage in order to bring about a chill; but when we obtained it we got the same result as with any other protein. Along the line of this is the work of Frank and Strauss who treated hay-fever with staphylococcus vaccine and reported results which compared favorably with those obtained with pollen vaccine. Anaphylactic reactions we have never observed. Regarding the symptoms, we have never observed anything that might not occur with the initial chill of any acute infection, and the dangers observed, provided precautions are taken in regard to dosage, are no greater. I do not think that the patient with severe arthritis is especially uncomfortable during the chill, and on questioning them they do not complain of pain in their joints as a result of the shaking. We have been unable to determine whether this mode of treatment lessens the frequency of endocarditis. In patients who have an endocarditis with arthritis we have never seen any results on the endocarditis.

Card Rating System for Food Handlers.—In Portland, Ore., the board of health has adopted a system of rating stores handling food products of any kind, with reference to the sanitary condition of such stores. A store whose sanitary condition, according to the inspection of the health board, averages 90 per cent. or better is given and is required to display a card showing that its rating is "A." Shops averaging only up to 80 per cent. are required to display a "B" card, and those rating under 80 per cent. a "C." The card must be displayed so that every patron may see it, and the regulation is enforced by frequent inspections. As might be expected a noticeable improvement has been made in all shops, each merchant being anxious to get an "A" rating. An advertising point is made by the merchant of a good rating, and customers profit by improved sanitary conditions.

ARTHRITIS AND FOREIGN PROTEIN
CHRONIC RHEUMATISM RELIEVED BY INTRA-
VENOUS INJECTIONS *

HENRY BASCOM THOMAS, M.D.
CHICAGO

Patients with chronic arthritis present a more vital problem in economy to the tax payers of the city and county and to the private hospital than almost any other cases. Their relative number for admission is large, and their stay is usually very long. There were 161 acute and 160 chronic arthritic patients in the County Hospital last year. St. Luke's does not admit chronic cases as a rule, yet many arthritic patients constantly receive careful and prolonged care there. Finally, many of these patients must go to the county or state poorhouses or homes for incurables when they have worn out their welcome in the city institutions.

In the spring of 1916, several patients with chronic arthritis appeared on my service at the County Hospital. They gave a history of treatment by "shots into the vein of something which made them chill and relieved their pain." They proved to be some of the first patients with intravenous injections of typhoid

In March, 1916, Müller and Weiss,² using the vaccine treatment in cases of gonorrheal arthritis, advanced the view that the beneficial effects produced by the vaccine therapy are due to the induced fever, or at least that the fever is a weighty component in these effects, and that the favorable effects are not due, or not mainly due, to the development of specific antibodies. They also state that the therapeutic effects seem to be greater the higher the degree of induced fever, and this is confirmed in my experience. See the case of H. S. below.

Jobling and Petersen,³ in speaking of the nonspecific factors in the treatment of disease, say:

It seems probable that the fundamental change on which the majority of [these] biologic reactions are based is one of colloidal dispersion, in that the injections bring about a less dispersed state affecting not only the serum proteins but also the serum lipoids. Such an alteration is sufficient to account for the fluctuations in the ferment-antiferment balance, and in the coagulation mechanism, as well as in the opsonic and complement powers of the serum, although it does not at present explain the increased antibody titer. With this as a basis we can understand that so many and diverse substances can bring about a reaction almost identical clinically and therapeutically. But here, as in so many other biologic problems which have to do with that most complex of tissues, the blood, it seems

TABLE 1.—DATA IN TWENTY CASES

Patient	Age	State	Nationality	Occupation	Examining-Room	Diagnosis
M. S.	39	Widow	U. S. A.	Laundress	Arthritis of hip	
J. D.	42	Widow	U. S. A.	Nurse	Multiple arthritis	
J. S.	54	Widow	Irish	Housework	Hallux valgus and arthritis	
L. Z.	56	Married	German	Housework	Arthritis deformans	
M. C.	42	Widow	Lithuanian	Janitress	Chronic osteoarthritis	
E. C.	55	Widow	U. S. A.	Housework	Chronic arthritis	
E. S.	28	Single	U. S. A.	Clerk	Multiple arthritis	
G. E.	22	Single	U. S. A.	College	Multiple arthritis	
M. C.	29	Married	German	Clerk	Multiple arthritis	
A. P.	44	Married	Hungarian	Laborer	Chronic arthritis	
F. S.	53	Married	German	Laborer	Osteoarthritis	
A. R.	36	Single	Russian	Laborer	Pes planus; chronic arthritis	
C. H.	54	Married	Swedish	Laborer	Hallux valgus; arthritis	
H. G.	32	Married	German	Laborer	Osteoarthritis	
J. O.	42	Married	Austrian	.....	Arthritis deformans	
H. W. (colored).	32	Married	U. S. A.	Laborer	Gonorrheal spurs; flat foot	
R. T. (colored).	18	Single	U. S. A.	Domestic	Arthritis	
H. R.	23	Married	Russian	Factory	Arthritis	
A. A.	54	Married	Italian	Laborer	Gonorrheal arthritis	
G. L.	49	Single	Norwegian	Iron-Molder	Flat feet; arthritis	

vaccine by Miller and Lusk,¹ whose first article on this new treatment appeared in June, 1916.

Anything which held promise of relief for chronic rheumatism was extremely attractive, and when advocated by experienced men, seemed worthy of an immediate trial.

A government strain of typhoid vaccine made by Dr. Moody at the laboratories of St. Luke's Hospital was used in the cases which form the bases of this report.

It seems to be fairly well established that typhoid vaccine in arthritis does not relieve symptoms by forming antibodies, that it is not a specific therapeutic agent, but that the benefit is derived from the protein carried in the dead bodies of the bacteria which are thought to produce a rise of temperature and hyperleukocytosis, just as other proteins like milk, proteose, horse serum, chicken serum, and sodium nucleinate are thought to do.

probable that no single factor can be identified as responsible for all the changes which occur, but that a whole train of events is inaugurated when the equilibrium of some of the delicate serum balances is disturbed, all of which tend toward a condition favorable for recovery from infection.

A large percentage of the patients under discussion had subacute and chronic cases, with beginning and advanced joint changes—hard working, ill fed and poorly cared for persons who sought the hospital as a last resort.

Table 1, of twenty cases of the series, gives an idea of the average age, nationality, occupation, civil state and examining-room diagnosis.

Rest in bed and a search for and elimination of the focus of infection is made a prerequisite to the injections in all cases, save in those in which the patients need the immediate relief from suffering which the vaccine gives. These have the treatment at once. If a sufficient interval has elapsed since the last meal, say six or seven hours, the gastro-intestinal reaction is less severe, and the patient less uncomfortable.

* From the Orthopedic Clinics of St. Luke's Hospital and the County Hospital.

* Read before the Section on Orthopedic Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Miller, J. L., and Lusk, F. B.: The Treatment of Arthritis by the Intravenous Injection of Foreign Protein, THE JOURNAL A. M. A., June 3, 1916, p. 1752.

2. Müller, R., and Weiss, A.: Fieberbehandlung Gonorrhöischer Komplikationen, Wien. klin. Wchnschr., 1916, 29, 249.

3. Jobling, J. W., and Petersen, William: The Nonspecific Factors in the Treatment of Disease, THE JOURNAL A. M. A., June 3, 1916, p. 1753.

In seeking the cause of the arthritis, the following possible sites of infection were kept in mind; tonsils, teeth, gums, sinuses, ears, eyes, urethra, prostate, gall-bladder, heart, gastro-intestinal tract, organs of female pelvis, etc.

In a few of the cases there was no demonstrable focus. In one patient who had a most severe multiple osteoarthritis affecting practically all joints, and who killed himself by taking poison, an exceedingly careful postmortem, in which particular attention was given to the urethra and prostate, revealed no cause for the crippling joint condition. Many other cases which I am in the habit of calling clean because the patients present at a glance a favorable hygienic condition—white, clean teeth and pink, hard gums—present no clue which enables us to find a focus of infection. My experience causes me to raise the question whether an obscure infected gland cannot do as much damage as a bad tonsil or an ulcerated tooth.

In subacute and chronic cases of osteoarthritis one will make no mistake if he prescribes 50 million typhoid vaccine intravenously, and in those cases which react only moderately cautiously raises the amount at intervals of two or three days to 75 million bacteria at an injection.

In eighty-six subacute and chronic cases treated, I have not yet seen harm done or alarming symptoms result from this treatment. Indirectly, several fatal cases have come to my attention, but they were, in my opinion, acute cases with alarming coexisting illness, and therefore should not be used as arguments against the free use of the vaccine in the general run of subacute and chronic cases coming to the attention of the orthopedist. Moderately advanced heart and kidney disease and tuberculosis of the lungs have not been considered sufficient reason for withholding the protein, but these diseases have been looked on as demanding carefulness in (a) the preparation of the patient, particular care being taken that the stomach is empty for several hours before the injection; and (b) the administration of a small initial dose, this to be increased gradually, but only after all the disagreeable symptoms of the former injection have disappeared and the appetite has returned.

TABLE 2.—PROTOCOL OF CASE 1

6-29-16, 7:30, 75 million			
Leukocyte Count	Temperature	Pulse	Respiration
Before injection, 13,600	98	76	20
Four hours later, 13,950	97.2	64	20
Twenty-four hours later, 13,800	97.4	60	20
No reaction to injection.			
7-6-16, 4:30, 75 million			
Leukocyte count:	Temperature	Pulse	Respiration
Before injection, 14,200	98.8	76	20
Three hours later, 12,000	101.2	112	22
Sixteen hours later, 20,000	99	80	20
Eighteen hours later, 12,200	98	76	18

RESULTS OF THE VACCINE

These may best be described under three heads: (1) the immediate effect; (2) the early relief from pain, and (3) the end-results of the treatment.

1. *Immediate Effect.*—This is an uncomfortable feeling which ranges from slight to very severe, accompanied by a chill, rise of temperature and emesis. The marked reaction is usually not so evident in the chronic as in the acute cases. The gastro-intestinal symptoms are less marked in cases of equal chronicity in which food has been withheld for four or six hours before the injection. The temperature charts in old cases frequently show a higher fever following the second and third injection.

CASE 1.—H. R., who showed no reaction to first injection, reacted to second with temperature of 101.2 and leukocytes 20,000. Dates of injections, leukocytes, temperature, pulse and respiration are shown in Table 2.

There was headache and nausea in two hours. Emesis in two hours, forty minutes. Severe headache in twenty-eight hours.

CASE 2.—H. S. was injected for the first time July 25, 1916, at noon. The temperature rose to 104.4 F.; at the second injection it reached 106 F. Cyanosis developed. This represents the most severe reaction among my patients. Unfortunately the blood counts were not taken. Part of the record is given in Table 3.

TABLE 3.—PROTOCOL OF CASE 2

	Temperature	Pulse	Respiration
75 million at noon	99	92	18
Pain in feet and head 11:03.....	102	120	24
Pain in feet and head 2 p. m.....	104	120	24
Severe headache at 3 p. m.....	104.4	124	22
Feels better at 6 p. m.	103	120	22
Head and feet pain at 8 p. m.....	104.4	120	28
Injection 7-27-16: 1 p. m.; 75 million	99.4	100	26
Chill, cyanosis, nausea, emesis at 2 p.m.	105	100	26
Headache 3:30 p. m.	106	140	28
Discharged 8-30-16. Recovery.			

2. *Early Relief from Pain.*—The practically complete relief from all joint pains and the optimism of the patient a few hours after the vaccine are most striking and pleasing factors in virtually all these cases. The patients feel cured. They are encouraged and hopeful. Following an interval of two days the pain usually reappears, but this interval decreases with the number of injections. After from twelve to twenty-four treatments over a period of from one to two months, these patients are in most cases able to leave the hospital as cured. Attention is, of course, given to any operative need the case may present, such as heel-spurs, and to proper balance.

3. *End-Results of the Treatment.*—These are not as satisfactory in my cases as Miller and Lusk report in their papers. The relief of pain has not been permanent in more than 30 per cent. of the patients treated. The remaining cases, however, have done much better than previously treated cases, and I consider this method superior to others I have used. The marked alleviation of symptoms and small percentage of dangerous results must eventually force it into more general use.

30 North Michigan Avenue.

ABSTRACT OF DISCUSSION

DR. WALTER G. STERN, Cleveland: The injection of a large amount of foreign protein into the blood stream is, of course, not without danger; but anything that promises relief in this (always intractable) class of cases is worthy of discussion. I have had no experience in the treatment of gonorrheal arthritis with typhoid vaccines, yet I cannot conceive how the typhoid vaccine protein would be superior to the gonorrheal vaccine protein, especially that of the strain used for the complement fixation test. Gonorrheal vaccine used subcutaneously never succeeded in curing acute gonorrheal arthritis, but it may be that the intravenous exhibition would be more efficacious. The clinical results from the use of foreign protein in chronic hypertrophic arthritis may be divided into three distinct stages: (1) the stage of damage from the injection of foreign protein, as shown by increased rigors, nausea, rise of temperature, and a higher leukocyte count; (2) the stage of improvement in symptoms, familiar to all of us who have tried to treat arthritis by any means; we have all in the past used injections of the thymus and other glands of internal secretion, and in almost all instances the patients say that they are better, and they are better for the time being; (3) but then comes the sad third stage of relapse, and in my experience in the use of typhoid vaccines

the third stage here is the same as in the use of injections of the organs of internal secretion. Some patients do well with injections of thymus, and then relapse, and it is the same with injections of pituitary gland. I am sorry to have to confess that in all my cases but one, the third stage after the typhoid vaccine injections was the same as the third stage after injections of any of the organs of internal secretion. The successes of Drs. Thomas and Miller with the typhoid protein are, however, so striking that I feel the proposed treatment is worthy of an extended trial.

DR. R. O. MEISENBACH, Buffalo: I should like to ask Dr. Thomas whether the patients that he has been treating had been having an elevation of temperature over a long period—say two months.

DR. HENRY B. THOMAS, Chicago: It is not a question of the kind of vaccine; dead bodies of bacilli, some kind of foreign protein, put into the circulatory system will cause the reaction. There is no advantage claimed for the typhoid vaccine over the gonorrheal or other vaccines containing foreign protein. With regard to the temperature, some of the subacute cases ran a moderate temperature, but most of them did not show as much temperature as the acute cases.

THE RÔLE OF HEPATIC TISSUES IN THE ACUTE ANAPHYLACTIC SHOCK*

W. H. MANWARING, M.D.

Professor of Bacteriology and Experimental Pathology, Leland Stanford Junior University, School of Medicine

AND

HAROLD E. CROWE, A.B.

Assistant in Experimental Pathology

STANFORD UNIVERSITY, CALIF.

The anaphylactic reaction is undoubtedly a reaction in which all tissues and all organs of the body take part. The clinical picture is presumably a physiologic balance between various anaphylactic and antianaphylactic mechanisms. The clinical control of anaphylaxis, as well as the ultimate development of anaphylactic theory, would necessitate an understanding of the nature of the reaction in each of the physiologically important tissues. The present investigation is an attempt to determine the nature of the reaction in hepatic tissues.

MATERIAL AND TECHNIC

The livers of normal and anaphylactic guinea-pigs were repeatedly perfused with dilute foreign protein, either in Locke's solution or in defibrinated normal or anaphylactic blood. The resulting changes in the toxicity of the perfusion fluid were estimated by subsequent tests with isolated anaphylactic lungs.¹

In making the pulmonary test, the ductus arteriosus is ligated, and a citrated cannula is tied into the pulmonary artery, delivering the perfusion fluid under constant pressure and temperature. After passing through the pulmonary blood vessels, the fluid is allowed to escape from the open left auricle. During the perfusion, the lungs are alternately expanded and allowed to collapse by air forced into the tracheal cannula, in a manner simulating the normal respiratory movements. Note is made of the resulting changes in resistance to inflation, and in the promptness and completeness of the expiring collapse.

Normal Lungs.—If normal guinea-pig lungs are thus perfused with Locke's solution or 50 per cent. defibrinated normal guinea-pig blood containing even as high as 20 M. L. D.² foreign protein, no distinct changes in the pulmonary elasticity are produced. The lungs are readily inflated, and collapse promptly, and completely, till the end of the test (seven to ten minutes).

Anaphylactic Lungs.—If anaphylactic guinea-pig lungs are similarly tested with from 0.5 to 1 M. L. D. foreign protein in Locke's solution or in 50 per cent. defibrinated normal blood, the lungs are invariably thrown into a typical anaphylactic response. After a latent period of from twenty to forty-five seconds, a slight resistance to inflation is usually observed, together with a slight slowness and incompleteness of the expiratory collapse. The reaction progresses rapidly, and usually ends in a complete pulmonary fixation or immobilization by the end of from seventy-five seconds to two minutes. At the end of the reaction, the lungs are of a liver-like consistency. They can neither be further dilated nor collapsed by changes of air-pressure in the tracheal cannula.

1. NORMAL LIVER

If the liver of a normal guinea-pig is repeatedly perfused with 0.5 to 1 M. L. D. foreign protein, either in Locke's solution or in 50 per cent. normal or anaphylactic blood, no distinct change in the toxicity of the perfusion fluid is observed on subsequent tests with isolated anaphylactic lungs. Slight increases or decreases in the length of the latent period are sometimes noted; but in no case is the latent period shortened or prolonged more than a few seconds. There is never a loss of the promptness or completeness of the subsequent pulmonary fixation.³

The normal guinea-pig liver, therefore, has no appreciably detoxicating, or antianaphylactic, action on foreign protein, either tested alone or mixed with normal or anaphylactic blood.

2. ANAPHYLACTIC LIVER

If the liver of an anaphylactic guinea-pig is similarly perfused with from 0.5 to 1 M. L. D. foreign protein in 50 per cent. anaphylactic blood, the perfusion fluid usually loses completely or almost completely its power to produce an anaphylactic response in subsequent tests with anaphylactic lungs. While control tests with unperfused protein mixtures may give complete pulmonary fixation within seventy-five seconds, anaphylactic lungs tested with the perfused mixture usually remain elastic and fully collapsible, till the end of the test (from seven to ten minutes).

The anaphylactic guinea-pig liver, therefore, has a marked detoxicating, or antianaphylactic, action on a specific foreign protein blood mixture.

Mechanism.—If the anaphylactic liver is repeatedly perfused with from 0.5 to 1 M. L. D. foreign protein in Locke's solution, no reduction in the toxicity of the perfusion fluid is observed on subsequent tests with anaphylactic lungs.

The detoxicating action of the anaphylactic liver is, therefore, not due to a direct action of the hepatic tissues on the foreign protein.

If the anaphylactic liver is repeatedly perfused with from 0.5 to 1 M. L. D. foreign protein in 50 per cent.

* Read before the Section on Pathology and Physiology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. W. H. Manwaring, and Yoshio Kusama (Jour. Immunol., 1917, 2, 157) give a sketch of perfusion apparatus.

2. M. L. D.=minimal fatal intravenous dose for a sensitized guinea-pig.

3. W. H. Manwaring and Harold E. Crowe (Jour. Immunol., 1917, 3) give data.

normal blood, a reduction in toxicity invariably takes place. The reduction, however, is only occasionally sufficient to prevent completely the anaphylactic response in subsequent tests with anaphylactic lungs. It is never as complete as in perfusions with anaphylactic blood mixtures.

The detoxicating action of the anaphylactic liver is, therefore due to a functional cooperation between the sensitized fixed hepatic cells and certain circulating normal and anaphylactic blood elements.

Chemical Changes.—Parallel precipitin titrations of perfusion fluids, before and after repeated passage through the anaphylactic liver show that there is no appreciable change in the amount of the foreign protein in the perfusion fluid as a result of the liver perfusions.⁴

The loss of the toxicity of the perfusion fluid is, therefore, not due to a removal or destruction of the foreign protein by the fixed hepatic cells.

On repeated passage through the anaphylactic liver, the perfusion fluid not only loses its power to produce the anaphylactic pulmonary reaction, but acquires a new power, that of causing an unusual relaxation or loss of tone in the pulmonary tissues. The lungs tested with the perfused fluid collapse more promptly and completely than normal. The edges of the lobes curl over, giving a wilted or flabby appearance on expiration. There is also a loss of the occasional power of the perfusion fluid to cause vasoconstriction.

The detoxicating action of the anaphylactic liver is, therefore, accompanied by and may possibly be due to an explosive formation or liberation of vasodilator and bronchodilator substances by the liver.

This finding is in harmony with analyses of the anaphylactic reaction in the dog.⁵ The pronounced fall of blood pressure, which is the essential feature of the acute anaphylactic shock in the dog, is not due to a direct action of the foreign protein on the sensitized blood vessels, but is an indirect phenomenon, due to the explosive formation or liberation of vasodilator substances by the liver.

CONCLUSIONS

The agreement between the foregoing findings would suggest that the explosive formation or liberation of vasodilator and bronchodilator substances by the sensitized liver is an essential feature of the acute anaphylactic reaction in all animals.

The demonstration of a functional cooperation between the sensitized hepatic cells and certain circulating blood elements, in the detoxication of foreign proteins, calls attention to the possibility of similar cooperations being operative in other antitoxic actions.

ABSTRACT OF DISCUSSION

DR. A. A. EGGSTEIN, Nashville, Tenn.: Will the foreign protein anaphylactic blood mixture, after having been perfused through the lung, cause the immobility of lungs of other sensitized guinea-pigs, or is the liver the chief organ in the detoxicating effect on the mixture? Will anaphylatoxin, proteoses, and other toxic proteins have an immobilizing effect on the lung of a normal guinea-pig?

4. W. H. Manwaring, Yoshio Kusama and Harold E. Crowe (Jour. Immunol., 1917, 3) give data.

5. Manwaring, W. H.: Ztschr. f. Immunitätsforsch. u. exper. Therap., 1910, 8, 2. The dogs here studied were adult street dogs, sensitized by a single subcutaneous injection with from 5 c.c. to 25 c.c. horse serum; kept in outdoor kennels, at winter temperature (London), and tested at the end of from fifteen to thirty days. It is, of course, possible that additional factors may be operative in more highly sensitized young dogs or puppies.

DR. W. L. MCFARLAND, New York: If my memory is not false I think that something along similar lines was said, so far as the liver is concerned, at a meeting before the Serologic Society several years ago. So far as the action of the liver in anaphylaxis is concerned, I have had no personal experience; but in connection with immunity and the formation of antibodies, at the Institute in Copenhagen six or seven years ago we injected a number of rabbits and goats in branches of the mesenteric vein for the production of agglutinin and found that there was practically no difference in the amount produced or in the rapidity of the production. By that method the liver seemed to have no influence.

DR. W. H. MANWARING, Stanford University, Calif.: There are a number of observations in the literature that point to the liver as having a marked detoxicating function in the acute anaphylactic reaction. Our studies have shown that this antianaphylactic action is not merely an expression of normal hepatic functions, but is largely due to a new, acquired liver function, developed as a result of the process of protein sensitization. To what extent the other tissues of the body share in this antianaphylactic function is a phase of the problem on which we are at present working.

Tests with protein split products give inconclusive results, due to the fact that such a large variety of foreign substances is capable of causing reactions in the isolated guinea-pig lungs.

FAMILIAL HEAD NYSTAGMUS IN FOUR GENERATIONS ASSOCIATED WITH OCULAR NYSTAGMUS*

N. S. YAWGER, M.D.

PHILADELPHIA

Combined nystagmus of the head and eyes, persisting during life and reappearing in consecutive generations, must be exceedingly rare, since we seldom find mention of this disorder.

The family reported in this article is of Russian Jewish nationality, and at least four generations of the family have shown the affliction, members of three of which I have examined. The features of these cases are the persistence of the associated nystagmus in the stock and throughout the lives of the individual members, together with certain other nervous manifestations, notably, stammering. Both sexes had the combined nystagmus and both transmitted it to their children.

FIRST GENERATION

From the fact that two brothers exhibited the condition, it is possible that other instances of nystagmus preceded them. Concerning one brother, we have no additional information. The other died at 86 years, and notwithstanding his disease is said to have had good vision. His descendants I have traced.

SECOND GENERATION

There were eight children, three sons and five daughters. Most of them died in early life, and I have been unable to gather any clinical data respecting them. One daughter who had nystagmus lived to be 80 years old. Another daughter did not have the disorder, although she transmitted it to her two sons, and it is interesting to note that these children were by different husbands. This Russian peasant woman came to America when she was 60 years old. She is still

* From the Department of Neurology, University of Pennsylvania, School of Medicine.

* Read before the Section on Nervous and Mental Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

active although now 78, and has given me the details regarding the family history.

THIRD GENERATION

It is in this period that the afflicted persons became available for study. Of three children, the daughter is normal and has no family, while the two sons, who are half brothers, exhibit the combined nystagmus. The elder patient, aged 48, is distinctly neuropathic; as a child he stammered badly, and eight years ago he had an attack of facial paralysis. He has been nystagmic from infancy, but during adult life the manifestations have been less apparent. The patient is not conscious of the head shaking, although the phenomenon often recurs several times a day. Suddenly, and usually during moments of abstraction, the head undergoes a series of horizontal, coordinated movements, consisting of five or six oscillations, of considerable amplitude and with an approximate frequency of twenty per minute.

No opportunity has been afforded to observe the eyes at the time of the head movements. The irises are brown. The ocular tremor has seldom been spontaneous since childhood, but it may be brought out by any extreme movement of the eyes. The oscillations are horizontal, the range is greatest when looking toward the left, and the speed, though irregular, is about 160 per minute. He has eight children who shall be referred to later.

The younger brother, aged 40, has exhibited nystagmus of the eyes from birth and of the head for the past five years. He is a tailor, enjoys excellent health, and has good personal habits except for incessant smoking. He is slightly dwarfish, his neck and thorax being disproportionately short. Though not subjectively aware of his head movements, he has been told that they occur many times a day. When looking in a mirror and with his attention directed toward the phenomenon, it is never manifested. The oscillations, which appear in series, are usually made up of ten or twelve individual movements; they are always horizontal, and impress the observer as a repeated sign of negation. While of less amplitude, the individual movements are more rapid, and the series recurs with greater frequency than do those of his half-brother. The speed is about 120 per minute.

Although he labors long hours at exacting work, he has not yet worn glasses. The irises are brown. An almost constant unsteadiness of the eyes is seen, and this is intensified by all extreme ocular movements; but the direction is invariably horizontal. The rate of movement is about 200 per minute.

His head nystagmus, though embarrassing, is not without its humorous side, and in childhood afforded much amusement to the schoolchildren. A customer entered his tailor shop to order clothes, and just then the dissent spasm occurred. The customer in surprise asked, "You do not wish to sell me again?" On another occasion, a collector called and, observing the persisting sign of negation, exclaimed, "You say no! You won't pay?"

FOURTH GENERATION

In the family of the younger brother there are two sons and one daughter. The older son, aged 16, shows no stigmata and has the mental alertness not uncommon to the Jewish race. The other children, who are twins, are undersized, rather delicate, and the boy is of slightly lowered mentality. The sister, aged 10, alone shows nystagmus of the head and eyes; the manifes-

tations in the eyes date from birth, and those of the head began a few months later. The head movements are not so uniformly horizontal as are those of her father and half-uncle. Her eye movements, which are horizontal, are irregular both in time and in amplitude; this ocular nystagmus is usually present, and has a speed at times of as much as 200 per minute.

In the family of the elder brother there are eight children, three of whom stammer the same as their father; but one appears to have acquired the habit through imitation. Another child, a daughter, also stammered during the period of a nervous breakdown of several weeks' duration. None of the children show spontaneous nystagmus of the head or eyes, but in one daughter extreme excursion of the eyes in any direction causes a horizontal nystagmus.

THE NATURE OF NYSTAGMUS

The term "nystagmus" is here extended beyond its usual application. Literally, it means to nod; and we observe in ophthalmology that the "nod" may be in different directions, giving us the various forms of nystagmus.

Nystagmus may be said to be involuntary, coordinated and rhythmical movements, of frequent occurrence and resulting from alternate contractions in opposing muscles. The term appears equally applicable to certain head movements, and occasionally it has been so used.

In describing nystagmus, Gowers¹ cites an interesting case; he writes:

Very rarely there is a slight movement of the head, corresponding to that of the eyes in direction, or in the opposite direction of that of the eyes. In a case lately under my care, with symptoms of cerebellar tumor and cerebellar nystagmus, the pharynx and the larynx were the seat of similar movement; that of the pharynx as horizontal, toward the median line; in the larynx there was a similar lateral movement of the arytenoid cartilages. The rate of movement was the same as in the ocular muscles, 180 per minute.

Nystagmus extending beyond the eyeballs was described by Popper,² and still later by Pick, who designated the condition accompanying the eye nystagmus as lid nystagmus. The latter was obtained with both the lateral and vertical movements of the eyeballs. It exceeded the ocular nystagmus when the patient looked to the right or to the left. Even head nystagmus was observed by Popper in a case of multiple sclerosis. The phenomenon of lid nystagmus as explained by Pick was that of diffusion of the disturbance causing ocular nystagmus, to the nucleus of the levator palpebrae superioris.

Conjugate deviation of the eyes is reported by Sklodowski³ as a new sign occurring with apoplexy. These peculiar movements lasted for more than forty-eight hours preceding death in a hemiplegic patient. The movements were lateral, continuous, slow and rhythmical, and at the rate of about sixteen per minute.

After death an area of softening was found in the right lower parietal lobe, the posterior portion of the second temporal convolution and in the adjacent part of the occipital lobe. The explanation offered by Sklodowski is that irritation of the subcortical region beneath the lesion may have caused movements of the eyeballs to the opposite side. After the active period subsided, exhaustion as a result of irritation occurred,

1. Gowers: *Diseases of the Nervous System*, Philadelphia, P. Blakiston's Son & Co., 1898, 2, 208.

2. Popper: *Mónatschr. f. Psychiat. u. Neurol.*, 39, 188.

3. Sklodowski: *Ztschr. d. g. Neurol. u. Psychiat.*, 31, 165.

and then the center of the opposite side provoked a movement.

In a patient studied by Rosenfeld,⁴ there was observed head nystagmus and also facial nystagmus; the latter occurred as rhythmic twitchings in one of the branches of the facial nerve, and appeared synchronously with ocular nystagmus. Rosenfeld assumes that there was a bilateral softening particularly in the central ganglions of the cerebrum. He states that vestibular nystagmus is characteristic of a supranuclear lesion.

During infancy, there are sometimes observed imperative movements of the head or nystagmus of the eyes, and occasionally these manifestations are associated; even a family form has been mentioned. However, the condition passes away in infancy or in childhood. Furthermore, the phenomenon probably represents a different disease. Thompson⁵ in an article "On the Etiology of Head-Shaking with Nystagmus (Spasmus Nutans) in Infants," writes:

The condition presented in the following article is a functional, coordinated neurosis of a harmless nature, which affects young infants and has a short, well defined clinical course.

He adds:

Dr. Alexander Bruce tells me that the nucleus of Deiters (one of the nuclei of the vestibular nerve lying in the lateral angle of the fourth ventricle) is in all probability the seat of the disturbance. He implies this from its connection with the oculomotor nuclei and with the anterior cornua of the cord.

Thompson further remarks:

It may, however, be said in passing, that head nodding and nystagmus (separate or combined) lasting during life is obviously an essentially different condition from the transitory neurosis with which we are at present dealing.

Nettleship believes that in spasmus nutans ocular nystagmus is never present at birth, and also that patients recover from the condition.

INFLUENCE OF HEREDITY

In 1911 Nettleship⁶ exhibited cases of hereditary nystagmus, some of which manifested head movements. His patients showed that transmission was more frequently through the mother, though not so invariably as in nystagmus without head movements.

To explain this phenomenon, Nettleship says:

If the object of the head movements were to cancel, neutralize or compensate for the eye movements, i. e., to steady the retinal images, we should expect, I think, that the two movements, although in the same plane and probably equal in rapidity, would have opposite directions.

As to my cases, the head movements and eye movements were in the same plane, but they varied greatly in speed.

Under certain conditions, rhythmical head movements are observed in animals. A well known instance is the weaving of the horse, which consists of lateral oscillatory movements of the head and neck. The habit is observed in some restless horses that are confined too closely to the stable, and therefore has its origin in idleness. Almost every one has observed the weaving of the bear in captivity, and a somewhat

similar swaying is seen in the elephant. However, such movements are probably entirely under the control of these animals.

ETIOLOGIC FACTORS

Ocular nystagmus in man may arise from many nervous diseases or disorders, and the site of origin often varies greatly. Sometimes it is observed in the lower animals. The horse shows nystagmus in epilepsy, meningitis and always in the stage of excitement of chloroform anesthesia. Nystagmus has been observed in dogs born blind and also in those with a congenital underdevelopment of the eyeballs. In certain toxic states the symptom is present in swine, as after drinking brine; in this type the nystagmus is due to the ingestion of a large quantity of sodium chlorid.

The importance of the color of the iris in ocular nystagmus has been commented on. In albinism the irises are without color and persons showing this condition are remarkably nystagmic. Nettleship⁷ observed a family in which a number of males had nystagmus and all of these were blue-eyed. In the cases I have studied, dark irises predominated. However, one would hardly expect the color of the iris to have much bearing on nystagmus of central origin, which is the probable seat of the disorder in this family.

As to transmission: in some diseases, such as hemophilia, night-blindness and the myopathies, the transmission is noticeably through the mothers, who are themselves often unaffected. This tendency was observed in the cases I have reported. In both instances in which the fathers transmitted the nystagmic tendency, they were themselves affected, while the mother who handed down the disorder was not nystagmic, but transmitted the affection to her two sons, who were children by different husbands.

Ophthalmologic studies and Bárány tests were not possible since these patients did not wish to submit to an investigation. I am unable to explain the remarkable cephalic and ocular movements exhibited by certain members of this family. Possibly the disorder belongs to the realm of physiologic pathology and is caused by some obscure instability of the centers governing these movements.

2005 Chestnut Street.

ABSTRACT OF DISCUSSION

DR. I. ABRAHAMSON, New York: Dr. Yawger indicates that the head-nodding and the stammering speech were connected. If this were the case then there would be a quivering of the voice. I think the fact that the stammering speech occurred must be accounted for on other grounds, and not on the ground that there was nystagmus of the vocal cords.

7. Nettleship: Royal Ophth. Hosp. Rep., 1886-1887, **11**, 366.

4. Rosenfeld: Ueber Vestibulären Kopfnystagmus und facialis Nystagmus bei Pseudobulbärparalyse, Arch. f. Psychiat., 1914, **53**, 1130.

5. Thompson, in Festschrift in honor of Abraham Jacobi, New York, Knickerbocker Press, 1900, p. 65.

6. Nettleship: Tr. Ophth. Soc., U. Kingdom, 1911, **31**, 159.

The Automobile as an Instrument of Death.—An upward trend in the mortality from automobile accidents is, possibly, to be expected in view of the steadily increasing use of these vehicles. Nevertheless, the continuously climbing death rate is deserving of more than passing notice. In the registration area in 1915, 3,978 persons were killed by automobiles. In 1914, only 2,826 suffered death in this manner. The death rate rose from 4.3 per hundred thousand population to 5.9, an increase of 37 per cent. Had there been seventy-five more deaths from automobile accidents in the registration area, more people would have died in this manner than through surface cars, subway trains, elevated trains, bicycles and all horse drawn vehicles combined.

FATAL SUPERFICIAL BURNS AND THE SUPRARENALS

NOTE ON THE OCCURRENCE OF SUPRARENAL LESIONS IN UNCOMPLICATED FATAL CASES OF EXTENSIVE SUPERFICIAL BURNS *

H. G. WEISKOTTEN, M.D.
SYRACUSE, N. Y.

It is quite generally accepted that clinical manifestations, anatomic findings and experimental evidence all indicate that extensive superficial burns are followed by severe toxemia which not infrequently results fatally within a few days. Of the lesions found at necropsy, emphasis has been placed on cloudy swelling of the liver and kidneys, focal degeneration in the splenic lymph nodules, and degenerative changes in the lymph nodes and intestinal lymph nodules.

My necropsy experience in uncomplicated cases of superficial burns fatal within a few days has shown that, in addition to the lesions mentioned, in all of these cases there occur changes in the suprarenals which are more or less characteristic. In fact, these changes in the suprarenals are the most prominent and characteristic of the necropsy findings.

The suprarenals are markedly swollen and deep red. The perisuprarenal fat tissue shows marked edema. On section, certain areas suggest extensive hemorrhage obliterating the normal markings. On section through other parts, the cortex and medulla appear markedly swollen and show reddish streaks suggesting congestion of the blood vessels.

On microscopic examination, there is evident marked congestion of the blood vessels with scattered areas of hemorrhage penetrating among the parenchymal cells. The gland cells are pale staining and much swollen. Many are apparently undergoing hydropic degeneration. Necrotic cells being invaded by polymorphonuclear and endothelial leukocytes are not infrequent. The picture in general is more or less comparable to the central necrosis occurring in the liver of the guinea-pig in chloroform poisoning, except that in the suprarenals the process is diffuse.

These changes in the suprarenals have been noted at necropsy in cases in which death has apparently resulted primarily from extensive superficial burns of two, three, four and six days' duration. In one case the left suprarenal measured 9 by 3 by 1.5 cm. and weighed 20.5 gm.; the right measured 7 by 4.5 by 2.5 cm. and weighed 25 gm. (average normal weight, from 4 to 7 gm.). This was the case of a railroad fireman, aged 21, who received extensive superficial burns of the face, forearms, thighs and legs as a result of a boiler explosion, and died three days later.

Kolosko,¹ in 1914, described what were apparently similar findings in the suprarenals in a number of fatal cases of extensive superficial burns. He interpreted the findings as representing hemorrhagic infarction of the glands.

It is perhaps noteworthy that these changes in the suprarenals are comparable to the changes occurring in the suprarenals of guinea-pigs dying several days after the administration of diphtheria toxin. This suggests that the changes are the result of the action of a more or less specific toxin possibly somewhat similar to diphtheria toxin.

As far as I know, such marked changes of this character in the suprarenal glands, at least in man, have not been observed in any other condition.

As a result of the foregoing observations, it would seem that these changes in the suprarenals are the best anatomic evidence we have that in extensive superficial burns death may be due to the action of a specific toxin originating probably in the burned areas.

THE CAUSE AND PREVENTION OF HERNIA *

MARSH PITZMAN, M.D.
ST. LOUIS

While the etiology of hernia should remain a subject of general interest until greater unanimity of opinion has been achieved, it takes on a more particular interest at this time, when hundreds of thousands of our young men are about to be mobilized. I say "general interest" advisedly because, according to the newer point of view, the problem of prophylaxis must essentially fall on the medical adviser. The considerable gap between the progressive scientific opinion of today and the conception of most practitioners is partly due to the fact that the interest of teachers has run beyond such an ordinary every-day occurrence as hernia into newer fields. Further, it is only natural that a new point of view should have difficulty in making headway against established conceptions—not only natural, but just—for this attitude is our only check against false innovations! The point of view presented in this discussion, however, is not really new, for it has had time to be accepted into many of the progressive texts of anatomy and of surgery. One very practical asset of the newer point of view is that it breaks away from the congenital theory, against which we acknowledge our defenselessness, and offers a positive plan by which, within limitations, hernias may be prevented.

A few lines will suffice to summarize the essential anatomic points. The real strength of the abdominal wall is due to the muscles, aponeuroses and deep fascias. Aponeuroses are simply wide flattened-out tendons, while deep fascias are layers made up of matted white fibrous tissue, which serve to encase all muscles on all surfaces. The five points of naturally lesser strength in the abdominal wall are the umbilicus and the two inguinal and the two femoral regions. The umbilicus is a puckered scar, while the inguinal canals serve as the passageway for the spermatic cord in the male and for the round ligament of the uterus in the female. It is possible to have a hernia follow along any vessel which goes through the abdominal wall, as the vessels start from inside of the inner deep fascia of the wall. Hernias along the femoral vessels, which are much the largest of those leaving the abdominal cavity, are simply relatively more frequent.

The newer point of view maintains that hernia is caused by increased intra-abdominal pressure, which must, however, be maintained during a prolonged period of time. Hernia is obviously not due simply to the strength or weakness of the abdominal wall, for it is a matter of common knowledge that many strong persons have hernias, whereas most weaklings do not. Perhaps the fairest statement is that hernia

* From the Department of Pathology, Syracuse University College of Medicine.

1. Kolosko: Ueber Befunde an der Nebennieren bei Verbrennungstod, *Vrtljschr. f. gerichtl. Med.*, 1914, 47, I, Supp. p. 217.

* Revision of a paper read at the meeting of the St. Louis Medical Society, April 14, 1917.

is due to a disproportion between the intra-abdominal pressure and the strength of the wall. In contradistinction to former beliefs, it is now held that hernias are invariably developed gradually, this opinion being based on clinical observation and on the anatomic structure of the hernial sacs. If a hernia has descended part way, it may under sudden strain increase rapidly in size; but this is an entirely different matter than really causing a hernia. On account of the valvelike arrangement of the openings in the abdominal wall, a single strain, no matter how great, tends simply to close the walls tighter. For example, the oft repeated experiment of pumping the peritoneal cavity full of air under great pressure in a normal postmortem specimen does not produce hernia.

The theory of congenital malformations as the cause of hernia reached the height of its popularity about twenty years ago. This theory fails, according to those who support the newer point of view, to explain many of the conceded facts. Most of the collected observations were correct, but the fault lay in the logic of interpretation. The persistence of the fetal peritoneal tubes was considered to be a cause of hernia, whereas nowadays the newer point of view maintains that these tubes persist and remain patent because there is increased intra-abdominal pressure. The congenital theory was in reality always more of a mask to cover our lack of knowledge than an explanation. Every person has these fetal peritoneal tubes in the inguinal canal, but no generally satisfactory answer has even been given to the question as to why these tubes persisted in some persons, whereas in most, practically speaking, they disappear. It is worthy of emphasis that no fetal peritoneal tube normally makes its exit through either the umbilical or the femoral regions; therefore the inguinal hernias were the only ones ever covered by the congenital malformation theory. At one time the congenital theory was pretty generally stretched to cover the etiology of most hernias during infancy, and the primary occurrence of hernias during adolescence. Alleged characteristics of congenital malformations were constantly being demonstrated on adults at the operating table, and even the primary hernias of senility were traced to a congenital origin.

A few lines will suffice to summarize our clinical evidence. The occurrence of all five hernias in an individual at the same time is not at all an uncommon clinical finding. For example, a weakly young child or a markedly senile person with chronically increased intra-abdominal pressure commonly presents this picture. The increased intra-abdominal pressure may be due either to chronic gaseous intestinal distention or to a chronic bronchitis or to a chronic obstruction to the urinary outflow. Such cases bear out the modern conception in that they show that all types of hernia have a common underlying etiology, specifically increased intra-abdominal pressure with relative weakness of the abdominal wall. Those of these children that survive their other troubles generally overcome the etiologic factor, and under proper supervision can commonly be cured without operative intervention. The inguinal hernia of adolescence is by all odds the commonest and therefore the most important of the hernias. It occurs much more frequently in the male, and is so frequently bilateral that the probability of a less far advanced hernia on the opposite side must always be carefully considered. The explanation offered for this type is that it is commonly due to

excessive intra-abdominal pressure caused by lifting heavier weights, etc., than the youth's abdominal musculature can withstand. But if the youth's abdominal musculature is gradually trained to withstand great pressure, according to the newer point of view, hernia will not occur. The inguinal hernia is much less common in the female, owing probably to the character of the work of females as a group, while the fact that the round ligaments are materially smaller than the cords of the testicles is considered by many to be a factor. The serious types of umbilical hernia are formed during middle life in connection with excessive stoutness. Here we typically have our recognized etiologic factors, that is, weakness of the umbilical region of the abdominal wall due to stretching and greatly increased intra-abdominal pressure. These hernias incapacitate the patients for exercise, and they therefore tend to become stouter. This is a typical vicious circle, which obviously calls for both preoperative and postoperative control of the patients, if the operative mortality is to be held down and the permanency of cure guaranteed.

In the modern surgical technics for the repair of hernias, while the sac is resected as in the earlier operations, more and more stress is being placed on the importance of the repair of the musculofascial layers of the abdominal wall in connection with all types of hernia. In conformity with the conceptions of the time, many of the earlier herniotomy technics resected the sac and disregarded the abdominal wall, which procedure is almost universally condemned by the surgeons of today. In connection with postoperative hernias the main factor is obviously the weakening of the abdominal wall, though eventually the factor of increased intra-abdominal pressure may enter into the problem. The two most common causes of marked weakness in the wall are sloughing of the aponeuroses and paralysis of muscles, the paralysis occurring medially to the incision and being due to the cutting of nerves. Any one with surgical experience will agree with the proposition that these hernias are more easy to acquire than to cure, although, to be fair, considerable progress has been made during recent years in handling these difficult cases. The point to be emphasized is that the problem of postoperative hernia should be considered in any incision into the abdominal cavity, due regard being paid to the anatomy of the wall, at least whenever this can be done without material sacrifice. If a prophecy is allowable, I wish to register my opinion that, with pioneer work out of the way and with improved diagnosis, the surgeon of the future will develop an improved prophylaxis against postoperative hernia.

This concludes the brief of my argument for the newer point of view. It has the natural prejudice of established conception to contend with, but on the other hand has the advantage of assuming a positive attitude toward the prevention of hernia. Even those who cannot bring themselves to concede the validity of the argument in its entirety certainly cannot object to the practical kernel of this discussion, to wit, the importance of the gradual training of the strength of the abdominal wall. If I read correctly the temper of our young men about to be called to the colors, many more will require the check-rein than the spur—and for those who accept the point of view presented, one of the reasons for their position is the risk of causing hernias.

Wall Building.

VALUE OF BLOOD PRESSURE DETERMINATIONS IN THE PRACTICE OF OBSTETRICS*

J. MORRIS SLEMONS, M.D.

NEW HAVEN, CONN.

The clinical usefulness of blood pressure determinations finds better illustration nowhere than in the practice of obstetrics. The supervision of women during pregnancy, it is well known, requires systematic observation of this kind; not infrequently it gives the first warning of an impending toxemia and affords a measure of its seriousness. When conservative treatment is unavailing, the persistence of arterial hypertension becomes a strong reason for the termination of pregnancy, as a means of preventing convulsions. And, though less appreciated, there are other uses for blood pressure determinations in obstetrics which deserve an equal prominence. In the period of convalescence after eclampsia, for example, blood pressure determinations have proved to be an excellent guide to the ultimate prognosis for these patients.

The clinical interpretation of autointoxication during pregnancy, in many ways as hazy as it ever was, still depends on secondary or even more remote effects of the responsible poison; the primary cause of the

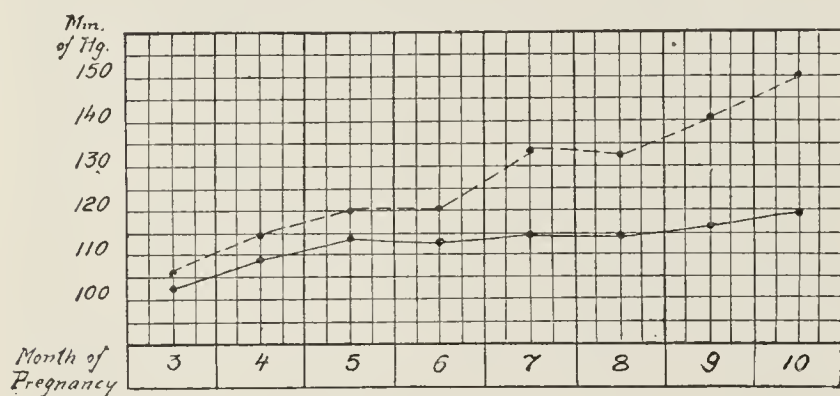


Chart 1.—Systolic blood pressure during normal pregnancy. The monthly average is represented by the solid line. The tension indicated (115 mm. of mercury) is considered normal. The broken line indicates the highest observation during each month. A pressure of 150 mm. of mercury should be regarded as an early sign of preeclamptic toxemia.

albuminuria of pregnancy and its alarming sequelae remains unknown. In search of the cause of eclampsia, investigators have not been helped materially by detailed analysis of the urine to determine the character and the quantity of the waste products it contained. Likewise, chemical analysis of the blood has been disappointing. As the latter method provided a nearer approach to the source of the toxic agent, there was reason to hope that its real nature would thus be revealed. However, this goal has not been attained; nor in the course of blood analysis has there been found a more reliable therapeutic guide than we previously possessed. Of this result I speak confidently, for during the past two years I have studied the blood of fifty cases of preeclamptic toxemia, eclampsia and allied intoxications and have determined the quantity of many of its constituents, including the nonprotein nitrogen, amino-acids, urea, uric acid, sugar, lipoids and calcium. Estimations of the capacity of the plasma for combining with carbon dioxid, generally accepted as a method for detecting

the presence of an acidosis, have also been made. Unusual values for these various factors are frequently found, but no constant relationship exists between any of them and the complications of pregnancy in question; and, therefore, the changes noted in the composition of the blood seem to be of a secondary character.

As the more intimate study of the urine and the blood has not brought us nearer to the solution of the eclampsia problem, the seriousness of albuminuria during pregnancy is determined from less satisfactory evidence than that available in some metabolic disturbances, as diabetic coma, the cause of which has been definitely ascertained. It is not implied, however, that excellent rules for the treatment of preeclamptic toxemia are lacking. The careful supervision of pregnant women serves effectively to protect them from eclamptic convulsions and, for this purpose, very simple observations are required. These include, first, accurate measurement of the quantity of urine voided during a period of twenty-four hours; second, estimation of the quantity of albumin by the Esbach tube, if albumin is present in measurable amount, and third, determination of the systolic arterial pressure. For several reasons, it is advisable to include the blood pressure in these observations: the technic is not difficult, the information gained is objective, and our experience has reached the point at which sufficiently definite rules for the interpretation of the findings may be formulated.

Obviously, in the presence of complications of pregnancy, the significance of the arterial tension will depend on knowledge of the tension in normal cases. There have been a number of statistical studies of this question, and fairly uniform results have been obtained, though the data collected thus far relate chiefly to the latter months of pregnancy. Interest in this period was the greater because it presented a tendency toward hypertension, whereas in the early months normal values were observed. These facts indicated an upward trend in the systolic pressure even during normal gestation. To secure first hand information regarding this phenomenon, Dr. A. H. Yudkin recently tabulated and analyzed the prenatal records of 500 normal obstetric cases treated in this clinic; his results are graphically represented in Chart 1.

In the average case, as indicated by the solid line in Chart 1, the systolic pressure during pregnancy remains within normal limits, although in the early months the values are somewhat lower, and in the later months somewhat higher, than are found in the middle trimester of gestation. From the fifth to the eighth month, the prevailing tension, 115 mm. of mercury, is identical with that generally considered normal.

Hypotension is more common in the early months of gestation, but may also occur in the later months, and is then said to be prophetic of shock during the approaching labor. In my experience, however, a systolic pressure of 90 mm. of mercury in the last month of pregnancy has not been incompatible with normal parturition.

On the other hand, the maximum degree of tension presented by normal cases is a question of great practical moment, for, if possible, we wish to know what height of pressure gives warning of impending eclampsia. Not infrequently in the latter half of pregnancy, hypertension occurs in patients who proceed

* From the Department of Gynecology and Obstetrics, Yale University School of Medicine.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

normally to term and pass safely through delivery. Even a pressure of 150 mm. of mercury may not indicate the existence of serious toxemia. Nevertheless, in these circumstances it is advisable to regard the hypertension as the earliest sign of preeclamptic toxemia, and, so regarded, it affords the opportunity to institute conservative treatment at a time when it is most likely to be effective. Consequently, my custom is to make daily observations on patients with a blood pressure of from 140 to 150 mm. of mercury. Hygienic, dietary and medicinal measures are begun and, when these are ineffective, labor is induced by the use of a uterine bougie.

While the greatest service of blood pressure determinations during pregnancy is to warn the physician that his patient is threatened with eclampsia, occasionally, even in the face of albuminuria such observations teach that the complication is not preeclamptic toxemia. This use of blood pressure was brought home to me in the treatment of a patient whose urine contained 3 gm. of albumin per liter though the systolic pressure was 135 mm. of mercury. In this instance, the responsible complication was pyelitis, and recovery followed the administration of urinary antiseptics.

The third useful purpose of blood pressure determinations in the practice of obstetrics pertains to the prognosis in cases of eclampsia. While the disease is in progress, the persistence of a high arterial pressure means that the therapeutic measures adopted have as yet been unavailing; a falling pressure, on the other hand, usually denotes clinical improvement and becomes a convenient measure for the degree of this improvement. But there are occasional exceptions to this rule, as when the pressure falls because of hemorrhage or of shock. The latter was responsible for the systolic pressure reaching 70 mm. of mercury in one of the patients, and here, of course, the subsequent rise in pressure denoted improvement. Generally, however, it is the opposite phenomenon which signifies that treatment has been successful.

The fall in blood pressure coincident with convalescence from eclampsia is illustrated by Chart 2. When admitted to the hospital, already in labor, this patient was suffering from a severe toxemia, though the first convulsion did not occur until after she was delivered. Venesection was then performed, but was of only temporary benefit. Various other therapeutic measures were tried, including the administration of morphin and cathartics, the use of hot packs and hypodermoclysis. As the patient was rapidly growing worse, we resorted to lumbar puncture, which had been found useful in two cases reported by Wilson.¹ Following this treatment there was only a slight convulsion, and within a few hours notable clinical improvement began.

Encouraged by this favorable experience the method has been given further trial; I have employed lumbar puncture in four other cases. One of these—probably a case of acute nephritis at the seventh month of pregnancy—was not benefited, and, similarly, another patient with antepartum eclampsia did not improve after a lumbar puncture. On the other hand, two desperate cases of postpartum eclampsia improved immediately following the treatment in question. Therefore, while in my judgment lumbar puncture may not be implicitly relied on, it adds

another procedure to be employed when convulsions continue after the patient has been delivered or when they first appear in the postpartum period.

The diastolic pressure is somewhat elevated in preeclamptic toxemia and eclampsia, though not to the same extent as the systolic pressure. Likewise, the pulse pressure, while increased, provides no better, if as good a guide, for treatment. Variations of the pulse pressure are less emphatic than in the case of the systolic pressure and, therefore, the latter is preferable as a clinical index.

In the fourth place, blood pressure observations are valuable because they assist toward reaching an ultimate prognosis in cases of albuminuria of pregnancy and eclampsia. This, of course, is of great moment; the patient wishes to know in the event of subsequent pregnancy whether or not she is likely to encounter the complication again.

From the statistics of hospitals and of private practice, it appears that one of every five or six women who suffer from a high grade albuminuria during pregnancy sustain permanent damage to the kidneys and, therefore, may expect complications in later pregnancies. To distinguish these types of cases, with favorable and unfavorable prognosis, there is no means so satisfactory as the study of the blood pres-

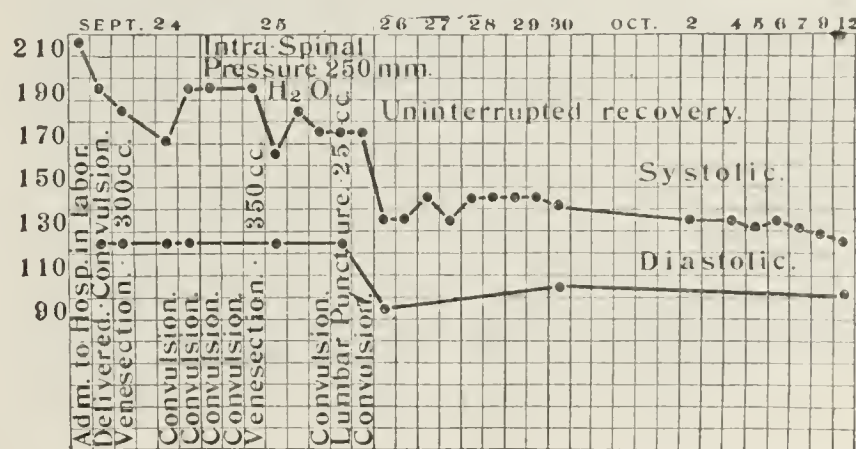


Chart 2 (Case 59173).—Systolic and diastolic pressure in eclampsia. Marked fall in blood pressure coincident with convalescence. Lumbar puncture especially caused decided reduction of pressure and improvement in the symptoms.

sure during the period of convalescence. Using this criterion in the study of fifty-two patients recovering from severe albuminuria, I have found that three groups may be distinguished. (1) Cases in which the blood pressure returned to normal within two weeks after delivery. Of these there were thirty-nine, or 75 per cent. of the series. Many of these women who suffered from convulsions during one pregnancy subsequently have passed through another without untoward symptoms; and on these grounds, I believe the ultimate prognosis for this group is favorable. (2) Cases in which hypertension persisted in the puerperium for a period of from six to eight weeks, a phenomenon indicative of permanent renal injury. In the series, there were five instances of this kind, or 10 per cent.; on discharge, their systolic pressures were, respectively, 150, 160, 180, 200, and 250 mm. of mercury. Subsequently three of these women required the interruption of pregnancy on account of nephritis, and it is reasonable to believe the prognosis is always unfavorable in this group. (3) Cases in which slight hypertension prevailed at the end of a month postpartum. In the series there were eight instances of this type, or 15 per cent. The prognosis is doubtful in these circumstances. Some of these

1. Wilson, W. T.: Lumbar Puncture for the Relief of Convulsions in Puerperal Eclampsia, *THE JOURNAL A. M. A.*, Sept. 2, 1916, p. 742.

women later passed through pregnancy normally, while others again suffered from serious albuminuria.

Briefly, then, my experience indicates that daily observations of the blood pressure during the puerperium of women convalescent from eclampsia and from less severe forms of albuminuria, enables the physician to reach a correct ultimate prognosis in approximately 85 per cent. of the cases.

Finally, blood pressure determinations are valuable as a guide for the treatment of patients suffering from cardiac complications during pregnancy. The patient whose systolic pressure is represented by the upper curve in Chart 3 had no special care during pregnancy and was referred to the hospital by a midwife. She was extremely ill because there was decompensation of the cardiac lesion, and also because she suffered from toxemia of pregnancy. After three days of observation, delivery was effected by cesarean section under nitrous oxid anesthesia. Clinical improvement began immediately, but progressed slowly, and the patient's recovery was uncertain for several weeks.

The second patient (lower curve) was carefully watched during the latter half of pregnancy. Renal complications did not develop, full term was reached, and delivery occurred normally. The credit for this satisfactory result belongs no less to the systematic

for estimating the work the heart is doing will provide such data, and this in turn will partly depend on knowledge of the blood pressure. By this means, then, it is not unlikely that we shall become able to decide whether or not the induction of labor is advisable as a prophylactic measure in cases of chronic valvular heart disease.

CONCLUSIONS

1. Blood pressure observations afford the means for the early detection of preeclamptic toxemia and for the determination of the severity of the autointoxication.

2. They are useful occasionally in the differentiation of pyelitis from the albuminuria of pregnancy.

3. They provide a measure of the efficiency of treatment during active eclampsia.

4. They afford a method of arriving at the ultimate prognosis in these cases.

5. When patients are carrying the double burden of a chronic valvular heart lesion and a toxemia, familiarity with the blood pressure is indispensable as a therapeutic guide.

6. Since knowledge of the blood pressure is required for the estimation of the work the heart is doing, probably by this means we shall acquire a more timely method of recognizing the approach of a break in compensation in cases of chronic valvular heart disease and, therefore, of deciding the question of inducing labor as a prophylactic measure.

284 Orange Street.

ABSTRACT OF DISCUSSION

DR. F. ASHLEY FAUGHT, Philadelphia: I regret that Dr. Slemons did not include the diastolic and pulse pressure in his study. I believe it is important if we are to get the chief value of these observations, to have preliminary records of the blood pressure of these patients before they become pregnant. We are then better able to judge of the relative bearing of variations in systolic pressure during pregnancy. In my observations the general average of records is systolic, 119; diastolic, 78; pulse pressure, 41. This corresponds with the 3, 2, 1 ratio; that is, the pulse pressure is three times the systolic pressure and twice the diastolic. These figures obtain in normal cases with slight variations. The low systolic pressure rises shortly before the fifth month; there is then a slight drop, with a rise again toward the end of pregnancy. On the contrary, the pulse pressure tends to become smaller, and my figures show that the pulse pressure falls from an average of 44 mm. in the second month to an average of 38 mm. during the last week of gestation. This is the direct result of a rise in the diastolic pressure. In studying some abnormal cases, even where there was not a decided rise in the systolic, I was surprised to find the pulse pressure in these toxic cases become much larger; in my series, 52.5 mm., average, as against 41 in the normal.

Another point for further investigation is that of the adequacy of the cardiovascular system in the latter months of pregnancy. Dr. Slemons has brought out an idea contrary to that usually suggested, and his experience has been sufficiently large for us to agree with him in this matter.

In regard to the value of the systolic pressure in relation to toxemias, those cases I have had opportunity of studying fell into many classes, none of which can be definitely picked out and pointed to as an example, so that I very much question whether the rise in pressure during pregnancy always is an indication of a dangerous toxemia.

DR. J. MORRIS SLEMONS, New Haven, Conn.: The greatest obstetric value of blood pressure observations is in connection with the early recognition of toxemias of pregnancy, but the diagnosis must not rest on blood pressure alone. I made that clear when I said that one must take into account at least three points in determining what form of treatment should be adopted, namely, the amount of urine passed in

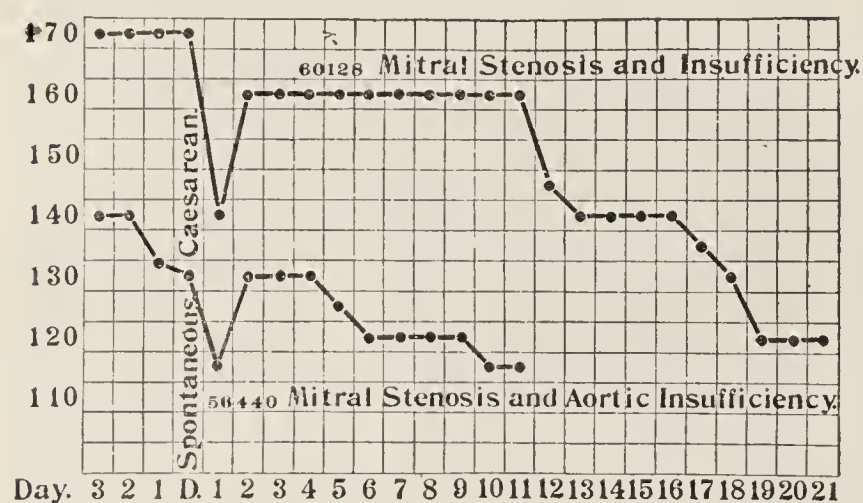


Chart 3.—Systolic pressure in patients having cardiac lesions. The top line (Case 60128) shows the pressure in a case of broken compensation and albuminuria; delivery was made by cesarean section. The lower tracing (Case 56440) illustrates the pressure in a case in which the heart lesion is well compensated, and without renal change; normal delivery at full term occurred.

observation of the blood pressure than to the care given the urinalyses. In this way, there was a rational basis for the advice the patient required; and she was safeguarded against the development of such serious complications as existed in the case first mentioned. If the pregnancy is properly supervised, there is opportunity to employ conservative therapeutic measures before the load becomes too great to be carried. And as renal complications are especially prone to develop in such cases, blood pressure determinations are imperative when pregnant women present cardiac lesions.

Blood pressure determinations thus far have not proved to be of material value toward predicting a break in cardiac compensation during pregnancy. In the presence of valvular lesions, the questions of fundamental interest are: As pregnancy advances what load will the heart eventually have to carry? And, in a given case, will the particular heart be equal to this task? Probably it will always be difficult, or even impossible, to find precise answers to these questions, but we shall have more accurate data for an opinion than is now available. A trustworthy method

the twenty-four hours, the degree of albuminuria, and the blood pressure. The importance of taking all this evidence into account is emphasized by what Dr. Faught has said. My experience agrees with his; in more than one instance I have seen patients with blood pressures of 180 and 190 go through labor without complications. But this is exceptional, and in these cases there was not a measurable amount of albumin and the output of urine in the twenty-four hours was normal. Therefore, we cannot depend on the blood pressure alone. If the quantity of urine and the degree of albuminuria, as well as the blood pressure, are accurately observed, the treatment will rest on the most rational basis.

DIVERTICULITIS OF THE LARGE INTESTINE *

WILLIAM J. MAYO, M.D.

ROCHESTER, MINN.

In a paper on acquired diverticulitis of the large intestine, in 1907, Wilson, Giffin and I¹ were able to demonstrate the pathology and to outline the clinical history of the condition to which Graser² called attention in 1898. Our five cases in which the diverticulous sigmoid was excised proved to be the first recorded in which an actual demonstration of the pathology of diverticulitis was established during life. Articles dealing with postmortem demonstrations of



Fig. 1.—Symptomless diverticula of the sigmoid.

diverticula of the colon had been rather frequent,³ and suggested an explanation of clinical experiences such

as those recorded in the contributions of Telling,⁴ Brewer,⁵ Beer,⁶ Plummer⁷ and others.

Since the recognition of the condition, we have resected portions of the large intestine for diverticulosis in forty-two cases. In thirty-six the sigmoid was involved, in one the transverse colon, in one the ascending colon, in one the hepatic flexure and cecum, in one the rectosigmoid juncture, and in two the rectum. The number of cases in which resection was not done but in which the patient was operated on for



Fig. 2.—Symptomless diverticula of the sigmoid.

abscess, fistula, etc., is not given because the presence of diverticula was not proved by the demonstration of the specimen. The diverticula were all of the acquired variety; that is, the mucous coat pouched through small openings in the musculature in contradistinction to true diverticula of the congenital, traction, or pulsion types in which all the intestinal coats cover the sac. The diverticula were multiple and occurred at any weak point in the circumference of the colonic wall, such as vessel holes or muscle defects. From 1 to 8 inches of the intestine were seriously involved, although much longer stretches showed a diverticulosis tendency. Hardened masses of feces were often found in the distal extremity of the narrow-necked diverticula, although, as a rule, only one or two of the diverticula were directly responsible for the existing diverticulitis and peridiverticulitis.

The signs and symptoms closely resembled those of appendical inflammation, with the marked difference that in the great majority of instances the disorder was on the left side of the abdomen. It is altogether

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Mayo, W. J.; Wilson, L. B., and Giffin, H. Z.: Acquired Diverticulitis of the Large Intestine, *Surg., Gynec. and Obst.*, 1907, **5**, 8-15.

2. Graser: Ueber multiple Darmdivertikel in der Flexura sigmoidea, *Verhandl. d. deutsch. path. Gesellsch.*, 1899, Berlin, 1900, pp. 254-256.

3. Gordinier, H. C., and Sampson, J. A.: Diverticulitis (not Meckel's) Causing Intestinal Obstruction, *THE JOURNAL A. M. A.*, May 26, 1906, pp. 1585-1590. McGrath, B. F.: Intestinal Diverticula: Their Etiology and Pathogenesis, with a Review of Twenty-Seven Cases, *Surg., Gynec. and Obst.*, 1912, **15**, 429-444.

4. Telling, W. H. M.: Acquired Diverticula of the Sigmoid Flexure, Considered Especially in Relation to Secondary Pathologic Processes and their Clinical Symptoms, *Lancet*, London, 1908, **1**, 843-850, 928-931.

5. Brewer, G. E.: A Consideration of the Etiology of Certain Cases of Left-Sided Intra-Abdominal Suppuration (Acute Diverticulitis), *Tr. Am. Surg. Assn.*, 1907, **25**, 258-269.

6. Beer, E.: Some Pathologic and Clinical Aspects of Acquired (False) Diverticula of the Intestine, *Am. Jour. Med. Sc.*, 1904, **128**, 135-145.

7. Plummer, S. C.: Technique of Removal of Tumors of the Large Intestine, Causing Obstruction, *Surg., Gynec. and Obst.*, 1906, **2**, 696-697.

probable that most of the reported cases of so-called "sigmoiditis" are examples of diverticulitis.

Of the forty-two patients in whom resection was done, 66.6 per cent. were males and 33.4 per cent. females. The average age was 53 years. The youngest patient was 27 years of age and the oldest 73. The average weight was 175½ pounds. The heaviest patient weighed 225 pounds, the lightest 120 pounds. Those of light weight were below their average weight for the previous ten-year period. In many cases, increased deposit of fat in the abdominal cavity undoubtedly had some influence in the development of the diverticula, especially if there had been a ten-

this origin. Twenty patients had pain in the left iliac fossa. In thirty-two constipation was marked. A diagnosis of inflammatory disease was made in twenty of the forty-two cases. The Roentgen ray showed obstruction, but in acute obstructions it did not differentiate diverticulitis from carcinoma, although it usually made the differentiation in chronic disease. Carcinoma was present in thirteen cases (31 per cent.).

Clinically, cases of diverticulitis may be readily classified into four groups:

Group 1. *Self-Limiting Diverticulitis and Peridiverticulitis*.—This group includes fleshy, middle-aged persons who present themselves with an acute sensi-

tive tumefaction in the left iliac fossa. The mass gradually disappears in the course of some days, with restoration to health. The disturbance is due to irritation of fecal concretions, dead epithelium and other contents in the thin-walled, narrow-necked sacs, which cause obstruction from edema and infection and penetration of bacteria to the peritoneal surface. There is marked tendency to relapse quite similar in character to that of relapsing appendicitis, and in the early histories of the patients of Groups 2, 3 and 4, it will often be found that several such attacks had occurred before the severe attack which necessitated surgical interference. That diverticulitis does not always produce trouble is shown by the relative frequency with which this condition is found postmortem, by the frequency with which diverticula of the sigmoid are a chance finding in the course of abdominal operations for other purposes, and by the frequency with which routine Roentgen-ray examination of the colon shows symptomless diverticula. We should not assume, therefore, that the presence of these diverticula, or even a single mild attack of diverticulitis which quickly subsides without obstruction or other serious symptoms, necessitates operation. Patients of this kind are often poor surgical risks from other causes, such as obesity, and a considerable mortality attends resection, the only operation that really cures the disease. It is only in those cases, therefore, in which the symptoms are serious or the disease becomes chronic or relapsing that operation is to be considered.

Group 2. *Diverticulitis and Peridiverticulitis with Formation of Abscess Resulting in Enterovesical, Enterocutaneous and*

Other Fistulas.—This group includes those cases in which infections—either a developing peritonitis with abscess formation or the results of infectious processes which connect the diseased colon with the cutaneous surface, the bladder, or neighboring intestine—lead to the necessity for surgical interference. The rule is that if an abscess forms it should be opened and drained, but a serious attempt should not be made at the primary operation to remove either the infected diverticula or the section of colon which contains them. None of our patients has died from a general septic peritonitis as the primary result of diverticulitis, although such cases have



Fig. 3.—Carcinoma of the sigmoid developing on diverticulitis. Specimen to be sectioned through orifices of diverticula, at Lines A and B (see Figures 4 and 5).

dency to the formation of intestinal gases. The average duration of symptoms was two years; the longest twelve years; the shortest seven days.

In thirty-four of the forty-two patients, a sensitive tumor was present in the left iliac fossa during the attack, which was attended by localized peritonitis and often by intestinal obstruction. In two patients, diverticula were found in the rectum. C. H. Mayo⁸ has shown that occasionally a deep-seated infection about the rectum eventuating in long fistulous tracts extending from the perianal region into the pelvis has

8. Mayo, C. H.: Diverticula of the Gastro-Intestinal Tract: Their Surgical Importance, THE JOURNAL A. M. A., July 27, 1912, pp. 260-264.

been reported. The management of cases of complicated fistulas in which there are openings into the bladder and colon and to the cutaneous surface, and especially that most common type in which an internal fistula connects the bladder and the sigmoid, is very difficult. The obesity of the patient and the enormous amount of scar tissue which surrounds the fistulous tracts add greatly to the operative difficulties. In enterovesical fistulas we have opened the peritoneal cavity, dissected out the fistulous tracts, and closed the openings in the bladder and colon with chromic catgut sutures. Rarely was the result immediately satisfactory. As a rule, a temporary fecal fistula to the surface formed after a few days, but when, following operation, the bladder and sigmoid were kept separated by rolls of rubber tissue, and especially when the sutured opening in the sigmoid was protected by omentum, these secondary fistulas eventually closed spontaneously. A retention catheter has been placed in the bladder for a week and a rubber tube fastened into the rectum following operation, to relieve tension.

Group 3. *Obstruction*.—In acute diverticulitis the obstruction is the result of infection and edema. Chronic obstruction is due to hyperplasia, adhesions and angulation—the hyperplastic stenosing type. The condition is practically identical with those in Groups 1 and 2, but the addition of the obstruction in these cases is so serious a feature that it seems best to classify them independently. It was most surprising, however, when the entire mass was dissected out and the diseased bowel laid open, to find so little actual obstruction. In this group a tumor is usually found, and in 31 per cent. malignant disease coexists. I do not know of a more difficult differentiation than to foretell whether a given obstructing tumor deep in the iliac fossa of an adipose patient is diverticulitis or carcinoma or both. On a number of occasions I have gone down on such tumors which had been explored and pronounced inoperable by surgeons of skill and experience, and on dissecting the tumor out, found that it was diverticulitis without carcinoma and that the enlargement of the lymphatic glands, which had been one of the determining factors in estimating inoperability at the previous exploration, was due to sepsis. As a rule, the obstruction from diverticulitis is not quite complete. In this respect it differs from that of carcinoma, in which condition complete obstruction may be the first symptom of the disease. Several times, with great difficulty, I have dissected out a considerable portion of the sigmoid and found that the infection involved only one or two diverticula. Therefore the offending diverticula might have been excised and the patient spared the risk of the more serious operation. In two cases it was possible to excise infected diverticula successfully and separate the obstructing adhesions. On a few occasions a tumor was explored because of our inability to differ-

entiate diverticulitis from carcinomatous disease. After a diagnosis of diverticulitis was established, drainage was instituted for the relief of the local peritoneal infection, with recovery of the patient. Fortunately, the Roentgen ray now furnishes the differentiation in a high percentage of cases. In acute obstruction it may be necessary to make a colostomy close to the obstructing mass so that the colostomy and tumor may be excised together at a second operation; or perhaps a better plan is to do a complete ileostomy

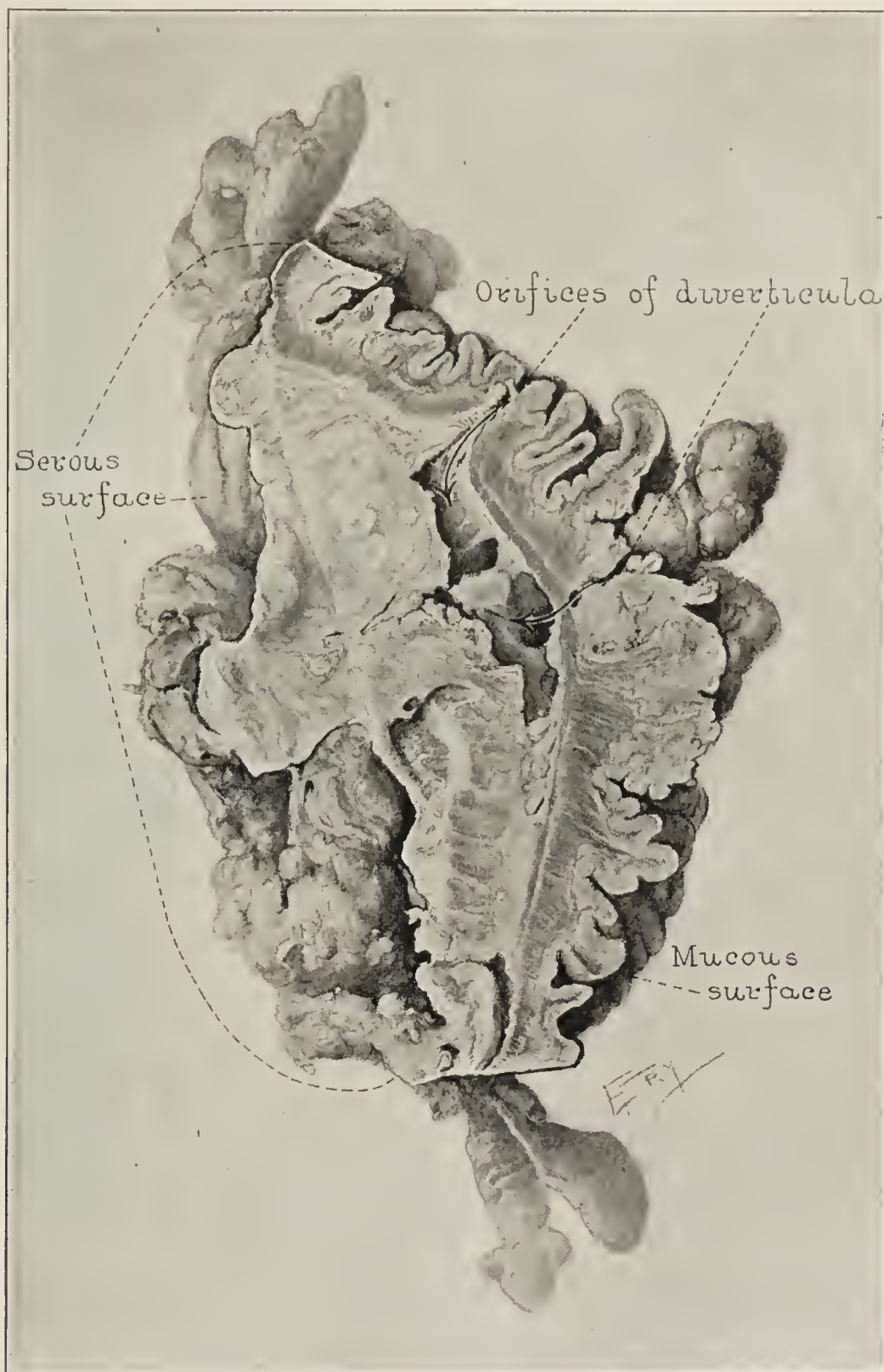


Fig. 4.—Half of the specimen shown in Figure 3, after a longitudinal division at Line A, showing courses of diverticula about which carcinoma has developed.

for temporary relief, then resect later, and finally, as a third stage, restore the ileum to the cecum.

GROUP 4. *Carcinoma Developing on a Diverticulum*.—This group is of great interest. Among the forty-two cases of resection for diverticulitis, there were thirteen in which carcinoma coexisted. The carcinoma had such definite relationship to the diverticulitis as to make it reasonable to assume that infection and irritation by hardened fecal masses in diverticula were the cause of chronic irritation and pre-

cancerous change. The only known fact of importance in the etiology of carcinoma is its relation to chronic irritation. The term "precancer" is used to denote certain cell changes taking place in the area of chronic irritation which, if found in connection with invasion of the tissues, would be typical of carcinoma.

Giffin⁹ found that for every sigmoid resected in our clinic for diverticulitis, seven had been resected for carcinoma. Our statistics show that in 300 resections for carcinoma, 180 were for sigmoid growths. In forty-two cases of diverticulitis of the large intestine, the diverticula were in the sigmoid in thirty-six. It has often been pointed out that carcinoma of the colon, especially of the sigmoid, may progress very slowly. Cases have been reported in which a colostomy was made for the relief of obstruction due to supposed carcinoma; the patients lived for a number of years and then died with carcinoma of the sigmoid, a fact which apparently proved that the condition had been carcinoma from the beginning and that the natural course of the disease had continued for eight or nine years. This inference is unwarranted. We have operated in several cases of this type, and on resection of the

mucosa. There was no carcinoma in the sigmoid, the malignant process being confined strictly to the diverticulum and the transverse colon. At the present time it is usually possible to differentiate between diverticulitis and carcinoma by the Roentgen ray since in carcinoma a filling defect will be found in addition to the less reliable findings of blood, pus, and mucus in the stool. With the sigmoidoscope we have been able to differentiate carcinoma associated with diverticulitis of the lower sigmoid and rectosigmoid, but have not been able to demonstrate diverticula.

Some of our patients with carcinoma associated with diverticula gave a long history of having had, at various times, inflammatory attacks with development of tumefactions which disappeared. After the carcinoma developed, the symptoms became more or less continuous. In reviewing a series of early specimens of sigmoid resected for supposed carcinoma, Wilson¹⁰ found that three which had been resected years ago, before all specimens were subjected as a routine to microscopic examination, showed diverticulitis and no carcinoma. The association of carcinoma with diverticulitis leads to the conclusion that when a tumor

appearing to be diverticulitis but without acute symptoms is found in the sigmoid or colon, and especially if the tumefaction only partially subsides and then continues as a chronic mass causing symptoms more or less marked, carcinomatous change is to be suspected and resection should be done. If there is definite obstruction at the time, or if the disease is advanced, the two-stage operation of Mikulicz, Bruns and Paul, as described by C. H. Mayo, may be adopted. Frequently, instead of leaving the tumor attached in the wound, we have cut the protruding bowel and tumor off, leaving the two ends of the intestine closed by a clamp on each, suturing the intestinal stumps into the wound behind the clamps and thoroughly covering the parts with petrolatum. After from twenty-four to forty-eight hours, or as long as the patient was able to stand the gas pressure from the complete obstruction, the clamps were removed.

The suggestion of Peck¹¹ to leave the ends of the intestine closed for some hours until adhesion takes place has been of great value on a number of occasions, and permits primary union of the operative wound.

Of forty-two patients with diverticulitis, with and without carcinoma, on whom we have done resections, 14 per cent. died as the result of the operation; that is, within four weeks. The mortality was high, but it must be taken into consideration that these patients were usually adipose, and it was often necessary to operate during the stage of obstruction, infection, etc. A large majority of the fatalities occurred in the earlier period when it was believed that the tumefaction was due to carcinoma, and extensive dissections seemed to be indicated. It is of great value, therefore, to be able to differentiate between diverticulitis and carcinoma, as in diverticulitis the removal of the mass of tissue which would be essential in carcinoma is not necessary. When a primary resection was made, we

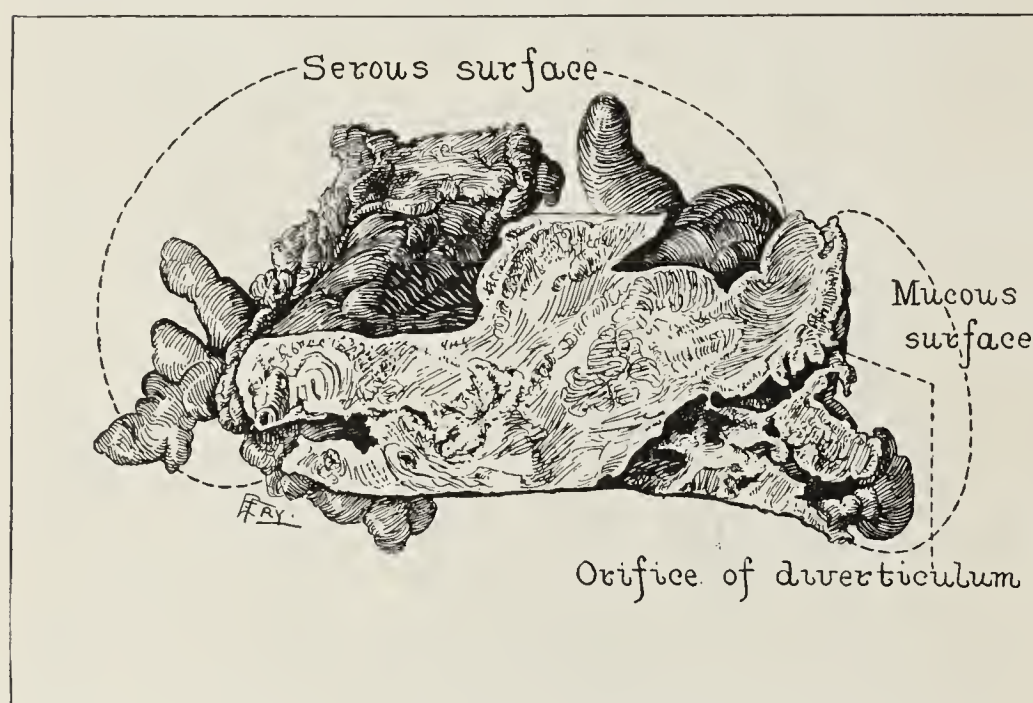


Fig. 5.—Half of section shown in Figures 3 and 4, after a horizontal division at Line B. Course of diverticulum through the orifice through which Line B passes.

growth found carcinoma developing on old diverticulitis. In tracing the early history it could be seen that the diverticulitis had been the cause of the obstruction for which the colostomy was done and that the carcinoma had developed at a much later date as the result of the chronic irritation. In one rather remarkable case, a supposed carcinoma of the sigmoid, associated with a carcinoma of the transverse colon, was found on exploration. I removed the left half of the transverse colon, the splenic flexure, the descending colon, and part of the sigmoid, uniting the remainder of the transverse colon to the lower sigmoid. When the specimen was unraveled, it proved to be diverticulosis of 6 inches of the sigmoid. The carcinoma had developed on one diverticulum which had become adherent to the transverse colon, and had spread into the peritoneal, muscular and submucous coats of the transverse colon without penetrating the

9. Giffin, H. Z.: Diverticulitis of the Rectum, *Ann. Surg.*, 1911, **53**, 533-537; The Diagnosis of Diverticulitis of the Large Bowel, A Clinical Review of Twenty-Seven Cases, *THE JOURNAL A. M. A.*, Sept. 14, 1912, pp. 864-866. Giffin, H. Z., and Wilson, L. B.: A Case of Carcinoma on Diverticulitis of the Sigmoid, *Am. Jour. Med. Sc.*, 1909, **137**, 661-666.

10. Wilson, L. B.: Diverticula of the Lower Bowel: Their Development and Relationship to Carcinoma, *Ann. Surg.*, 1911, **53**, 223-231.

11. Peck, C. H.: Diverticulitis, *Tr. New York Surg. Soc.*, 1910; *Ann. Surg.*, 1910, **52**, 264.

employed an end-to-end union, but as a rule found it wise either to suture the anastomosed area well up into the peritoneum and leave the suture line exposed, or to pass a folded strip of rubber tissue entirely around the anastomosis to suspend it in the wound, as there was a tendency to late infections, and unless provision was made for drainage, slowly progressing peritonitis occasionally caused death. To provide against gas pressure we have sometimes passed a good-sized red rubber tube by way of the rectum entirely through and well above the anastomosed area and fastened it with a single suture to the anus.

In very extensive cases with obstruction, Balfour¹² advises making a complete ileostomy close to the cecum after the manner of Brown,¹³ bringing the end of the ileum out through a small opening in the right



Fig. 6.—Carcinoma developing on diverticulitis.

side and closing its distal end completely, thus entirely diverting the intestinal contents from the large intestine. A cecostomy is made at the same time for cleansing the colon. This renders a resection of the involved colon much safer subsequently. Later, the end of the ileum is joined to the cecum end-to-side. A great advantage of this procedure is that the colon can be cleansed and maintained empty, and soon becomes nearly free from bacteria. Considerable experience with complete ileostomy in the management of ulceration of the colon has shown that the patient maintains weight and excellent health, and that the disability is not at all so great as would be thought.

After several weeks the stool becomes partly formed, is easily caught and contained in any one of the various colostomy bags, and there is much less odor than with a colostomy. I venture to say that, on the average, an ileostomy is much less of a nuisance than a colostomy.¹⁴

ABSTRACT OF DISCUSSION

DR. D. ROBERTS, Brooklyn: I am sure that diverticula are common in the colon. In a large percentage of cases the symptoms are mild. It is significant that patients with lower abdominal pain have been entirely free from such pain after a dose of barium or of bismuth. When there is partial obstruction of the colon, care should be taken to avoid complete obstruction by stirring up an old constipation, making acute symptoms. In diarrhea with fecal obstruction, which these people complain of, patients do better without laxatives than with them, because they make the feces liquid and consequently more irritating.

DR. MILES F. PORTER, Fort Wayne, Ind.: In a patient brought into the hospital for the relief of intestinal obstruction, after a hasty examination I opened the abdomen and concluded that I had to deal with inoperable cancer of the sigmoid. I therefore divided the intestine, dropped the lower end and brought up the upper end under the impression that my patient would be relieved so far as surgery could do this by making an artificial anus and giving the lower portion opportunity to rest, my idea being that she would at least be comfortable in the short time she had to live. A few months later I was requested to visit her town for the purpose of closing her fistula. I declined on the ground that her fistula was necessary to life. The woman after years is living today with her fistula closed by nature, a monument to my ignorance. In other words, she had a diverticulitis which I regarded as an inoperable cancer. The second point in regard to this case is that the diverticulitis is cured, but is she still having a slowly growing cancer? I appreciate what Dr. Mayo said about that, but the case occurred more than eight years ago. The woman, when I last heard from her a few months ago, was in perfect health. The case suggests that it would be wise in many of these cases, when we are in doubt, to adopt the two-stage operation, doing a colostomy and allowing the patient to rest for three or four weeks. You will be surprised to find how comparatively easy it is to remove radically the carcinoma that is left behind. It has been my misfortune to see patients brought into the hospital with diffuse peritonitis from a perforated diverticulum who have died in spite of our efforts to relieve them.

DR. W. J. MAYO, Rochester, Minn.: As a rule, I think the majority of cases give symptoms at times, but in many instances not enough to justify operation, although one should operate if recovery from an acute attack does not rapidly take place, provided the patient is a good surgical risk. In forty-two consecutive cases in which resection of the sigmoid was performed, three, which we believed to be carcinoma, proved to be diverticulitis. There is a possibility of carcinomatous degeneration in about 31 per cent. A number of patients who came to us had had colostomy, as described by Dr. Porter. But these patients with diverticulitis did not have histories and findings that were indicative of carcinoma. Sudden obstruction and a tumor mass adherent to the back of the bladder or the side of the pelvis or to the intestines, suggests diverticulitis when there have been no previous symptoms of carcinoma, such as passage of mucus and blood. In the absence of symptoms which occur with cancer in these cases, one should expect to find diverticulitis. The patient with relapsing diverticulitis or chronic stenosing tumors should be given the best possible chance of cure by local removal of the disease in a one-stage or two-stage operation.

14. Since completing this paper, I have read the following articles with great interest and profit:

Drummond, H.: Sacculi of the Large Intestine, with Special Reference to Their Relations to the Blood-Vessels of the Bowel-Wall, *Brit. Jour. Surg.*, 1917, 4, 407-413.

Telling, W. H. M., and Grunier, O. C.: Acquired Diverticula, Diverticulitis, and Peridiverticulitis of the Large Intestine, *Brit. Jour. Surg.*, 1917, 4, 486-530.

12. Balfour, D. C.: Meckel's Diverticulum: A Report of Fifteen Cases, *Jour. Minnesota Med. Assn.*, 1911, 31, 110-112.

13. Brown, J. Y.: The Lane Operation: The Indications for and the Limitations of the Procedure, with a Discussion of the Principles Underlying It, *Tr. South. Surg. and Gynec. Assn.*, 1911, 24, 137-150.

A SIMPLE METHOD OF AGGLUTINATION
OF MENINGOCOCCI *

RUTH TUNNICLIFF, M.D.

CHICAGO

The following is a simple and rapid method for differentiating by agglutination the meningococcus from other gram-negative cocci grown from the nasopharynx of meningitis patients and contacts:

Equal parts of horse serum, normal or antimeningitic, whole human blood in sodium citrate solution (1 part to 2 parts of 2 per cent. sodium citrate in salt solution), and a suspension of organisms are incubated ten minutes, smeared on a glass slide, stained and examined microscopically. In the mixture with normal horse serum there is, as a rule, very little or no clumping of the meningococcus, while in the one containing antimeningitic serum there is decided agglutination. In the event that cultures of organisms, meningococci or otherwise, should be agglutinated in mixtures with normal horse serum, it would be necessary to use dilutions of the serum, normal as well as immune, in order to bring out the specific agglutinins of the immune serum.

In many cases, agglutination of the meningococcus occurs in the immune serum without the presence of human blood, but the blood gives a better staining specimen and appears to promote agglutination. This effect was observed first in the course of observations on opsonins in antimeningitic serum.

The suspensions of micrococci are made by adding one or two colonies from the original plate or a loopful of a subculture to 2 or 3 drops of physiologic sodium chlorid solution.

In making the tests, bent capillary pipets are used. First, a small quantity of serum, about 1 drop, is

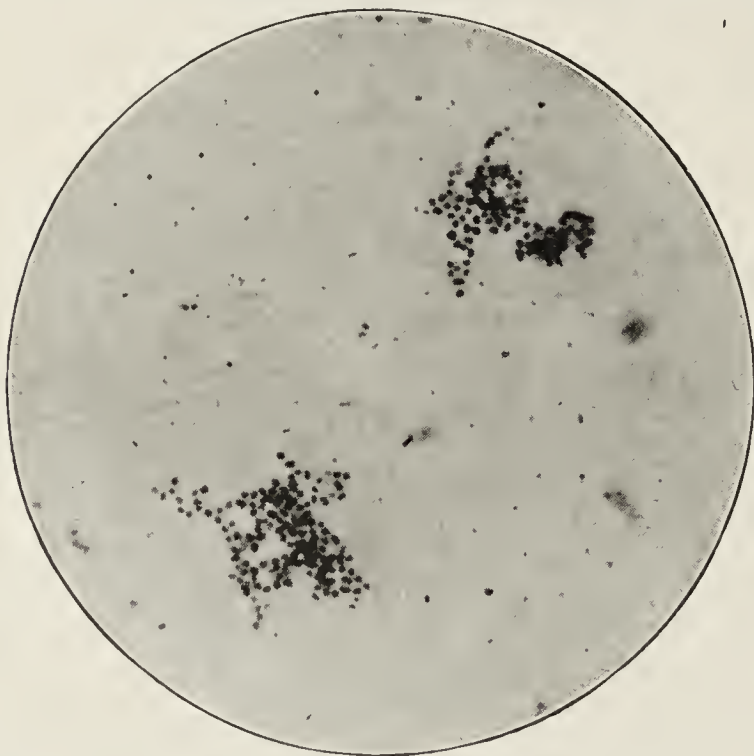


Fig. 1.—Agglutination of meningococci by specific serum as demonstrated by rapid method here described.

drawn in, the upper end of the column marked with a pencil, and then drawn up to admit an air bubble; next an equal amount of citrated blood is aspirated; when a sufficient number of pipets has been prepared in this way, the bacterial suspensions are made, and of each suspension the amount already indicated on the pipet is drawn into each of two pipets, one with

normal horse serum and one with antimeningitic serum. Now the contents of the pipets are mixed in the bend, and after an incubation of ten minutes at 36 C. (or room temperature for twenty minutes), the contents are gently mixed again and blown out on a glass slide, spread with cigaret paper and, when dry, stained unfixed with carbolthionin, or fixed with heat and stained with methylene blue.

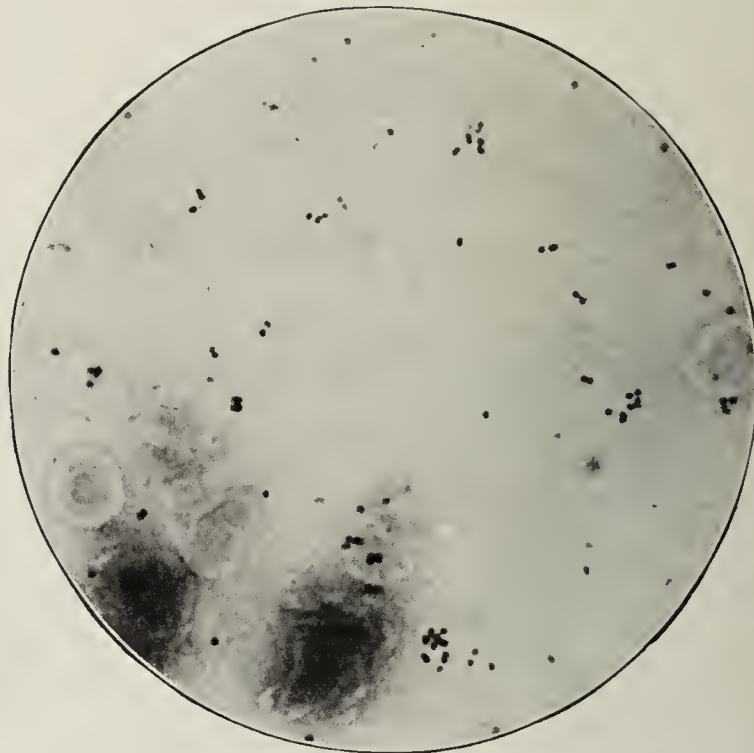


Fig. 2.—Absence of agglutination in control preparation with normal horse serum.

In this way about ten cultures can be examined in one hour, which is less time than it takes to make the macroscopic agglutination test. If the original colonies on the plates are separate, suspensions can be made with them and the organisms differentiated as early as sixteen hours or so after the original cultures have been made. If subcultures are used for the suspensions, the diagnosis is made twenty-four hours later; in any case, twenty-four hours may be saved, and often forty-eight, as compared with the macroscopic method.

One hundred and eighty cultures isolated by Dr. George Mathers from the nasopharynx of meningitis patients and contacts have been identified by this method. One hundred of them have also been examined by the macroscopic method of incubating twenty-four hours at 56 C., and whenever agglutination occurred by this method it also occurred in the tests made as here described. Four strains of meningococci were agglutinated microscopically but not macroscopically, probably owing to the higher dilution of the immune serum (1:50) in the macroscopic test. Forty of these cultures were from convalescent meningitis cases. Spontaneously agglutinable or inagglutinable strains of meningococci have not been encountered so far as I am aware. The other gram-negative micrococci in the cultures gave no agglutination, microscopically or macroscopically. The antimeningitis serum used was obtained from the Department of Health of New York City.

Pedagogic Celibacy.—Not less than half a million women are potentially affected by the institution of pedagogical celibacy—an institution which is to be compared with that of sacerdotal celibacy in the amount of permanent harm that it is capable of doing to the race.—*Jour. Heredity*, June, 1917.

* From the Memorial Institute for Infectious Diseases.

THE TREATMENT OF DEFORMITIES
OF THE SPINE CAUSED BY
POLIOMYELITISA REPORT OF EIGHT CASES IN WHICH FUSION
OPERATIONS WERE PERFORMED *

RUSSELL A. HIBBS, M.D.

NEW YORK

Deformities which develop in consequence of permanent damage to the muscles of the spine from anterior poliomyelitis are among the most difficult with which the orthopedic surgeon has to deal, and I know of no means which can be depended on to prevent their progress. Plaster jackets and braces can, at best, only retard the development of deformity.

It has seemed to me practical, therefore, in such cases, to do a fusion operation on the spine exactly similar to that which has been used in the treatment of Pott's disease at the Orthopaedic Hospital since 1910.

It is my purpose to report eight cases in which this operation has been done for scoliosis. None of these patients were operated on until long after the acute attack, and obviously one would not operate at all if there were any prospect of recovery of the muscles affected. I do not think, however, it is at all necessary to wait as long as we have waited in these cases.

This operation is in every essential feature precisely the same as that performed on patients with Pott's disease. Since there seems to have been some misunderstanding of the technic of the operation, perhaps a description of it here will not be out of place.

An incision is made directly over the spinous processes through skin, subcutaneous tissue and ligament to the tips of the spinous processes. The periosteum over each tip and the ligament between is split. The periosteum is then elevated from the bone over a part of each process in turn. As the periosteum is separated from the bone, small packings of gauze are made to prevent oozing. Separation of the periosteum is carried forward gradually until each spinous process and lamina is completely bare to the base of the transverse process. This is done in children with a blunt periosteal elevator and in adults with a sharp one, as in the latter the periosteum is more adherent.



Fig. 1 (Case 1).—Condition before operation.

The periosteum is then pushed from the adjacent bases of the spinous processes and the adjacent edges of the laminae to the ventral side with a small curet or a periosteal elevator. With this dissection made, the operative field is ready for any treatment of the exposed bone that is desirable. The first thing to be done is to curet the lateral articulations which lie at the base of the transverse process and are always easily reached in children and in most adults. After this is accomplished, a small piece of bone is elevated from the laminae and turned down, its free end resting on the one next below it. The spinous processes are then partially divided, with forceps for that purpose, and broken down so that the tip of one comes in contact with the base next below it. This completes all that is necessary to do to the bone.



Fig. 2 (Case 1).—Condition after operation.

The periosteum and ligament which have been separated are then brought together and sutured in the center with interrupted ten day chromic catgut. The skin wound is closed with continuous ten day chromic catgut. Dressings and brace or jacket are applied.

The importance of cureting the lateral articulation is evident, as it insures a fusion of bone at that point. Turning a piece of bone down from one lamina across to the next below prevents any tissue from falling between the laminae, thus insuring their fusion, while the importance of the transposition of the spinous processes is obvious. With the closure of the periosteum in the center, we have practically a periosteal tube filled with fresh, healthy, bleeding bone in uninterrupted contact from one end of the operative field to the other, insuring a fusion of the lateral articulations, laminae and spinous processes.

Immediately after operation a brace or jacket is applied, maintaining as much correction as is comfortable to the patient. My own preference is a steel brace which has already been made and fitted before operation. The patient is kept in bed for eight weeks, and the brace is worn for one year.

In six of these cases there was conspicuous deformity, and such weakness in three, that the patients could not sit up unaided, much less walk. All of them have been given a much better posture, much more stability, and, it is believed, protection from a progressive increase of deformity and probably have been saved from the necessity of wearing a brace or jacket for indefinite periods.

I can see no possible disadvantage in fusing even longer segments of the spine than in these cases; in fact, I think in some it would have been better to make

* Read before the Section on Orthopedic Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

a longer fusion. If, as seems probable, such an operation can prevent these conspicuous deformities, it should be done in many of these cases and earlier, before such irreparable damage has taken place.

REPORT OF CASES

CASE 1.—H. H., boy, aged 6, who had infantile paralysis at 11 months, was admitted to the hospital, June 20, 1914. There was loss of power in all muscles of the right thigh and leg; there was some power in the external rotators, abductors and external hamstring of the left leg, but very slight power in the calf and long flexors; there was complete loss of power

even this was not possible without holding herself up by her hands. After correction of the leg deformities, a spine fusion was done, Nov. 3, 1915, extending from the eleventh dorsal to the fourth lumbar vertebrae, inclusive. Fusion is complete throughout the operative field, and she has capacity

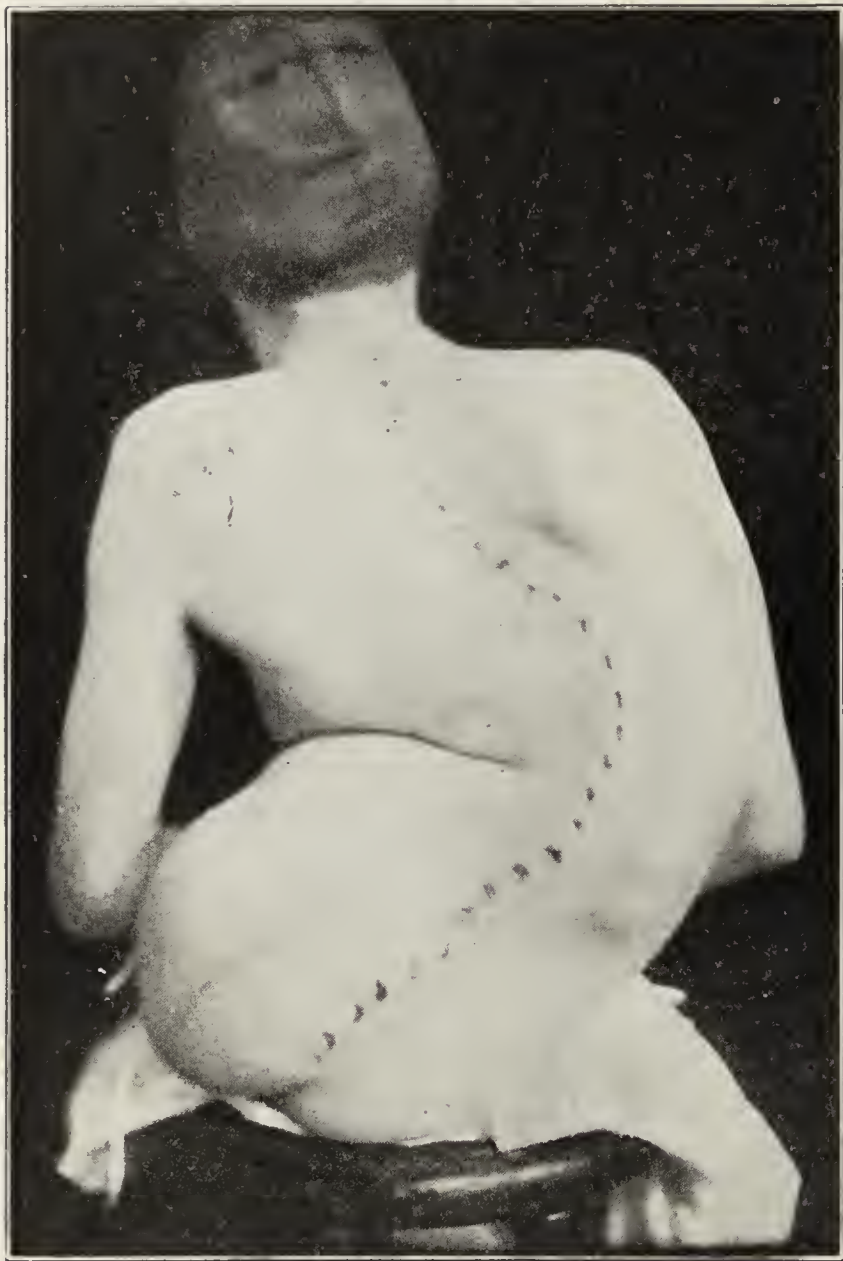


Fig. 3 (Case 2).—Position assumed by patient on attempting to sit.

in all the other muscles. Muscles in the right lumbar region of the spine were extensively involved, and there was a marked dorsolumbar curve to the right with marked rotation; the patient was unable to sit up at all without support. At the operation, June 23, 1914, a fusion was done from the tenth dorsal to the fourth lumbar vertebrae, both inclusive. The wound healed without complication, and there has taken place a fusion throughout the operative field, preventing any increase in deformity and increasing the stability of the spine so that sitting unaided is possible. Support was worn for one year afterward, and with braces applied to legs the patient is able to walk. Figure 1 shows the patient before operation and Figure 2 after operation.

CASE 2.—J. K., girl, aged 14, entered the hospital, April 27, 1915. She had infantile paralysis at 3½ years of age, both legs being extensively involved with conspicuous deformities and extensive involvement of the spine, permitting a right dorsolumbar curve with marked rotation. She had never been able to walk or sit up since paralysis. Figure 3 shows the position assumed by the patient on attempting to sit;



Fig. 4 (Case 2).—Condition one year after operation.

now to sit up without assistance and, while I do not believe a sufficient number of vertebrae were included in this case, at the same time the patient is immensely improved. Figure 4 was taken one year after operation; with braces on her legs, the patient is able to walk. She still wears a light steel support to her spine.

CASE 3.—C. R., boy, aged 14, had infantile paralysis at the age of 5, with extensive involvement of both legs and the spine and a dorsolumbar curve with convexity to the right and with marked rotation. January 19, a fusion operation was done from the ninth dorsal to the third lumbar, inclusive. Fusion is complete, progress of deformity stopped, and the stability of the spine much improved. Figure 5 was taken after operation. Photograph before operation was not obtainable.

CASE 4.—W. D., boy, aged 6, had infantile paralysis at 2 years of age, with extensive paralysis of both legs. The spinal group of



Fig. 5 (Case 3).—Condition after operation.

muscles permitted a marked dorsolumbar curve to the right with rotation. The patient was admitted to the hospital, May 1, 1916. Fusion operation from the eighth dorsal to the third lumbar vertebrae, inclusive, was performed, May 19, 1916. Complete fusion was secured, with marked improvement; no progress of deformity

was detected. Figures 6 and 7 show the condition before and after operation.

CASE 5.—S. S., boy, aged 6½ years, had an attack of infantile paralysis at 4 years, leaving extensive paralysis of both legs and the spine. The patient never had walked or

right with marked rotation. Spinal fusion from the seventh dorsal to the fourth lumbar was performed, July 18, 1916. Complete fusion was obtained and improvement was marked. Figures 12 and 13 show the condition before and after operation, respectively.

CASE 8.—W. B., boy, aged 16, had infantile paralysis at 2 years of age. The right quadriceps, left anterior tibial and peroneal groups of muscles were affected, and also the right spinal group, permitting a right dorsolumbar curvature with marked rotation. Spine fusion was performed, Dec. 29, 1916, including the eighth dorsal to third lumbar. Fusion was complete and improvement in both positions and stability of spine resulted. Figures 14 and 15 show the condition before and after operation, respectively.

130 East Thirty-Sixth Street.

ABSTRACT OF DISCUSSION

DR. EMIL S. GEIST, Minneapolis: How many vertebrae should be fixed?

DR. FRED J. FASSETT, Seattle: I think we all agree with Dr. Hibbs that it is bad for a patient to wear a body support longer than is necessary. We could go further and say that is difficult to find any form of body support which in

a paralytic scoliosis, will do the work. I have done only the bone splinting operation. In such cases, even where the splint has firmly healed in place, it has not had the slightest effect on the curvature or the rotation. If any operation would control a paralytic scoliosis it would be one which

been able to sit up. The position when the patient attempted to sit up is shown in Figure 8, taken before operation. Deformities of the legs were corrected and a spine fusion done, July 6, 1916, from the sixth dorsal to the third lumbar. While there has been marked improvement, evidenced by the fact that the patient can now sit without support, and with braces on his legs is able to walk, it is possible that a more extensive fusion might have been better. However, there can be no question that progress of the deformity has been checked, and improvement is marked. In such a case, of course, operation should have been performed long before such conspicuous deformity developed. Figure 9 was taken after operation.

CASE 6.—J. D., boy, aged 16, had infantile paralysis at 1 year with complete paralysis of one leg, with the left spinal group affected, permitting a marked dorsolumbar curve to the left with rotation. The patient was unable to sit without assistance. Spine fusion was performed, Dec. 13, 1916, from the tenth dorsal to the third lumbar. Marked improvement in both position and stability of spine followed. In this patient, also, a spinal fusion should have been done earlier in life. Figures 10 and 11 show the condition before and after operation, respectively.

CASE 7.—F. D., boy, aged 9, had infantile paralysis at 4 years, leaving an extensive paralysis of the right leg and right spinal group, permitting a dorsolumbar curve to the



Fig. 6 (Case 4).—Condition before operation.



Fig. 7 (Case 4).—Condition after operation.



Fig. 8 (Case 5).—Position assumed by patient on attempting to sit.



Fig. 9 (Case 5).—Condition after operation.

produced a perfect mass of new bone about the processes. This is what the operation used by Dr. Hibbs appears to do.

DR. JOHN RIDLON, Chicago: I should like to have Dr. Hibbs say, if he will, why he did not make an effort to correct these spines before doing the fixative operation. These

spines can be considerably, and sometimes completely, corrected; but the problem is to hold them in the corrected position. His operation would seem to be the way of holding them there; but why not do the other thing first?

a substantial human tissue splint, and will in a way serve as a means of holding the trunk erect. If scar tissue will produce scoliosis, it is only fair to make it serve as a means of correcting it.

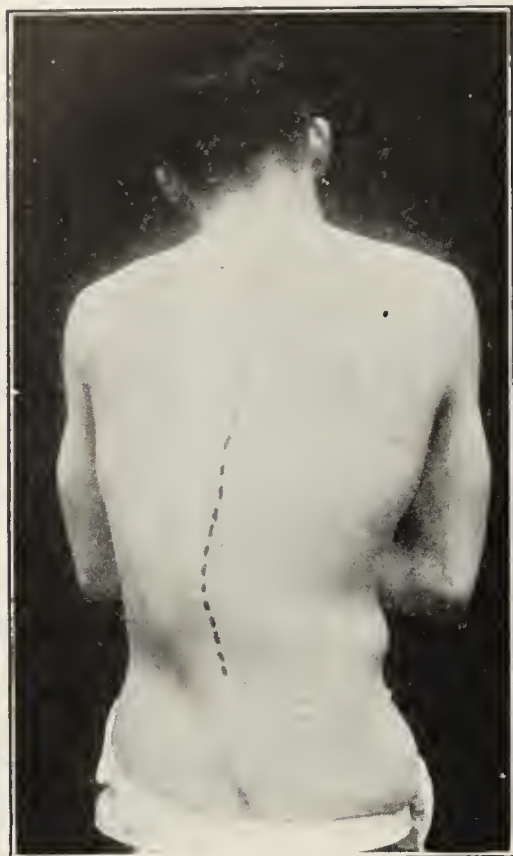


Fig. 10 (Case 6).—Condition before operation.

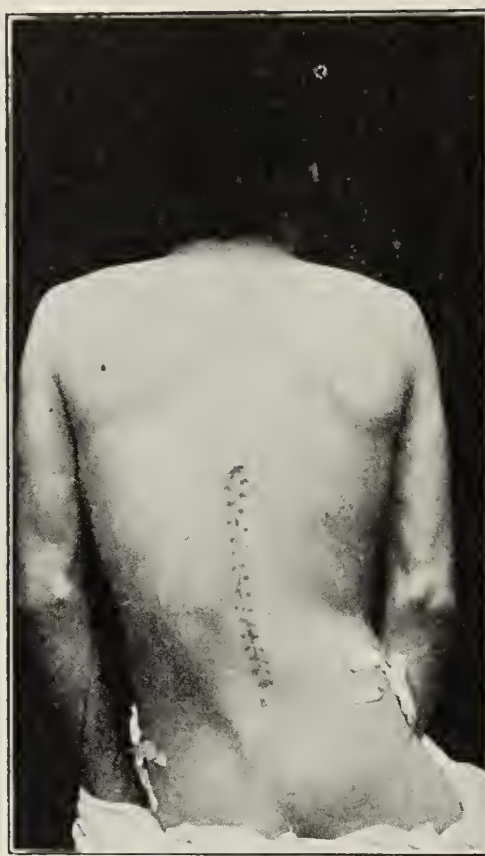


Fig. 11 (Case 6).—Condition after operation.



Fig. 12 (Case 7).—Condition before operation.

DR. HORACE R. ALLEN, Indianapolis: From time to time there come into our practice children and adults with horrible scolioses due to injury. I have had cases in which the patient had been burned, and the resulting cicatricial tissue would pull them over, and when the scar tissue was deep there was almost no way to get them straightened. I should

DR. JOHN RIDLON, Chicago: Some scar tissue stretches instead of contracting, and it is not very good procedure to try to straighten a scoliotic spine by putting scar tissue on the convex side.

DR. ALBERT H. FREIBERG, Cincinnati: I commend what seems to me an excellently conceived procedure for these

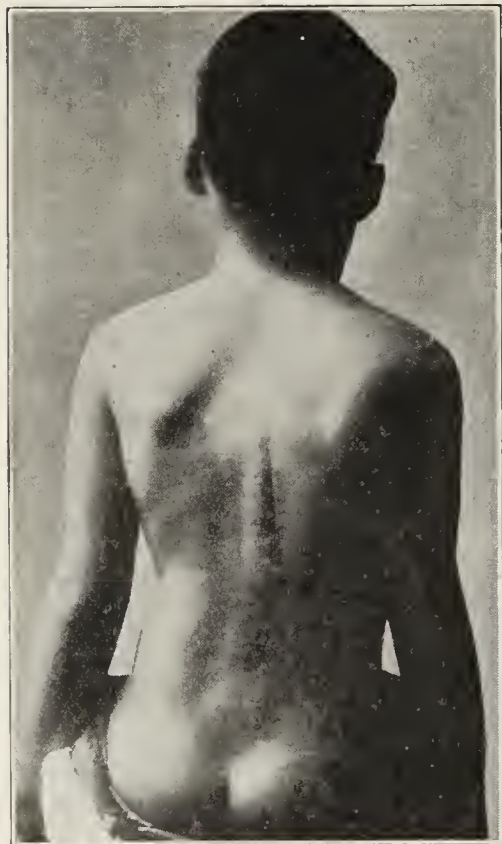


Fig. 13 (Case 7).—Condition after operation.

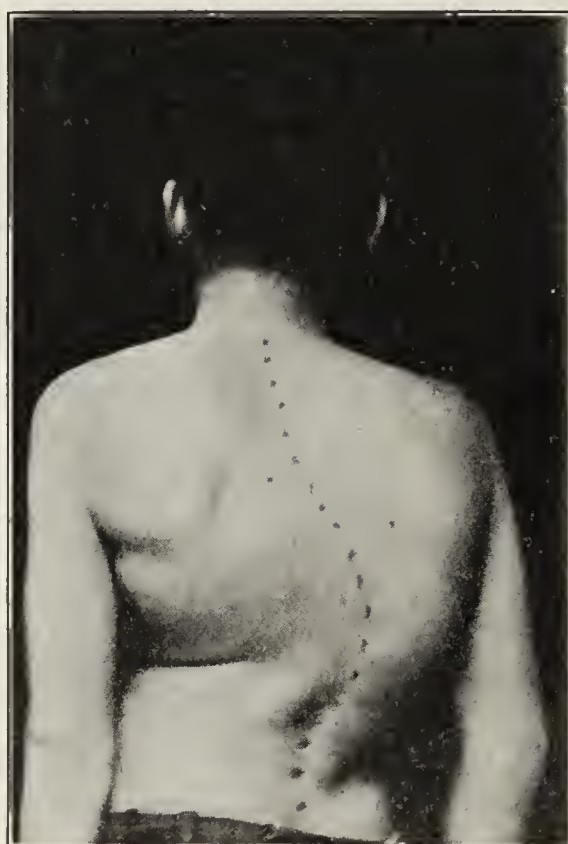


Fig. 14 (Case 8).—Condition before operation.



Fig. 15 (Case 8).—Condition after operation.

like Dr. Hibbs to say whether he thinks the artificial production of scar tissue on the convex side might not be of benefit by contracting and holding the spine straight. Scar tissue is inelastic, as every one knows, and if it is deep enough and properly located it will be strong enough to serve as

cases, and it seems to me, also, that it would be no mistake to operate in these cases earlier than has been done. I would regard this as the one exception that I might be willing to make to operating on paralytic deformities early. Whatever we may feel with regard to the relative merits of the bone

grafting operation and the operation of Dr. Hibbs for Pott's disease, it seems to me that this would be the operation of choice for paralytic scoliosis, because it attacks the deformity at the periphery of the curve, which is supposed to be the chief point of merit in any fusing operation for Pott's disease. There is a large question that Dr. Hibbs will have to decide for us, and that is whether the correction he obtains will endure. It seems to me that there is abundant reason to doubt that, since there is inequality of muscular action, which will persist, presumably, as long as the child lives. It is a question whether the response to muscular pull on one side, and absence of it on the other, will not eventually cause a yielding of the vertebrae and an increase of the deformity.

DR. E. D. EBRIGHT, Wichita, Kan.: For the class of cases shown, I think Dr. Hibbs' operation is a most important advance. Since last fall I have seen forty-two of these scolioses that, if they had been allowed to go on, would have become exactly the type of case represented by the worst picture shown by Dr. Hibbs. I think the necessity to do that operation, however, is a reproach to the medical profession, for these deformities can be prevented if the disease is taken in time and properly treated. As Dr. Freiberg says, the paralyzes are equal on both sides, and the back is as liable to slump one way as the other. The fusion operation is much preferable to the splinting operation, which controls the spine in flexion and extension only, while this method stops side bending as well.

DR. WALTER TRUSLOW, Brooklyn: We have watched these cases this summer and have prevented the deformity, and we have seen the strength slowly come back under protection and carefully guided muscle training. Of course, we cannot yet know the ultimate result.

DR. JAMES W. SEVER, Boston: It is not a question of muscle training over a period of a year; it is a question of holding the corrected position in these cases by adequate apparatus over a period of ten or fifteen years. If one talks of holding them for six months or a year only, one has not the correct conception to base results on.

I was glad to hear what Dr. Ebright said, but I think that he is an optimist, especially with regard to correction of scoliosis due to infantile paralysis. If he knows of any method to prevent its increasing in infantile paralysis I should like to know it.

DR. RUSSELL A. HIBBS, New York: The question asked by Dr. Geist, as to how many vertebrae to fuse, I would answer by saying that it depends on the extent of the curve. In some it was only necessary to fuse five or six; and in others, as many as twelve, depending on the extent of the curve and the amount of paralysis. No one would contemplate doing the fusive operation on a child whose spine was only temporarily affected. We wait and see the amount of permanent damage done by the infection.

In answer to Dr. Freiberg's question as to the permanency of the correction of these deformities, I would say that a longer time must elapse before a definite answer can be given. My own feeling is that it may be permanent.

In answer to Dr. Ridlon's question as to whether corrective work is done before operation, it is, and should always be. I feel, however, that if a longer experience proves that a fusion operation will permanently prevent these deformities, it should be done earlier.

Imports of Senna.—Only since the beginning of the war has senna become an article of export from Aden to the United States, according to Consul Addison E. Southard, at Aden (*Commerce Reports*, July 2, 1917). The first shipments were made in the second quarter of 1916 and amounted to 31,273 pounds. Smaller shipments were made during the third quarter of the year. In the second quarter of 1917 the shipments amounted to 82,868 pounds, valued at \$42,407, ranking second in value of articles exported to the United States from Aden. The crude drug comes to Aden from the Yemen and other Red Sea Arabian provinces and the poorer grades from Abyssinia and French Somaliland. At Aden it is cleaned before export, Indian women being employed to pick it over and throw out twigs, discolored leaves, etc.

REPORT OF AN OUTBREAK OF DIPHTHERIC WOUND INFECTION AMONG RETURNED SOLDIERS

J. G. FITZGERALD, M.B.

Major, Canadian Army Medical Corps; Associate Professor of Hygiene, University of Toronto, Faculty of Medicine

AND

D. E. ROBERTSON, M.B.

Major, Canadian Army Medical Corps; Assistant in Surgery, University of Toronto, Faculty of Medicine

TORONTO

We have been unable to find, in the literature accessible to us, references to epidemic outbreaks of wound infection due to *Bacillus diphtheriae*. The cases which have come under our observation during the past six weeks have therefore been of considerable interest.

For some months, wounded men of the Canadian Expeditionary Force on whom amputations of arms or legs or both were necessary have been returned to Toronto for further orthopedic treatment. Such patients were under the care of the Military Hospitals

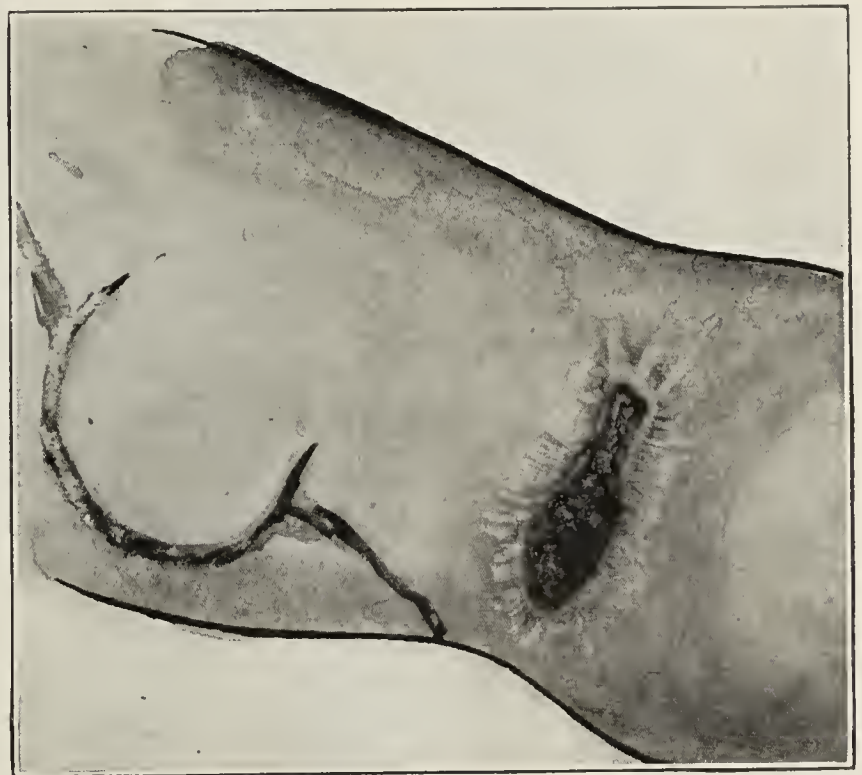


Fig. 1.—Diphtheric infection of inner side of left leg. The sinus is sunk (all around outside edge) below the normal level of the skin. The sinus (inside) is about one-eighth inch deep from its outside edge. Swelling is prominent.

Commission Command, "D" Unit, to which one of us (D. E. R.) is attached for duty.

During the first week in May, 1917, as a result of a thorough examination of suppurating stump wounds, one or two cases were observed which strongly suggested diphtheric infection. One of us (D. E. R.) made a clinical diagnosis of skin diphtheria, ordered a bacteriologic examination, had the man isolated, and diphtheria antitoxin was administered.

May 19, 1917, this man (who belonged to an infantry battalion) was admitted to the isolation department of the military base hospital, Toronto, suffering from a diphtheric infection of a leg stump. The patient had a reamputation of the leg, March 31, 1917. For some time his stump did very well. About May 11 his stump showed signs of infection, and a bacteriologic examination revealed that the infection was due to *B. diphtheriae*. As soon as the patient was admitted to the base hospital, one of us (J. G. F.) as Sanitary Officer No. 2 in Military District No. 2,

commenced a thorough investigation of all infected wounds, stump or other, in returned men of the Canadian Expeditionary Force who were in hospital or were outpatients at any of the military convalescent hospitals in Military Division No. 2. Further, nose and throat swabs were taken from all of these patients and from all other contacts, including the personnel, medical officers, nursing sisters and men.

Between May 20 and June 7, 1917, sixty-seven men with suppurating wounds, chiefly amputation wounds, were swabbed. Of this number thirty-two were found to be suffering from *B. diphtheriae* infection. In addition to these wounded men who were so infected, a nursing sister with a slight wound of one

index finger was also discovered to be suffering from diphtheric infection of the finger. A careful investigation revealed the fact that this nursing sister had been doing the dressings of men who were suffering from suppurating amputation wounds. She had not been in the habit of wearing rubber gloves while doing these dressings. She observed after a short time that a slight abrasion on her finger became infected. It was learned that among others she had dressed the wounds of the first cases of this condition which were discovered. When she was assigned to duty in the hospital in which these patients were being treated she was not infected. Shortly after commencing the work she became infected, and was undoubtedly infected by one of the men whose wounds she was dressing. It was at first strongly suspected that she was responsible for the outbreak. Very soon, however, patients were found whose wounds had never been dressed by the nursing sister in question and who had, as a matter of fact, been returned to Canada after this nursing sister was sent to the isolation department of the base hospital. Two or three cases were discovered in men immediately on their arrival in Toronto from overseas, and they gave a history of having had suppurating wounds for some time before returning to Canada.

It was extremely probable, therefore, that patients with diphtheric wound infection were being returned to Canada from overseas. Since a routine bacteriologic investigation of all cases of suppurating wounds had not been made, it was impossible to learn who was the original source of infection.

Of the first twenty patients investigated, several had been in Canada for some time. It seemed possible that in some of these cases infection may have been transferred from one man to another, or in certain instances acquired while the men were on pass. We have been informed also that some of the men removed their dressings while they were out on pass to show the stumps to friends. Infection might, of course, have taken place under such circumstances while the men were away from the hospital.

Since it has been observed that possibly 1 or 2 per cent. of normal healthy persons are carriers of *B. diphtheriae* it was a matter of interest that as a result of the bacteriologic examination of the nose and

throat swabs of all the patients examined and of the contacts only two carriers were found. One of these men was a healthy carrier, the other was a man with a large infected wound of a leg stump which infection was due to *B. diphtheriae*, and he had probably transferred the infecting microorganism from his leg stump to his nasal mucous membrane. Forty-three suppurating amputation wounds were found to be infected with other microorganisms, chiefly *Staphylococcus pyogenes-aureus*. Of the men with wounds infected with *B. diphtheriae*, six at least had what looked like diphtheric membranes, and clinically they somewhat suggested diphtheria because of the toxic symptoms, which, however, were much less marked than in the ordinary clinical types of diphtheria. Not a single clinical case of diphtheria with infection of the mucous membrane of the mouth, nose or throat was observed in this outbreak.

The six men who had most marked symptoms suggesting skin diphtheria all improved greatly after antitoxin was given.

The first man so treated noted the greatest improvement in his stump within forty-eight hours after antitoxin was administered. The pain and swelling and brawny induration were less evident.

One of the most important points from the clinical aspect is that an infection due to *Staphylococcus pyogenes-aureus* may so closely resemble infection due to *B. diphtheriae* that without a bacteriologic examination the nature of the infection cannot be determined. This is illustrated in the wash drawings which have been made of a case of wound infection due to *B. diphtheriae*, and of another caused by *Staphylococcus*

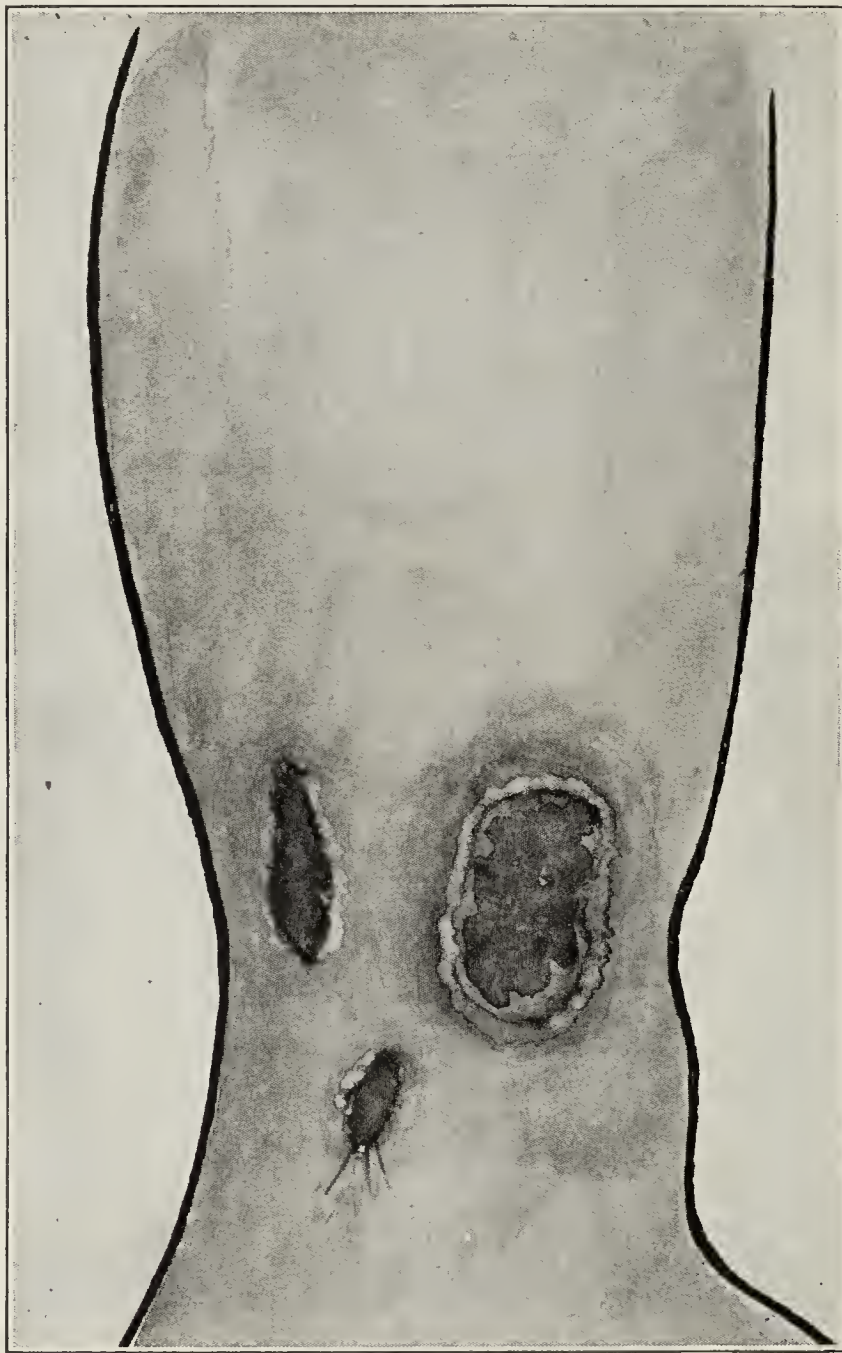


Fig. 2.—*Staphylococcus pyogenes aureus* infection; shrapnel wounds of right leg above ankle. The small sinus to the left is about one-eighth inch deep; the large sinus is about one-sixteenth inch deep.

pyogenes-aureus. Clinically they presented almost exactly the same appearances.

The types of *B. diphtheriae* found in cultures of some of these cases are shown in the photomicrograph. Granular forms were found in a number of cases; these organisms grew well on blood serum, and on this medium showed the typical morphology. They did not grow on ordinary lemco agar. In one or two instances, organisms which grew as granular types on blood serum appeared as solid forms on agar.

The wounds in which the infection was due to *B. diphtheriae* invariably began to clear up when antitoxin was administered, as was done in all cases. Such cases had shown no improvement whatever when an acid solution of hypochlorite (Lorain Smith), etc., was used alone. As soon as the body fluids became strongly antitoxic, improvement was noted. Experiments to determine the virulence of seven of the strains of *B. diphtheriae* causing these infections have been undertaken.

From the culture isolated in the case of P. E., a man suffering from an infected gunshot wound of the upper forearm, a toxin was produced, which in a dose of 0.5 c.c. killed a guinea-pig weighing 250 gm. in thirty-six hours. Another guinea-pig of the same weight was given a similar dose of this toxin, and in addition 1,000 units of antitoxin. The second guinea-pig was kept under observation for two weeks; it gained in weight and showed no paralysis. Several other strains tested showed somewhat less virulence.

The length of time required to clear up these infections varied considerably. One patient gave two successive negative cultures one week and a half after his infection was first determined, and he was given appropriate treatment. Twenty-three of the twenty-eight patients first observed had two successive negative cultures and were discharged from hospital in six and one half weeks or less. The average stay in isolation of these first twenty-three patients was thirty days. Five of the original twenty-eight patients still gave positive cultures more than six weeks after the nature of the infection was ascertained.

The treatment in all cases was practically the same. The men were isolated, were given diphtheria antitoxin, and their dressings were done with a rigid regard for asepsis. It has also been recommended that in future a routine bacteriologic examination of all suppurating wounds be made; also, that in no case should dressings of infected wounds be undertaken without rubber gloves being worn. It is regretted that because of the pressure of other work a Schick reaction could not have been done on all these cases.

Responsibility of Medical Staff.—The commanding officer of today, who is wise, instinctively acts according to the sentiment of Gen. Winfield Scott: "I am in the habit, myself, when on duty with troops, of paying great deference, and even of yielding my opinion, on matters deeply affecting health and life, to the advice of my medical staff."—Lieut.-Col. C. C. McCulloch, Jr., U. S. Army: The Scientific and Administrative Achievement of the Medical Corps of the United States Army, *The Scientific Monthly*.

CONICAL CORNEA, OR ANTERIOR MYOPIA *

EDWARD JACKSON, M.D.

DENVER

This subject, last brought before the section in the valuable symposium by Burnett, Sattler and Hermann Knapp, seventeen years ago, is of great scientific and practical interest, and our knowledge of it is still fragmentary. It has broad relations with other pathologic conditions of the eye and with more general problems of nutrition. The phrase "anterior myopia" is suggestive of relations to the larger class of posterior myopia and the process through which the great majority of cases of myopia develop. Both keratoconus and posterior or axial myopia arise from the pathologic distention of the sclerocorneal coat. In their production, states of general nutrition and local conditions both share, but to quite different extents. Axial myopia has been the subject of extended and thoughtful study, especially by our colleague, Dr. S. D. Risley. The succession of events, eye-strain, uveal congestion, scleral softening and distention, and passage of refraction from hyperopia to myopia have been often watched. Especially has astigmatism been noted, as an important factor in the production of eye-strain; the eyes passing, as Risley has phrased it, "from hyperopia to myopia through the turnstile of astigmatism."

The use of the eyes for near work is also recognized as a very general condition of the causation and progress of myopia. General diathetic diseases have also been considered to cause myopia. Batten¹ made a strong argument for the connection of myopia with general disease, and reported seventeen cases in support of this view, mostly of myopia arising in connection with cardiovascular disease. The share of general im-

paired nutrition in causing myopia has not been so well demonstrated as the share of near eye work and strain from astigmatism, but it seems necessary to assume such a factor to account for the fact that in many patients astigmatism, eye-strain and retinochoroidal hyperemia leave undiminished hyperopia, while others become less hyperopic or myopic.

In the production of keratoconus the same factors may be concerned, but with far different relative importance. In anterior myopia, conditions of lowered general nutrition seem to be of first significance; anemia, acute general disease, chronic diathetic diseases, and impaired nutrition from many causes seem clearly associated with the beginnings of conical cornea. These may from the first cooperate with eye-strain, and later certain mechanical factors perpetuate and increase the trouble; but conical cornea rarely, if ever, begins when the patient is in robust general health. It is easy to see why the nonvascular cornea should especially suffer from lowered nutrition; while the most vascular portion of the sclera at the posterior

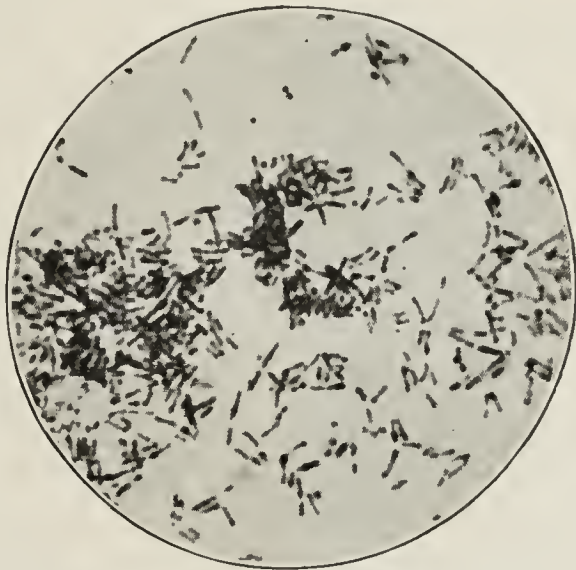


Fig. 3.—Culture of *B. diphtheriae* isolated in Patient P. E.: granular types especially numerous.

* Read before the Section on Ophthalmology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Batten: *Ophth. Rev.*, 1892, p. 1.

pole of the eye should be most involved in a process, marked by active hyperemia. In axial myopia the brunt of the pathologic process falls near the posterior pole of the eye and near to the temporal side of the optic disk. The influences that produce keratoconus show little or no effect except toward the center of the cornea well removed from the vascular limbus. The beginnings of keratoconus are not closely associated with near work for the eyes, although after the defect has come into existence, and the eye is crippled for distant vision, the same vicious circle is established as in axial myopia; and the deterioration is

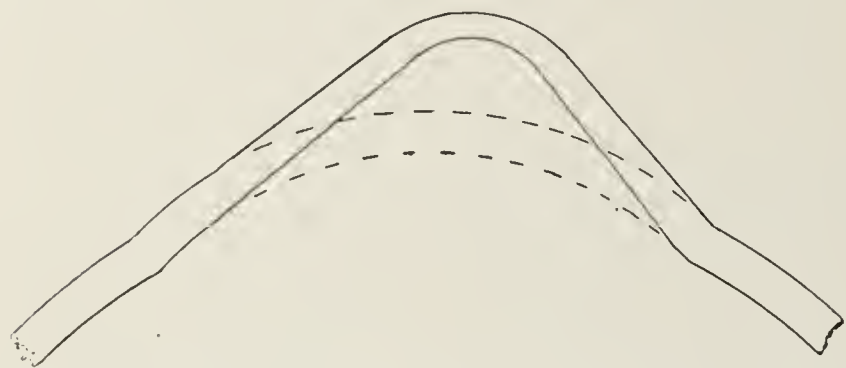


Fig. 1.—Diagram representing bulging of conical cornea of 2 mm. with thinning of apex.

likely to be more rapid and to go much farther because of the presence in keratoconus of high and variable astigmatism.

The conditions under which keratoconus begins are often difficult to determine. But in all cases that I have investigated carefully in this respect there has been a clear history of some antecedent severe impairment of nutrition.

One patient had suffered from extreme epistaxis; another from many attacks of epistaxis resulting in anemia; another had suffered from marked anemia from other causes, and three others first noticed defective vision while recovering from typhoid fever. One began after a severe attack of pleurisy. Others traced the beginning of the trouble clearly to scarlet fever and measles, although no history of special ocular inflammation at the time could be obtained, and there was no evidence of keratitis. A woman of 40 came out of two years of invalidism with astigmatism of 5 and 6 D. incapable of perfect correction, although there was no evidence that her sight had been defective before that. A poorly nourished girl rapidly developed conical cornea at puberty.

This importance of generally depressed nutrition in causing keratoconus is also illustrated in the fact that most cases are bilateral, thirty-one out of forty-eight. Of the remaining seventeen, one patient had lost one eye probably from conical cornea, and the operations done for it; and in six others there was evidence that the eye, which was not counted as having conical cornea, had at one time been disturbed by the same process, but had soon regained a nutritive equilibrium retaining good vision with moderate astigmatism. That is, of forty-eight cases, thirty-eight were really in the beginning instances of binocular disturbance. The importance of impairment of general nutrition in causing keratoconus seems certain.

THE MECHANISM OF KERATOCONUS

Plaut² reported a case of conical cornea in which the affected part of the cornea was greatly thickened, and experimentally produced in rabbits a condition resembling conical cornea in which the membrane was

greatly thickened. But the great mass of evidence indicates that thinning as well as softening of the tissue occurs so that it yields before normal or even diminished intra-ocular pressure.

Salzmann³ reports examination of a keratoconic eye in which the thinnest part of the cornea, the apex of the cone, was 0.17 mm. in thickness, one-fourth or one-fifth the normal. He cites seven other reports of similar observations in which the apex of the cornea was found thinned to one-half or one-third the normal thickness. The ease with which the highly conical cornea can be indented by the lid margin, or altered in shape by lid pressure, makes it certain that the essential change in keratoconus includes thinning of the cornea with distention.

The actual protrusion in a case of conical cornea is generally much less than commonly occurs in posterior myopia. A protrusion of 1 mm. makes a very marked conicity. My notes show no case of protrusion of the cornea of over 2 mm. Yet that lengthening of the anteroposterior axis of the eyeball would cause only 6 D. of myopia. Anterior myopia is to no important extent axial. It is preeminently myopia of curvature (Fig. 1). The protrusion rarely involves the whole cornea. It often affects little more than one-half the area. In a few chronic cases of gradual development the whole cornea is altered in shape, and in some others the protrusion blends so gradually into the conicity of the cornea that the appearance suggests involvement of the whole cornea in the pathologic distention. Often the pathologic bulging is distinctly marked off from the normal corneal curve. Generally the apex of the cone is situated below and to the nasal side of the center of the cornea, often as much as 2 or 3 mm. from the center. I have never noted it exactly at the center. This eccentric bulging gives the high astigmatism that marks all cases of keratoconus. The center of the protrusion may present a fairly regular spherical curve, although usually it does not. But this center is so small that the light admitted through it is a very small proportion of that entering the pupil; and it may be so enormously myopic as to be far beyond the limits of correcting glasses or any possible usefulness in vision.

ASTIGMIA

Generally the apex of the cone does not come in front of the contracted pupil. The patient is compelled to see through one side of the cone and so has to contend with high astigmatism. In the direction of a line radiating from the apex of the cone, the cornea is relatively or actually flattened. In a direction at right angles to this, the tangent of a circle having the apex as a center, the curvature is progressively increased as the apex is approached. Thus arises the high regular astigmatism which with irregular astigmatism characterizes the refraction of conical cornea. Of forty-five cases of keratoconus given optical correction, all had marked astigmatism. The amounts of



Fig. 2.—Corneal curvature modified by lid pressure produced by traction with tip of finger near the outer canthus.

2. Plaut: *Klin. Monatsbl. f. Augenh.*, February, 1900, p. 65.

3. Salzmann: *Arch. f. Ophth. (Graefe's)*, 67, 1.

regular astigmatism noted in these seventy-nine keratoconic eyes are given in the accompanying table.

Almost as characteristic as the high degree of regular astigmatism is its variability from day to day, or test to test, under variations of light; and its tendency to change from year to year, in amount, and to a less degree in direction. The astigmatism as indicated by

AMOUNTS OF REGULAR ASTIGMIA IN SEVENTY-NINE
KERATOCONIC EYES

Diopters of Astigmatism	Number of Eyes
From 1 to 2	1
From 2 to 3	1
From 3 to 4	11
From 4 to 5	13
From 5 to 6	24
From 6 to 7	10
From 7 to 8	7
From 8 to 9	7
9	1
10	2
14	1
21	1
Total	79

the glass preferred also varies greatly from the curvatures of the corneal meridians as shown by the ophthalmometer. Take the following case under observation thirteen years, while passing through college, medical school and hospital internship:

CASE 1.—L. G. W., aged 19 when first seen.

Nov. 6, 1903:

Right, Ophthalmometer + 4. cy. axis 120°
Lens — 3.50 Sph. \ominus + 2.50 cy. axis 153°
Left, Ophthalmometer + 3.50 cy. axis 60°
Lens — 5. \ominus + 3. cy. axis 10°

Dec. 26, 1908:

Right, Ophthalmometer + 4. cy. axis 140°
Lens — 3.25 \ominus + 0.75 cy. axis 160°
Left, Ophthalmometer + 4. cy. axis 65°
Lens — 4.50 + 2. cy. axis 5°

Aug. 29, 1910:

Right, Ophthalmometer — 4.50 cy. axis 130°
Lens — 3.75 \ominus + 3. cy. axis 170°
Left, Ophthalmometer + 4.45 cy. axis 60°
Lens — 4.50 \ominus + 2. cy. axis 5°

Feb. 28, 1914: This patient's refraction changed with the use of pilocarpin.

Right, without: — 3.75 cy. axis 86° = $\frac{5}{10}$ partly
With pilocarpin: — 0.50 \ominus — 3.50 cy. axis 110° = $\frac{5}{10}$ mostly
Left without: — 5.50 \ominus + 3.75 axis 5° = $\frac{5}{10}$ partly
With pilocarpin: — 5.50 \ominus + 3.75 axis 5° = $\frac{5}{10}$ mostly

March 2, 1914: Without pilocarpin:

Right — 0.50 \ominus — 3. cy. axis 95° = $\frac{5}{12}$ partly
Left — 5.50 \ominus + 3.50 cy. axis 5° = $\frac{5}{10}$ mostly

March 6, 1914:

Right — 2.75 cy. axis 95° = $\frac{5}{10}$ mostly
Left — 5. \ominus + 3.25 cy. axis 180° = $\frac{5}{10}$ mostly.

July 3, 1916: The eyes now became less variable and still required:

Right — 3. cy. axis 87°
Left — 5. cy. \ominus + 3.25 cy. axis 180°

For reasons given below, the close correction of such astigmatism, at least to the extent of securing the best vision, and the keeping of the correcting glasses closely adapted to the eye, is of great practical importance.

EFFECTS OF LID PRESSURE

The effort to get the best vision is instinctive and persistent. It prompts the patient to try all sorts of experiments. The presbyope goes through the "trombone performance." The patient with uncorrected astigmatism twists his head until he looks through his glasses obliquely in a way that makes them give the greatest assistance; the myope with too weak glasses looks through them obliquely to increase their strength, getting all the theoretical disadvantages of a full correction with some very important practical ones added. The myope without glasses partly closes his

eyes, to lessen the circles of diffusion, thereby getting from the Greeks the name for his defect, which it retains today.

The patient with keratoconus, especially if it be largely myopic, is likely to resort to similar pressure to overcome, so far as possible, the disadvantageous curvature of the cornea. The long recognized "nipping" of the lids not only narrows circles of diffusion; it can also alter to a marked degree the corneal curvature, especially when the cornea is thinned and softened.

CASE 2.—Miss G. E. F., aged 34, could change the curvature of her cornea equivalent to 1 D. change of refraction without closing the lids enough to prevent watching the ophthalmometric images. The effect was always to diminish the curvature in the horizontal meridian and increase it in the vertical meridian. The latter, however, was neutralized by the stenopæic effect of narrowing the palpebral fissure. Her cylinders, which were

Right — 6.50 axis 120°
Left — 11. axis 120°

varied as much as 1 D. either way in frequently repeated tests, and as much as 15 degrees in the directions of the meridians chosen. The ophthalmometer reading indicated

Right — 5. cy. axis 80°
Left — 5.50 cy. axis 155°

at repeated observations.



Fig. 3.—Face of patient at rest. Note wrinkles about the eye of a man of 27.

Observations on other patients show that the usual effect of "nipping" the lids is that given above: to lessen the curvature in the direction of the palpebral fissure and increase it at right angles thereto, diminishing the myopia in the former and lessening the effect in the latter meridian. An unusual way of making such changes in the corneal curvatures is illustrated in the following case:

CASE 3.—A. M. H., a schoolgirl, aged 12, had the following vision and refraction:

Right $\frac{4}{27}$ partly — 4. sph. \ominus + 1. cy axis 95° = $\frac{1}{4}$
Left $\frac{4}{100}$ and with — 9. sph. = $\frac{4}{20}$

While not wearing glasses, she found she could bring up her vision so that she could see the blackboard by dragging on the outer canthus and upper lid of her right eye with the tip of a finger, as shown in Figure 2. In this way she brought up vision to $\frac{4}{7.5}$ partly.

This patient was seen regularly at intervals of from twelve to thirty months, and by the time she was 19 her myopia had increased 2 diopters.

CASE 4.—K. F., man, aged 27, in 1903, had scarlet fever when 14, and was sick for a year afterward, from which period he dated his poor sight, which had gradually increased. He

had high conical cornea. His corneas were almost clear, showing a very slight general haze, and the ocular fundus was normal. The ophthalmometer showed:

Right + 7. cy. axis 130°

Left + 10. cy. axis 80°

The following gave him the best vision:

Right + 5. sph. \ominus — 8. cy. axis $75^\circ = \frac{4}{9}$

Left — 6. cy. axis $80^\circ = \frac{4}{40}$

He was not wearing glasses, having been unable to get any that helped him. Vision with either eye without lid tension was probably about $\frac{4}{100}$, but the instant his attention was directed to the letters, a curious distortion of the whole face occurred with lid tension that brought his vision up to $\frac{4}{20}$. The change is shown in Figures 3 and 4.

The apex of the cone was below the edge of the 4 mm. pupil in each eye, and the lower part of each pupil (half for the right and two-thirds for the left) was myopic. The upper part of each pupil was hyperopic. In his attempts to see (Fig. 4), the lower lid was pressed hard against the eyeball and stretched so that the edge of the lid went straight across the middle of the pupil. He was given correcting lenses, and warned of the importance of getting entirely out of the habit of compressing the eyeball with the lids.

At the end of eleven months he returned with corrected vision right $\frac{4}{5}$ and left $\frac{4}{40}$, and his corneas entirely clear. He had given up the habit of lid tension so completely that he could reproduce the effect very imperfectly and with special



Fig. 4.—Face distorted by strong contraction of orbicularis to improve vision by lid pressure on the cornea.

effort. It was eight years before he could come again wearing the same glasses, which now required change, and the left eye had developed high myopia with choroidal absorption.

Right + 4. sph. \ominus — 8. cy. axis $72^\circ = \frac{4}{6}$ partly

Left — 4. sph. \ominus — 8. cy. axis $140^\circ = \frac{4}{18}$

Since then I have not seen him, but have heard from him that the sight of his left eye "is almost gone, and the right eye is in bad shape."

The following case shows how even the posterior distention of axial myopia may not save the cornea from protrusion, or how the malnutrition and softening of the coats may involve both the posterior and the anterior pole.

CASE 5.—B. G. M., girl, aged 15, a bright student devoted to music, and strenuous in all she undertook, but anemic and "nervous," was brought to me for her eyes, Sept. 21, 1916. She had been wearing glasses since 8 years old, and now required them strengthened to:

Right + 0.75 sph. \ominus — 1.25 cy. axis $175^\circ = \frac{4}{4}$ plus

Left + 0.62 sph. \ominus — 1.25 cy. axis $5^\circ = \frac{4}{4}$ plus

There was little choroidal disturbance, but the optic disks were red and slightly hazy. The ophthalmoscopic readings were:

Right + 1.50 cy. axis 90° added to 43.5 D.

Left + 2. cy. axis 90° added to 44. D.

There was some conjunctival hyperemia, burning and itching, in addition to the headache for which she came. She was under my care for four months and left with all symptoms relieved. June 19, 1912, she returned, having been under good professional care in Chicago and elsewhere. The strenuous educational process had been supplemented by social engagements. The ophthalmometer now showed:

Right + 1.25 cy. axis 90° added to 44. D.

Left + 10. cy. axis 100° added to 49. D.

The left eye was clearly suffering from conical cornea. A — 10. cy. axis 10° gave it vision of $\frac{4}{50}$.

She next came, Sept. 14, 1912. The ophthalmometer showed:

Left + 9.50 cy. added to 52. D.

Lens, Left + 3. sph. \ominus — 16. cy. axis $145^\circ = \frac{4}{15}$ partly.

No marked change in the right eye, but

Right + 0.62 sph. \ominus — 1.12 cy. axis $168^\circ = \frac{4}{5}$ partly.

Oct. 4, 1916, she came once more broken down in health, highly anemic, listless, hopeless, and almost blind. She had been under treatment by various oculists in other cities. There was a history of operations, corneal ulcers, and finally enucleation of the left eye. Vision in the right was less than $\frac{4}{100}$; she was wearing a compress on it much of the time, and using eserine. It had suffered from an "ulcer" last winter. The ophthalmometer showed but little regular astigmatism with a corneal curve of over 70 D., corneal radius about 5 mm. A — 30 D. sph. lens gave vision of $\frac{6}{100}$. There was a nebula near the center of the cornea. The use of a bandage was almost stopped, being occasionally used for pain, the eserine was continued, and everything done to build up the general health of the patient.

Jan. 11, 1917, the eye felt better, and the iris was of good color and structure. The ophthalmometer showed:

+ 6 to + 8 cy. axis 80° , added to 60 or 65 D.

Hot bathing of the eye has been substituted entirely for the bandage. The eye feels worst in the morning. The patient is to keep the head elevated.

CASES 6 and 7.—F. B., aged 18, and his sister, aged 17, both came for conical cornea, with the history that every member of the family wore glasses. They were both students, the brother then in college. In all three eyes the area of protrusion was comparatively small and situated below the center. The brother's correction and vision was:

Right + 4.50 sph. \ominus — 7. cy. axis $90^\circ = \frac{4}{4}$ partly

Left + 4. sph. \ominus — 7. cy. axis $100^\circ = \frac{4}{15}$ partly

After eight years, the patient living on a ranch, these are:

Right + 3.50 sph. \ominus — 7.50 cy. axis $90^\circ = \frac{4}{6}$

Left — 5. sph. — 7.50 cy. axis $85^\circ = \frac{4}{12}$

The sister had only the right eye affected. She had vision:

Right + 1. \ominus — 4. cy. axis $38^\circ = \frac{4}{6}$

Left + 1. sph. \ominus — 0.25 cy. axis 90°

After four years she showed:

Right + 2. sph. \ominus — 5. cy. axis $55^\circ = \frac{4}{4}$ partly

Left + 1.75 sph. \ominus — 0.37 cy. axis $65^\circ = \frac{4}{4}$ plus

These patients have taken proper care of their eyes, although living about 200 miles away so that they could be seen only at long intervals. The same is true of the following case:

CASE 8.—Jan. 29, 1910, S. J. G., aged 19, high school student, dated his poor sight to typhoid fever five years before. The eyes had not grown worse since. Both corneas were conical, the apex of each cone being fairly central, and the reflections of the rings of Placido's disk fairly circular. The centers of the pupils showed with the ophthalmoscope a myopia of 20 to 30 D., and the margins of the dilated pupils in the direction of the radii hyperopia of 15 to 20 D. The ocular fundus was normal in each eye, so far as could be determined. The patient was put on the regular use of pilocarpin. Lenses given:

Right — 15. sph. \ominus — 8. cy. axis $20^\circ = \frac{4}{30}$

Left — 10. sph. \ominus — 5. cy. axis $20^\circ = \frac{4}{30}$

He was seen six months later with vision: Right $\frac{4}{50}$, left $\frac{4}{12}$.

Sept. 12, 1914:

Right + 3. \ominus — 6. cy. axis $25^\circ = \frac{5}{15}$ partly

Left + 6. \ominus — 1. cy. axis $180^\circ = \frac{5}{15}$

Jan. 26, 1917: He comes several hundred miles to be seen once.

Right + 4. \ominus — 6. cy. axis $25^\circ = \frac{5}{15}$

Left shows keratitis, hazy with facet at apex of cornea 1 mm. in diameter, no staining with fluorescein. He has completed school and college, and is now teaching school. He has used the pilocarpin continuously, but has not used his glasses sometimes during summer vacations.

In this paper no attempt has been made to give any complete account of conical cornea or complete histories of any of the forty-eight cases on which it is based. All of these cases have shown marked conicity of the cornea in some projection, asymmetrical except in Case 8. None of them has shown any marked choroidal disease or atrophic crescent except Cases 1 and 2. In the series of cases from which the forty-eight were taken, there were thirty-nine cases of myopia with 3 D. or over of astigmatism, and seventeen cases of hyperopia, with astigmatism of 3 D. or over. None of the forty-eight patients, except Case 5, was subjected to operation, and all the worst cases have been included above.

The points to which attention is directed are:

1. Keratoconus arises from yielding of the cornea to intra-ocular pressure during a period of impaired nutrition, commonly due to general disease.

2. It gives rise to curvature ametropia, about which the ophthalmometer and the shadow test give little information of value for the selection of glasses.

3. The subjective tests with lenses give widely variable results; and a decision as to the best lens is reached only after many trials, under varied conditions influencing the pupil.

4. It is extremely important that glasses should give the best vision under the conditions under which they will be used without lid pressure, which is to be carefully avoided.

5. The treatment should include:

Every effort to build up and sustain nutrition.

The continuous use of a miotic in the worst cases, usually pilocarpin.

The avoidance of softening the cornea by any form of bandages.

Under proper care operative treatment will rarely be needed.

A NEW OPERATIVE METHOD FOR THE RELIEF OF ADVANCED CASES OF KERATOCONUS

WITH REPORT OF TWO CASES *

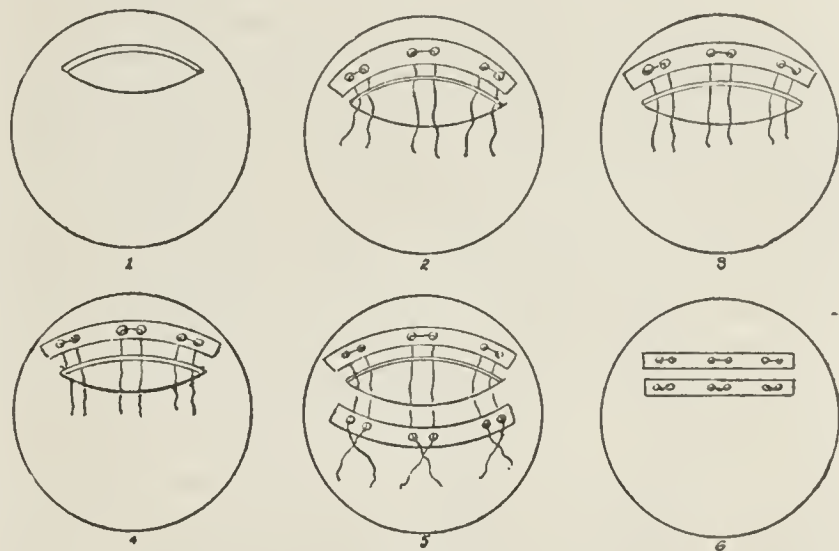
MEYER WIENER, M.D.

ST. LOUIS

Conical cornea was observed by Demours as early as 1747, and has been described by many authors since that time. There has never been any satisfactory explanation as to its production or cause. It is known that it is more frequent in females than in males, and is generally first noticed between the twelfth and fourteenth years of life. The probability is that some disturbance of internal secretion is the most potent causative factor.

Many operations have been devised for the relief of this condition, none of which has given entirely satisfactory results. The earlier surgical attempts to relieve conical cornea were bent toward changing the refraction of the eye behind the cornea rather than to alter the cornea itself. In 1817, Sir William Adams advised

breaking up of the crystalline lens by needling. Tyrrell suggested a still different procedure, that of performing a peripheral iridectomy, on the theory of there being less deformity toward the margin of the cornea than in the center, and consequently a peripheral pupil would be of advantage. Crichton modified this a little later by permitting the iris to prolapse, and tying a ligature around it, thus distorting the pupil. Frequent puncturing of the periphery of the cornea has also been resorted to for many years. Von Graefe suggested the greatest advance for the relief of this condition by proposing that the epithelial coat of the apex be shaved off and then cauterized with silver nitrate; finally the floor of the resulting ulcer was punctured, the object being to try to bring about scar contraction with resulting flattening. Bowman had previously excised a disk of corneal tissue from the apex with a trephine, but without any great success. A number of cases in which he excised an elliptical piece were reported by Bader. To prevent prolapse of the iris he passed horse-hair sutures through the cornea, previous to making the excision, afterward tying them over the edges of the wound. This operation has probably been the one most frequently advocated of those procedures which we might term purely surgical. The



Details of operation: 1. Elliptic incision of cornea near margin. 2. Gold strip with double-armed sutures already in place ready to be passed through peripheral margin of cut. 3. Sutures passed through peripheral margin of wound. 4. Sutures passed through central margin of wound. 5. Sutures passed through second gold strip. 6. Gold strips in place after completion of operation.

use of the electric cautery, or frequent punctures of the apex with a needle, being more simple and less dangerous, are the methods most often used today, when anything at all is advised. Recently a case of marked flattening has been reported from the use of the high frequency current applied to the apex of the cone.

The great objection to excision of the apex of the cone, or of a peripheral part of the cornea, has been the almost invariable prolapse of the iris into the wound with the sudden gush of aqueous, with its resulting infection, or irritation from an extensive leukoma adherens. The method which I am proposing is an excision of the corneal tissue in such a manner as to avoid iris prolapse. This I have succeeded in doing, and with fairly good visual results.

As the cornea near the apex of the cone is so thin as to preclude the probability of a successful dissection, I have elected to excise a segment near the periphery, as best suited to the method. The idea is to excise a segment of the cornea, including as nearly as possible its entire thickness, without puncturing Descemet's membrane, and then suture the wound. Necessarily there is an unusual tension on the stitches

* Read before the Section on Ophthalmology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

which would cause them to tear through almost immediately unless some extraordinary means were employed. This difficulty is met by tying the sutures over thin gold plates, on the same principle as that employed in bringing together the gap in cleft palate. This method of suturing was described by me at the 1915 meeting of the Academy of Ophthalmology and Oto-Laryngology.

Gold strips 0.005 mm. in thickness and 1 mm. wide are used, with holes 1 mm. apart, and just large enough to permit the passage of the smallest curved eye needles. The length is cut according to the size of the wound to be sutured. An elliptic incision is made in the cornea near the limbus, with a small, sharp scalpel. The object is to go as deeply as possible without penetrating Descemet's membrane. The length is about 8 mm. and the width 3 mm.

The apex of the part to be excised is then picked up with a tiny sharp hook, and the resection carefully begun. The most important part of the dissection is to get a good start, as the apex of the ellipse can then be grasped with fixation forceps, and by putting the flap on the stretch, the layers of the cornea can easily be separated. This separation can be readily accomplished by following, with the point of the knife, the white line at the point of attachment of the flap to the cornea. By keeping the blade of the knife flat against the corneal surface, using only the tip, and alternately stretching and then separating, there is not much danger of entering the anterior chamber. Double armed sutures are then passed around the first gold strip through the small openings, then in turn through the central flap of the wound, through the limbus flap, finally through the openings of the second gold strip placed on the opposite side, and then tied over this second strip with one tie. The stitches are then alternately tied more firmly together until the wound is approximated. Linen threads are an advantage on account of their strength. The amount of tension which this form of suturing will withstand seems to be almost unlimited. If there is no infection they will not pull through, provided the technic is good. The technic is delicate and difficult, but can be acquired by any experienced operator with much practice and patience. It is essential that the bored holes shall be polished in order that the stitches may slide easily. I believe it to be an advantage purposely to puncture the anterior chamber at the periphery, away from the wound, after the sutures are all in place, and just before tightening and closing the wound, in order to permit easier approximation of the wound and facilitate healing with lessened tension. The plates are left in position, with comparatively little irritation, for eight or nine days. They are easily removed by simply cutting the loop over each gold plate, when the thread readily pulls through.

The following is a brief history of the patient on whose eyes this operation was performed:

M. S., girl, aged 15, first came to the Jewish Hospital dispensary for treatment, April 30, 1915. She had a very pronounced case of conical cornea in both eyes with ability to count figures at 7 feet with the right eye and $\frac{18}{100}$ with the left. Her refraction was carefully determined, but no improvement of any value could be secured, minus lenses making letters clearer, but not bringing up the visual acuity by measurement. She was put on epinephrin chlorid, 1:1,000, three times a day, as we had seemingly had some good results in mild cases of keratoconus and keratectasia with this treatment, as recommended by Pontius. It did not help, however, and, Feb. 23, 1916, she was admitted to the Jewish Hospital,

and the right eye operated on two days later. March 6, the stitches and plates were removed, and, March 12, patient discharged from the hospital. There was considerable photophobia and conjunctival redness for many weeks after the operation, but these slowly subsided.

Sept. 12, 1916, visual acuity had reached $\frac{18}{100}$ in the right and fallen to fingers at 7 feet in the left. As the operated eye was considerably better than the left, or unoperated one, the patient begged to have the same thing done for the left.

She was admitted to the hospital, Oct. 9, 1916, and operated on, October 11. A segment was excised from the lower quadrant, as in the right eye. March 7, the stitches and plates were removed, and the patient discharged from the hospital, Oct. 29, 1916. November 28, the visual acuity was $\frac{18}{100}$ in the right and $\frac{18}{200}$ in the left. The visual acuity in the right has remained stationary, and in the left, March 8, 1917, had improved to $\frac{18}{75}$.

A peculiar phenomenon about this case is that while the patient asserts that a —4.0 D. S. to a —7.0 D. S. lens will improve each eye very much, she cannot be made to read farther. There is a linear scar on each cornea in the lower quadrant which can readily be demonstrated but which does not disfigure the patient and would not be noticed by a casual observer. I believe that there will be still further improvement with time, but if this should not develop, I shall advise excision of another segment. The patient is willing.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRs. JACKSON AND WIENER

DR. SAMUEL D. RISLEY, Philadelphia: In the usual concept of axial myopia I believe we have been too prone to fix our attention solely on the pathologic changes at the posterior pole. The posterior staphylomas, the macular atrophies, etc., because of their grave significance, have claimed our attention to the exclusion of other features frequently manifested in increasing or changing refraction of the dioptric system. In a relatively large percentage of young people, especially young children, these changes in refraction occur without notable evidence of disease at the posterior pole. Given a case of congenital anomaly of refraction, with or without, but usually with, some associated abnormality of binocular balance, the act of vision cannot be exercised without abnormal effort or strain. Under this strain the vascular uveal tract becomes unduly congested, the intra-ocular tension rises, the circulation of the nutritive fluids is impeded and the nutrition of the globe impaired. The relatively soft or tender sclera of childhood yields to the increased intra-ocular pressure and stretches or distends, whereas the tough and therefore resisting sclerotic of middle life fails to give way and we have the phenomena of so-called glaucoma.

We need find no difficulty in regarding the resulting impaired nutrition of the cornea as an important factor in the changed curvature of the cornea, the shifting meridians, etc., which we so often are compelled to observe, or that in extreme cases the result may be conical cornea, or what I have frequently seen—a wave-like curve of that membrane instead of a demonstrable cone-like distention forward. I quite agree with Dr. Jackson that these conditions are prone to occur in people in impaired health, or in fat, flabby patients without resisting power, or in the underfed or sick.

DR. E. C. ELLETT, Memphis, Tenn.: I regret that I have had no experience with Dr. Wiener's treatment of conical cornea, and must therefore limit what I have to say to the technic of this method of corneal suture, based on animal experiment exclusively. This experience has impressed me with the difficulties of the procedure, to which I well refer under a number of heads.

1. Illumination: It is essential to have perfect illumination, preferably by a photophore or some other form of portable electric light.

2. It was not possible for me to do this work without the magnification secured by some form of binocular loupe.

3. The knife, preferably a scalpel, must be perfect.

4. It is necessary that the two cuts outlining the portion to be removed should penetrate the cornea to the same depth. This requires care and experience.

5. The removal of the portion included between the incisions is not especially difficult if the above precautions are observed.

6. The difficulty of handling several sutures and two rather long plates without tangling things up is very great, and if one suture breaks in tying, it will greatly try the patience of all concerned.

7. The last objection can be to some extent overcome by using a short plate, 3 mm. in length, drilled with two holes to accommodate a single double armed suture.

8. It would be still simpler to dispense with the plates, and pass each needle in and out along one edge of the incision, having the loop cross the incision at one end and the two free ends tied across the other end. For this purpose, as well as for use with the suture plates, the needles and thread suggested by Kalt for corneal suture are most satisfactory. The needles are round, not cutting, and make a wound which does not so readily cut out, although more difficult to push through the tissues than a cutting point.

9. By slightly undermining the edges approximation is made easier; but I am not sure that it would not make infection more probable.

One is surprised, in doing this and other work involving dissection or suturing of the cornea, to note the toughness of the membrane. It seems quite as capable of holding sutures as is the sclera.

DR. WILLIAM H. WILDER, Chicago: The question of the causation of keratoconus is an interesting one. It seems to me that the idea of a lack in general nutrition is not a sufficient explanation, for this condition of the eye is so infrequent, even in persons whose general nutrition is impaired, and is seen in persons apparently in good health.

I have always entertained the thought that there must be some anatomic peculiarity, possibly congenital, to account for the progressive thinning and subsequent bulging of the cornea. That there is an actual anatomic change even at an early stage of the process is evidenced by the fact that the nerves seem to have suffered and there is a distinct lack of sensitiveness in the most prominent part of the cone. Even before there is much bulging, this may be demonstrated by touching the tip of the conus with a probe, when it will be found to be quite insensitive. Later when the cornea becomes thinner, one may observe a pulsation of the tip, shown by a slight movement of the reflected images of the mires of the ophthalmometer as pointed out by Axenfeld and others.

In advanced cases, with vision greatly impaired, it seems to me we are justified in resorting to operative procedures in an attempt to check the bulging or to improve the sight.

A method I have used in several cases with benefit is the following: With a galvanocautery tip heated to a cherry red, four small incisions are made in the cornea from the limbus to within 2 or 3 mm. of the tip of the conus, at points on the cornea corresponding to 12, 3, 6, and 9 on a clock dial. These burns should extend through Bowman's membrane and widen out slightly as they approach the limbus. The resulting contracting scars have a tendency to flatten out the central portion of the cornea which remains clear. A somewhat similar method has been proposed by Dr. Posey, who makes only one such radiating incision. Care must be taken not to penetrate the cornea. In the patients treated there was distinct improvement of vision, and the method does not interfere with any subsequent procedure that one may have to practice.

DR. EDMOND E. BLAAUW, Buffalo: How is it that Dr. Jackson in a short time sees forty-five cases, and in other regions, at least in Buffalo, I have not been able to see forty-five cases in twenty years? There may be something in the region in which we live. In Germany, too. How can you make a diagnosis with this slight amount of astigmatism? I would like to ask Dr. Jackson how often he found the hemosiderin ring? We should always keep in mind

that we have in many instances a self-limiting disease. I have seen many cases stop without apparent reason and nothing done in the way of operation. In the cases of keratoconus we have most probably a form of hyaline infiltration of the substantia propria. It occurs to me that we have to deal with a condition similar to nodular opacity of the cornea, often overlooked because it needs a great deal of research. I have seen fluorescein sometimes bring out opacities in the cornea before the binocular loupe. Uthoff has recorded the microscopic findings in conical cornea with hyaline infiltration.

Now, if it is so important that lid pressure should be eliminated, are we not warranted in doing a canthoplasty? We can always resort to stitching up the defect. I have seen the pulsation. That is exceptional. Dr. F. Park Lewis showed me such a case. In my opinion it is rare. When must we operate? That is the great thing for us to know.

DR. HUNTER H. TURNER, Pittsburgh: Drs. Jackson and Risley have both mentioned features leading up to a certain element which in my experience has been of paramount importance in the production of this condition. Skillern, who is recognized as an authority on diseases of the accessory nasal sinuses, says that infection of these cavities following the diseases mentioned by Dr. Jackson is very common, much more so than is ordinarily believed, and that the primary infection is followed by a secondary infection of chronic character which persists indefinitely. He claims that the resulting tissue hyperplasia constitutes a point of lessened resistance which is affected by constitutional toxemias, and that the local effect is manifested by a turgescence of the nasal tissues. I wish to go on record before this section as stating that this nasal turgescence is always associated with a turgescence of the vessels of the retina and conjunctiva, with a tendency to increase in intra-ocular tension. I have had quite a number of cases of conical cornea in the early stages under treatment for years, which have remained stationary, the principal treatment being directed to the controlling of the sinus condition by competent rhinologists, and care in the matter of diet. This tendency to congestion and hypertension, in my experience, is present in every case of progressive change in the ocular dioptries toward the myopic side.

DR. L. WEBSTER FOX, Philadelphia: I consider conical cornea one of the most mysterious of all eye diseases. You who have read the classical work of Nottingham on conical cornea—a book of 200 pages—know that he has thoroughly covered the ground of operations devised and abandoned. Many of these operations were autoplasty, or various cuts and incisions made in the cornea to try to reduce the nipple-shaped projection, if possible. All of these experiments have been carried out by me—varied incisions and sutures. A suture through the cornea is not half as disastrous as it appears, for the cornea has great resisting forces. You will remember the old Critchett operation for staphyloma—incision and suture—from which no deleterious results followed.

I am greatly interested in this operation of Dr. Wiener's, but I have come back to the English method—the application by the cautery. At present I have two patients in the hospital who have been operated on within the last ten days, and in both cases I used this method. One operation may not be sufficient; in that case a second one may be carried out. As I have said above, Morton's method and also that of Critchett have been my favorites. In following the cautery method I have obtained a deep saucer depression, and the final act is to pierce the center so that the aqueous will escape; in this way I have obtained good results. This mode of procedure makes a central scar. After performing the operation as outlined, an iridectomy is the next step, and after all inflammation has been allayed, a tattooing of the scar. A workable eye is thus obtained. Under the best conditions the chances are that one operation will not bring about the desired results. I have repeated the operation three times in one case, and finally, from about $\frac{5}{200}$ vision, got $\frac{20}{50}$.

Fario, an Italian surgeon, cut out a small portion of the cornea three different times, leaving a hole through which

the aqueous humor gradually drained. The first excision was practiced at the upper part of the cornea, the second at the lower, and the third at the upper and inner. Each piece of the cornea removed was triangular in shape, the apex being near the scleral margin.

Dr. Wiener's method is worthy of our consideration, but I am afraid his difficult surgical technic will not take the place of the actual cautery. However, I shall give it a trial.

DR. EDGAR S. THOMSON, New York: I should like to say a word in connection with Dr. Wiener's operation. I have done six or seven conical cornea operations, excising the summit of the cone. It seems to me the results were better than cauterization because of less scarring. In one instance I did not excise a large piece of the cone, but the sutures pulled through on the third day. They were deep. There seemed to be an unusual amount of traction on the cornea. I had difficulty in keeping the lips of the wound together. The eye was finally practically lost. I do not know that that is a very common accident. It seems to me Dr. Wiener's operation would keep the lips of the wound in close apposition and guard against an accident of that sort.

DR. EDWARD JACKSON, Denver: With reference to clouding of the cornea, I want to express my agreement with Dr. Risley's observation that a certain clouding of the cornea may be checked temporarily, and is rather frequent at an early stage. We know that the worst cases ultimately show some permanent clouding; but this early clouding may be entirely recovered from. I have not convinced myself that it is always located in, or confined to, the membrane of Descemet.

With reference to an anatomic peculiarity of the individual's cornea, I note that two of the cases I have given here were in brother and sister. They are the only two cases that I can recall occurring in the same family; but as far as this instance would go, it might point to a family peculiarity of the cornea. We certainly have myopia running in families to a striking extent; but it is quite unusual for conical cornea to affect more than one member of a family.

As to the number of cases, my forty-eight cases have not been seen in twenty-one years, but in thirty-five years. They include practically all the cases that I have had under observation for any length of time in private practice. The cases are not very common, and one case may be seen by a number of men—is apt to be so—and under observation for long periods of time, so that they seem to have an importance which the actual numbers do not support.

The pulsation of the conical cornea seen with the ophthalmometer I have occasionally noted; and I had one patient who spontaneously called attention to the pulsation of his vision. When the vision was about as well corrected as it could be, any active exertion gave him the pulsation of distinctness of vision. He could count his pulse by the changes in the distinctness of vision.

Infection of the nasal sinuses was not looked for in a good many of the earlier cases of the series. It has been present in some. My figures would not indicate how often. I am sure it is a condition worth careful looking for.

The lid pressure to which I called attention is not due to the deformity of the lids, or to the weight of the lids on the eyeball or from a narrow palpebral fissure. It is the pressure of a voluntary effort to change the refraction by lid pressure. The girl with myopia who could bring her vision right up did not do it by movements of the lids, but by placing the finger on the lower lids and making traction. In the case of the man, he made similar pressure on the cornea, but by a peculiar grimace; the lid was tensely drawn. The illustration was not as striking as his movements when first seen. As soon as he had put on glasses the pressure on the cornea stopped. The pressure then made his vision worse and he stopped it. That is the object of giving glasses, so that they will see best without additional pressure on the eyeball.

DR. MEYER WIENER, St. Louis: I believe illumination is very important. I use ordinary north window daylight and no modifications, but I still retain good accommodation. There is no question about the difficulty of handling the sutures. They are complex and are apt to get twisted.

That is merely a detail which can be overcome by care and patience. These plates do not cause any irritation. They lie flat against the cornea and the lids can bat over them after the bandage has been removed. In the animals on which I experimented, there was never anything put over the eye. I had no infection that I can recollect in any of the animals, and there were two or three dozen. The operation developed first by using a loop suture before the plates were used. The loop suture pulled through after a few days, never lasting long enough for the wound to heal, so that the plates were suggested.

I think emptying the anterior chamber purposely by a small puncture near the periphery is good. It gives a chance for the wound to heal and with, eventually, a better result. The advantage over cauterization is that if the operation is successful it leaves only a linear scar which can only be noticed by careful examination. I believe the operation should be performed only in extreme cases when all other palliative measures have been tried and have failed.

I have used also in a couple of cases of mild form epinephrin 1 to 1,000, as advised by Pontius, and seemingly the cases were improved greatly by its use.

I should like to see Dr. Fox, of all men, perform this operation. I think men who have highly developed technical skill—and I have never seen one with greater skill—should perform this operation. He is the type of man who can perform it and get a successful result.

PULMONARY EDEMA IN PNEUMONIA AND ITS TREATMENT*

W. A. BASTEDO, M.D.

Assistant Professor of Clinical Medicine, Columbia University, College of Physicians and Surgeons

NEW YORK

Edema of the lungs becomes a clinical condition when there is such an accumulation of tissue fluid in the tissue spaces that it transudes into the alveoli. Thus the patient's lung tends to fill with fluid to the exclusion of air, and actually approximates the condition in drowning. The edema appears first in the lower lobes and the middle lobe, and not till the late stages does it extend to any great degree to the upper lobes.

The first distinctive signs are dyspnea and large liquid râles over the lower lobes. In severe degrees of edema the breathing is that of suffocation, there is cyanosis, and there exudes or is expectorated from the mouth a thin serous frothy fluid often tinged with blood. This fluid contains protein, and is recorded as amounting to as much as 2 liters (J. L. Brown¹).

Edema of the lungs may present itself in many pathologic states. In pneumonia it may appear either as a slight local area of edema surrounding the inflamed portion of lung, and of no clinical importance, or it may occur with considerable rapidity of onset as a generalized edema such as that described. This exposes the patient to a suffocative death, and calls for prompt measures if it is to be relieved. Fortunately it not infrequently proves amenable to therapeutic measures.

Edema is the result of a failure of the removal factors to keep pace with the production of tissue fluid, owing either to increased production or to diminished power of removal or to both. For its production, edema fluid has but one source, the blood, from which it transudes through the walls of the pulmonary capillaries. For its removal there are three pathways,

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Brown, J. L.: Virginia Med. Semi-Month., September, 1915.

namely, the capillaries, which empty into the pulmonary veins; the lymphatics, which empty into the systemic venous system, and in the severe cases the bronchial tubes, which carry it to the mouth to be exuded. That the capillaries carry away by far the greater part of the tissue fluid has been firmly established by Starling;² and we must accept Starling's dictum that "while capillary blood pressure determines transudation, the osmotic pressure of the proteins of the blood determines absorption." For it is obvious that while tissue fluid may transude from the capillaries owing to the filtration pressure in the blood stream, there cannot be a tissue-fluid pressure sufficient to make filtration back into the capillaries. Hence the surplus fluid must return to the capillaries by osmosis; and this happens because after the transudation of the diffusible substances by filtration through the capillary walls, the capillary blood is concentrated and its osmotic pressure is greatly increased, so that it can again take up diffusible fluid. It is not known whether or not the proteins as well as the salts in the fluid can be reabsorbed.

The factors favoring increased production of tissue fluid are:

1. *Increased Intracapillary Pressure.*—Filtration from the capillaries is dependent largely on the pressure in the capillaries; and the extent to which filtration may be changed by raising the intracapillary pressure is shown by an experiment of Starling² in which raising the blood pressure by 50 mm. of mercury for a few minutes was sufficient to cause an increase of loss by filtration of from 10 to 15 per cent. of the blood volume. Increased intracapillary pressure may result from heightened arterial pressure, dilatation of the arterioles, venous obstruction, or increased total volume of blood (plethora). It may rise so high as to break down the normal resistance of the capillary wall and permit a larger percentage of proteins than normal and even blood cells to pass through.

2. *Increased Permeability of the Capillary Wall.*—This may result from circulating poisons, local irritants, or lack of oxygen or nutritive material. The last conditions are present in prolonged venous congestion. With acetic ether administered intravenously, Miller and Mathews³ obtained pulmonary edema whether there was a rise in pulmonary pressure or not. Fischer⁴ believes that "an edema results whenever the oxygen supply to the parenchyma of the lung is sufficiently interfered with." Welch⁵ has stated that a larger proportion of the cases of pulmonary edema than is generally supposed is due to inflammatory changes in the vascular walls.

3. *Hydremia.*—This condition, which is an excess of water in the blood, if accompanied by plethora, as after a large intravenous infusion of physiologic sodium chlorid solution, may be a factor in the increased production of tissue fluid.

The factors favoring diminished removal of tissue fluid are:

1. *Lymph stagnation*, due either to decreased motion of the lungs or to obstruction of the lymphatic trunks. As the lymphatics empty into the superior vena cava,

congestion in the systemic venous system practically stops all lymph flow.

2. *Diminished capillary absorption*, owing either to venous obstruction, to a watery condition of the blood, or to transudations rich in protein and consequently with a high osmotic pressure. Such a transudate may be present in edema of the lungs. In one paroxysmal case Martin⁶ found 6.302 per cent. of protein in the edema fluid.

3. *Increased molecular concentration of the tissues*, so that they have increased osmotic pressure, and therefore take up more fluid than normally or hold the fluid more firmly.

Between the production and removal factors there is great flexibility of accommodation, and it is probably not till more than one of the abnormal factors is present that edema ensues. Mackenzie⁷ has declared that "edema of the lungs invariably accompanies dilatation of the right heart," and this is a frequent statement in textbooks. But aside from Mackenzie the best authorities on heart conditions agree that failure of the right ventricle will not make edema of the lungs; in fact, the best circulatory condition to favor the production of pulmonary edema would be failure of the left ventricle with continued activity of the right; or as stated by Welch⁸ in 1878, there should be a disproportion in the work of the left ventricle as compared with that of the right. It is to be remembered, however, that in pneumonia the right and left ventricles usually fail together, as, for example, when auricular fibrillation supervenes. The consequent venous obstruction of itself produces the necessary combination of factors, for it results in increased capillary transudation, in increased permeability of the capillary wall owing to malnutrition and lack of oxygen, in diminished capillary absorption, and in lymphatic stagnation (the lymph either stops flowing or passes into the superior vena cava and thus immediately returns to the pulmonary capillaries). A part of the oxygen and nutritive supply to the lungs also comes from the bronchial arteries, which fail in their supply when the left ventricle breaks down. Bolton,⁹ working with Starling, has shown that stagnation of blood alone without either plethora or raised capillary pressure may suffice to produce edema.

Manifestly, therefore, the most important cause of pulmonary edema is failure of the heart. Contributory causes would be any of the other causes of dyspnea, and of these the first in importance would be depression of the respiratory center. But not to be forgotten also among the causes of dyspnea are acidosis, severe pleurisy, and the direct and reflex effects of pressure below the diaphragm from tympanites or acute dilatation of the stomach. Further possible contributory causes may be the presence of an inflamed area in the lung tissue, and a general invasion of the lung by bacteria.

Among the important factors favoring the movement of blood through the lungs are adequate respiratory movements (Mackenzie⁷). These may be interfered with because of a depressed respiratory center, or because of the mechanical limitation of the excursion of the ribs or diaphragm owing to an extensive pleurisy or to upward pressure against the diaphragm by abdominal distention. Further, as pointed out by

2. Starling, E. H.: *The Fluids of the Body*, W. T. Keener & Co., 1909.

3. Miller and Mathews: *A Study of the Mechanical Factors in Experimental Acute Pulmonary Edema*, *Arch. Int. Med.*, October, 1909, p. 356.

4. Fischer, M. H.: *Edema and Nephritis*, New York, John Wiley & Sons, 1915.

5. Welch, quoted by Hare, in Osler and McCrac: *Modern Medicine*, Philadelphia, Lea & Febiger, 1914, 2.

6. Martin, quoted by Hewlett, H. M.: *Intercolonial Med. Jour., Australasia*, 1903, 8, 611.

7. Mackenzie, J.: *Diseases of the Heart*, Oxford Medical Publications, 1913; *Symptoms and their Interpretation*, Shaw & Sons, 1909.

8. Welch: *Virchows Arch. f. path. Anat.*, 1878, 72, 375.

9. Bolton and Starling: *Heart*, 1909-1910, 1, 292.

Hirschfelder,¹⁰ when the edema is once established, the lung is distended so that its tissues are under compression; and its elasticity is lowered so that it gives a respiration resembling that of emphysema.

That acidosis is a cause of edema has not been established; but von Jaksch¹¹ reported the finding of acetone in the expired air in some cases of edema of the lungs, and Norris¹² mentions the frequency of acetone in the pneumonia urine. Furthermore, Lewis¹³ pointed out the prevalence of acidosis in lobar pneumonia, and held acidosis as largely responsible for the pneumonia dyspnea, and later Lewis and Barcroft¹⁴ reported severe acidosis in three lobar pneumonia patients, two of whom died.

That bacterial invasion is a cause is suggested by the statement of Welch that in irregular and localized edema (not pneumonic) and in extensive and even general edemas, he obtained colonies of bacteria from the lungs, mostly streptococci and lanceolate micrococci, in such numbers that they must have been in active growth in the lungs.

That anaphylaxis is a possible cause of pulmonary edema was established by Rosenau and Anderson;¹⁵ but any anaphylactic reaction in the pulmonary edema of pneumonia has not been demonstrated.

TREATMENT

Our therapeutic aim must be to lessen the production and increase the removal of the fluid. Both objects are to be accomplished primarily by improvement in the pulmonary circulation, and secondarily by attention to the contributory factors. In all cases, therefore, cardiac failure is to be treated. In addition, further therapeutic consideration may be required for respiratory insufficiency, acidosis, deficient oxidation, and abdominal distention.

Cardiac Failure.—This may come on suddenly with a change of rhythm, such as with the onset of auricular fibrillation or auricular flutter, or it may come on more gradually with simple acute dilatation. Its treatment is by a member of the *digitalis* series. In auricular fibrillation or auricular flutter an intravenous injection of strophanthin or ouabain, 0.5 mg. ($\frac{1}{130}$ grain), acts usually in an hour or less. If no effect is apparent, it may be repeated two hours after the first dose. In simple dilatation it works more slowly and less certainly. If digitalis has already been given, as is frequently the case in pneumonia, the beginning intravenous dose of strophanthin should not exceed 0.3 mg. ($\frac{1}{200}$ grain); for in patients already under the influence of digitalis, a single milligram of strophanthin intravenously has caused death. I do not include camphor, strychnin and caffein in this section, as I do not consider them circulatory stimulants.

Nitroglycerin has many advocates on the theory that it relieves the left ventricle by opening up the systemic arterioles. But failure of the left ventricle in pneumonia is not due to high tension in the systemic arteries, and therefore a result is obtained that is not wanted. Furthermore, nitroglycerin tends to open up the pulmonary arterioles and so let more blood into the pulmonary capillaries to produce more edema fluid.

Stengel¹⁶ says that, in his experience in acute paroxysmal pulmonary edema, nitroglycerin and the nitrites generally failed entirely; while Miller and Mathews³ in nitric oxid edema of the lungs found that it did not dilate the pulmonary arteries and only had the undesirable effect of a marked fall in carotid pressure. On the other hand, however, Ward¹⁷ of Albany, declares that it must be used in large doses, from $\frac{1}{20}$ to $\frac{1}{10}$ grain every minute for thirty minutes, and that it relieves the dyspnea even before it causes flushing of the face—a statement which I do not quite comprehend, for flushing comes almost instantly; and if the dyspnea is so quickly relieved why continue the remedy for thirty minutes?

Venesection is considered one of the most reliable procedures in the pulmonary edema of pneumonia. It has the effect of lessening systemic venous congestion and the plethora which exists in a stagnant circulation. Bolton and Starling⁹ consider that it serves to relieve the distention at the venous end of the heart, and so enables the heart to beat more effectively. In conditions of circulatory stagnation they found that in all phases of respiration there is probably slight positive pressure in the big veins near the heart instead of the normal alternating positive and negative pressure, and that this was a definite obstruction to the emptying of lymph into the venous system. Lazarus-Barlow¹⁸ has noted that after bleeding, the specific gravity of the tissues rose, that is, tissue fluid had been lost. Burton-Opitz¹⁹ has shown that venesection regularly lowers the viscosity of the blood, and Starling² has pointed out that by venesection not only is diffusible fluid removed from the plasma but also proteins in large quantity, and that the blood volume is quickly restored by absorption of isotonic tissue fluid, so that it becomes more watery. Lawrence²⁰ believes that repeated blood-letting, when indicated, does not have any ill effects on the composition of the blood, and Hamburger²¹ demonstrated that the freezing point of the blood remains unaltered. It is to be noted that in pneumonia we are not dealing with high arterial pressures, as in uremia.

Miller and Mathews,³ in their experimental edema of the lungs, found that before any effect could be seen on the pressure in the pulmonary artery it was necessary to withdraw a sufficient amount of blood to lower the general blood pressure to a dangerous degree. The pressure in the pulmonary artery, however, is not the criterion of the value of any procedure in pulmonary edema, as this pressure is dependent on the relation of the right ventricular output to the caliber of the pulmonary arterioles. These, though weak in muscle, are the gates which regulate capillary inflow, and may be looked on as protectors of the capillaries.

Rolla²² calls attention to the lessening of the alkalinity of the blood following venesection, and advises that when there is a tendency to acidosis it be accompanied by the administration of alkali.

Respiratory Insufficiency.—To stimulate the respiratory center, the three drugs most considered are atropin, caffein and strychnin. Further treatment for respiratory insufficiency might be oxygen inhalation, artificial respiration, the removal of mechanical impediments to breathing, and counterirritation.

10. Hirschfelder, A. D.: Diseases of the Heart and Aorta, Philadelphia, J. B. Lippincott Company, 1910, p. 147; Proc. Internat. Cong. Med., 1913.

11. Von Jaksch: See Norris, Note 12.

12. Norris, in Osler and McCrae: Modern Medicine, Philadelphia, Lea & Febiger, 2, 948.

13. Lewis, T.: Lectures on the Heart, Paul B. Hoeber, 1915.

14. Lewis, T., and Barcroft, J.: Quart. Jour. Med., 1915, 8, 30.

15. Rosenau, M. J., and Anderson, J. F.: Sudden Death Following the Injection of Horse Serum, Bull. 20, Hygienic Lab., U. S. P. H. S.

16. Stengel, A.: Am. Jour. Med. Sc., 1911, 141.

17. Ward, S. B.: Albany Med. Ann., November, 1909.

18. Lazarus-Barlow: Jour. Physiol., 1894, 16; 1895, 19; 1896, 20.

19. Burton-Opitz, R.: Quart. Jour. Exper. Physiol., 1905.

20. Lawrence: Boston Med. and Surg. Jour., February, 1916.

21. Hamburger: Osmotischer Druck und Ionenlehre, Wiesbaden, 1904, 2, 30.

22. Rolla, C.: Riforma Med., Naples, 1914, 30, 28.

(a) *Atropin*: In therapeutic amounts, atropin has but little power to stimulate the respiration in man. It does, however, tend to dilate the bronchi, and this may in some cases prove useful. There is a remote possibility also that by abolishing vagus action it may have the same effect as cutting the vagus nerves, which Porter and Newburgh²³ have shown to result in a normal respiratory rate in pneumonia in dogs. They believed that this prevented the exhaustion of the respiratory center. We hardly think this a possible effect of atropin in human pneumonia. Atropin has the great disadvantage that through vagus action it abolishes any action of digitalis or strophanthin on the auriculo-ventricular conduction tissues, and completely neutralizes the effect of digitalis or strophanthin in steadying the work of the left ventricle. Furthermore, as Miller and Mathews³ report, in the experimental production of edema of the lungs by the intravenous administration of acetic ether or iodids, the developing edema was not checked by atropin, nor was the life of the animal prolonged. And in experimental epinephrin edema of the lungs in rabbits, Stengel¹⁶ found that atropin actually increased the rapidity of onset and the degree of edema. It does not act, as asserted by some, to "dry up the secretion," for the edema fluid is a transudate and not a secretion. Atropin, therefore, would seem to give little promise of real value, and to have decided disadvantages. But it is not to be feared, as stated by Talley,²⁴ because of its "marked vasomotor stimulant influence with consequent rise in blood pressure," for atropin as used therapeutically does not have such an action.

(b) *Caffein*: In the doses available in man caffeine is distinctly stimulating to the respiratory center. I have several times seen edema of the lungs in pneumonia supervene on a respiration greatly slowed by morphin given for pleuritic pain; and I have seen these edemas and others not due to morphin yield quickly to hypodermics of caffeine and sodium benzoate. That the diuretic value of caffeine may add to its advantages is a bare possibility, though it is probable that diuresis, unlike in other edemas, aids but little if any in influencing edema of the lungs in pneumonia. That therapeutic doses of caffeine do not act by stimulating the circulation is now well established. A possible disadvantage, as mentioned in my book on pharmacology,²⁵ and later by Barton,²⁶ is a slight effect in counteracting the action of digitalis on the heart in auricular flutter or fibrillation; but this action on auriculoventricular conduction is slight as compared with that of atropin. Caffeine is only an emergency drug, and should not be employed as a routine in pneumonia, as it interferes with sleep.

(c) *Strychnin*: This is too weak a respiratory stimulant for therapeutic use, but it may enhance the value of other measures by inducing a general increase of reflex activity. If the reflexes are already overactive, strychnin is contraindicated.

(d) *The Inhalation of Oxygen*: This is employed in the full belief that it increases the oxygen carried in the blood. That it does so is probable but not altogether proved. Loevenhart²⁷ laid stress on the fact that even when the supply of oxygen is ample,

decreased oxidation in the body may occur; Kraus²⁸ showed that in cardiac failure the amount of oxygen taken up by the blood and of carbon dioxide given off is practically unchanged; and Zuntz and Schumberg²⁹ report that when they caused polypnea by carbon dioxide, and thus greatly increased the total oxygen taken into the lungs, there was no alteration in the amount of oxygen taken up by the blood.

Yet Benedict and Higgins,³⁰ at the Carnegie Nutrition Laboratory, found that oxygen inhalation lowered the pulse rate, though it induced no change in metabolism, and no change in the character, depth or frequency of respiration. And Parkinson, in reporting a similar lowering of the pulse rate, attributed it to the improved work of a better oxygenated heart muscle. Starling found that with the normal tension of oxygen in the alveolar air of man, the hemoglobin and plasma carried about 15.6 volumes per cent., while after the breathing of pure oxygen for a short time, the percentage rose to 19.9 volumes per cent. Hill and Flack³¹ noted that after hard exercise of men not in good training, as in boxing bouts, it not only hastened their recuperation by abolishing the hurried shallow breathing, but had a value in preventing the usual stiffness of the muscles which results from unwonted exercise. It would seem, then, that oxygen inhalation does result in a systemic effect, however the effect is brought about.

In cases of cyanosis, Starling calls attention to the fact that the high carbon dioxide tension of the blood lessens the degree to which the oxygen tension may be raised. G. N. Stewart noted that oxygen inhalation increased the blood flow in the hands in a case of recurring cyanosis due to the depressed respiration of emphysema and chronic bronchitis, and Bence found that, in cases of cyanosis, oxygen resulted in decreased viscosity of the blood.

The net results of these researches give us the impression that while oxygen inhalation has little effect in normal persons, it may have decided value in those cases in which the oxygen tension of the blood is already low. And this is the case in pulmonary edema in pneumonia.

Add to this the probable benefit of a direct supply of more oxygenated air to the lung tissues and the impaired capillary endothelium, and the good effect of increased oxygenation on acidosis, and it would seem that the inhalation of oxygen is a good therapeutic measure.

(e) *Artificial Respiration*: Adequate respiratory movements are important in the propulsion of blood through the lungs, inspiration normally enlarging the capacity of the pulmonary capillaries and veins. But in pulmonary edema the lungs are more or less in the same condition as in emphysema, and their excursion is diminished. Therefore, compression of the chest in expiration to take the place of the lost lung elasticity, and expansion in inspiration tend to overcome stagnation in the pulmonary blood stream. Following the suggestion made by Haven Emerson,³² after he found that he could abolish experimental edema of the lungs in animals by artificial respiration, using positive pressure through the trachea, Barringer³³ employed

23. Porter and Newburgh: *Am. Jour. Physiol.*, December, 1916.

24. Talley, in Musser and Kelly: *Practical Treatment*, Philadelphia, W. B. Saunders Company, 1914, p. 199.

25. Bastedo, W. A.: *Materia Medica, Pharmacology and Therapeutics*, Philadelphia, W. B. Saunders Company, 1913.

26. Barton, William: *Am. Jour. Med. Sc.*, 1915, p. 150.

27. Loevenhart, A. S.: *Harvey Lectures*, Philadelphia, J. B. Lippincott Company, 1914-1915.

28. Kraus, quoted by Hirschfelder (Note 10).

29. Zuntz and Schumberg, quoted by Hirschfelder (Note 10).

30. Benedict and Higgins: *Am. Jour. Phys.*, 1911, 28.

31. Hill and Flack: *Recent Advances in Physiology and Biochemistry*, Edward Arnold, 1908.

32. Emerson, Haven: *Artificial Respiration in the Treatment of Edema of the Lungs*, *Arch. Int. Med.*, May, 1909, p. 368.

33. Barringer, T. B.: *Pulmonary Edema Treated by Artificial Respiration*, *Arch. Int. Med.*, May, 1909, p. 372.

full artificial respiration with success in a pulmonary edema not pneumonic. It was thought that positive pressure could not be used in human beings, and it is a question whether even ordinary artificial respiration could be instituted in a pneumonia patient. But Kulenkamp³⁴ confined his efforts to compression of the thorax in expiration, and reports good results. Mackenzie⁷ suggests removing all restraint by placing the patient in the position to breathe most freely and by making him inspire deeply. I would suggest that possibly a mechanical apparatus might be employed, though I have no knowledge of any such. (Since this was written Dr. S. J. Meltzer has brought forward such an apparatus.)

(f) *The Relief of Abdominal Pressure*: This may be accompanied by a hypodermic of pituitary extract followed if necessary by other methods for treating tympanites or acute dilatation of the stomach. It is to be noted that in pneumonia gastric lavage is impossible or at least dangerous.

(g) *The Removal of the Limitation of Breathing from Pleurisy*: This requires that if the patient's side has been strapped, the strapping should be removed to allow freer motion.

(h) *Counterirritation*: This is generally obtained by mustard, dry cupping, hot fomentations or hot poultices. As there is no direct anatomic connection of the lung tissues with the chest wall, any effect on the lungs must of necessity be through the nervous system. That a relation through the nervous system does exist was demonstrated by Dana in 1887, and in 1903 Head³⁵ pointed out that tenderness of the superficial tissues might be a manifestation of inflammation or injury to one of the internal organs. Mackenzie,⁷ Hertz³⁶ and Sherrington³⁷ have demonstrated conclusively that irritation of the superficial tissues which are supplied by the cerebrospinal nervous system may affect underlying viscera and vice versa. So far as the abdomen is concerned, there is some evidence to suggest that strong counterirritation results in constriction of the arterioles in the underlying viscera, and it is possible that such an effect takes place in the lungs. At any rate, counterirritation is one of the measures regularly employed and valued in the edema of pneumonia. I employ dry cupping. In dry cupping, the mechanical edema of the tissues produced by suction can hardly be a factor beyond the counterirritant effect. That is to say, the popular belief that fluid is sucked out of the lungs by the cups is a fallacy.

(i) *Lowering of the Head-End of the Body*: This procedure, to facilitate removal of the fluid from the lungs, has been practiced with benefit in edema of the lungs from pilocarpin and anesthetics. It is possible that some change in posture might favor the emptying of the lungs in pneumonia.

Acidosis.—In diabetes, when acidosis is serious, the specific remedies are great quantities of alkali, such as sodium bicarbonate, and great quantities of water administered by every available route. But in pulmonary edema much water is contraindicated, and isotonic solutions of sodium bicarbonate should not be given either by rectum or intravenously, for the fluid thus introduced has a tendency greatly to increase the capillary transudation in the lungs. Sodium bicarbonate should, however, be given by mouth; or, if this

is not feasible, it may be introduced intravenously in hypertonic 10 per cent. solution in amounts of 400 c.c. I have had experience with this and have found the hypertonic solution absolutely well borne. As mentioned before, oxygen inhalation probably tends to lessen acidosis, and venesection tends to increase it.

Morphin has proved almost specific in acute paroxysmal edema of the lungs, as described by Stengel,¹⁶ probably because, as suggested also by Billings,³⁸ "in many of these patients an element of shock and mental disturbance contributes to the severity of the symptoms." But in the complicated edema of pneumonia it is dangerously depressing to the respiration, checks expectoration and favors the development of tympanites.

SUMMARY

In the treatment of pulmonary edema in pneumonia, the most reliable procedures are: strophanthin intravenously, caffein subcutaneously, oxygen inhalation, venesection, and perhaps counterirritation to the chest. Supplementary treatment should be determined by the presence of acidosis or other associated conditions.

57 West Fifty-Eighth Street.

ABSTRACT OF DISCUSSION

DR. SAMUEL J. MELTZER, New York: In discussing Welch's theory of pulmonary edema Dr. Bastedo referred to its presentation in my lectures on edema and made a statement which I wish to correct. Inflammatory processes of the lung do not play a rôle in this theory. The essential point of it is the assumption that in pulmonary edema there is a disproportion between the activities of the two ventricles, that of the right being more effective. The difference need not be large.

I was pleased that Dr. Bastedo did not mention epinephrin as a possible therapeutic agent. Several years ago its use was advised by some of our consultants. About fifteen years ago I discovered that epinephrin is often an effective agent to produce pulmonary edema—but not to cure it. The Transactions of the Association of American Physicians several years ago contained an illuminating discussion of that subject.

Dr. Bastedo did not mention artificial respiration as a therapeutic means. When Dr. Emerson suggested it several years ago I had then some doubts about its usefulness. I think now more favorably of it; it ought to be given a trial, especially when one is in possession of a reliable apparatus.

DR. JACOB DINER, New York: Dr. Bastedo pointed out three important factors in edema. Dr. Bastedo also mentioned the inefficacy of cupping, and I hoped he would say something about the cataplasmata for the purpose of drawing out the fluid. If we use this for its hygroscopic effect we can convince ourselves of its uselessness. It is only the glycerin in the cataplasm which is hygroscopic and that to a very limited extent. This can readily be demonstrated by exposing glycerin in a moist atmosphere. We are going contrary to the very mechanism (in physiology) which would aid circulation and we are increasing the intoxication. We are pressing on a chest which is already laboring hard, by putting 250 gm. of mud or kaolin on it. With the lowest average rate of respiration and expansion we have a load equaling 7,500 gm. raised 5 cm. per minute, and this by a chest already laboring hard. We are compressing the circulation, mechanically obstructing the venous return and adding to the pulmonary edema, and in addition calling on the heart for additional, unnecessary work. Too much cannot be said against this manner of medication.

DR. WALTER J. WILSON, JR., Detroit: I should like to emphasize the value of caffein. A number of years ago its use was followed in a short time by such results that a patient who seemed to be moribund made a good recovery and

34. Kulenkamp: Deutsch. med. Wchnschr., 1909, 25, No. 32.

35. Head, H.: Brain, 1893, 16; 1894, 17.

36. Hertz, A. F.: The Sensibility of the Alimentary Canal, Henry Frowde, 1911.

37. Sherrington, C. S.: Schäfer's Text Book of Physiology, 1900, 2.

38. Billings, quoted by Stengel (Note 16).

is now in good health. This was in a case of bronchopneumonia. Other similar cases have strengthened my faith in it under such conditions as described in the paper. Atropin, while it depresses the vagus endings, does not alter the effect of digitalis on the heart muscle directly and is not contraindicated unless other conditions such as auricular fibrillation are present.

DR. EDWARD F. WELLS, Chicago: The presence of the form of pulmonary edema which we usually have in mind in pneumonia is not of frequent occurrence but it is a contingency in any case, and for that reason preparation should be made for its possible appearance at the very beginning of treatment. It will not come on early and there is no harm in having things ready. Digitalis—I believe I voice the profession—is a useful remedy in pneumonia, and personally I begin early and continue it throughout the course of the disease, not in very frequent doses, but in amounts producing apparent effect. Strychnin is begun a little later and is given regularly for the special purpose of stimulating the reflexes, the respiratory in particular. Have ready a cylinder of oxygen, which may be of use and certainly can do no harm to the patient, but I do not advise its constant use; have it ready in case of emergency. Full instructions are given to the nurse as to what should be done in the actual appearance, which is usually sudden, of pulmonary edema. These directions consist first in giving at once $\frac{1}{16}$ or $\frac{1}{8}$ grain of morphin hypodermically. I place but little dependence on atropin, but a small amount may be given, say $\frac{1}{150}$ to $\frac{1}{200}$ grain; but morphin is the most important remedy in this case. So far as I have seen, the results of treatment depend on the promptness with which these measures are taken on the appearance of the edema. The second important advice is that immediately on the advent of edema the mouth and nostrils shall be made the lowest portion of an inclined plane. The whole body should be raised to such degree as will allow any excess fluid in the respiratory tract to escape by the mouth and nostrils. The amount escaping in this manner is sometimes very great. A stimulating enema of glycerin, Epsom salts and water is of secondary importance.

DR. WALTER A. BASTEDO, New York: My paper included a paragraph on morphin and also a paragraph on mechanical means for evacuating the fluid. I said morphin had proved successful in paroxysmal edema, but in the complicated edema of pneumonia I believe it should not be employed, as it is dangerous to the respiration, checks expectoration and favors tympanites. I have known edema to be produced by morphin in pneumonia. Like Dr. Wells, I use digitalis early in pneumonia, and this same practice has been adopted at the Rockefeller Institute.

Dr. Wilson's question about atropin versus digitalis is a big one to discuss. Undoubtedly often cardiac failure in pneumonia is the result of the onset of auricular fibrillation or auricular flutter. The impulses going from the auricle to the ventricle cause the ventricle to beat in a disorderly and inefficient manner. In these cases we deal with a disturbance of rhythm, and our desire in the use of digitalis is to prevent the passage of the smaller impulses from the auricle to the ventricle; that is, we desire a degree of heart block so that the ventricle can go on beating efficiently without regard to the erratic beating of the auricle. This is the effect of digitalis in these cases, and it is annulled by atropin. The stimulation of the muscle of the heart has not been proved to be an effect of digitalis that can be elicited satisfactorily in therapeutics; and as a rule the effect on the rhythm is evidently greater than the strengthening effect on the muscle. Furthermore, stimulation of the muscle often has the effect of causing great excitability of some part of the muscle, so that we get extrasystoles without increasing the work of the ventricle. I think, therefore, it is of great importance in pneumonia not to check by the administration of atropin, any possible value of digitalis on the auriculoventricular bundle of His. In regard to Dr. Meltzer's remarks I think that Dr. Welch answered well the arguments against his theory. I am glad that Dr. Meltzer referred to the subject. A disproportion between the right and left ventricles is not an easy thing to determine, and if the heart failure is due to a change in rhythm, as it fre-

quently is in pneumonia, both ventricles fail together. The epinephrin question I did not bring up because Dr. Meltzer many years ago established the idea that it was dangerous in any condition that might lead to edema of the lungs. As he mentioned, too, the edema of the lungs from epinephrin occurs usually when you do not want it.

VERTIGO AS A SYMPTOM OF PRIMARY DISEASE OF THE LABYRINTH*

GEORGE E. SHAMBAUGH, M.D.

CHICAGO

The symptom of vertigo was for the first time associated with disease of the internal ear by Ménière in 1861. Previous to that year, vertigo was considered to be a symptom distinctly of intracranial disease. Ménière published a series of articles on the occurrence of disease of the internal ear presenting symptoms resembling cerebral apoplexy. Eleven cases in all were reported, in which in the absence of any previous ear trouble the patient was suddenly seized with vertigo, associated with tinnitus and deafness. One of his patients died from an unknown cause five days after the attack of vertigo. The macroscopic postmortem examination disclosed a grumous mass filling the semicircular canals. No lesion was detected in the brain or spinal cord. On the basis of these findings, together with the facts regarding disturbance of equilibrium brought out by the experiments which Flourens had previously carried out on the semicircular canals of pigeons, Ménière concluded that the symptoms observed in his patients were the result of hemorrhage into the labyrinth.

Following these publications by Ménière, a great many cases have been reported presenting the characteristic symptoms of sudden onset of vertigo with tinnitus and deafness. Many of these were described as cases of Ménière's disease, and it was assumed that hemorrhage into the labyrinth was responsible for the labyrinth disturbance. The symptoms have appeared quite variant in different cases. In some, a single attack, with sudden onset, threw the patient violently to the ground and produced severe tinnitus with total permanent loss of hearing. In others, there was a long series of attacks, varying widely in severity. In most of these cases each attack registered a distinct progress in an increasing labyrinth deafness. In some, the disturbance of equilibrium, as well as the tinnitus and the deafness, was slight and appeared quite transitory. In still others, the vertigo occurred quite independent of tinnitus or deafness. It became apparent quite early that one cause was not responsible for the symptoms in all of these cases. In some, the symptoms were the result of disturbance in the labyrinth caused by an extension of middle ear infection. In other cases the symptoms were the result of demonstrable intracranial disease. Of those cases in which the disease was primarily in the labyrinth, not infrequently the manner of onset, as well as the transitory character of the disturbance, precluded the possibility that an actual hemorrhage into the labyrinth had given rise to the symptoms.

An effort has been made by some writers to restrict the use of the term "Ménière's disease" to those cases of primary involvement of the labyrinth in which the

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

suddenness of the onset, together with the marked permanent loss in the hearing, seemed to make the diagnosis of an actual hemorrhage into the labyrinth the probable cause. The gradual transition between those cases in which hemorrhage into the labyrinth seemed to account most readily for the symptoms and those in which, from the transitory character of the symptoms, the possibility of an actual hemorrhage was excluded, made it quite impossible to separate a distinct group of cases and assert that these alone were the result of hemorrhage into the labyrinth, and that all the other cases of primary disease of the labyrinth presenting symptoms of attacks of vertigo with tinnitus and disturbed hearing were not caused by hemorrhage.

For these reasons many writers have given up the use of the term "Ménière's disease" for any of these cases, even for those in which it seems certain that a hemorrhage into the labyrinth has given rise to this syndrome, as, for example, when these symptoms occur in cases of pernicious anemia. The term "Ménière syndrome" has, however, come into general use to designate attacks of vertigo when associated with tinnitus and deafness, irrespective of the cause, whether it be from disease of the labyrinth secondary to middle ear infection or to meningitis, or to disease occurring primarily in the labyrinth, or whether it is occasioned by intracranial disease causing disturbance of the central tract of the eighth nerve. This term is an appropriate one by which to designate a characteristic group of symptoms, especially since it serves to perpetuate in otologic literature the name of the physician whose contribution represented a distinct epoch in otology.

Vertigo is now recognized to be as distinctly an aural symptom as is tinnitus, and when present indicates a disturbance of the vestibular nerve, either in its peripheral distribution in the semicircular canals or in its central pathways in the brain. In this paper I shall discuss only those cases of primary disease of the labyrinth producing vertigo.

PHYSIOLOGY .

In order to interpret intelligently the symptoms of vertigo arising from disease of the labyrinth, it is important to keep clearly in mind a few fundamental facts in the physiology of the internal ear. The mechanism in the labyrinth for preserving the body equilibrium, the vestibular apparatus, accomplishes this end largely through the medium of tonus impulses to the skeletal muscles, which keep these muscles in a state of constant stimulation. The tonus impulses from the two labyrinths stimulate for the most part opposing groups of muscles, and since the impulses from both sides are equal, a state of equilibrium is preserved. A sudden alteration in the tonus from one labyrinth disturbs this equilibrium and gives rise to vertigo. The disturbance of equilibrium arising from a sudden disturbance of tonus is always temporary because a compensatory tonus rapidly develops to restore the equilibrium. A gradual destruction of function in one or both labyrinths may proceed even to the point of complete loss of function without ever giving rise to sensations of vertigo.

Keeping these fundamental facts in mind, let us inquire into the various processes which are known to involve the labyrinth primarily and produce the symptom of vertigo. In the first place there can be no doubt that a hemorrhage into the labyrinth will

produce the characteristic Ménière syndrome. Hemorrhage into the labyrinth is, however, in all probability a very rare occurrence, whereas vertigo from primary disease of the labyrinth is by no means uncommon. It is indeed doubtful whether the symptoms in any of the cases reported by Ménière were the result of hemorrhage into the labyrinth. Regarding the one case which came to postmortem, there are good reasons for believing that this case was one of epidemic meningitis with extension into the labyrinth. The view that the labyrinth symptoms resulting from large doses of quinin are caused by a congestion or actual hemorrhage into the labyrinth is now given up. In the same way, the Ménière syndrome, which so frequently develops in cases of chronic progressive nerve deafness, is in all probability not often, if ever, the result of hemorrhage in the labyrinth, as was previously supposed. The conditions which are known to produce hemorrhage into the labyrinth include especially such diseases as pernicious anemia, leukemia and purpura hemorrhagica.

Embolism of the labyrinthine artery occurs especially in caisson workers, as the result of gas emboli, and produces in its most characteristic form the apoplectic type of the Ménière syndrome. I have seen a single case in which a blood embolism lodging in the artery of the labyrinth appeared to be the probable cause of a sudden attack of the Ménière syndrome, with a total permanent loss of hearing. The accident occurred during the puerperium, about one week after confinement.

Vertigo is not an infrequent symptom of advanced otosclerosis, in which its occurrence heralds the extension of the spongifying process involving the bony capsule of the labyrinth to the semicircular canals.

Syphilis, both during the secondary and the tertiary stages, often invades the labyrinth, giving rise to attacks of vertigo. Involvement of the labyrinth in hereditary syphilis is also quite frequently observed. In these cases, attacks of vertigo are not at all uncommon, and when present indicate a fresh extension of the disease. Very often in cases of syphilitic degeneration in the labyrinth, in which the involvement of the vestibular mechanism can be demonstrated by means of the turning tests, as well as by caloric stimulation, the process does not cause vertigo. This absence of vertigo is sometimes observed in cases in which, judging from the progress of the deafness, the degeneration appears to be extending quite rapidly. In explanation of the absence of vertigo, it is believed that the loss of function has proceeded so evenly as to allow the development of compensatory tonus to keep pace with the loss of labyrinth tonus. It is only a sudden progress in the degenerative process that enables the disturbance of tonus to give rise to vertigo. This vertigo will take place when the progress of the disease has been comparatively slight, provided only that it develops suddenly.

Neuritis of the eighth nerve is a not infrequent cause of vertigo. This neuritis may be the result of poisoning from drugs, such as quinin, tobacco or alcohol. More often the neuritis is caused by toxins from infectious fevers, such as measles, scarlet fever, diphtheria, influenza, mumps, typhoid and florid tuberculosis. As a rule, the involvement of the vestibular nerve causing attacks of vertigo takes place simultaneously with a degeneration of the cochlear nerves, producing tinnitus and deafness. In some cases the vestibular nerve alone is involved. Here tinnitus and

deafness are absent, and only the attacks of vertigo indicate the involvement in the internal ear.

By far the most frequent occurrence of vertigo is in association with a chronic degenerative process developing quite independent of syphilis or of the infectious fevers and involving, as a rule, the peripheral neurons of both the cochlear and the vestibular nerves. When the cochlear nerve is involved, the characteristic symptoms are a continuous high pitched tinnitus and a more or less extensive defect in hearing at the upper end of the tone scale. In some cases the vestibular nerve alone is involved. The involvement of the vestibular nerve is not infrequently associated with attacks of vertigo. Such attacks are always an indication of a sudden increase in the degenerative process and are associated with an increase in the tinnitus and the deafness when the cochlear nerve is also involved in the process. It is possible by means of the rotation tests and the caloric stimulation to demonstrate the loss of function taking place in the semicircular canals in these cases. It has been for these cases of primary disease of the labyrinth of unknown origin, presenting the characteristic attacks of the Ménière syndrome, that some would have us preserve the term "Ménière's disease," the assumption being that the distinct attacks are each the result of hemorrhage into the labyrinth.

The characteristic course which these cases take, the chronic progressive nature of the degeneration going on in the labyrinth, the acute exacerbations, often occurring quite suddenly, and resulting in attacks of vertigo associated, as a rule, with tinnitus and deafness, all resemble so closely the course of neuritis in other nerves when caused by chronic foci of infection, that it seems entirely probable that focal infection may be the underlying cause for not a few of these cases of progressive degenerative processes involving the eighth nerve.

The sudden exacerbation producing the characteristic Ménière syndrome can be accounted for exactly as are the exacerbations in any peripheral neuritis of focal origin, as the result of a fresh shower of bacterial emboli liberated from the primary focus and which, for some as yet not entirely accounted for predilection, select the peripheral neurons of the eighth nerve as their target. The varying degree of the severity of the attacks, ranging from a total, even permanent, destruction of function to the slight temporary disturbance sometimes observed, finds here a ready explanation, which was not the condition when we assumed that the severe cases of the Ménière syndrome occurring in primary disease of the internal ear were the result of hemorrhage into the labyrinth, and the milder cases were the result of an angioneurosis. The fact that the degenerative process in the labyrinth may progress without acute exacerbation and therefore without attacks of vertigo is quite in harmony with the chronic neuritis of other nerves.

An additional evidence that focal infection takes a part in the production of neuritis of the eighth nerve is found in those cases in which the Ménière syndrome is observed in patients suffering from acute articular rheumatism. In the literature there are a number of such cases reported as rheumatism of the internal ear. We now regard acute articular rheumatism as a systemic infection from some primary focus, which very often is located in the faucial tonsil. The occurrence of acute exacerbations is one of the characteristic symptoms developing in cases of acute rheumatism.

SUMMARY

1. Primary disease of the labyrinth produces attacks of vertigo whenever the vestibular apparatus is involved by an acute process.

2. Hemorrhage into the labyrinth is much less common than was formerly supposed.

3. An embolus lodging in the labyrinthine artery occurs especially in caisson workers, as the result of gas emboli, and gives rise to the characteristic Ménière syndrome.

4. Syphilis in the secondary and tertiary stages, as well as in hereditary syphilis, not infrequently involves the internal ear and gives rise to vertigo.

5. Neuritis of the eighth nerve from overdoses of drugs, such as quinin, tobacco and alcohol, may produce neuritis of the eighth nerve with the Ménière syndrome.

6. Toxic neuritis of the eighth nerve as the result of infectious fevers frequently gives rise to attacks of vertigo.

7. The most frequent occurrence of vertigo is in connection with a primary chronic degenerative process involving the peripheral neurons of the eighth nerve and occurring independent of syphilis or the infectious fevers.

8. The probable cause for many of these cases is to be found in a neuritis of the eighth nerve, as the result of some chronic focus of infection, such as is so frequently seen in chronic disease of the faucial tonsil.

9. Attacks of vertigo occurring in connection with acute articular rheumatism are the result of neuritis of the eighth nerve and a symptom of the systemic infection from some primary focus.

122 South Michigan Avenue.

AURAL VERTIGO OCCURRING IN SUPPURATIVE DISEASE OF THE MIDDLE EAR*

PHILIP D. KERRISON, M.D.

NEW YORK

I think the majority of experienced otologists will confirm my statement that severe vertigo resulting from middle ear suppuration without labyrinthine involvement is not sufficiently common to call for prolonged discussion here. At least, the distinguishing features of the vertigo in such cases may be more profitably analyzed in connection with special case reports. The following conditions, however, require passing mention:

1. A few cases of chronic middle ear suppuration have been observed or reported in which granulations in the region of the oval window and pressing on the stapes have caused vertigo which has been relieved by careful removal of the granulations. I recall one such case which I saw with Dr. Harmon Smith in which operation later was successfully performed by the late Dr. Sheppard of Brooklyn. The diagnosis of this condition would, in most cases, be tentative prior to operation. It could be determined with some degree of certainty only on (a) the presence of the granulations; (b) retention of fair hearing power; (c) normal reactions to the tests of vestibular irritation, and (d) absence of response to the fistula test. Such cases

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

probably do not occur in the proportion of from 1 to every 5,000 cases of chronic middle ear suppuration.

2. Vertigo depending on a defect, either congenital or resulting from disease, in the labyrinthine capsule, the membranous labyrinth remaining intact, is a somewhat rare condition. Such a patient was sent by Dr. F. Risden from an outside clinic to the Manhattan Eye and Ear Hospital for examination and discussion. The salient features were a perforated drum membrane with moderate discharge, frequent typical attacks of vestibular vertigo, fairly good hearing, and a pronounced reaction to the fistula test.

3. Aural vertigo in middle ear suppuration depending on a so-called paralabyrinthitis—a congestion extending through the labyrinthine capsule to the membranous labyrinth—is usually easily distinguishable from the vertigo of diffuse suppurative labyrinthitis. The diagnosis and treatment cannot be discussed here.

4. Aural vertigo due to serous labyrinthitis need not be described, since it differs in no way from that due to suppurative labyrinthitis to be described later. Serous labyrinthitis, though probably a pathologic entity, is not in the acute or active stage easily distinguishable from suppurative labyrinthitis. The practical therapeutic deductions from this hypothetical lesion are nearly covered in the statement that a vertigo of distinctly vestibular type, accompanying a middle ear suppuration, and not coupled with complete unilateral loss of hearing should be treated as far as possible expectantly, that is, bone surgery, unless otherwise imperatively indicated, should be avoided or at least postponed until all symptoms suggestive of vestibular irritation have subsided.

The vertigo associated with all of the foregoing conditions is invariably and distinctly of vestibular type. I know of no distinct type of vertigo characteristic of suppurative disease confined to the tympanum. So invariable and constant are certain vestibular elements in every case of vertigo accompanying tympanic suppuration that the occurrence in such a lesion of a vertigo of different type would in itself go far to prove an extra-aural origin. If one speaks, therefore, of the vertigo of middle ear suppuration, one must inevitably refer to the familiar vestibular type.

PHYSIOLOGIC BASIS OF SUPPURATIVE LABYRINTHITIS

Two clinical types of vertigo occur in suppurative labyrinthitis: (1) the vertigo of the onset or acute stage, and (2) the vertigo of the latent or quiescent stage. But in whatever phase or degree of severity it may be observed or whatever stage of the lesion it may represent, the physiologic basis is always the same: diminution or loss of vestibular irritability in the diseased ear.

It has been stated, probably on theoretical grounds rather than exact clinical observation, that the actual onset of a labyrinthine infection is announced by a symptom depending on vestibular irritation, that is, nystagmus toward the diseased ear, this initial irritation being quickly replaced by loss or diminution of vestibular irritability, and nystagmus toward the sound ear. Practically, this exceedingly transitory stage of initial irritation is never seen by the aurist in diffuse suppurative labyrinthitis. The vertigo of the acute stage cannot, therefore, be ascribed to vestibular irritability, but rather to disturbance of vestibular balance, the sudden loss of vestibular irritability in the diseased

ear being in effect equivalent to stimulation of the opposite, sound vestibular mechanism.

DIAGNOSIS

The Vertigo of the Acute Stage.—This symptom is accompanied by the following invariably associated phenomena: spontaneous vestibular nystagmus; subjective sensation of the rotation of surrounding objects in the plane of the nystagmus, and tendency of the patient, if standing, to fall or move in the plane of the nystagmus and in the direction opposite to that of the quick eye movement. The patient's vertigo is increased when he turns his eyes in the direction of the quick nystagmus movement, and is lessened when he looks in the opposite direction. These three concomitant symptoms of the onset constitute the characteristic syndrome of the acute stage of the disease.

Course.—It is impossible to dissociate these phenomena or to discuss one without the other. In uncomplicated cases of suppurative labyrinthitis, the vertigo, the nystagmus and the ataxia tend simultaneously and quite rapidly to subside, so that within a week or ten days following the onset, they may have completely disappeared. When the nystagmus has wholly disappeared, so also has the characteristic vertigo. After the nystagmus has completely subsided, the patient may complain of vague, indefinite sensations of dizziness. This subjective disturbance, which is not rotary in character, may be due to weakness, circulatory disturbance or gastric upset resulting from the attack; but such vertigo cannot be conclusively traced to the labyrinth.

The Vertigo of the Latent Stage.—This phenomenon is neither constant nor invariably prominent or noticeable. It refers to the liability of the patient, after all characteristic symptoms of the acute stage have disappeared, to a sudden, violent and usually quite unexpected disturbance of equilibrium during which, unless forewarned, he may meet serious injury. Such attacks, if they occur, are usually brief and are always induced by some body position or physical effort to which the patient has not become reeducated or reaccustomed, as on first going up or down stairs; sudden looking upward toward the sky; sudden turning while crossing a street in response to a noise; diving, or standing on some narrow support at an unaccustomed height (as on scaffolding). The danger of these attacks varies with individuals, and becomes progressively and rapidly more remote as the patient becomes reeducated in the various body postures and muscular actions, by which they may be induced. Until this process of reeducation is complete, however, it is clear that this form of vertigo may constitute a menace to the patient's life.

Surgical Significance of Vertigo in Labyrinthine Infection.—The surgical significance of the vertigo of the acute stage is that of a recent infection of a minute bone cavity the anatomic pathways from which to the meninges have not yet been closed or guarded by the deposition of inflammatory products. The surgical significance of the latent stage is of a focus of infection in a small bony space presumably walled off by inflammatory exudates, but still subject to further breaking down with consequent spread of infection to the meninges.

GENERAL THERAPY

A logical general plan of treatment deducible from the foregoing and applicable to a majority of all cases of diffuse suppurative labyrinthitis not already com-

plicated by intracranial infection, might be formulated somewhat as follows: during the vertigo of the acute stage, absolute rest in bed; local treatment reduced to a minimum, and avoidance or postponement of all bone surgery not otherwise imperatively indicated. In the quiescent, or latent, stage, a radical operation, combined with careful surgical drainage of the labyrinth, is the only treatment in accordance with sound surgical law, and which safeguards the patient's future.

There is one other class of cases—rare, but of undoubted occurrence—which must be briefly mentioned. In the course of a chronic middle ear suppuration, the patient develops characteristic vestibular vertigo with associated phenomena. The symptoms gradually subside, leaving the ear absolutely deaf or hearing profoundly reduced; caloric reactions are absent. After a period, which varies in length, of complete freedom from vertigo, there is a second attack closely resembling the first, from which the patient again recovers. Thereafter he may be subject to recurrent attacks which render life miserable either by reason of their severity or by the sense of insecurity or of impending disaster during the interperiods of relief. Bárány mentioned to me cases of this sort coming under his observation. Such a clinical picture might be explained by the hypothesis of a very slowly progressive bone necrosis of some part of the bony capsule so situated as to produce more or less walling off of some portion of the labyrinth prior to the first characteristic vertiginous attack. Such a patient carries with him constantly the possibility of serious intracranial involvement with each successive attack. This condition would, in my opinion, be a most positive indication for the labyrinthine operation.

Vertigo in any suppurative lesion of the ear is always a symptom to be treated seriously. If due to a suppurative process confined to the tympanum or mastoid, and exerting an influence only indirectly on the labyrinth, the aurist's best judgment is required as to how, and particularly when, to deal surgically with a lesion which in recurrence may include the labyrinth. If the vertigo is clearly a result of labyrinthine infection, the need of sound surgical judgment is even greater.

In considering questions of treatment, we shall do well to bear in mind one fact which I have not seen stated in the literature of the subject, and which, from their writings and clinical reports, many writers have seemed wholly to ignore, namely, patients do not die of suppurative labyrinthitis *per se*. Those patients who die on account of this lesion invariably do so as the result of a secondary intracranial infection: meningitis, cerebellar abscess, or sigmoid sinus thrombosis. Operative technic is most important; it is not, however, the sole desideratum in dealing with the infected labyrinth. An operation, logical enough in intent, may carry overbalancing risks of causing that which it seeks to avert, that is, a spread of infection toward the meninges. There is also in suppurative labyrinthitis, more perhaps than in any other surgical disease, a period of greatest operative safety as also of operative risk.

There is no absolutely safe method of treatment; no rule of action which in the varying aspects of the disease may be relied on to save all its victims. In each individual case, surgical treatment must take account of the following several points: (a) immediate chances of recovery, that is, with and without operation; (b) possible influence of any operation in

causing a spread of infection; (c) stage of the disease in which operative intervention is safest, and (d) ultimate risk to life if the labyrinthine focus of infection is not surgically eliminated.

58 West Fifty-Sixth Street.

VERTIGO DUE TO INTRACRANIAL DISEASE*

T. H. WEISENBURG, M.D.

PHILADELPHIA

There is no symptom more difficult to define on the part of the patient than vertigo, because this term is used to describe the slightest giddiness, falling sensation, epileptic aura or fainting spell.

Vertigo has been described as a feeling of discomfort arising from a disturbance of the relations of the body to space or a feeling of loss of balance. One of the best descriptions is by Hughlings Jackson, who described vertigo as a sensation of motor origin the result of a discord between the impressions which come from the labyrinth, the cerebellum, eye muscles and from other sources with which they coordinate or act in harmony. As the result of the discord of these impressions, consciousness is affected with a distressing sensation known as vertigo. Jackson rightly emphasized that this sensation is perceived through the cerebral hemispheres.

It would be important if it were possible to differentiate organic from functional vertigo from the clinical description furnished by the patient. To some extent this can be done, and yet mistakes are common. I knew of a patient suffering with vertigo who, for many years, was shown before medical students as a case of hysteria in the various medical institutions of Philadelphia, but who died from a cerebellopontile tumor growing from the eighth nerve, while, on the other hand, functional vertigo is frequently diagnosed as organic.

VERTIGO IN INTRACRANIAL TUMORS

Tumors of the cerebral hemisphere do not produce dizziness unless there is considerable increase of intracranial pressure. Therefore vertigo appearing in cerebral tumors should at once arouse a suspicion of great increase of intracranial pressure, or of disease of the posterior cranial fossa.

Tumors or other lesions in the posterior cranial fossa nearly always cause vertigo either because of the direct involvement of the vestibular fibers or by indirect implication of these fibers through pressure. Slowly growing gliomatous lesions may directly involve the vestibular fibers without causing the slightest dizziness.

An attempt has been made by Grainger Stewart and Gordon Holmes to differentiate the forms of vertigo into, first, the sense of movement of self or surrounding objects; and second, an indefinite sensation, generally described as a giddy feeling. According to these authors, in intracerebellar tumors the external objects in front of the patient move from the side of the lesion to the opposite side, this being also true of the subjective rotation of self in intracerebellar lesion; but in extracerebellar tumors the subjective rotation of self is from the healthy side toward the side of the lesion. These symptoms would be valuable in differen-

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

tiation between intracerebellar and extracerebellar tumors, were they present in all cases; but in my experience this differentiation cannot be made, for in my own cases the sense of rotation of objects or self, while it has been present, has been always more or less indefinite.

In the second form of vertigo, described by Stewart and Holmes, the patient suddenly becomes dizzy, generally after some abrupt movement; the surroundings become dark, and there may be numbness or weakness in the extremities, associated with intense nausea and a tendency to fall backward or to the side of the lesion; consciousness may be impaired but never lost, objects may seem to swim or intermingle indiscriminately in front of the patient, and he may feel that if not supported he would fall in any direction, or collapse.

It would seem as if these indefinite feelings of giddiness should have the greatest localizing value because they may be present only when the head or eyes are deviated in a certain direction. Again, this indefinite sense of vertigo may be apparent only when the eyes alone are deviated toward the direction of the lesion.

I have selected examples of lesions in different localities as illustrations of the type of vertigo occurring in different kinds of cases.

TUMORS OF THE CEREBELLOPONTILE ANGLE

An analysis of operative cases and of the tumors in the posterior cranial fossa in my laboratory gave very interesting results.

In a patient with a left cerebellopontile angle tumor growing from the eighth nerve involving the seventh nerve and the pons and cerebellum secondarily, the patient would not experience dizziness on looking to the right or on standing upright, but whenever he looked to the left suddenly he experienced a sense of dizziness and would feel as if objects were swimming on that particular side. Turning his head slowly would produce no sensation. In a case in which a tumor grew from the right middle cerebellar peduncle into the cerebellopontile angle involving the eighth nerve secondarily, the patient preferred to lie on the right side of his head, for when he sat up he felt dizzy. When sitting he would always lean forward and to the right, feeling more comfortable in this position. In another patient in whom a right cerebellopontile angle tumor invaded the pons and the cerebellum by pressure and in whom there was also involvement of the right fifth, seventh, eighth, ninth and tenth nerves, no vertigo whatever was present. In this patient there was entire absence of choked disc and of increase of intracranial pressure.

TUMORS OF THE CEREBELLUM

In a patient aged 6 years, in whom a cyst was accurately localized and removed for me by Dr. George P. Müller, the cyst being on the right superior lateral lobe of the cerebellum, while the asynergy was very marked, vertigo was entirely absent. There was no increase of intracranial pressure.

In another patient in whom a gliomatous tumor was removed from the right cerebellum by Dr. Wayne Babcock, there were mild general pressure symptoms. This patient had dizzy spells associated with nausea and vomiting. He described the dizziness as a feeling as if everything were going from under him, and likened it to rolling down a hill and falling into a hole. When in bed he would have to lie on his face and then turn his head because he felt as if everything were dropping from under him. He would never put his

head directly back in a barber chair, but first would have to turn on his side and then put his head back. If he did not do this he had a sensation that things were going around. He never felt as if he were going around the objects. Later on the dizzy spells would come on only when he was stooping over. In this patient, after a decompressive operation and removal of a certain amount of the brain tumor tissue, these symptoms promptly disappeared.

In another patient in whom there was found a tumor in the vermis and the right inferior lateral lobe, the symptoms began with an attack of dizziness which lasted for a day. Recurrent attacks would not last so long. During these she felt as if she were turning around, the head down, the feet up. These sensations were not constant, the intermissions lasting about a minute. Accompanying these attacks there would be at times nausea and vomiting. Gradually these attacks became less and less, and she felt dizzy only when turning her head to the right. She described these attacks as a feeling of dizziness between her eyes and over her eyebrows or a swimming of the head. She was free of these when on a level or turning her head in any direction excepting to the right. When she did so the dizziness started synchronously with the movement, and was most marked when the head was turned extremely to the right and instantly ceased when the median line was reached.

In another patient in whom postmortem examination revealed internal hydrocephalus of the fourth ventricle with pressure on the inferior vermis, the dizziness was described as a sensation as if the head were turning around from one side to the other. Objects in front of him never moved.

These descriptions of cases could be carried on indefinitely, but some conclusion can be reached from their study. It is apparent that there is no focal or recognizing value in the clinical description of vertigo furnished by the patient. It is also evident that vertigo or dizziness is present only in certain sets of conditions. First, there must be increase of intracranial pressure in which the vestibular fibers are indirectly implicated. Secondly, the lesion must involve the vestibular fibers directly and must be of such a character that the fibers are destroyed, for a slowly growing gliomatous tumor may not give any symptoms at all. Finally, the conclusion may be reached that vertigo in itself is not a focal symptom. Its presence or absence, however, helps in the diagnosis in the manner detailed above.

FUNCTIONAL VERTIGO

It is generally known that certain organic cerebral conditions produce vertigo, the most frequent, of course, being arteriosclerosis. Besides, chronic cerebral anemia or hyperanemia and the bodily changes occurring in the climacteric frequently produce dizziness. It is hardly necessary to mention the fact that ocular palsies are frequently the source of vertigo. In a patient with a cerebellopontile tumor growing from the eighth nerve, the dizziness was extreme. There were also ocular palsies. Correction of the latter entirely removed the vertigo.

In my experience, however, dizziness is most commonly found in the nervous patient. Oppenheim believes that any one can bring on a feeling of vertigo by concentrating his thoughts on the process of loss of balance and by calling up the recollections of giddiness, which are familiar to every one. Neurasthenic individuals have this power in a still greater degree, and

in them fear and thought of vertigo are quite sufficient to produce it. In these patients, the nature of the vertigo can sometimes be told by the description of the patient, and of course also by exclusion. For example, in a patient with the fear of the presence of a cerebellar tumor, there is a feeling of swaying from side to side only when he reaches for an object, such as an instrument, and yet in the performance of the muscular exertion were he to touch an intervening object only slightly with the finger tip this swaying would disappear. He plays a very good game of golf and never has the slightest sensation when doing so, nor does he have this when he stands still. The fact is that in this man the fear of falling obtrudes itself into his consciousness to such an extent that the sense of dizziness or the fear of it is always imminent. Especially common is dizziness in the traumatic neuroses, when the head is injured. In practically all these cases dizziness disappears with settlement of litigation; but it cannot be said that the description furnished is characteristic any more than that the description is such as to put you on your guard against the possibility of its being labyrinthine in origin.

It should not be forgotten that neuroses often are associated with definite labyrinthine involvement, and in these cases the nature of the dizziness is exaggerated to an amazing degree. I saw such a patient with Dr. David Riesman a few months ago. This patient, a woman, aged 49, became dizzy at the age of 35. The dizziness was described as a sort of indefinite feeling within the patient which was chiefly marked when looking to the left. Ear examination by Dr. George MacKenzie was not satisfactory because of the sensitiveness of the patient, yet did not denote anything of an organic nature. For fourteen years this patient has tyrannized over her mother and two sisters, who have given up their entire time to attend to her. She never moves her head without bracing herself in a certain way and having these three devoted relatives help her move. She does not allow any one to walk in the room because she does not want to be jarred. She sleeps upright. Yet neurologic examination is entirely negative. When told by various neurologists and ear men that she has nothing organically wrong she promptly abuses them and tells them that they do not know their business. This probably is the most exaggerated case of this kind I have ever seen.

EPILEPTIC VERTIGO

One of the most difficult differential diagnoses to make is between aural vertigo and the minor types of epilepsy, a distinction which is not recognized as frequently as it should be. There may be only a feeling of turning or uncertainty or an actual rotation which is either partial or complete, or there may be a sudden fall. Of course, aural vertigo can always be told from the minor epileptic type in the fact that in epilepsy there is nearly always a history of major spasms. For many years since my attention has been called to it, I have never failed to obtain a history of minor spasms, especially the psychic type, in every patient with epilepsy. This fact is not so generally recognized as it should be. The confusion arises in the fact that minor epileptic attacks often are accompanied by tinnitus, and there might be only a slight giddiness with not a complete loss of sensation.

Epilepsy and labyrinthine vertigo occasionally occur in the same patient. It must also be recognized that aural vertigo as well as epilepsy may occur during

sleep. The cause must be referred to the instability of the center for equilibration.

VALUE OF THE BÁRÁNY TESTS IN INTRACRANIAL LOCALIZATION

In 1913, with other neurologists, I attended the International Medical Congress in London and was impressed with the excellent work of Bárány and its value in cerebellar localization. On my return I was fortunate enough to induce Dr. Isaac H. Jones to take up this work. It is not necessary for me to point out the results achieved by Dr. Jones and his co-workers. Suffice it to say that there is no doubt in the minds of the neurologists fortunate enough to be associated with Dr. Jones of the value of this work. I myself am of the opinion that no neurologic examination of the posterior cranial fossa is ever complete unless advantage is taken of the data furnished by the Bárány tests.

I wish, however, to call attention to what I consider a rather dangerous deviation from the work as originally laid out. My remarks are not uttered in a spirit of criticism, for, as I have tried to emphasize, I have too high an opinion of the merits of this work; but in the interest of scientific accuracy I feel it necessary for me to state my views, although they may be in antagonism to those expressed by some of the previous readers of papers on this subject.

The fiber tracts leading from the labyrinth through the vestibular nerve into the Deiters group of nuclei and from there into the cerebellum, pons and cerebral cortex are by no means definitely known. Neither is there accurate evidence that there is a so-called vestibular center in the temporal cortex. While cerebellar localization has advanced in recent years, and incidentally the first localization chart in the human cerebellum was advanced by Dr. Mills and myself, yet this scheme of ours is by no means definitely proved, and has necessarily not been generally accepted and will not be until we have furnished more pathologic data. I make these statements because it is a mistake to assume that the fiber tracts are definite and that we know accurately their location. It at once becomes apparent that it is not possible by means of the ear tests alone to localize a tumor in a definite portion of the pons, cerebellum or medulla, or any of the constituent anatomic structures in which the vestibular tracts are located. It would be far better for the sake of scientific accuracy and for the future welfare of this work that whatever statements are made at the present time should be made in the most tentative manner, and not accepted until proved by accurate pathologic data. Take, for example, the posterior longitudinal bundle, which is an important part of the vestibular system. A great deal of work has been done, and yet many years of research have failed to tell us its component parts, and where this tract begins and ends; yet some of the workers in this field have assumed that these tracts contain certain vestibular fibers and that there is no doubt about their location.

Years of neuropathologic work have proved to me that it is very difficult to establish fiber tracts in any part of the nervous system. It has become necessary, therefore, to assume certain facts. This is right and is scientifically proper, for unless we exercise some scientific judgment and imagination, no progress can be made. It is right, therefore, to make assumptions from clinical evidence; but it must be understood that these are only tentative.

1909 Chestnut Street.

VALUE OF BÁRÁNY TESTS IN THE DIAGNOSIS OF VERTIGO, FROM WHATEVER CAUSE*

ISAAC H. JONES, A.M., M.D.

PHILADELPHIA

Although it has been generally recognized for many years that vertigo may result from ear disturbances, the conception that all vertigo, from whatsoever cause, is peculiarly an ear study is the outcome of recent studies by Bárány methods. We have known that vertigo may be a symptom of disturbance in the ear, or, within the brain, or may accompany refractive errors, or disorders involving gastro-intestinal, cardiovascular or renal systems. We therefore, up to the present time, have always classified vertigo according to its apparent etiology, calling it "gastric" vertigo, or "renal" vertigo, or falling back in obscure cases on the old reliable diagnosis of "idiopathic" vertigo. The very vagueness of such a classification shows that we have had no real conception of the actual mechanism that is responsible for dizziness. However, if by a study of the vestibular apparatus we come to realize that it is this balance mechanism that keeps us from being dizzy, we become convinced that vertigo is impossible unless there is an irritation, impairment or destruction of some portion of this "vestibular apparatus," by which we mean the internal ears and their intracranial pathways. The ear tests enable the otologist to study the integrity of each and every part of this mechanism. Therefore, dizziness need no longer be regarded as something vague and mysterious. It becomes a distinct clinical entity and may be intelligently studied.

To be sure, the ear-tests do not furnish absolute, final and complete information as to everything whatsoever that has to do with vertigo. For example, by ear study, we are not able to tell whether the source of a toxemia has been in the kidneys, or the gastro-intestinal tract, or in a focal infection. These tests, however, open up a definite method of approach in this most obscure field, and furnish the possibility of accurate diagnosis and intelligent treatment. Have we, in fact, any other method of attacking this problem except by the ear-tests? Surely any opinion based on history or analogy or empiricism is at best merely a conjecture.

The tests themselves are best presented by the moving pictures. The first reel demonstrates the normal responses in normal persons. [Moving pictures were shown, presenting the American modification of the Bárány chair; the technic of the turning and caloric tests, showing the necessity of putting the head in certain definite positions in order to stimulate certain definite semicircular canals; and the demonstration of normal responses, in nystagmus, past-pointing and falling, after stimulation of the various semicircular canals.]

The nerve pathways from the ear to the eye-muscles and the nerve pathways from the ear to the cerebral cortex, with their branches and subdivisions, constitute our conception of the "vestibular apparatus." As the vestibular portion of the internal ear is essentially the *sense-organ* of this apparatus, we may properly speak of the apparatus as the "ear mechanism." It is the disturbance of this mechanism,

and only the disturbance of this mechanism, that produces vertigo. When this ear-mechanism functions normally, perfect equilibration is the result. If for any cause, immediate or remote, there occurs a disturbance in this mechanism, vertigo is the result.

Dr. Lewis Fisher and myself have attempted to classify under separate headings the various types of conditions that can produce vertigo. We take this opportunity to submit the following classification:

1. Involvement of the ear-mechanism by a lesion in the ear itself.
2. Involvement of the ear-mechanism by a lesion involving the intracranial pathways from the ear.
3. Involvement of the ear-mechanism by ocular disturbance, either through the eye-muscle nuclei, or through association fibers from the cuneus to the cortical terminus of the fibers from the ear, in the posterior portion of the first temporal convolutions.
4. Involvement of the ear-mechanism by cardiovascular disturbance.
5. Involvement of the ear-mechanism by toxemias from any organ or part of the body.

So far as our present knowledge goes, this classification includes all the causes of vertigo.

It is to be noted that regardless of the cause, vertigo is due to the involvement of the ear-mechanism. Let us discuss the causes seriatim:

1. Lesions in the ear itself have been completely presented by Dr. Shambaugh and Dr. Kerrison in this symposium. They have shown that a lesion of the vestibular portion of the internal ear produces dizziness, staggering, nausea, vomiting and perhaps diarrhea, just as an affection of the cochlea produces noises in the head. The general practitioner is familiar with the significance of tinnitus and recognizes that he is dealing with an ear condition. When confronted, however, with vertigo, nausea and vomiting, it is questionable whether, at the present time, the physician is apt to suspect the ears as the possible cause of all these symptoms. This, of course, is due to the newness of this study. When we realize that we otologists have come to recognize the importance of the vestibular labyrinth only in the last decade, it is only natural that the physician has not had his attention sufficiently called to the phenomena of internal ear disturbance. When a physician sees a case of vertigo, one of his first thoughts should be of the ear itself.

2. Lesions within the brain, such as tumor, hemorrhage, thrombosis, infarct, abscess, gumma, tubercle, specific neuritis, multiple sclerosis, syringomyelia, poliomyelitis or meningitis, produce vertigo by affecting the intracranial pathways from the ear. Dr. Weisenburg has made this clear to us in his part of this symposium.

The value of ear-examination in the differential diagnosis between lesions in the ear and lesions in the brain is best illustrated by citing two cases. In one case the history and symptoms indicated a lesion of the ear, and yet it turned out to be an intracranial lesion. In the other case the history and symptoms indicated an intracranial lesion, and yet it turned out to be a lesion in the ear.

CASE 1.—J. B. K., man, aged 39, in September, 1914, as he stepped off a train, was suddenly seized with violent vertigo, nausea and vomiting. The vertigo was so severe that he fell to the platform and was taken to the hospital, where he was confined to bed for ten days, during which time the vertigo gradually diminished. There was coincident complete deaf-

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

ness in the right ear. Here we have the typical classical picture of the so-called "Ménière's disease"—a sudden hemorrhage into the internal ear. Yet it turned out to be a beginning tumor in the right cerebellopontile angle, from which the patient died in seven months.

CASE 2.—Mrs. Agnes G., aged 44, in July, 1914, suddenly began to have difficulty in walking, and in September had severe attacks of vertigo, nausea and projectile vomiting. The diagnosis of brain tumor was made, and neurologic consultants found that the symptoms and tests suggested that the tumor was in the right cerebellar hemisphere. This diagnosis was confirmed by the Roentgen-ray report, which stated that it was a cyst in the right cerebellar hemisphere. The surgeon was about to operate, but hesitated because the ear examination suggested that the lesion was in the right labyrinth and because the cerebellum appeared normal. (The past-pointing after ear-stimulation was normal—both arms past-pointing properly both to the right and to the left.) The patient had an uninterrupted convalescence without operation, has given birth to a healthy child, and has remained in excellent health ever since (a period of two and one-half years).

One thing cannot be too strongly emphasized—we otologists do not attempt to make a diagnosis of intracranial conditions. When an ear-examination suggests that we are dealing with an intracranial condition, we recognize that we are obviously beyond the field of otologic study, and immediately feel the need of a thorough examination by a neurologist to whom such a case properly belongs. The ear-examination, like the eye-examination, simply furnishes information of value to the neurologist. It is the neurologist who alone is fitted by his training to draw conclusions from all the data, including the ear-examination.

3. Ocular conditions producing vertigo are naturally best studied by the ophthalmologist. If the ear-tests fail to show any impairment of the ears or their intracranial pathways, an eye examination is indicated. Many cases of vertigo are cured by correction of ocular defects. This happens so often in the experience of ophthalmologists that many seem to be convinced that the eye is the most important organ to study in cases of vertigo. Surely, however, the eye is not the organ of balance. If you destroy the eye the individual becomes blind, but he does not become dizzy. On the other hand, we all know how destruction of the internal ear, or simply the slightest irritation of the internal ear, produces violent vertigo and disturbance of equilibrium.

4. Cardiovascular irregularities may produce vertigo by causing ischemia or hyperemia of any part or parts of the ear-mechanism—either within the internal ear itself or its intracranial pathways, or in its associated centers in the cerebral cortex.

5. Toxemias affecting the ear-mechanism may be grouped into two classes:

(a) Evanescent toxemias which have produced no degeneration of the cellular elements within the internal ear or its intracranial pathways.

(b) Toxemias which have produced a definite impairment of some portion of the ear or its pathways.

The cases of evanescent toxemia constitute a very large proportion of the cases of vertigo that are seen by the physician. The simplest illustration of this type of vertigo is the dizziness produced by the ingestion of alcohol. The mere presence of alcohol in the stomach does not produce vertigo. It is only when the alcohol reaches the ears and the brain that the person becomes dizzy.

CASE 3.—Mrs. Van S., aged 32, had no symptoms ascribable to her ears, but was referred by Dr. McGlinn because she

complained of vertigo. In October, 1913, she woke up one morning with a violent attack of vertigo, accompanied by nausea, vomiting, retching and diarrhea. The attack suggested ptomain poisoning in every particular except that there was no pain in the abdomen. These symptoms continued for forty hours, and then the patient improved progressively for the following four days. On the fourth day she was out of bed and apparently had entirely recovered, but on bending over to kiss her boy she suddenly felt that she was plunging forward through a door. This second attack lasted another day. Gradual improvement followed, so that at the time of the ear examination, ten months later, she stated that she noticed vertigo only when she lay down at night. In October, 1914, she woke up one morning with the sensation that the bed was falling over. This attack, like the others, gradually diminished in severity after a few days. Between attacks she merely noticed that when she went to bed at night it took about half an hour to go to sleep, because she felt a little dizzy, and she could not sew or read because it made her dizzy.

Examination of the ears revealed normal cochleas, normal semicircular canals, and normal pathways from the ear throughout the brain. The diagnosis suggested under these circumstances was that we were dealing with a purely functional neurosis, or with a mild toxic irritation of the internal ears. On receiving this report, Dr. McGlinn recognized that the probable source of this toxemia was a pyuria due to pyelitis and an associated cystitis. Under the vigorous use of hexamethylenamin, the pyuria was markedly improved. Dr. McGlinn noted distinctly that when the pyuria was least marked there was practically no vertigo. During the past year and a half the patient has been practically free from either the pyuria or the vertigo. In the past few days, however, the pyuria has returned, and with it the vertigo.

Toxemias which produce a definite impairment of the internal ears include the powerful toxins, such as in mumps or syphilis, and also the repeated assaults of a milder toxin, such as those from the gastrointestinal tract or from a focal infection.

CASE 4.—Mrs. W., aged 58, had her first attack of vertigo in 1897. It lasted only a few minutes. She had three or four such attacks during the next fourteen years. A severe attack in 1911 occurred while she was walking along the street. These attacks came on at irregular intervals. In October, 1915, a severe attack occurred while she was sitting in the theater, and she was taken to the hospital, where she remained for seven days. Because of the attacks of nausea, vomiting, diarrhea and emaciation, a diagnosis was made of gallbladder carcinoma. Operation, however, showed the gallbladder to be negative. Subsequent ear examination made it perfectly plain that all her symptoms had been due to recurrent attacks of labyrinthitis. Her physician, Dr. Robert L. Pitfield, has noted that when she eats fish or eggs she has a marked gastrointestinal disturbance and that the vertigo accompanies this disturbance. Under dietetic treatment she has recovered, and at the present time is in excellent health.

CASE 5.—Miss C. H., aged 27, was referred by Dr. Francis Packard, who felt it advisable to remove the pathologic tonsils, but hesitated to do so because the patient had complained of severe and continuous vertigo for a period of over six months. This dizziness was almost continuously present. It made no difference whether she was lying down or standing. Occasionally at night the vertigo would be so severe as to wake her from a sound sleep. For the previous year or two the patient had noticed that when going up or down in an elevator she would almost faint. Six months ago, however, the definite vertigo began, and there appeared at the same time "an appearance of an eruption just under the skin." She had always had exceptionally good health until this skin eruption and vertigo commenced. The report of the ear examination read: "There is no evidence of any intracranial involvement along any of the pathways from the ear. There is a proportionate impairment of nystagmus, vertigo and past-pointing, indicating a slight impairment of function of the vestibular portion of the right labyrinth. The diagnosis suggested is a toxemia which has affected the internal ears at

intervals, thus producing the vertigo; the condition is in no sense serious. If the toxemia can be eliminated, it is probable that she will have no more attacks of vertigo." Dr. Packard removed the tonsils. In a few days there was a complete disappearance of the vertigo, and the skin eruption also disappeared at the same time.

CASE 6.—H. H., man, aged 42, was referred by Dr. Vincent Lyon with a history of an attack, nine months before, of acute articular rheumatism involving almost all the joints. At the time, the patient was confined to the hospital for seventeen days, and after leaving the hospital continued to have occasional recurrences of the involvement of the joints. Three months after the original attack, the patient began to complain of vertigo and staggering, and was referred for an examination of the ear in the attempt to discover the cause of the vertigo. The ear report read: "Examination shows a distinct impairment of both internal ears, in both the cochlear and vestibular portions. This suggests that a source of toxemia must be searched for. It may be that the same toxic substance that causes his joint involvement may also have caused this toxic labyrinthitis." Roentgenoscopy revealed abscesses at the roots of two teeth. These abscesses were drained by the removal of these two teeth. Within a week the patient ceased to have any vertigo or staggering, and also all the rheumatic symptoms entirely disappeared. That the removal of the focal infection at the roots of the teeth cured this patient entirely of all his symptoms makes it strongly suggestive that this focal infection was responsible for his entire illness. The toxemia, on the one hand, had involved the joints, and, on the other hand, had involved the internal ears, thus producing the vertigo and staggering.

These varied conditions that produce vertigo may be illustrated by the moving pictures. [Moving pictures were now shown, consisting of cases of different types of involvement of the labyrinth, including fistula from chronic middle ear suppuration; syphilitic neuritis of the eighth nerve; lesions of medulla oblongata and pons, including tumors, policephalitis and multiple sclerosis; lesions of cerebellum, including cases in which tumor has been removed with recovery; and cerebellopontile angle tumors, with necropsies.]

In conclusion, in any given case of vertigo the first thing to be done is to examine this ear-mechanism which is responsible for the vertigo. One thing we know positively—the tests will show either abnormal or normal responses. If the responses are abnormal, the tests will help to locate the point of the disturbance, either within the ear itself or along its pathways within the brain. If the responses are normal, we have then narrowed down the diagnosis to (1) a purely functional neurosis; (2) ocular disturbance, or (3) an evanescent toxemia, the source of which must then be searched for.

Therefore, just as we examine the urine in nephritis or diabetes, or as we have a Wassermann test made in cases of suspected syphilis, just so by the ear-tests we can analyze the apparatus responsible for dizziness. Only rarely does a "dizzy case" remain obscure after these ear-tests, and in most instances the diagnosis becomes clear and simple.

Medical Arts Building.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. SHAMBAUGH, KERRISON,
WEISENBURG AND JONES

DR. H. T. PATRICK, Chicago: I should like to ask Dr. Jones whether he has performed the Bárány tests on a man with alcoholic vertigo, drunk enough to stagger, and if so, what the results were.

I venture mildly to take issue with Dr. Shambaugh on the point that vertigo is due to a toxic or degenerative neuritis in the vestibular nerve. Vertigo is essentially a paroxysmal

affection. If there be such a thing as continuous vertigo, compared to a continuous tinnitus, it may be due to neuritis; but that the vertigo which comes on suddenly, lasts a few seconds, a few minutes or a half hour, should be due to a neuritis is repugnant to my neurologic training. Neuritis of a motor or a sensory nerve is a continuous condition—of irritation or the lack of conduction. There is pain or lack of sensation. The pain of a neuritis is a continuous pain; it is not a paroxysmal pain, not at all like tic douloureux, or facial neuralgia, which is essentially paroxysmal. The focal infections, which are so frequent, rarely cause neuritis; they cause arthritis. Most of the cases of such origin, supposed to be neuritis, notably brachial neuritis, sciatic neuritis, intercostal neuritis, are not neuritides at all; they are cases of arthritis of the shoulder, hip, and the joints of the spinal column. The neuritis of infection or intoxication is generally a multiple neuritis, though occasionally it is local. In either event the symptoms are not paroxysmal.

I believe that Dr. Weisenburg's caution is essentially apropos. We must draw definite conclusions with great circumspection. For instance, I recently held a postmortem on a young girl who had lost practically one half of her cerebellum with a cyst that had penetrated the pons beyond the middle line, so that the cyst on the right side caused a facial palsy on the left, and yet she never had a particle of vertigo. The question of vertigo in the neuroses is one of great interest and practical importance. The most important thing is that neuroses cause no vertigo. There is a sensation of dizziness, but it is not vertigo at all. In the neuroses there is apprehension and doubt, a feeling of great uncertainty, and definite phobias, constituting a kind of emotional vertigo. The patient has a feeling that he is going to fall, that he is going to stagger, that he has to hold to a person or piece of furniture to keep from falling. In fact, they do often hold on with a vigorous grip. But they really have no vertigo. These patients do not need investigation of the labyrinth. They need investigation of the personality in its widest sense.

DR. WELLS P. EAGLETON, Newark, N. J.: As otologists we must realize that the majority of patients with cerebellopontine angle involvement present themselves early in the disease because of ear symptoms, and frequently they have been treated for many months, and sometimes for years, for progressive deafness or for slight vertigo, before outstanding neurologic symptoms appear.

As to brain abscess, I am persuaded that every case of suppurating ear that gives any cerebral symptoms whatever should have a thorough functional test, as light may thus be had during the early stages of a brain abscess. Examination of the reported cases of brain abscess show that very few have been diagnosed early enough to give a proper chance of recovery, and this largely for the reason that in spite of suppuration of the middle ear, the functional tests that we now have have not been systematically and repeatedly followed while the patient was in condition intelligently to cooperate in their application.

Regarding neuroses, a large number of people come to us complaining of a sensation of dizziness. Sir Victor Horsley called attention to the frequency with which perversion of the sexual act causes a sensation of vertigo; in my experience this has been a common cause, and when a patient comes in complaining of a roaring in the head and vertiginous sensation, it has been my routine to question him regarding this, with the result, when present, that correction of this vice will promptly cure the vertigo.

As regards increased intracranial pressure, the systematic application of the cold caloric furnishes the otologist with the means of its early diagnosis, which may be as important as the papilledema of the ophthalmologist. In cerebellopontine angle tumors the increased intracranial pressure interferes, in a large proportion of cases, with the nystagmus and vertigo normally induced by the cold caloric of the unaffected side; when applied in the upright position the nystagmus is absent and no sensation of vertigo is elicited.

The fixation apparatus to which Dr. Jones referred is an instrument to be condemned. With the fixation apparatus, even if directly in front of the patient, there must be some

convergence, which inhibits more or less the normal reflex. Furthermore, in looking for evidence of nystagmus to the right with the apparatus in the side positions, as recommended by Bárány, the nystagmus is increased to the right when looking to the right, and diminished when looking to the left. Purely vestibular nystagmus should be studied with the patient looking straight ahead and at some distant point. I have done quite a little work with Alexander's modification of the von Stein goniometer motor, and had excellent results with it. Dr. Breen's modification has a support where the patient can put his heel. In the tests that I made, the patient's feet were bared and a little rosin used to prevent slipping. I was able by careful technic to obtain constant results in all positions.

Dr. Weisenburg pointed out that we may have vertigo without nystagmus, which is true; so, too, may we find nystagmus without vertigo; furthermore, we may find nystagmus, vertigo and past-pointing in a purely ocular condition—in those conditions in which there is a paresis of one of the extra-ocular eye muscles, pointed out by Stewart long ago, and quoted again by Panse in his monograph on "Schwindel." So in cases of doubt or even in mild cases, every possible source should be studied before coming to a positive conclusion that the nystagmus and vertigo are of vestibular origin. Vertigo may occur, as pointed out by Dr. Weisenburg, in cases of tumor in any part of the brain, provided there is sufficient pressure, especially if the pressure has been brought about within a reasonably short space of time. Recently I had a case of the kind. There was a large cyst in the frontal lobe. The patient had no vertigo, but he did have an excessive degree of physiologic nystagmus, while the two sides reacted excessively promptly to galvanism. Dr. Weisenburg mentioned one case in which Dr. Jones had given a patient considerable distress from testing, and I have seen such cases. One of the nicest and easiest things to do, if one has a neurotic patient, is to try the galvanic test. That is not so distressing to the patient as turning, since a normal reaction is obtained with three to five amperes, manifested by nystagmus without vertigo. The patient is not made sick with it.

DR. LEWIS FISHER, Philadelphia: In analyzing the findings of an ear examination one is guided by the following: 1. If stimulation of the labyrinth produces perfectly normal responses, both vertigo and nystagmus, there is evidently no impairment of the vestibular apparatus, and the vertigo is produced by something irritating the apparatus. 2. If stimulation of the labyrinth fails to elicit any responses whatever, the trouble is in the labyrinth or the eighth nerve, because that is the one place where one lesion would interfere with all of the reactions. 3. If a patient shows nystagmus and no vertigo, or vertigo and no nystagmus, such a lesion is not labyrinthine. An experience with many pathologic cases naturally teaches us to regard certain "phenomena-complexes" as meaning a lesion of a certain type and we are impelled to suggest occasionally a diagnosis. For instance, when ear findings show a nonreacting ear, with deafness on one side, with an absence of responses to stimulation of the vertical semicircular canals of the opposite side, we immediately recognize that all the cerebello-pontile tumors we have examined give just such findings, whereupon we do not think that we are presuming too much when we suggest to the neurologist that he is perhaps dealing with just such a lesion. To sum up, the otologist does not attempt to make a pathologic diagnosis; his function is to furnish information of which the neurologist may or may not avail himself as he pleases.

DR. E. L. MYERS, St. Louis: I work in a dispensary where we have about fifty cases a day, and the case that I am about to report has some relation to the Bárány test. A boy had been sent in by the school physician for a disturbance in his vision. This boy had a nystagmus which could be brought out by closing one eye and asking him to fix laterally. The boy could see absolutely perfectly and had no nystagmus when he was looking straight ahead, but the moment he closed the left or right eye, he showed equal nystagmoid movements with the unclosed eye. He was examined by neurologists and serologists, etc., but they could not make a definite diagnosis as to the cause. Dr. Max W. Jacobs of

St. Louis says that this is one of a few such cases reported. If Dr. Jones will help me out by explaining it, I will be obliged to him.

DR. NORVAL H. PIERCE, Chicago: What was the character of that nystagmus?

DR. E. L. MYERS, St. Louis: It was what I would consider a true spontaneous nystagmus. The motion would be one way at one time, but if the eye was turned to the other side, it would be the other way. The boy said he was afraid to walk on joists, and that when he stood on a street coping he had a sense of dizziness.

DR. GEORGE F. KEIPER, Lafayette, Ind.: I wish to emphasize the point brought out by Dr. Weisenburg with reference to the rotation test. I formerly was enthusiastic about this test, and then I saw several patients who were made worse after it. We ought not to make a rotation test with any person until we have given him a thorough physical examination, investigating all the details with reference to the organs, and then making an examination of the eyes. The examination of the eyes is important. I should like to ask Dr. Jones whether the patient with the insensitive cornea had glaucoma. Glaucoma sometimes produces vertigo.

DR. ISAAC H. JONES, Philadelphia.: It was a benign tumor.

DR. PHILIP D. KERRISON, New York: I wish to ask Dr. Weisenburg if in his opinion a tumor in the cerebellopontile angle would invariably cause vertigo; in other words, was the development of such a tumor with complete absence at all times of vertigo clinically possible?

DR. A. A. HAYDEN, Chicago: Dr. MacKenty spoke of electrical tests. There are three tests, the caloric, the turning and the electrical. I understand the latter is the least pleasant and least reliable. I should like to ask Dr. Jones to elaborate on this in his closing remarks.

DR. GEORGE E. SHAMBAUGH, Chicago: I wish to emphasize the following points: First, the most frequent cause for vertigo is disturbances in the internal ear, and of these internal ear conditions the most common is a progressive degenerative process which can readily be demonstrated by our functional tests. The second point is one which was brought out clearly in this symposium and in recent years is becoming more and more recognized by the specialists. This is that the work in any special field requires close cooperation between the specialist and men working in other lines of medicine. In this particular field the neurologist is our companion, but in many of our cases the internist is the one from whom we get the greatest assistance. I am convinced that we have already a very satisfactory basis for making a differential diagnosis between vertigo which is the result of disease processes in the internal ear, and vertigo which is caused by some intracranial disturbance.

I am glad to hear from Dr. Patrick definitely why he finds it difficult to accept the conclusions expressed in my paper, that the chronic degenerative processes in the internal ear which cause so many cases of vertigo may be the result of changes due to chronic focal infection. This objection expressed by Dr. Patrick, as I gather it, is that neuritis as the result of focal infection is a process which runs a more or less chronic course, whereas, in these cases of vertigo the disturbance is almost always temporary. Dr. Patrick's difficulty lies in the fact that he has failed to grasp the significance of the symptom of vertigo. Vertigo is always a temporary affair and even when it is the result of a sudden, complete destruction of the function of the internal ear, the vertigo lasts a very short time, at most a few weeks. Vertigo is never caused by a slowly progressing process which is destroying the function of the internal ear. Its presence always indicates a sudden acute exacerbation of this process. Now, as a matter of fact, in the cases referred to in my paper there is going on in the labyrinth a chronic, progressive degenerative process which is not a temporary affair, but is exactly like the chronic degenerative neuritis such as involves the optic nerve in cases of focal infection. The symptom of vertigo arises in these cases only when there happens to be an acute exacerbation, and then only when this acute process involves the vestibular part of the ear.

DR. THEODORE H. WEISENBURG, Philadelphia: In regard to Dr. Kerrison's question, I have seen a number of instances of tumors of the cerebellopontile angle without vertigo, but in these cases the eighth nerve was not involved pathologically.

Regarding Dr. Fisher's comments, I only wish to emphasize that the future advances in this work will altogether depend on the coordination of those interested and the neurologists, because the latter are chiefly concerned with it. It is necessary to go slowly in assuming that the anatomic data are indisputable, until that is definitely proved by pathologic work. I am glad to say that such coordination is not only possible, but is actually going on in Philadelphia.

DR. ISAAC H. JONES, Philadelphia: Dr. Patrick has asked about the effect of alcohol on the internal ear. Those enthusiasts in Vienna who started the studies of the labyrinth made it a point to test individuals who were intoxicated. The turning and caloric tests produced *hyperactive* responses in nystagmus, past-pointing, vertigo and falling, and especially in nausea and vomiting. Alcohol unquestionably produces a hyperactive condition within the labyrinth.

In regard to the case of spontaneous nystagmus the etiology of which is obscure, it is possible that this case may be cleared up by means of the ear tests. It is in just such obscure cases that the ear tests are of value.

ACUTE ASCENDING TOXIC (OR DEGENERATIVE) MYELITIS

REPORT OF A CASE WITH NECROPSY FINDINGS

JULIUS R. GLOBUS, M.D.

NEW YORK

This is an extremely rare disease, and there are only a few cases on record. In some cases the exact nature of the condition has probably been overlooked, and they have gone on record by the name of the similar and somewhat more common disease known as Landry's paralysis. But the clinical picture, and to a certain degree also the histologic findings, in these two allied conditions are so different and distinct, that there should be no difficulty in classifying them as two entirely separate diseases.

REPORT OF CASE

History.—L. W., a man, aged 31, white, born in the United States, a bricklayer, was admitted, May 3, 1917, to Dr. C. E. S. Webster's service. The patient was well developed physically and well nourished. He had never been sick before, except for measles in early childhood. The family history was negative. He drank and smoked moderately. There was no history of sexual excesses, exposure or trauma. Syphilis and gonorrhea were denied. On the night before admission, he came home slightly under the effects of alcohol, but apparently well otherwise. When awakening next morning he found himself helpless to such a degree that he could not even change his position in bed. Both upper and both lower extremities were found in a condition of complete flaccid paralysis, with the exception only of the fingers of the right hand, which he could move slightly, but which were also found paralyzed a few hours later. He could, however, move his right shoulder until a few hours previous to his death. In addition, all the muscles of the trunk were paralyzed, and breathing was purely diaphragmatic.

Course.—The neck showed slight rigidity, but the patient could move his head in all directions, although these movements were slightly painful; otherwise there was no pain anywhere. The face was pale in the beginning and became flushed with the rise in temperature. The pupils were moderately dilated, equal, and reacting to light and accommodation. Nothing abnormal was found about the heart or lungs. The liver and spleen were not palpable. The bladder was very much distended, and on catheterization 73 ounces of urine were obtained. The bowels were obstinately constipated. All reflexes were gone.

Sensation was completely lost in both lower extremities and trunk, and very markedly diminished in both upper extremities; it was only slightly diminished, if at all, in the lower part of the neck.

The patient's temperature on admission was 95 F. The pulse was 60, and respiration 24. The patient was given strong hot coffee, a hot enema and plenty of external heat. The temperature was going up gradually, and in seven hours reached 97.5 F. Pulse was 100 and respiration 26. Four hours later the temperature was 100, pulse 120 and respiration from 26 to 30, and remained at this height until death.

The patient was fully conscious, and his mind remained perfectly clear throughout the illness. He was quite comfortable until the last hour, when he apparently began losing control over the muscles of articulation and deglutition.

When he had been in the hospital for twenty-seven hours (and between thirty-six and forty-two hours after the onset of the disease) the patient became suddenly deeply cyanosed and died in a few minutes, from respiratory paralysis.

The urine showed a faint trace of albumin, but otherwise was negative.

The blood count revealed 12,000 white cells, 82 per cent. polymorphonuclears, and 18 per cent. small lymphocytes.

Lumbar puncture gave 35 c.c. of perfectly clear, colorless fluid under pressure, with sixty cells per cubic millimeter; negative globulin and positive sugar. Smear and culture revealed no organisms. The spinal fluid Wassermann test was negative.

Necropsy.—This revealed the medulla, cervical cord and upper dorsal very soft and spongy throughout, and the cord congested in the anterior portion. There were no changes in the brain. The spleen was somewhat enlarged and congested. There were no changes in any of the other organs.

Histologic examination revealed the general topography of the cord not altered. The spinal meninges were normal, except for a slight dilatation of the blood vessels. Round cell infiltration was absent.

The gray matter of the cord showed vacuolation of the anterior horn cells, which in certain areas had proceeded to fragmentation of the cell. There was a generalized edema of the anterior horns, the edema extending to the posterior horns. The blood vessels were markedly dilated, and not surrounded by round cell infiltration. The changes outside the gray matter consisted of a general edema of the nerve fibers and supporting neuroglia, with absence of round cell infiltration.

Sections of the medulla showed, as the only demonstrable histologic change, a generalized edema with absence of hemorrhage, round cell infiltration, or other evidence of inflammation.

COMMENT

It is clear that this case belongs to the group of diseases which are often known under the general term of acute ascending paralysis, the other members of this group being Landry's paralysis and acute anterior poliomyelitis (especially the fulminant type). But it differs from the others clinically by the loss of sensation, there being either no change in sensation at all in the two others, or hyperesthesia, if any, and complete absence of pain, this element being present to a certain degree in Landry's paralysis — pain in the back and tingling and cramp like pain in the extremities — and still more marked in poliomyelitis.

Pathologically, we meet here a condition of acute degeneration of the nerve elements and neuroglia with nearly complete absence of inflammatory changes, as adventitial and perivascular cell proliferation, which differentiates it from acute poliomyelitis, as well as from inflammatory or infiltrative myelitis, while true cases of Landry's paralysis present practically no changes either gross or microscopically, with the exception of slight edema and some general hyperemia of the cord.

Lincoln Hospital and Home.

Special Article

MODE OF INFECTION, MEANS OF PREVENTION AND SPECIFIC TREATMENT OF EPIDEMIC MENINGITIS*

SIMON FLEXNER, M.D.

NEW YORK*

SERUM TREATMENT

(Concluded from page 725)

Mode of Administering the Serum.—In practice the first dose of the serum is injected without delaying until a positive culture result or even a positive microscopic film is obtained. The clinical signs having aroused suspicion that the case may be one of epidemic meningitis, lumbar puncture is performed. A fluid at all turbid is taken to be presumptive evidence of meningococcus infection. A fluid quite clear arouses doubt. But in the latter instance, immediate centrifugalization and microscopic examination of the sediment may show beginning leukocytosis, and the application of the Noguchi test²⁰ excess of globulin. Those findings indicate an inflammatory process. The latter test may be carried out while the lumbar puncture needle is in position, as may also the microscopic examination of a film stained by Gram's method in order to reveal gram-negative micrococci, presumably the meningococcus, within or outside the leukocytes.

The disease having, through bacteriologic examination of the cerebrospinal fluid or nasopharynx, been shown within another twenty-four hours to be definitely or with a high degree of probability epidemic meningitis, the subsequent course of treatment will be determined by its severity and progress.

The steps, therefore, are as follows: Diagnostic lumbar puncture, the results of which arousing suspicion, is followed immediately by the injection of 30 c.c. of the antimeningococcic serum in adults and corresponding doses in children. The cases having been proved by bacteriologic examination to be epidemic meningitis, two or three additional doses are administered at successive twenty-four hour intervals, irrespective of any favorable outlook, unless there arise definite indications to the contrary. The purpose of the three or four successive doses is to guard against relapse when the symptoms seem to yield completely to the first injection or two of the serum. The

number of injections required by a case of average severity is from four to six.

When the onset is more violent or the case has come under observation at a later stage, the procedure is the same, except that it may be advisable to repeat the injection at twelve hour intervals on the first day and even afterward. The number of doses of serum required for this class of case averages from six to ten. Not a few cases have terminated in recovery when very protracted; and instances are reported in which 1 liter or even more of the serum has been injected into the membranes in doses ranging from 30 to 60 c.c. before the infection finally yielded. The prolonged course results from repeated relapses or reinfection of the meninges arising from some protected focus of multiplication of the meningococcus not freely reached by the serum. This condition may be due to late or to inadequate treatment, but has been known to appear in spite of vigorous and even early beginning of the serum injections.

In instances of which very few have been reported, the meningococcus induces a general blood infection without concomitant changes in the cerebrospinal fluid. Intravenous injections of the serum in doses of from 40 to 60 c.c. are indicated and have been successfully employed.

The maximum dose of the serum is not 30 c.c. In very severe or in protracted cases, quantities of 40 and even 60 c.c. may be administered. The massive quantities have been known to bring about an arrest of the infection in certain cases which were not responding well to the smaller doses. It is, however, the exceptional case in which the larger doses are required.

The administration of the serum should be continued until the temperature has fallen to and continues at normal for two or more days; but as in some cases the cerebrospinal fluid becomes clear of meningococcus and even of inflammatory cells and the obvious symptoms abate, although the temperature still keeps above normal, it is desirable to interrupt the injections of the serum and to observe closely the effects under the latter rather unusual circumstances. If the serum is too abruptly discontinued without taking account of the general symptoms and local conditions, the probability of relapse is increased.

Withdrawal of cerebrospinal fluid always precedes the injection of the serum, and it is advisable to remove a volume of the fluid greater than that of the serum injected. Not infrequently from 50 to 60 c.c. of the fluid may be withdrawn. Some physicians of experience prefer always to perform lumbar puncture in adults under general anesthesia. Certain patients are very sensitive to the puncture and apprehensive of it, and the introduction of the serum is sometimes attended with severe pain in the buttocks radiating down into the legs. Moreover, under the semi-asphyxial condition induced by the anesthetic, the pressure in the cerebrospinal fluid rises and a more voluminous outflow is obtained. Quantities of the fluid of from 70 to 100 c.c. may thus be removed. Younger persons and young children especially mind the puncture much less.

And yet it is doubtful whether a general anesthetic should be resorted to except in special instances; in very sensitive patients a local anesthetic may be advisable.

The mere withdrawal of a quantity of cerebrospinal fluid with its contents of multiplying and

* From the Laboratories of the Rockefeller Institute for Medical Research.

* As the subject matter of this article is of timely importance, the reprints have been prepared in advance of the publication in THE JOURNAL, and can be had by sending a stamped, self-addressed envelope to this office or to the author.

20. Two parts of the cerebrospinal fluid to be examined are mixed with 5 parts of a 10 per cent. butyric acid solution on physiological salt solution and are heated over a flame and boiled for a brief period. One part of a normal solution of NaOH is then added quickly to the heated mixture, and the whole boiled once more for a few seconds. The actual quantities of these three agents preferred are 0.1 or 0.2 c.c. of the spinal fluid, 0.5 c.c. of the butyric acid solution, and 0.1 c.c. of the normal sodium hydroxid. It is necessary to take the precaution to employ for this test only cerebrospinal fluid entirely free from blood. The presence of an increased content of protein in the cerebrospinal fluid is indicated by the appearance of a granular or floccular precipitate, which gradually settles to the bottom of the tube, beneath a clear, supernatant fluid. The velocity and intensity of the reaction vary according to the quantity of the protein contained in a given specimen. The greater the amount of the protein, the more quickly and distinctly the reaction appears. The granular precipitate appears within a few minutes in a specimen containing a considerable increase in protein, while one hour may be required to obtain a distinct reaction in specimens weaker in protein. In obtaining the reaction, the time period should not be greater than two hours. (Noguchi, H., Serum Diagnosis of Syphilis and Luetin Reaction, Philadelphia and London, 3d edition, 1912, 223.)

degenerating meningococci may be in itself a benefit; however this may be, it is quite certain that a lumbar puncture performed during the recovery to relieve pressure often seems to speed up the convalescence.

The directions for administering the serum may be stated as follows:

The lumbar puncture is performed under aseptic precautions in the third or fourth lumbar space. The patient lies on the side with the back arched, thus giving the greatest possible distance between the spines of the vertebrae. The notch nearest a line connecting the crests of the ilia is found, in the midline of which the needle is introduced and pushed forward and a little upward. The distance to which the needle sinks depends on the muscular development and age of the patient: it varies from $\frac{1}{2}$ to 3 inches. The cerebrospinal fluid is allowed to flow out until the pressure is so reduced that only three or four drops come per minute. The serum is warmed to body temperature and introduced *very slowly* under the least possible pressure and *preferably* by the gravity method. The barrel of a syringe or a funnel may be used. The rubber tubing should be long enough to be raised from 12 to 15 inches, and its diameter should be from $\frac{1}{8}$ to $\frac{1}{4}$ inch. The quantity of serum injected should be less by from 5 to 10 c.c. than the volume of fluid withdrawn. In cases in which no fluid can be removed (so-called dry tap) and the serum still appears to flow into the membranes, great care must be exercised and the patient closely watched for the slightest change in pulse and respiration, which indicates that the introduction must be stopped. If, during the administration of the serum or immediately afterward, the respiration should entirely cease or the pulse become rapid and thready, it is advisable to withdraw some of the serum while the needle is still in position, or even to reintroduce the needle for the purpose immediately. These alarming symptoms are not necessarily serious; but if the withdrawal of serum does not ameliorate the condition, artificial respiration should be at once instituted and protracted if necessary and epinephrin or other heart stimulant injected hypodermically. Sometimes the exudate in the meninges is very thick and refuses at first to pass out through the needle. Gentle suction with a syringe may be tried, or warmed sterile salt solution, or even the serum may be allowed to run in and then out in order to start the flow.

The injection of the serum may also be controlled advantageously by employing a blood-pressure apparatus as advised by Sophian.²¹ The withdrawal of cerebrospinal fluid exerts an inconstant effect on the blood pressure. Usually there is a fall; when the fall equals 10 mm. of mercury, the removal is interrupted. The pressure is then used as the guide to the quantity of serum injected. As a rule, rapid injection with force causes a still greater drop. Using the gravity method, it is advisable to allow ten minutes for the dose to run into the meninges; sometimes twenty minutes may be safer, especially in cases with low pressure at the beginning or in which the pressure dropped quickly. A fall of the pressure of 20 mm. of mercury in an adult with average pressure of from 110 to 120 mm. of mercury is regarded as a proper indication to discontinue the injection. Occasionally there is an initial rise in the pressure after a few cubic centimeters of serum have flowed in followed by a subsequent drop as larger

quantities are injected. Rarely the pressure rises materially after the injection is completed. Through the use of this guide the quantity of serum given at a dose tends to be smaller than when the pressure is not taken. In employing this control, the aid of an assistant is required to take the blood pressure.

Mode of Action of the Serum.—The serum acts locally on the meningococcus and on the exudate, and in this way arrests the infection and promotes subsidence of the inflammation and restoration of the damaged membranes. To bring about these effects, it must be brought into direct relation and kept in continuous contact with the seat of infection. Since the serum reaches the normal meninges not at all and the inflamed meninges very little from the blood, it is useless to inject it subcutaneously or even intravenously in expectation that it will find its way into the subarachnoid space. Moreover, to be effective, it is necessary that the serum should be maintained continuously and in high concentration in the meninges, and as the cerebrospinal fluid is constantly leaving the subarachnoid space by way of the venous blood, the injections must be repeated at suitable intervals.

The first effect of the serum is undoubtedly to injure the meningococcus, which quickly becomes reduced in numbers, is altered in size and staining property, is more numerous taken up by leukocytes (phagocytes), and especially loses its power to grow in cultures. These changes may result from the first or a subsequent injection. The morphologic alterations produced by the serum consist of swelling, fragmentation and weaker staining power of the meningococcus.

The restraint put on the multiplication of and the degeneration produced in the meningococcus by the serum is promptly followed by a clearing up of the turbid or even purulent cerebrospinal fluid. As the inflammatory exudate loses pus cells and returns to a limpid condition, the leukocytes in the general blood, increased during the accession of the inflammation, undergo reduction in number.

In accounting for the beneficial action of the serum, its several properties and associated effects must be taken into account. That it acts directly on the meningococcus and depresses its viability is readily shown both by film and culture tests. The meningococcus is not only altered in form and made more readily phagocytizable after one or several of the serum injections, but the disintegration products are also neutralized by the antiendotoxin contained in the serum. Hence the serum possesses bacteriolytic, bacteriotropic (opsonic) and antiendotoxic properties. Levy has prepared an interesting statement of the periods of disappearance of the meningococcus from the cerebrospinal fluid: Thus in eighteen cases it was no longer found after the first injection, in thirty-three cases after the second, in thirty-five cases after the third, in fourteen after the fourth, in nine after the fifth, in four after the sixth, and in one after the eleventh.

The injection of horse serum into the meninges is always followed by transient leukocytosis of the cerebrospinal fluid. Hence when antimeningococcic serum is administered in cases in which the fluid is almost clear, it will be found more turbid on the next puncture twenty-four hours later. This leukocytosis due to the aseptic inflammation induced by the horse serum is harmless; it quickly subsides. Notwithstanding its

21. Sophian: Epidemic Cerebrospinal Meningitis, St. Louis, 1913, p. 54.

power to induce leukocytosis, the arrest of the infectious process in cases in which the fluid is turbid or purulent nevertheless enables the serum to bring about rapid clearing up of the fluid.

Influence on Duration of Disease and Mode of Termination.—Cases of meningitis are very varied in respect both to their intensity and to their evolution. Rarely the disease sets in severely and yet terminates in recovery, sometimes in a few days; or the onset is mild, although later the infection develops an alarming gravity; while yet again the disease progresses slowly or continuously through weary weeks or even months to end usually, but not always, in death. The cases of ordinary severity pursue a middle course, while the fulminant ones arise and terminate within from a few to forty-eight hours. The last variety to be mentioned is the ambulant, sometimes called abortive cases:²² the subjects are commonly slightly ill so that recovery is the rule. Nevertheless in rare instances death may suddenly supervene; while somewhat more frequently the slight illness intensifies progressively until the ordinary form is evolved.

Accurate knowledge is lacking of the relative frequency with which the several types of meningitis occur in different epidemics. Information of the frequency of the extreme cases—the fulminant and the abortive or ambulant so-called—is particularly desirable. Probably the last two should not be thrown together, as the former tends to set in sharply and terminate in recovery by crisis, while the latter begins insidiously and later attracts attention by suddenly passing into the severe disease. Exceptionally an outbreak has been composed wholly of mild or abortive cases proved by bacteriologic examination of the cerebrospinal fluid to be epidemic meningitis. The proportion of fulminant cases appears to be larger at the beginning than at the end of an epidemic. Certain epidemics have been notable by reason of their absence. Again, they have appeared in associated groups, one case following another in rapid succession in barrack, school or family.

Neither the symptoms nor the mode of evolution support a definite prediction as to the probable course of the disease. A sharp discrimination between the several clinical types of the disease set up is often wanting in practice. Hence the outcome of single cases is an uncertain guide to the value of a therapeutic measure.

Death may be considered as taking place under three sets of circumstances: (a) rapidly, after sudden onset, as in fulminating meningitis; (b) through a gradual intensification of the symptoms and after a duration of six to ten days, or (c) slowly and after the disease has become chronic.

Recovery also, when it occurs, is not by a single mode but at least two modes of termination. The transition to convalescence and recovery is generally by a process of gradual amelioration of the symptoms, or lysis. Exceptionally, the transition takes place abruptly by a sudden cessation of the symptoms, or crisis.

The duration of the disease may be considered according to the period elapsing before either death or recovery takes place. Flatten analyzed 1,481 cases according to the time of death: Twenty-five per cent.

terminated within the first three days, 24 per cent. from the fourth to the seventh day, and about 50 per cent. later than the seventh day of illness. Survival for the first weeks afforded no great insurance of recovery. One half of the cases surviving the first week terminated between the fifth and eighth week.

Viewed from the side of recovery, the duration fluctuated with the type of case. Strümpell states that the critical period falls between the fifth and tenth day when either death results or convalescence begins; but the previous figures given do not bear out this formula. Heubner states that the average duration of the disease terminating by lysis is from four to six weeks; Ziemssen gives from two to four weeks, and Holt's figures for the New York epidemic of 1904-1905 show that among 350 cases in which the patient recovered, the duration in 3 per cent. was one week or less and in 50 per cent. five weeks or longer.

All the foregoing relates to nonserum treated cases. The question now arises as to the influence of the serum treatment on the duration and manner of recovery. Undoubtedly the usual mode of spontaneous recovery is by lysis, and the exceptional mode is by crisis. The histories of 830 serum cases treated and recorded have been analyzed by Flexner from the point of view of the length of persistence of active symptoms and the manner of recovery. As regards the first, the average period of active symptoms was eleven days. This period does not embrace the entire time during which the patients were under observation, as recovery of lost strength and ability to resume ordinary vocations took a greater number of days. But what is especially striking is the fact that in 30 per cent. of the 830 cases, the cessation of the active symptoms was abrupt or by crisis. But manner of recovery is influenced by the period of the disease at which the serum injection is begun, for while termination by crisis and by lysis occurs about equally when the injection of the serum is begun in the first three days of illness, the number of cases ending by lysis rises steadily when the injections are begun later than the third day. Levy, who has especially considered the duration of the active symptoms under the serum treatment, states that in 127 cases it averaged 12.5 days, but calculated from the time elapsing after the first serum injection was given, it was only 6.86 days. By termination of the disease is meant the disappearance of fever and usual symptoms and return of cerebrospinal fluid to normal. One effect often persists for some time after all other active symptoms have abated, namely, stiffness of the neck with or without retraction. Finally, and in due time this yields.

COMPLICATIONS: SEQUELS, RELAPSE, ACCIDENTS AND MIXED INFECTIONS

The attendant conditions arising in the course of epidemic meningitis are various: The common complications are due to intercurrent infections of the respiratory tract, otitis media and certain rarer affections. The sequels which are of specific nature affect various organs of importance. Taken together they have included from 20 to 25 per cent. of all cases accurately observed during the preserum period. Since the employment of the serum has become more general, the occurrence of complications and sequels, aside from serum disease, has diminished. Thus the French and German figures of the recent epidemic

22. Hochhaus, H. (Deutsche med. Wchnschr., 1915, 41, 1185), has observed a group of abortive cases in some of which the cerebrospinal fluid was clear, contained an excess of albumin, and in two instances revealed meningococci.

give from 20 to 25 per cent. as the preserum figures. Netter and Dopfer have given for the serum period 6.3 and 6.2 per cent., respectively.

Sequels.—The three severer specific sequels relate to the meningococcus infection of the internal ear, the eye and the joints; while other serious sequels consist of hydrocephalus, residual paralysis or impaired mentality. The most frequent severe sequel is that resulting from the involvement of the structures of the internal ear. The figures of the preserum period covering this affection as given vary from 12 to 33 per cent. Among the 1,294 serum-treated cases analyzed by Flexner, permanent affections of the internal ear occurred in forty-five instances, or 3.5 per cent. Deafness was complete in thirty-nine and partial in six instances. The eyes are less frequently attacked. The milder affection consists of meningococcic conjunctivitis, probably due to extension of the infection from the nose by way of the tear duct. The severer affection is an iridochoroiditis or metastatic ophthalmia,²³ arising usually in one eye only, and frequently leading to destruction of the bulb. The frequency for the preserum period given varies from 4 to 10 per cent. of all cases; in Flexner's series the percentage was 1. Arthritis is also a variable sequel. Severe inflammation and suppuration arise in part only of the affected joints. When suppuration occurs, the injection of the antimeningococcic serum into the joint has been followed by prompt amelioration of the symptoms.²⁴

The frequency with which the sequels arise would seem to have been definitely influenced by the serum treatment except in the case of deafness due to involvement of the essential structures of hearing. The attack on the auditory nerve and internal ear follows sometimes so soon after the appearance of the first signs of meningitis that the hearing is either already impaired or lost on the second day of illness. But as, in not a few cases, the inner auditory apparatus is involved later in the course of the disease, it is quite probable that the prompt arrest of the infection, which often results from the serum, may serve to reduce materially the frequency with which this lamentable by-effect is produced.

Paralysis and impaired mentality are infrequent sequels, but hydrocephalus is a frequent resultant of epidemic meningitis. The internal form of hydrocephalus arises from interference with the escape of the cerebrospinal fluid, usually or invariably infected with the meningococcus, from the cerebral ventricles. The imprisonment of the fluid is brought about sometimes from closure of the exits at the base of the brain by an inflammatory exudate plastered over the foramina of Magendie and Luschka. In other instances, however, there is no organic obstruction but merely a functional lack of mechanical resistance which permits distention of the ventricles under moderate pressure, eventuating possibly in temporary obliteration of the outlets of the fourth ventricle by the weight of the dilated lower horns which press the cerebellum down against the medulla.

The importance of the recognition of the essential pathology of internal hydrocephalus in epidemic meningitis arises from the fact that when separation has been effected between the spinal subarachnoid space and the cerebral ventricles, so that the antimeningococcic serum cannot be introduced into them through lumbar puncture, it may nevertheless be safely and even efficiently introduced directly by ventricular puncture. Already several cases have been reported in which the infected and purulent ventricular fluid has been removed and replaced by the serum to be followed by complete recovery.²⁵

The technic of intraventricular injection of the serum is not attended with particular difficulty in young children with open fontanel. The scalp over the anterior fontanel is shaved and rendered surgically aseptic. The needle, which is about 8 cm. long, is inserted near the lateral angle of the fontanel, about 2.5 cm. from the median line, and is gently pushed downward and slightly inward toward the median line to a depth of about 3 cm., when the cerebrospinal fluid will usually begin to flow. When this has ceased, a quantity of serum, usually considerably less than the amount of fluid withdrawn, is allowed to run in by gravity. In older children and in adults a trephine opening is made at a point 3 cm. above and behind the external auditory meatus before tapping the ventricles.

Serum Disease.—The use of the antimeningococcic serum, like all other therapeutic serums, is attended with so-called serum disease. It is even possible that this annoying, but usually harmless attendant on serum therapy is more frequent after subarachnoid than after subcutaneous administration. From one third to one half of the treated patients develop some degree of serum disease. The condition comes on about the eighth or tenth day with fever, the usual skin eruption, pain in the joints, digestive disturbance, etc. The important thing is not to mistake these symptoms for a relapse of the infection. Usually any doubt may be immediately removed through lumbar puncture and examination of the cerebrospinal fluid, which will show few cells and no meningococcus. The reinjection of the serum, under the impression that a relapse is threatening, is to be avoided for the reason that a temporary accession of the symptoms, including retraction of the head, may be induced through the fleeting aseptic chemical meningitis induced. Moreover, because of the interval between the last injection and the reinjection, conditions may be favorable to the induction of the anaphylactic reaction, which should, of course, be avoided.

Relapse.—A certain number of the patients responding to the serum treatment suffer recrudescences or relapses of the severe symptoms. This condition is attended by a reinvasion of the cerebrospinal fluid, previously clear or clearing, by the meningococcus. It is sometimes difficult to state or determine just what constitutes a relapse, and the danger of confusing the condition with serum disease has just been mentioned. The most trustworthy guide, next to long and complete intermission of the symptoms, is afforded by bacteriologic and cytologic examination

23. Netter (Compt. rend. Soc. de Biol., 1915, **68**, 90) recorded two instances of suppurative iridochoroiditis due to meningococcus in which the intravitreal injection of the serum is stated to have led promptly to the abatement of the inflammation. Sight was retained.

24. Longo. A. (Pediatria, 1917, **25**, 312; Abstr., THE JOURNAL A. M. A., 1917, **69**, 322), has just reported on 31 cases, of which 19 were given adequate serum treatment and all recovered without appreciable sequels, while the remaining 12 either received no serum or were given in all one or two injections. Of the latter, 7 died and the other 5 were left with deafness, hydrocephalus, mental impairment, or convulsions.

25. Cushing and Sladen: Jour. Exper. Med., 1908, **10**, 548. Fischer L.: New York Med. Jour., 1910, **91**, 625. Netter and Debré: La méningite cérébro-spinale, Paris, 1911, p. 272. Bouché: Jour. de méd. de Bruxelles, 1912, **17**, 61. Neveu-Lemaire, Debeyre, and Rouvière, Compt. rend. Acad. sc., 1916, **162**, 88. de Verbizier, A., and Chauvel, F. (Bull. et mém. Soc. méd., 1916, **32**, 1138), report an adult case with recovery and refer to another successful case in an infant by Triboulet, Rolland and Fenestre. Korteweg: Nederl. Tijdschr. v. Geneesk., 1917, **1**, 1340; Abstr., THE JOURNAL A. M. A., 1917, **69**, 160.

of the cerebrospinal fluid. Returning turbidity of the fluid with increasing cell count, and especially the reappearance of the meningococcus, are decisive. Prompt resumption of the serum injections often, but not invariably, suffices to suppress the reinfections of the meninges arising doubtless from some protected, because little accessible, active focus in the meninges or ventricles.

Accidents.—Certain accidents, though rare, are known to attend the subarachnoid injection of the antimeningococcic serum. They are sometimes alarming, but of very brief duration and sometimes so serious as to threaten life. They arise chiefly from two causes: (1) increased intracranial pressure, and (2) anaphylaxis. The notion, advanced a few years ago, that the phenolic preservative employed to maintain sterility in the serum is the dangerous agent, has not been supported by painstaking experimental study, and close observation of treated cases of epidemic meningitis.²⁶ Attention has already been drawn to the importance of care in the introduction of the serum, which is best accomplished by the gravity method; in that way excessive intracranial pressure is guarded against. Should arrest of the respiration, weak heart action and collapse occur, withdrawal of the serum, prolonged artificial respiration and cardiac stimulants by hypodermic injection are indicated. Everything should be in readiness at the time the serum is administered to carry out these restorative measures. Anaphylaxis, a far less frequent but apparently possible source of accident, is to be guarded against as in the analogous instance of other therapeutic serum injection by means of a desensitizing dose of the serum introduced subcutaneously.

In this connection, it is well not to lose sight of the essential fact that in epidemic meningitis the struggle is with a highly fatal disease, and the one means now possessed to combat it is the antimeningococcic serum. From this it follows that it is not justifiable to withhold the remedy because of a remote danger of accident when a far greater danger threatens by reason of the fatality of the disease itself.

Mixed Infections.—In certain instances mixed infections of the meningococcus and other pathogenic bacteria arise. They are rare. The severer and more frequent concomitant infecting micro-organisms are the staphylococcus, streptococcus and pneumococcus. The first two have been known to be introduced into the meninges by the lumbar puncture needle, especially in cases in which many punctures have been made. It is sufficient to point out this danger, in order to indicate the way to avoid it. Concomitant infections with the tubercle bacillus have been reported by several bacteriologists. The cases of mixed infection are uninfluenced essentially by the antimeningococcic serum and, invariably or practically so, end fatally.

CONCLUSIONS

The foregoing presentation of the case for the prevention and specific treatment of epidemic meningitis is founded on what appears to be a considerable array of facts and trustworthy testimony of the feasibility of the one, and the marked success of the other. There is, therefore, very little to add in the form of concluding remarks. That every practical effort will be made by the military and civil authorities to control epidemic meningitis among our troops and our civilian

population, we must believe. It may, therefore, suffice to quote here the conclusion arrived at by the author after critical study of 1,300 cases of the disease treated with the serum supplied by the Rockefeller Institute:

It is our belief that the analyses of histories of cases of epidemic meningitis which have been presented, furnish convincing proof that the antimeningococcic serum, when used by the subdural method of injection, in suitable doses and at proper intervals, is capable of reducing the period of illness; of preventing, in large measure, the chronic lesions and types of the infection; of bringing about complete restoration to health, in all but a very small number of the recovered, thus lessening the serious, deforming and permanent consequences of meningitis, and of greatly diminishing the fatalities due to the disease.

But, finally, it may be observed that these results, devoutly to be desired and capable of being accomplished, are all contingent on the production and administration of adequate preparations of the antimeningococcic serum. And it may well be feared that unless proper control and standardization of the serum are undertaken, our hopes and just expectations will not be realized.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, SECRETARY.

CALCREOSE.—A mixture containing in loose chemical combination approximately equal weights of creosote and lime.

Actions and Uses.—Calcreose, when administered internally, is claimed to have the same actions and uses as creosote. It is claimed that calcreose does not readily produce gastric distress, nausea and vomiting.

There is some evidence to indicate that by the use of calcreose, relatively large quantities of creosote may be administered, but it appears probable that such tolerance is due to the slower absorption and excretion and therefore decreased efficiency. That the creosote contained in calcreose is liberated in the body is evident from the fact that during its elimination by the kidneys it has produced albuminuria and phenol urine.

Dosage.—From 0.25 to 1 Gm. (4 to 16 grains) every two to four hours, beginning with small doses and gradually increasing until tolerance is reached. Calcreose may be given in the form of calcreose solution or as tablets (see below).

Manufactured by the Maltbie Chemical Co., Newark, N. J. U. S. patent No. 1,047,961 (Dec. 24, 1912; expires 1929). U. S. trademark No. 94789.

Solution Calcreose.—Prepared by adding 454 Gm. (1 pound avoirdupois) calcreose to 3785 Cc. (1 gallon) of water, agitating occasionally during twenty-four hours, filtering and adding enough water through the filter to make 3785 Cc. (1 gallon) of solution.

Dosage.—Four to 8 Cc. (2 to 4 fluidrachms) in a half-glass of water, followed immediately by one-half glass of water, beginning with 4 Cc. (1 fluidrachm) in one-fourth glass of water.

Calcreose Tablets, 4 grains.—Each coated tablet contains calcreose 4 grains.

According to the patent specifications calcreose is made by the interaction of equal parts of creosote and lime in the presence of water. A minute quantity of phenolphthalein is added to the finished product to improve the color of calcreose solution.

Calcreose is a dark brown powder, having an empyreumatic odor and a sharp phenolic taste. It is partially soluble in water; the alkaline solution containing calcium compounds of the phenolic bodies of creosote while the insoluble portion consists largely of calcium hydroxide and calcium carbonate.

BETANAPHTHOL BENZOATE (See N. N. R., 1917, p. 197).

Betanaphthol Benzoate-Calco.—A non-proprietary brand complying with the standards for betanaphthol benzoate.

Manufactured by The Calco Chemical Company, Bound Brook, N. J.

26. Flexner, Simon: THE JOURNAL A. M. A., 1913, 60, 1937. Auer, J.: Jour. Exper. Med., 1915, 21, 43.

Therapeutics

FOOD FOR CHILDREN FROM TWO
TO SEVEN

It is possible to fulfil the requirements of a proper diet, meet the conditions of present unusual prices, and still have a wide choice of foods for children from 2 to 7 years of age, according to a leaflet of the Department of Health of the City of New York. This leaflet was prepared on account of the dearth of compiled information on the feeding of the important group in the community between the ages named. It represents careful work by Drs. L. Emmett Holt,

TABLE 1.—COST OF FATS

	Cost of 1,000 Calories, Cents	Price per Pound, Cents
Cottonseed oil	7.3	31
Oleomargarin	8.5	30
Peanut butter	8.8	25
Butter	11.9	43
Olive oil	12.1	51
Bacon	13.8	37
Cream (extra heavy, 40 per cent.)	19.8	65 (pint)
Bacon, sliced, in jars	22.2	65

Graham Lusk, Linnaeus E. LaFétra and Godfrey R. Pisek, assisted in the computation of food prices by Dr. F. C. Gephart, and is said to be designed for the use of visiting nurses, social service workers and others coming in contact with those in need of instruction in food economies. Under present circumstances it may have practical application in a wide field.

The leaflet outlines and gives the cost in calories, per pound, etc., for the ages named, of a diet sufficient (balanced), digestible and economical, containing the essential food substances, fat, carbohydrate (sugar or starch) and protein, besides other elements which

TABLE 2.—COST OF CEREALS

	Cost of 1,000 Calories, Cents	Price per Pound, Cents
Corn meal, in bulk	3.6	6
Hominy, in bulk	3.6	6
Broken rice, in bulk	3.7	6
Oatmeal, in bulk	3.8	7
Samp, in bulk	4.2	7
Quaker Oats, in package	4.4	8
Macaroni, in package	4.5	13
Wheat flour, in bulk	4.6	8
Malt breakfast food, in package	4.8	14
Pettijohn, in package	5.3	12
Cream of wheat, in package	5.7	10
Farina, in package	5.9	12
Cracked wheat, in bulk	5.9	10
Pearl barley, in package	6.0	10
Barley flour, in bulk	6.1	10
Whole rice, in bulk	6.1	10
Wheatena, in package	8.1	14

must be considered — water, certain salts and “vitamins.” These substances must be furnished in proper proportions to maintain health. It has been found that a healthy child from 2 to 4 years old requires daily from 1,200 to 1,400 food units (calories); from 4 to 7 years of age the amount should be from 1,400 to 1,700 calories.

Fats.—Regarding fats, it is said that both animal and vegetable fats are useful as foods, the animal fats being superior, however, and of these the most economical is said to be oleomargarin. The cost of the fats is given in Table 1.

Carbohydrates.—The carbohydrates include cereals, vegetables, breadstuffs, sugar and sweets. These are cheaper in bulk, and more expensive when purchased in special packages. When arranged according to

their food value and price per pound, the cereals appear as in Table 2.

It will be seen that, when purchased in bulk, oatmeal, corn meal, hominy, samp and rice are most economical. Their cost in that form is contrasted in

TABLE 3.—COST OF READY-TO-SERVE CEREALS

	Cost of 1,000 Calories, Cents	Price per Pound, Cents
Shredded Wheat Biscuit	7.8	13
Grape-Nuts	8.6	15
Force	9.4	16
Corn Flakes	11.7	20
Puffed Rice	23.5	52

Table 3 with the so-called ready-to-serve cereals with proprietary names. These proprietary foods are of higher cost and more difficult of digestion by young children, which more than offsets the ease of preparation.

Vegetables.—The cost and relative caloric values of the various vegetables are set forth in Table 4. The value of vegetables, it is said, depends not only on the amount of fat, carbohydrates and protein which they contain, but also on their richness in iron and other important salts, and on the amount of fiber, which aids proper action of the bowels. For these

TABLE 4.—COST OF VEGETABLES

	Cost of 1,000 Calories, Cents	Price per Pound, Cents
Turnips	20.0	2.5
Sweet potatoes	21.8	10.0
White potatoes	25.8	4.0
New beets	27.6	5.0
Onions	29.3	6.0
Spinach	30.0	3.3
Green peas	39.2	10.0
Lima beans	39.2	10.0
Cauliflower	42.9	6.0
Carrots	50.0	8.0
String beans	55.6	10.0
Squash	76.2	8.0
Lettuce	89.4	7.0
Celery	214.0	15.0

reasons they are indispensable to a proper diet notwithstanding their relatively high cost. Spinach, beet tops, chard and other “pot greens” are said to be of particular value. It is said, however, that for children of the ages under consideration, no raw vegetables, such as radishes, tomatoes, cucumbers, onions or celery, no green corn, peppers, egg plant or cabbage should be allowed.

Breadstuffs.—Hot bread or rolls, griddle cakes and doughnuts should not be given to young children, but corn bread should be used for at least one meal a day. Bread and rolls should be stale or dried on the stove or in the oven till crisp. The costs of the various breadstuffs are given in Table 5.

TABLE 5.—COST OF BREADSTUFFS

	Cost of 1,000 Calories, Cents	Price per Pound, Cents
Ginger snaps	6.3	12.0
Graham bread	8.2	10.3
White bread	8.5	10.3
Rye bread	8.7	10.3
Graham crackers	9.2	18.0
Soda crackers	9.4	18.0
French rolls	10.8	14.0
Uneda Biscuit	12.4	24.0

Sugars and Sweets.—No candy or chocolate should be given before a child is 5 years old, it is said, and then not more than one piece a day. Not more than one teaspoonful of sugar should be given on a dish of cereal.

Protein Foods.—One of the greatest difficulties, it is said, in furnishing a proper diet at moderate cost is to supply the proteins in the amount needed. These foods as a class cost much more than either fats or carbohydrates. The cheapest and best protein for children, even at present prices, is said to be milk. Costs and values of proteins are given in Table 6.

TABLE 6.—COST OF PROTEINS

	Cost of 1,000 Calories, Cents	Price per Pound, Cents
Milk (Grade A)	18.5	13 (quart)
Roast beef (rib)	23.4	26
Buttermilk	26.5	9 (quart)
Lamb chops (loin)	32.7	43
Lamb chops (rib)	34.9	38
Young codfish (fresh)	38.6	12
Chicken (roasting)	41.3	32
Eggs	44.7	45 (dozen)
Beef steak (round)	45.6	34
Haddock	46.0	12
Flounder	50.0	12

Fish at certain seasons are cheap and useful. Vegetables high in protein may largely replace meat in the diet, such as beans and peas, fresh or dried, which may be given as soups. Together with milk and bread, they may entirely replace meat. Wheat and oats contain most protein. Among the protein foods interdicted for children are sausage, pork, ham, liver and smoked, salt or dried fish.

Fruits.—Fresh fruits, though expensive except for the short time when they are in season, should be given freely. It is said, however, that berries, cherries, pineapple and plums should not be given, since they are not easily digested, and are usually expensive. A warning is given against stale or unripe fruit, or fruit out of season. Bananas should be thoroughly ripe, or else baked or boiled. The more extensive use of stewed dried fruits is urged. Fruit should be given with other foods and not between meals. The costs of fruits are set forth in Table 7.

TABLE 7.—COST OF FRUIT

	Cost of 1,000 Calories, Cents	Price per Pound, Cents
Fresh (in season)		
Grapes	14.9	5
Rhubarb	15.4	1
Bananas	20.0	6
Apples	23.7	5
Pears	46.0	12
Oranges	58.8	10
Peaches	96.7	15
Dried		
Prunes	8.4	10
Apples	11.1	15
Peaches	12.5	15
Apricots	15.5	20

Desserts.—Desserts permitted to young children are plain puddings made from rice, farina, cornstarch or stale bread; custard; junket, ice cream not oftener than twice a week and in small portions, bread with (corn) syrup or jelly; plain cookies, gingersnaps, sponge cake or lady fingers once daily with meals. Pastries, pies and rich cakes, particularly those made with nuts and dried fruit, are forbidden.

Drinks.—Milk, not less than a pint nor more than a quart daily, at present prices, is cheaper and better than any other food of equal caloric value. It is indispensable for younger children. Cocoa, made with milk, may be substituted for milk in cold weather. Children should drink from two to four glasses of water daily. Tea, coffee, wine, cider and soda water are interdicted.

Habits to Be Avoided.—Food at other than regular meal times; entire meals consisting of only one

article of food; imperfect chewing of food; rapid eating with much drinking during meals; feeding between regular meals; coaxing or forcing the child to eat without appetite.

Cooking.—Cereals should be cooked for not less than one hour, and most of them for three hours. A double boiler or a fireless cooker may be used. Green vegetables should be cooked with very little water; all vegetables should be thoroughly cooked. Potatoes should be boiled with the skins on and peeled afterward, thus saving at least one sixth of the potato. Meats should be roasted, broiled or boiled; neither meat, chicken nor fish should be fried. Roasted or broiled meats should be eaten rare. Eggs should not be fried. Meat stews with potatoes and other vegetables are to be recommended, provided they are thoroughly cooked and the fat has been removed. Clear soups have almost no food value, but when vegetables, barley, noodles or rice are added are useful foods. Thick soups, especially those made with peas and beans, with the addition of milk, are nutritious and cheap, and, it is said, can largely replace meat and eggs in the diet.

Sample Diets.—Following are sample diets furnishing sufficient quantities of food for healthy growth, but omitting meat on account of its high cost:

SAMPLE DIET—TWO TO FOUR YEARS

Breakfast, 7 a. m.: Cereal (oatmeal, hominy, rice or corn meal), 2 to 3 good tablespoonfuls with 1 even teaspoonful sugar and 2 ounces milk. Crisp toast or bread (stale), one or two slices with butter. Milk, 8 ounces, from cup.

Morning lunch, 10:30 a. m. Milk, 6 ounces. Bread (stale), one slice.

Dinner, 1:30 p. m.: One egg, or cup thick soup. Rice or macaroni, 2 tablespoonfuls, or one small baked potato. Fresh vegetable, 2 tablespoonfuls. Stewed fruit, 3 or 4 tablespoonfuls. Bread, one or two slices, with butter. Water.

Supper, 6 p. m.: Cereal, 2 or 3 good tablespoonfuls with sugar and 2 ounces milk. Milk, 6 ounces, from cup. Bread and butter, one slice. Custard, junket or plain pudding, 2 to 4 tablespoonfuls.

SAMPLE DIET—FIVE TO SEVEN YEARS

Breakfast, 7:30 a. m.: Cereal (as given for two to four years), 4 tablespoonfuls with 1 teaspoonful sugar and 2 ounces milk. Bread (stale), (white, graham or corn bread), or toast, with butter, two slices. Fruit, one fully ripe banana, peach, pear, or grapes, in season. Cocoa made with milk, one cup; or milk, 8 ounces.

Dinner, 12:30 p. m.: Meat stew with vegetables; or soup made with milk and peas or beans; or fish; or egg. Potato, rice, samp or macaroni with oil or butter. Fresh vegetable (spinach, chard, squash, carrots, turnips, string beans, boiled onions or celery), 3 tablespoonfuls. Bread and butter, one or two slices. Stewed dried fruit (apples, peaches, prunes, apricots), 3 or 4 tablespoonfuls. Ginger snaps or plain cake or jelly sandwich. Water.

Supper, 6 p. m.: Cereal as at breakfast, with soup, or one egg. Bread (stale), two slices, with butter or peanut butter. Cup of cocoa made with milk. Plain pudding made with milk; or stale bread with corn syrup.

Old Age Dependency.—It is estimated that one and one-quarter million persons in the United States who have reached the age of 65 are in want and are supported by charity, public and private. This means that 28 per cent., or, in other words, more than one out of every four are dependent on public or private charity. In Massachusetts, where an excellent census was recently completed (1915), it was found that close to 35,000 persons out of a total of 190,000 were the recipients of public or private relief. This constitutes 18.2 per cent. of the total population 65 years and over, but does not include a very large number who received assistance or maintenance from relatives and other unregistered sources.—Louis I Dublin, *The Vital Statistics of Old Age*.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address "Medic, Chicago"

Subscription price Five dollars per annum in advance

*Contributors, subscribers and readers will find important information
on the second advertising page following the reading matter*

SATURDAY, SEPTEMBER 8, 1917

NERVE REGENERATION AND THE NEUROTIZATION OF PARALYZED MUSCLES

Despite the high degree of perfection which surgical technic and aseptic procedure have attained, the transplantation of certain organs into the body has encountered unexpected if not insurmountable difficulties. In the case of thyroid tissues, for example, it appears that success may be obtained only when there is an actual dearth of similar functioning tissue in the organism which receives the transplant. Likewise the transplantation of parathyroids, even in the same species, seems to succeed far more readily in the case of individuals previously deprived of these glandular structures. In those endowed with a suitable parathyroid outfit, additional transferred glands apparently undergo atrophy. In other words, the retention or survival of functional capacity in such structures depends on a physiologic need of their activity in the organism involved.

A somewhat comparable experience has just been reported by Elsberg¹ in attempts to secure functionally successful nerve implantations in muscles. He found that it is quite possible to reestablish effective neuromotor connections in paralyzed muscles by the implantation either of nerve from the same muscles or of foreign nerve. Stimulation of either implanted or reimplanted nerves may be followed by good contraction of the muscle, and such neurotization of a muscle is still possible even when it has been deprived of its nerve supply for many weeks. But Elsberg has also found that hyperneurotization of a normal muscle is impossible; a normal muscle cannot be made to take on additional nerve supply. The implanted nerve cannot make any neuromotor connections, and its stimulation will usually fail to have any effect on the muscle. If, however, the muscle is permanently separated from its original nerves, then the implanted nerve — which until now has been unable to form a connection with the muscle fibers — will establish neuromuscular connections, and electric stimulation of the nerve will soon cause normal contractions of the muscle.

These studies prove that if a muscle once has its normal nerve supply, no other motor nerve is able to make neuromuscular connection with the same muscle. But, further than this, Elsberg has ascertained that if the normal nerve is cut and reimplanted into a muscle and at the same time a foreign motor nerve is also implanted into the same muscle, only the former will make neuromuscular connections. Why or how the normal nerve of a muscle gains ascendancy over the foreign nerve affords an interesting though unanswered speculation. Elsberg remarks that it is impossible at present to state whether the discrimination is due to a more rapid regeneration of the normal nerve or to the fact that the regenerating normal nerve has an inhibitory influence on the intramuscular regeneration of the foreign implanted nerve. The axis cylinders of the normal nerve to the muscle seem to be able to reestablish their former connections with the end plates or bulbs or to form new end organs more quickly or more powerfully than do those of a nerve which has belonged to a different muscle.

BENCE-JONES PROTEINURIA

In 1847, Bence-Jones presented before the Royal Society of London a paper, "On a New Substance Occurring in the Urine of a Patient with 'Mollities Ossium,'" in which he described for the first time the substance since known as the Bence-Jones protein. It was rediscovered and described by Kühne¹ in 1869. In view of certain chemical reactions, particularly peculiar changes of solubility in the urine under the influence of heat, the Bence-Jones protein has often been classed with the proteoses, such as those formed in the partial digestion of native proteins.

More recent investigations, in which the newer chemistry and knowledge of the biologic relations of the proteins have been taken into account, make it seem less likely, if indeed at all probable, that the Bence-Jones protein which occurs in the urine of patients with multiple myeloma of the bones is of a proteose nature. Taylor and Miller² of the University of Pennsylvania have ascertained, for example, that the Bence-Jones protein separated from the urine exhibits powers of sensitization and anaphylactic response in suitable test animals. Accordingly, they have concluded that the anaphylactic activity of this protein confirms the belief that it is a higher protein of individual biologic stamp and not a degradation stage in the hydrolysis of any body protein. The proteoses produced by hydrolysis are not anaphylactically active.

The separated Bence-Jones protein is easily digested under appropriate conditions by both the gastric and

1. Elsberg, C. A.: Experiments on Motor Nerve Regeneration and the Direct Neurotization of Paralyzed Muscles by Their Own and by Foreign Nerves, *Science*, 1917, 45, 318.

1. For a historical account, see the dissertation of Rosenbloom, J.: A Contribution to the Study of the Nature and Origin of the Bence-Jones Protein, New York, Columbia University, 1909.

2. Taylor, A. E., and Miller, C. W.: Studies in Bence-Jones Proteinuria, *Jour. Biol. Chem.*, 1916, 25, 281.

the pancreatic proteolytic enzymes. Hopkins and Savory,³ who made an elaborate study of this protein at the University of Cambridge, England, concluded that it yields all those amino-acids which are to be obtained from typical proteins, and is therefore not a fractional product arising from the partial breakdown of protein in metabolism. Correspondingly, Taylor and his colleagues have decided that the protein is not proteose, but a higher protein of definite biologic stamp—a human product closely resembling the normal blood proteins.

The striking feature of Bence-Jones proteinuria, as it has been expressed by Taylor, Miller and Sweet,⁴ is the free passage of large quantities of the protein through a kidney which holds back the normal serum proteins. Experiments on animals show no direct toxicity of the protein. Normal subjects are able to utilize or catabolize a moderate amount of Bence-Jones protein, even when this is injected rapidly into the circulation; but a limit is soon reached beyond which the excess protein is promptly excreted in unchanged condition. It has been pointed out² that if the Bence-Jones protein is to be regarded as foreign to the tissues of the subject, we should expect, according to the Abderhalden hypothesis, that a special ferment would soon be aroused to destroy it in the body; and certainly there would seem to be nothing in the nature of the substance itself to resist such a fate. Yet instead of being digested, large quantities of it are excreted in its native condition, apparently free from hydrolysis; and this may continue indefinitely. Under such circumstances we must dismiss the idea of a protective ferment.

With respect to the origin of the unique protein, the Philadelphia investigators have discussed two sources: The protein may be a special product of the tumor cells of the myeloma; or it may be a normal or possibly aberrant stage in the synthesis of some body protein, the completion of which is interfered with by deficiency of some necessary condition. The Bence-Jones protein is of endogenous origin in any event. The supposition that it arises in the bone marrow is a natural one in view of its association with disease of this tissue. Rosenbloom¹ at one time actually ventured the assumption that the protein may be formed from osseo-albuminoid by the action of enzymes present in the bone marrow. But Taylor, Miller and Sweet⁴ believe that the surprisingly large amounts secreted—as much as 30 gm. per day in their case—would indicate some more general source. In view of its biologic reactions, they prefer to relate it more closely to the blood proteins, and to ascribe its origin to an interrupted or abnormal synthesis of some normal body protein. The protein evidently circulates with great freedom throughout the body, for it has been

found in the pleural fluid and in the blood in determinable amounts. As its origin still remains obscure, renewed efforts should be made to discover new cases of its occurrence and to investigate them intensively.

THE HUMIDITY OF SCHOOLROOMS

We have referred on previous occasions to the lack of evidence concerning the effect on health and comfort of the relative humidity in living rooms. The hasty assumption that a low relative humidity means similar dehydrating power, whether in a desert or in a schoolroom, is obviously unjustified. Consideration of the principles of elementary physics is sufficient to show that other factors, such as air movement and air temperature, are of great importance in determining the loss of heat and of moisture from the human body. The emphasis sometimes laid on “humidifiers” and humidifying processes by newspaper sanitarians may conceivably divert attention from more significant matters. It is plainly impossible to maintain proper atmospheric conditions of any sort without taking into account air temperature and air motion as well as air humidity. The useful if somewhat awkward expression, “air-conditioning,” has come to represent for ventilating experts the sum total of the factors involved.

Palmer, of the New York State Commission on Ventilation, recently presented a paper at the Chicago meeting of the American Society of Heating and Ventilating Engineers which brought out this point with great force and clearness. Very interesting dryness records in rooms of public schools were cited, showing plainly that comfort does not depend solely on humidity. In one building, three fan-ventilated, humidified rooms were contrasted with three window-ventilated, unhumidified rooms. The five complaints of excessive dryness that were received from teachers all came from the fan-ventilated, humidified rooms. There are many things to be considered in such studies. The rate of evaporation from the body is perhaps even more affected by air movement than by relative humidity. The sensation of dryness is not always measurable by the loss of water from the body. As Palmer says: “On a cold windy day in winter we feel dry. This sensation must come not from a water loss that is at all comparable [with what occurs in summer] . . . but from the appreciable evaporation of what water is accessible on the skin, and the failure of the cold, contracted, waterless skin surface to keep the supply up to the demand.” It is within the experience of every one that the sensation of dryness becomes acute under conditions in which the water loss from the body cannot be made up by drinking.

The question of the evaporation of water from the nose and lungs is of course on a somewhat different footing from that relating to the whole body. Here, however, excessive humidity seems to be more detri-

3. Hopkins, F. G., and Savory, H.: *Jour. Physiol.*, 1911, **42**, 189.

4. Taylor, A. E.; Miller, C. W., and Sweet, J. E.: *Studies in Bence-Jones Proteinuria*, II, *Jour. Biol. Chem.*, 1917, **29**, 425.

mental than slight humidity. The nasal mucous membrane of the workers in the warm, moist atmosphere of laundries appears to be in a worse condition than that of the firemen and boiler tenders who are exposed to hot, dry air. According to Palmer, respiratory affections among schoolchildren are associated with high temperature rather than low relative humidity.

It is certainly not fair to state or to imply that schoolrooms admittedly dry and drying are as dangerous to health as deserts. The known physiologic effects of life in deserts are not duplicated in our northern schoolrooms in winter, even if the relative humidity is "lower than in deserts." The loss of moisture from wet objects and from the human body is much less. Even the sensation of uncomfortable dryness is absent in schoolrooms with a low relative humidity, but without excessive continuous air flow and too great warmth (over 68 F.). As Palmer well expresses it: "Relative humidity by itself is thus a criterion of neither dryness nor dryingness, nor the sensation of dryness."

YEAST

From time to time yeast has attained a transitory popularity as a therapeutic agent. Its use in this way in practical medicine has been based essentially on empiric considerations. Yeast is rich in nucleic acid, but this has not found any special applications. The fat-like substances obtainable from yeast have been recommended in certain alimentary conditions, without finding any widespread acceptance.

More recently yeast has acquired interest from somewhat different angles. In these days of food shortage and enforced conservation, it has come to be realized that the minute yeast cells are endowed with a remarkable capacity of synthesizing one of the most valued nutrients, namely, protein. This substance can be built up out of the simplest forms of nitrogenous compounds by yeasts, in contrast with the incapacity of the higher organisms to construct protein out of anything less complex than the ready made amino-acids. It is reported that in Europe yeast has actually been grown on a large scale in solutions of sugar, salt and simple nitrogenous compounds for the sake of securing the much desired proteins. The utilization of yeast protein for cattle feeding is a current practice abroad; and the satisfactory digestibility and availability of the same product by the human organism has repeatedly been announced since the beginning of the war.¹ In this country the yeast which is produced as a by-product of the brewing industry is for the most part discarded as waste; in the distilleries it becomes a part of the distillers' grains that are extensively employed as feeds in the dairy industry:

Still newer is the indication that yeast is comparatively rich in at least one of the as yet unidentified accessory factors in nutrition now popularly spoken of as vitamins. Hopkins² of the University of Cambridge, England, first directed attention to this unique property of yeast. It has been verified by Funk and Macallum,³ and recently Osborne and Mendel⁴ have given substantial evidence of the potency of yeast to render a diet not otherwise capable of inducing maintenance effective in nutrition.

Yeast has been used, like extracts of rice polishings, to cure the experimental polyneuritis induced in birds by a diet of polished rice. From the experiments of Osborne and Mendel it appears that less than 2 per cent. of dried brewers' yeast suffices to induce small experimental animals to grow on artificial food mixtures on which alone they fail to thrive. How the use of yeast as an adjuvant to otherwise inadequate food mixtures exerts its beneficial effect is not yet made clear. Satisfactory growth in these cases is promoted by liberal eating. Anything which renders food more palatable may stimulate one to eat more liberally of it. This can scarcely be the explanation of the potency of the yeast as it is effective even when fed apart from the rest of the food. It may have a favorable effect on the metabolism and thus improve the general condition so that more food is consumed. Small quantities of milk and extracts of many of the common plant foods, such as the cereal grains, have been found to act in the same way. There seems to be little doubt, therefore, that yeast also contains something comparable with the so-called water-soluble vitamins of the diet. A specific need for yeast can scarcely be predicated on this fact, however; for any well selected human dietary containing the usual variety of animal and vegetable foods is not likely to be devoid of the widely distributed water-soluble type of vitamin. We mention this to check premature enthusiasm for a new vitamin.

VITAMIN DEFICIENCY AND DISEASE

The expression, "deficiency disease," has come to be employed in the highly restricted sense of a disorder of metabolism due to the lack of some specific unidentified dietary substance or "vitamin" in the ration. Like most novel conceptions, it readily found enthusiastic advocates, precisely as the demonstration of the undisputed existence of diseases of bacterial origin made infection a popular explanation of all manner of unsolved maladies. The hypothesis at the basis of the current explanation of deficiency diseases was strikingly verified in the investigations of the pathogenesis of beriberi. It is not surprising, there-

1. Yeast in a New Rôle, editorial, *THE JOURNAL A. M. A.*, April 29, 1916, p. 1390; Yeast Nutriment in Bread Making, Sept. 30, 1916, p. 1023.

2. Hopkins, F. G.: *Jour. Physiol.*, 1912, **44**, 425.

3. Funk, C., and Macallum, A. B.: *Jour. Biol. Chem.*, 1915, **23**, 413; 1916, **27**, 51. Funk, C.: *Jour. Biol. Chem.*, 1916, **27**, 1.

4. Osborne, T. B., and Mendel, L. B.: *The Rôle of Vitamines in the Diet*, *Jour. Biol. Chem.*, 1917, **31**, 149.

fore, that such pathologic puzzles as scurvy, pellagra, rickets and other as yet unexplained diseases have been put into the same class. And thus a multiplicity of vitamins has been postulated.

The probable failure of the theory of a specific deficiency in the diet to account for the genesis of scurvy has recently been reviewed in *THE JOURNAL*.¹ The all but complete demonstration that scorbutus is the outcome of a diet inappropriate in its physical rather than its chemical make-up justifies an attitude of skepticism regarding the validity of the "vitamin" theory of the etiology of the other diseases now classed in the same general category. The essentials of an adequate diet can now be formulated with a presumable dependability not approached before the modern studies of nutrition.² They are believed, on the basis of experiment rather than mere conjecture, to include protein of suitable quality and in adequate amounts, an abundance of available energy in the form of digestible nutrients, suitable inorganic substances, and an appropriate content of water-soluble and fat-soluble dietary factors not heretofore identified.

Evidently malnutrition of a severe type may attend the consumption of a diet defective in respect to any of these several factors. When none of them is missing, as far as the trained student of nutrition can discover, it is imperative to search for some defect of texture or some other latent alimentary danger before the more convenient hypothesis of a new specific vitamin deficiency is elaborated. In view of the fact that several alleged "deficiency diseases" are actively under investigation at the present time, it seems worth while to record a recent prediction of McCollum and Pitz.³ Trained in the intensive study of nutrition in health and disease, they venture the belief that inquiry will establish what is now all but demonstrated, namely, that unfavorable proportions among the well recognized constituents of the diet as well as of the two recently appreciated ones, together with unsatisfactory physical factors and injury wrought through the agency of micro-organisms inhabiting the alimentary tract, will account for all the observed types of pathologic functioning which are referable to errors in the diet.

1. The Etiology of Scurvy, editorial, *THE JOURNAL A. M. A.*, Sept. 1, 1917, p. 728.

2. For a comprehensive review of the subject, compare McCollum, E. V.: The Supplementary Dietary Relationships Among Our Natural Foodstuffs, *THE JOURNAL A. M. A.*, May 12, 1917, p. 1379.

3. McCollum, E. V., and Pitz, W.: The "Vitamine" Hypothesis and Deficiency Diseases: A Study of Experimental Scurvy, *Jour. Biol. Chem.*, 1917, **31**, 229.

Biology and the Citizen.—The time has come when one cannot be a good citizen without some knowledge of biology. The person who does not believe in vaccination or the so-called "germ theory" of disease or quarantines, who fights against taxes to improve the water supply or to dispose of sewage or to get rid of malarial mosquitoes, who opposes the appointment of health officers, or the scientific inspection of milk and other foods, or the medical examination of school-children, is not only an ignoramus but he is also a bad citizen. —E. G. Conklin, *Yale Review*.

Current Comment

MEDICAL STUDENTS, INTERNS AND THE DRAFT

Elsewhere in this issue appears the official announcement of the regulations prescribed by the President as a solution of the serious question of drafting medical students and hospital interns. This announcement comes as a logical and welcome conclusion to *THE JOURNAL*'s campaign on this vital question. The facts obtained from *THE JOURNAL*'s questionnaire relative to the number of medical students that would be drafted left no doubt that the medical situation of the future would have been threatened as regards both military and civil life. All will rejoice, therefore, that a practical solution of the problem has been discovered. As has been repeatedly stated, the Provost Marshal decided that there is no provision in the selective service law of 1917 — the conscription law — under which medical students can be exempted or discharged. The solution discovered, however, utilizes a section of the National Defense Act, which was passed in 1915, and which became effective in June, 1916. It is under this same law that the Medical Officers' Reserve Corps is organized. This law, it will be remembered, in addition to providing for an Officers' Reserve Corps also provided for an Enlisted Reserve Corps. Medical students and interns who have been drafted therefore will be in the same relative position to the Army as physicians who are members of the Medical Officers' Reserve Corps, not on active duty. At the same time, and in like manner, they will be subject to assignment to active duty when any emergency may require. This means, of course, that if a young man should decide not to continue his medical education he would be subject to order to active duty.

THE ALVEOLAR AIR IN ASTHMA

In asthma, and in obstructed expiration in general, there is a disturbance in aeration in the lungs. This is shown with scientific accuracy by the increased content of carbon dioxide that has been measured during the asthmatic attack by various investigators. The explanation of the admittedly insufficient aeration of the blood has been a debated point. Not long ago Hoover¹ attributed the disturbance to a respiratory cause. He concluded from his studies that "the real difficulty of ventilation in asthma lies in a distention of the infundibula, and this fails to permit an equal diffusion of carbon dioxide throughout the alveolar air." Friedman and Jackson² of the Laboratory of Physiology at the University and Bellevue Hospital Medical College, New York, have, however, pointed out that the extremely ready diffusibility of carbon dioxide gives little plausibility to Hoover's hypothesis. As the result of careful experimental studies, they are inclined to believe that a circulatory factor is the important one.

1. Hoover, C. F., and Taylor, Lester: The Ventilatory Function of the Lung in Emphysema and Asthma, *Arch. Int. Med.*, January, 1915, p. 1. Hoover, C. F., and Gammon, J. E.: The Dead Space in Moderate and Large Respiratory Ventilation, *ibid.*, April, 1915, p. 591.

2. Friedman, E. D., and Jackson, H. C.: The Carbon Dioxide Content of Blood and of Alveolar Air in Obstructed Expiration, *Arch. Int. Med.*, May, 1917, p. 767.

The cough in asthmatics, along with the voluntary attempts to aid respiration, would accentuate the embarrassment of the lesser circulation in the lungs. The positive intrabronchial pressure during the prolonged expiration inevitably interferes with the free flow of blood through the pulmonary capillaries, as Friedman and Jackson have demonstrated experimentally. There is a damming back of the blood on the venous side, with little opportunity for gaseous exchange. As a consequence, there is an accumulation of carbon dioxide in the blood with the liberation of the gas into the alveolar air, chiefly during the short inspiratory phase of asthmatic breathing. The low pulse pressure, probably due to diminished systolic volume, the enlarged veins in the neck, and the cyanosis suggesting a certain amount of general venous stasis that appears whenever a rise in intrathoracic pressure interferes with a free flow of blood to the heart, are added clinical phenomena observed in asthma, furnishing further grounds to suspect that circulatory disturbances are primarily responsible for the conditions associated with obstructed expiration.

THYROID, PARATHYROID AND CARBOHYDRATE METABOLISM

Much of the evidence respecting the possible rôle of the endocrine glands in the metabolic functions is so conflicting or uncertain that every series of findings that are reasonably concordant deserves more than passing notice. There are continually recurring suggestions of a relationship between the thyroidal structures, which include both the parathyroids and the thyroids proper, and carbohydrate metabolism. Precisely what the nature of this connection is has not been solved. Underhill¹ and his collaborators have deduced from an experimental standpoint the probability that the parathyroids exercise a more profound function in regulating carbohydrate transformations than do the thyroids. They assert that after thyreoparathyroidectomy the assimilation limit for glucose given by mouth or subcutaneously is significantly lowered in dogs. Thyroidectomy alone fails to produce such an effect. On the other hand, the extirpation of three parathyroids causes a diminished assimilative power for glucose, and the removal of three parathyroids plus one thyroid produces no greater effect than is observed after the excision of the three parathyroids alone. With two intact parathyroids, the power of the body to utilize sugar is not decreased even in the complete absence of the thyroids. In a new group of experiments, Janney and Isaacson² of the Montefiore Hospital for Chronic Diseases, New York, have observed that the blood sugar after thyroidectomy showed a marked decrease, averaging about 25 per cent. less than the normal value. Whereas the feeding of glucose in suitable quantity to

normal fasting animals provokes a hyperglycemia lasting several hours, in these investigations after thyroidectomy, glucose fed under the identical experimental conditions failed to raise the blood sugar to the level attained before the operation. Although there thus is some conflict of opinion as to what part of the thyroid-parathyroid outfit is really responsible for these effects on the behavior of carbohydrate in the organism, evidence is accumulating, as Janney and Isaacson remark, to show that a persistent low sugar content may be a sign of insufficient internal secretion of some sort. They have observed hypoglycemia in cretinism. It is present in myxedema, in Addison's disease, and after removal of the suprarenal bodies. The experimental fact that there is a lessened tendency to hyperglycemia on carbohydrate ingestion after thyroidectomy has stimulated the New York investigators to suggest that the removal of thyroid tissue might lower the blood sugar in diabetes mellitus, possibly with beneficial results. This is at present nothing more than a speculation; but it is one not devoid of immediate interest and suggestiveness in relation to human pathology.

PREYING ON THE YOUNG SOLDIER

Writes a physician:

"The enclosed envelope with contents was sent to my son, who is drafted for the Army. Evidently all of these boys are getting it. Something ought to be done to protect the boys."

The envelope contained a card on one side of which was printed a picture of the "Heart of Hot Springs, Ark.," headed "World's Garden of Health Controlled by U. S. Government." On the other side the Microzone Medicine Company of Hot Springs, Ark., advertises "the only treatment which will positively cure inherited or contracted specific blood poison permanently." Further, the recipient is told that "out of 7,000 patients who have taken our treatment . . . not one has failed to be cured permanently. Many were cured privately at home by mail. . . ." In addition to the card, the envelope contained two crude facsimiles of ten dollar Confederate bills, on the back of which "Microzone," the "King of all treatments for blood poison," was advertised — "\$25 for full treatment!" The Microzone Medicine Company, according to material in our files, is operated by a quack, one J. M. Byrd, whose license the Arkansas authorities revoked in 1913. In a letter written in 1914 Byrd said: "I am now confining myself to the sale of a syphilitic cure . . . and I can make more money in that way and make it much easier than to do a general practice." At the same time Byrd was advertising a pamphlet with a salaciously suggestive title. Now, it would seem, Mr. Byrd would make more easy money by selling a fake syphilis cure to the young men who make up the National Army. Some men make a living out of war by robbing the dead on the battlefields; they at least do not impair the efficiency of the army. Other men rob the boys in khaki while they live, taking both money and health. They do this at a safe distance from the firing line and use as an instrument the United States mails.

1. Underhill, F. P., and Blatherwick, N. R.: Studies in Carbohydrate Metabolism, VI, The Influence of Thyreoparathyroidectomy upon the Sugar Content of the Blood and the Glycogen Content of the Liver, *Jour. Biol. Chem.*, 1914, **18**, 87.

2. Janney, N. W., and Isaacson, V. I.: The Influence of Thyroidectomy on the Blood Sugar, *Proc. Soc. Exper. Biol. and Med.*, 1917, **14**, 99.

RUNNING TRUE TO FORM

"Form," "style," "type" or "character" signifies that indefinable something in every man that enables one to know what is the height of that man's possible achievement and what he may be counted on to do under any given circumstance. Therefore, when a motley crew of long-haired individualists were driven from pillar to post in their efforts to hold a meeting for the purpose of deriding the government and hindering its efforts in the war, when they finally found a haven in Chicago and were given police protection by its burgomaster; when finally they assembled to hear their favorites orate and berate from the rostrum, who occupied that exalted position? None other than Nuxated Iron Mason, whose blood — "nuxated" — runs cold at the thought of Americans going to war, and ex-Senator Works, the "old reliable," who, when in the Senate, could always be counted on to obstruct any measure for the good of the public health. Here they were again — running true to form.

POPULAR IMPRESSIONS ABOUT
DENTAL CARIES

The subject of dental caries has long been actively debated both by the few who have given some scientific attention to the problems of defective teeth, and by the many who are satisfied with hasty and haphazard, empiric generalizations as a basis for the diffusion of information. In this field, as in so many others, the acquisition of more accurate information has served to dispel many of the illusions fostered by the propaganda of years. Every item of dependable knowledge about dental decay is doubly welcome at the present time, when the medical examination of thousands of the young men of America in the prime of life is exhibiting an almost appalling condition of the teeth. Furthermore, every device of clever advertising is being employed to win converts to some particular form of tooth powder, paste or mouth wash on the basis of the unguarded statements of enthusiastic manufacturers who understand the psychology of the purchasers. A recent investigator¹ has contributed evidence of the unreliability of two of the more popular impressions about the teeth. One is that the teeth of primitive races are relatively immune to caries. This is not borne out by inquiry as to the conditions of such peoples from different parts of the world. Many of them seem to be quite as subject to toothache as is the average American. The second negatived popular impression is that which has associated dental caries with a diet preponderating in carbohydrate. Protein-eating races are apparently quite as susceptible to these tooth defects. Meat eaters have no advantage over the vegetarians. Perhaps it will appear that the prevention of stagnation within the oral cavity is a far more potent factor in the freedom from caries than the indefinite feature of the chemical type of the diet. In any event, there is little basis for the cocksure claims which support the panaceas to which our public is so partial.

1. Marshall, J. A.: The Composition of Saliva in Relation to the Incidence of Dental Caries, *Am. Jour. Physiol.*, 1917, **43**, 212.

THE FATE OF INOSITE IN THE BODY

The repeated attempts in recent years to find a place for phytin and similar organic compounds of phosphoric acid in human therapy lend interest to the physiology of the constituent groups. The futility of expecting any unique advantage from the phosphoric acid component because it is administered in the form of an ester or some comparable organic derivative has been clearly exposed in *THE JOURNAL*.¹ In addition to phosphoric acid, phytin and analogous plant products yield inosite, $C_6H_{12}O_6$, a compound highly suggestive of carbohydrate relationships, though it is in reality hexahydroxybenzene. In the past, experiments with inosite have indicated that it is not readily utilized.² A considerable amount may disappear when administered by mouth; but this destruction of inosite has usually been ascribed to the action of the intestinal flora. Recently, however, Greenwald and Weiss³ of the Harriman Research Laboratory at the Roosevelt Hospital, New York, have tested the fate of inosite in animals rendered diabetic with phlorizin. The results indicate that inosite may be converted into glucose in the living organism, though the process is slow and incomplete. This instance of the somewhat remarkable chemical transformation of a benzene derivative into a sugar in the body does not give any new hope, however, to those who would endow inosite with some special pharmacologic or therapeutic potency.

AN APPEAL FOR BELGIAN AND
FRENCH PHYSICIANS

In *THE JOURNAL* for July 21 and August 25 Dr. W. W. Keen appealed for contributions to be used to rehabilitate the physicians of Belgium and northern France, particularly in the regions from which the Germans have been driven, and which now are being reinhabited and restored. Up to the present time, Dr. Keen writes, his appeals have not met with an encouraging response. This may be due to the enormous and continuous demands on every one because we ourselves are now involved in the war. Dr. Keen suggests that there should be no delay; that funds are sadly needed now to secure office furniture, instruments, appliances, and other medical necessities. Houses are already being built, and people are gathering in villages and towns that have been desolate. All this means accidents, sickness and the immediate need of the doctor. Without office furniture, without instruments — in fact, without anything except willing heads, hands and feet — the physicians are seriously handicapped in the charitable work they are attempting to do. We hope that the response to the appeal will be instantaneous and generous, so that there may be immediate relief to the present depressing situation. Dr. Keen will acknowledge through *THE JOURNAL* all contributions he may receive. He should be addressed at 1729 Chestnut Street, Philadelphia.

1. The Nutrient Value of Inorganic Salts of Lime and Phosphoric Acid, editorial, *THE JOURNAL A. M. A.*, Aug. 15, 1914, p. 581. Phytin—Fortossan, *Propaganda*, Jan. 30, 1915, p. 456. Inosite as a Food, *Miscellany*, Sept. 16, 1916, p. 900.

2. For the literature see Anderson, R. J.: *Jour. Biol. Chem.*, 1916, **25**, 391.

3. Greenwald, I., and Weiss, M. L.: The Fate of Inosite Administered to Dogs, *Jour. Biol. Chem.*, 1917, **31**, 1-14.

Medical Mobilization and the War

"The purposes of the United States in this war are known to the whole world—to every people to whom the truth has been permitted to come. They do not need to be stated again. We seek no material advantage of any kind. We believe that the intolerable wrongs done in this war by the furious and brutal power of the imperial German government ought to be repaired, but not at the expense of the sovereignty of any people—rather a vindication of the sovereignty both of those that are weak and those that are strong."

MEDICAL MILITARY INFORMATION FOR PHYSICIANS

The pamphlets listed below will be sent on receipt of a self-addressed envelope and the postage stated.

1. The Medical Officer of the Army, by Lieut.-Col. William M. Bispham, M. C., U. S. Army, including also articles by Lieut.-Col. Robert E. Noble, M. C., U. S. Army; Col. T. H. Goodwin, C. M. G., D. S. O., and several supplements. 82 pages, 6 cents.

2. What the Civilian Physician Called to Active Service With the Army Should Know, by Lieut.-Col. William J. H. Lyster, M. C., U. S. Army. 16 pages, 2 cents.

3. G. O. 66 and Circular No. 2, Rules for the Examination of Recruits. 2 cents.

4. Bulletin VII. Army Service Schools. General Information for Officers Entering Service in Medical Reserve Corps. 2 cents.

5. Mode of Infection, Means of Prevention and Specific Treatment of Epidemic Meningitis, by Simon Flexner, M.D. 2 cents.

Medical Students and Hospital Interns May Join the Enlisted Reserve Corps and Be Discharged by Local Board from Service in the National Army

The Provost Marshal General has sent the following to the governors of all states:

The President prescribes the following Supplemental Regulations governing the execution of the selective service law:

First. Hospital interns who are graduates of well-recognized medical schools or medical students in their fourth, third, or second year in any well-recognized medical school who have not been called by a local board may enlist in the Enlisted Reserve Corps provided for by Section 55 of the National Defense Act under regulations to be issued by the Surgeon-General, and if they are thereafter called by a local board they may be discharged on proper claim presented on the ground that they are in the military service of the United States.

Second. A hospital intern who is a graduate of a well-recognized medical school or a medical student in his fourth, third, or second year in any well-recognized medical school, who has been called by a local board and physically examined and accepted and by or in behalf of whom no claim for exemption or discharge is pending, and who has not been ordered to military duty, may apply to the Surgeon-General of the Army to be ordered to report at once to a local board for military duty and thus be inducted into the military service of the United States, immediately thereupon to be discharged from the National Army for the purpose of enlisting in the Enlisted Reserve Corps of the Medical Department. With every such request must be inclosed a copy of the order of the local board calling him to report for physical examination (Form 103), affidavit evidence of the status of the applicant as a medical student or intern and an engagement to enlist in the Enlisted Reserve Corps of the Medical Department.

On receipt of such application with the named inclosures the Surgeon-General will forward the case to the Adjutant-General with his recommendations. Thereupon the Adjutant-General may issue an order to such intern or medical student to report to his local board for military duty on a specified date, in person or by mail or telegraph, as seems most desirable. This order may issue regardless of the person's order

of liability for military service. From and after the date so specified such person shall be in the military service of the United States. He shall not be sent by the local board to a mobilization camp, but shall remain awaiting the orders of the Adjutant-General of the Army. The Adjutant-General may forthwith issue an order discharging such person from the military service for the convenience of the Government.

Three official copies of the discharge order should be sent at once by the Adjutant-General to the local board. On receipt of these orders the local board should enter the name of the man discharged on Form 164A and forward Form 164A, together with one of the certified copies of the order of discharge, to the mobilization camp to which it furnishes men. The authorities at the mobilization camp will make the necessary entries to complete Form 164A, and will thereupon give the local board credit on its net quota for one drafted man.

British Hospital Ship in Canal Zone

A British hospital ship carrying several hundred wounded men from New Zealand to England recently passed through the Isthmian Canal, and a magnificent reception was given them by the people of Colon during their stay of two days at that port.

Osler's Son Dies from Wounds

Second Lieut. Edward Osler, R. A., only son of Sir William Osler, died in England, August 31. He was wounded recently while on active duty in France, and had been taken to England for treatment.

NEWS OF THE TRAINING CAMPS

Experiences of a Rookie on His First Day at Fort Benjamin Harrison, Indiana

The medical officers' training camp at Fort Benjamin Harrison has been in active running order since June 1, 1917, and has been growing like the proverbial Topsy from that date till the present time. The total number of undergraduate and graduate student officers is now approximately 1,400, most of whom are members of the Medical Reserve Corps. There are, however, numerous National Guardsmen among the number, and a few men who have passed their preliminary examinations for the regular army and are taking the same course as the others in order to qualify for their commissions.

The medical rookie immediately realizes that he is here for business. His first adventure is usually a mile walk from a small country station to the camp. If he has been unlucky enough to arrive on an early train to which no dining car is attached he is apt to make for a small refreshment stand just outside the station, only to be held up by a firm but politely smiling sentry, who informs him that the joint is run by a bunch of hold-up men and that no soldiers are allowed to patronize it. Disappointed but hopeful, he grasps his suitcase and sets his face campward. There will be breakfast awaiting him there beyond a doubt; it is only 7:15 a. m.

On arrival within the line of wooden barracks he soon realizes that he has not lost his way, because he is greeted with the cheery salutation of "Hello Doc" from scattered groups of bronzed veterans. From others more waggishly inclined come cries of "Where's your orderly, Doc?" "Did you bring your side-arms?" "How about those spurs, Doc?"

From this breezy welcome he forms two conclusions, first that he is among friends, and second that there must be something unusual about his personal appearance. So being a trained observer he soon decides that his spotless officers' serge and cap are at fault, and makes a mental note to remedy the condition at the first opportunity.

Having found the Adjutant's Office he shows his War Department telegram for purposes of identification, dictates his personal history to a sergeant, and is assigned to quarters. Right here it should be said that this official telegram is the most essential part of any officers' equipment. If he becomes separated from this he may as well give up hope of ever getting any pay or consideration of any kind.

His quarters are found to consist of a space 5 feet wide by 8 feet long in a wooden barracks. As his baggage has not arrived he moves round the barracks making the acquaintance of his company mates. On inquiring timidly as to the chances of getting a little breakfast he finds that this function is already a thing of the past, and that the cooks are preparing for dinner. He therefore resigns himself to starvation

and the tedium of waiting. In due course of time his baggage arrives by army mule team and he has the privilege of acting as his own porter between the A.-G.'s office (Adjutant-General) and the barracks. With feverish haste he tears open his army locker and doffs the spotless serge and cap in favor of cotton breeches, O. D. wool shirt, and campaign hat.

Attired then like a veteran he sallies forth to inspect his surroundings and get some idea of the schedule ahead of him. He finds the general plan of the camp very simple. Each company has two wooden barracks, one of which is partitioned at one end in order to form a small executive office for the instructors in charge. The barracks are approximately 90 feet long by 20 feet wide, and are arranged to house from forty to fifty men each. Each company also has its own mess hall, a building of similar construction, which is also partitioned at one end so as to form a kitchen and pantry. Finally, each company is supposed to have its own latrine, though lack of construction materials has delayed the construction of some of these units. They are supplied with water-closets, running water, and excellent shower baths, with hot and cold water and concrete floors.

The schedule of the recruit's first day is of necessity somewhat casual, much of it being spent in getting settled and learning the way about. The few necessary supplies which he may have overlooked in his packing are easily found at the quartermaster's store, where all manner of military equipment may be secured at the most reasonable of prices. The morning, therefore, is chiefly occupied with these minor errands, and is wound up by a talk from one of the company instructors—usually a National Guardsman who has seen service on the border—covering the subjects of camp cus-

Lagarde of the Surgeon-General's Office, Major Bloodgood of Johns Hopkins University and Prof. Alonzo Taylor of the Bureau of Conservation of Food were among the distinguished visitors and speakers who visited the camp during the week. Col. Henry Page, commandant, arranged the greatest review of medical officers and sanitary troops ever held in the history of the United States, in honor of the officers above mentioned. Colonel Dercle stated that had he not witnessed it he would not have believed that men could have been trained so well in so short a period of time. Colonel Goodwin, who has been connected with the British General Staff, and under whose direction hundreds, if not thousands, of medical officers have been trained, stated that he had never witnessed anything so impressive and had never seen such efficiency in medical troops who had been trained for six months, or more, as was shown by the review of men who had been in training for less than three months. He congratulated the commandant and his staff of instructors for the magnificent way in which their untiring efforts had produced these results.

THE REVIEW

The troops were led by two battalions of medical officers, consisting of 1,400 men, under the command of Majors Derby and Boyd; these were followed by regimental sanitary detachments, field hospital units and ambulance companies fully equipped, and the National Guard sanitary detachment. There were over 5,000 men in the line, which took over an hour to pass the reviewing officer.

At the conclusion of the review there was a demonstration of the method of establishing a regimental aid and ambulance dressing station, and in the setting up of a field hospital. A



Ambulances in Review at Fort Oglethorpe

toms, uniforms, salutes, and hours for rising, eating, and retiring. The noon meal, so eagerly anticipated, is delayed an hour or so because the company mess has not as yet been started and it is therefore necessary to borrow the hospitality of one of the older companies and to wait until their meal is over and the tables reset. In the afternoon some preliminary drill is tried by those of the company who have arrived, and the rest of the time is given over to the business of getting settled. The thought of roll call at 5:30 a. m. is sufficient to send most men to bed at a very early hour, usually an hour or more before the official time for "lights out" (10 p. m.).

Our medical rookie, therefore, may be left to enjoy an untroubled repose. Having by special request of the C. O. discarded all the insignia of rank, and by his action assumed the status of a cadet for the instruction period, he retires to his rest with a feeling that he is now to have a real chance of getting at the work for which he has—possibly at considerable personal sacrifice—volunteered his services.

Fort Oglethorpe

The week of August 20 was one of the most eventful weeks, since the organizing of this training camp. It marked the completion of the first course, and over 400 medical officers graduated and were sent to camps Dix, Lee, Mead, Wheeler, Gordan, Jackson, Hancock, etc.

VISITORS OF THE WEEK

Colonel Goodwin of the British Medical Service, Colonel Dercle of the French Medical Staff, Colonels Munson and

demonstration was then given of the way in which the medical personnel evacuated a battlefield of the wounded following an engagement; the various first aid methods employed, and to how great an extent the ingenuity of the individual man is brought out in the devising and the utilizing of what he has in immobilizing the injured parts. The method of transporting the wounded to the first aid station was then shown, how the litter bearers transport wounded to the waiting ambulance, thence to the dressing station, where dressings were reapplied, if necessary, and how finally the wounded were transported by other ambulances to the field hospital.

SPECIAL LECTURES

Colonel Dercle gave a very interesting talk during the week on the methods of handling the sick and wounded of the French army. Colonel Goodwin gave a series of three lectures on the British Medical Service and his experiences during retreat from Mons to the Marne. His simplicity and whole heartedness quite won the hearts of the entire camp. Colonel Lagarde, who is one of our greatest authorities on gunshot wounds, gave a series of five most instructive and interesting lectures on that subject. Prof. Alonzo E. Taylor gave a brilliant talk and brought out the necessity of all the people of this country aiding in the conservation of food stuffs.

PERSONAL NEWS

Major Raymond C. Turck, adjutant of the camp, has been appointed chief sanitary inspector at Camp Wheeler, Ga. His duties have been taken up by Capt. Walter Weiser, who will act as adjutant for the next camp. Capt. Damon Pfeiffer has been appointed assistant adjutant.

Major William Pepper has been visiting his family in Philadelphia for the past ten days.

Major John E. Boyd has been appointed major of the First Battalion of student officers.

Mrs. Richard Derby, formerly Ethel Roosevelt, has been visiting her husband, Major Richard Derby, who is in command of the Second Student's Battalion.

Col. Henry Page, commandant, entertained at dinner Saturday evening at the Chattanooga Country Club, his guests were: Colonels Goodwin, Dercle, Munson, Lagarde and Prof. Alonzo Taylor.

The following is the tentative list of instructors for the next camp: captains, Walter R. Weiser, Damon B. Pfeiffer, Davis W. Parker; majors, William Pepper, Richard Derby, John E. Boyd; first lieutenants, James Burnie Griffin, George M. Piersol, Albert McConnaghy, Gilbert W. Brehm and Russel Jones.

JUNIOR INSTRUCTORS

Captains, Blase Cole, Edward J. D. Beardsley; first lieutenants, Newdegate M. Owensby, Theodore Le Boutillier, Robert E. Seibel, William Wilmerding and William H. McLain.

Orders to Officers of the Medical Corps

Officers of M. C. to Camp Dix, Wrightstown, N. J., 78th Division, for duty: Lieut.-Cols. George M. Ekwurzel and John W. Hanner.

Officers of M. C. to Camp Travis, Fort Sam Houston, Texas, 90th Division, for duty: Lieut.-Cols. Robert H. Person and Paul S. Halloran.

First Lieut. Frederick E. Thode, M. C., to Fort Clark, Texas, for duty as C. O., Field Hospital Co. No. 30.

First lieutenants of M. C. to stations as follows to command ambulance companies named: Roy M. Fortier to Fort Clark, Texas, No. 28; Harvard C. Moore to Fort Clark, Texas, No. 29; Charles W. Riley to Fort Clark, Texas, No. 30.

Col. Charles Lynch, M. C., to Base Hospital No. 2, El Paso, for duty.

Lieut.-Col. Patrick H. McAndrew, M. C., at Fort Bliss, to Fort William H. Seward, Alaska, for duty.

Lieut.-Col. Frank W. Weed, M. C., to Camp Funston, Fort Riley, Kan., 89th Division, as sanitary inspector.

Officers of M. C., to Camp Pike, Little Rock, Ark., 87th Division, for duty: Lieut.-Col. Robert M. Thornburgh, chief surgeon; Major Charles E. Freeman, sanitary inspector.

Lieutenant colonels of Medical Corps to Camp Sherman, Chillicothe, Ohio, 83d Division, duty: Samuel J. Morris, as sanitary inspector; Wallace DeWitt, as chief surgeon.

Lieut.-Col. Robert M. Blanchard, M. C., to Camp Shelby, Hattiesburg, Miss., 38th Division, duty as chief surgeon.

Officers of M. C. to Camp Lee, Petersburg, Va., 80th Division, duty: Lieut.-Col. Charles E. Marrow as chief surgeon; Major Henry P. Carter as sanitary inspector.

Officers of M. C. to Camp Lewis, American Lake, Wash., 91st Division duty: Lieut.-Col. Lloyd L. Smith as sanitary inspector.

Major Robert H. Pierson, M. C., to Camp Travis, Fort Sam Houston, Texas, for duty as division sanitary inspector.

Majors of M. C. to camps opposite their names for duty as division sanitary inspectors, Nat. Army: John W. Hanner, Camp Devens, Ayer, Mass.; William A. Powell, Camp Dix, Wrightstown, N. J.

Major Earl H. Bruns, M. C., to Washington for duty.

Major Frank W. Weed, M. C., to Camp Funston, Fort Riley, as division sanitary inspector, Nat. Army.



Col. Page and Staff of Instructors at Medical Officers' Training Camp Attending Review at Fort Oglethorpe

Officers of M. C. to Camp Upton, Yaphank, Long Island, N. Y., 77th Division, for duty: Lieut.-Cols. Charles R. Reynolds and Major Alvin W. Schoenleber.

Officers of M. C. to Camp Gordon, Atlanta, Ga., 82d Division, for duty: Lieut.-Col. Conrad E. Koerper and Major William T. Cade, Jr.

The following lieutenant-colonels, Med. Corps, will proceed to the places below named for duty as chief surgeons of their divisions: Craig R. Snyder to Camp McClellan, Anniston, Ala., 29th Div.; Louis C. Duncan to Camp Wheeler, Macon, Ga., 31st Div.; Levy M. Hathaway to Camp Logan, Houston, Texas, 33d Div.; Jacob M. Coffin to Camp Cody, Deming, N. M., 34th Div.; Wilson T. Davidson to Camp Doniphan, Fort Sill, Okla., 35th Div.; William M. Smart to Camp Beauregard, Alexandria, La., 39th Div.; Philip W. Huntington to Camp Meade, Annapolis Junction, Md., 79th Div.; James M. Phalen to Camp Grant, Rockford, Ill., 86th Div.; John L. Shepard to Camp Funston, Fort Riley, Kan., 89th Div.; Orville G. Brown to Camp Fremont, Palo Alto, Calif., 41st Div.

Officers of M. C. to Camp Taylor, Louisville, Ky., 84th Division, for duty: Lieut.-Col. John H. Allen and Major Luther R. Poust.

Lieut.-Col. Llewellyn P. Williamson, M. C., to duty at Camp Devens, Ayer, Mass.

Major Ernest G. Bingham, M. C., is designated C. O., medical officers' training camp, at Fort Des Moines.

Major Guy V. Rukke, M. C., Plattsburg, N. Y., to Fort Porter, N. Y., assuming command of Base Hospital No. 2.

Capt. Shelley U. Marietta, M. C., to Fort Clark, Texas, for duty as C. O., Field Hospital Co. No. 28.

Capt. George B. Lake, M. C., Fort Clark, Texas, to study as C. O., Field Hospital Co. No. 29.

Capt. Hiram A. Phillips, M. C., to Detroit, Mich., assuming command of Base Hospital No. 36.

Capt. Harry R. Beery, M. C., to Indianapolis, Ind., assuming command of Base Hospital No. 32.

Officers of M. C. to the camps indicated opposite their names for duty as division sanitary inspectors, Nat. Army: Major Howard H. Baily, Camp Rockford, Ill.; Major Charles E. Freeman, Camp Pike, Little Rock, Ark.; Major Philip W. Huntington, Camp Meade, Annapolis Junction, Md.; Major Samuel J. Morris, Camp Sherman, Chillicothe, Ohio; Major Lloyd L. Smith, Camp Lewis, American Lake, Wash.; Major Thomas J. Leary, Colon, Camp Jackson, Columbia, S. C.; Capt. Guy L. Qualls, Camp Custer, Battle Creek, Mich.

Captains of M. C. to duty at camps named as division sanitary inspectors, Nat. Army: William T. Cade, Jr., Camp Gordon, Atlanta, Ga.; Henry P. Carter, Camp Lee, Petersburg, Va.; Clarence E. Fonk, Camp Dodge, Des Moines, Iowa; Luther R. Poust, Camp Taylor, Louisville, Ky.; Alvin W. Schoenleber, Camp Upton, Yaphank, N. Y. (August 22, Ward D.), inspector; Major Peter C. Field as chief surgeon.

Officers of M. C. to duty, Camp Dodge, Des Moines, Iowa, 88th Division: Lieut.-Col. Jay R. Shook as chief surgeon; Major Clarence E. Fronk as sanitary inspector.

Officers of M. C. to Camp Custer, Battle Creek, Mich., 85th Division, for duty: Lieut.-Cols. William A. Powell as sanitary inspector; Cosam J. Bartlett as chief surgeon.

Lieutenant colonels of M. C. to recruit depot specified after his name for duty: Powell C. Fauntleroy, Fort McDowell, Calif.; Joseph T. Clarke, Jefferson Barracks, Mo.; Allen M. Smith, Fort Logan, Colo.; Francis M. C. Usher, Fort Slocum, N. Y.

Lieut.-Col. George A. Skinner, M. C., from Nogales, Ariz., to San Antonio Base Hospital 1, for duty.

Officers of M. C. to Camp Devens, Ayer, Mass., Seventy-Sixth Division, for duty: Major Joseph L. Siner as sanitary inspector; Major Llewellyn P. Williamson as chief surgeon.

Capt. William K. Bartlett, M. C., to Walter Reed General Hospital, Takoma Park, D. C., treatment.

Capt. William Denton, M. C., to station and duty at Fort Ethan Allen, Vt.

The following lieutenant colonels, M. C., to duty as chief surgeons at camps named: Perry L. Boyer to Camp MacArthur, Waco, Texas, Thirty-Second Division; Raymond F. Metcalfe to Camp Bowie, Fort Worth, Texas, Thirty-Sixth Division; Kent Nelson to Camp Jackson, Columbia, S. C., Eighty-First Division; Alexander Murray to Camp Kearney, Linda Vista, Calif., Fortieth Division; Major Arthur M. Whaley to Camp Sevier, Greenville, S. C., Thirtieth Division, as chief surgeon.

Orders to Officers of the Sanitary Corps

Capt. John F. Krauser, Sanitary Corps, to duty at Fort Mason, S. F., Calif.

First Lieut. Harvard D. Moyer, Sanitary Corps, to duty at Field Medical Supply Depot, Washington.

First Lieut. Daniel Millen, Sanitary Corps, to Camp Sevier, Greenville, S. C., as medical supply officer of division and property officer of base hospital at Camp Sevier.

First Lieut. Gustave Fonteyne, Sanitary Corps, to Camp Green, Charlotte, N. C., as medical supply officer of the division and property officer of base hospital.

First Lieut. Patrick Haughey, Sanitary Corps, to Camp Dix, Wrightstown, N. J., as medical supply officer of the division and property officer of the base hospital at Camp Dix.

Major James Ten Broeck Bowels, S. C., to duty at Washington.

Orders to Officers of the Medical Reserve Corps

ALABAMA

To Fort Ethan Allen, Vt., as drillmaster and instructor for hospital corps, Lieut. G. C. Kilpatrick, Irvington.

ARIZONA

To report by telegraph to the commanding general, Lieut. Sidney C. Williams, Chin Lee.

ARKANSAS

To Camp Lewis, American Lake, Wash., as roentgenologist, Lieut. F. E. Diemer, Hot Springs.

To Camp Pike, Little Rock, to duty at base hospital, H. W. Graves, Elm Springs; S. J. Fuller, Little Rock; I. S. Butler, Marshall; J. S. Jenkins, Pine Bluff, and W. K. Read, Texarkana.

To Fort Oglethorpe for a course of instruction, Lieut. Robert E. Weaver, Hope.

CALIFORNIA

To Camp Fremont, Palo Alto, Capt. Shadworth O. Beasley, San Francisco; for duty in connection with camp laboratory, Lieut. R. L. Rierson, Oakland.

To Camp Kearney, Linda Vista, for duty, Lieut. Sylvan L. Haas, San Francisco.

To Jefferson Barracks, Mo., for duty, Lieut. Caro W. Lippman, San Francisco.

To Letterman Hospital, S. F., for duty, Lieut. C. L. Tranter, San Francisco.

To command Base Hospital No. 34, Philadelphia, Capt. R. G. DeVoe, Fort McDowell.

To report by telegraph to commanding general, Western Department, for assignment to duty, Capts. Alonzo DeM. Snyder, Corning; Charles B. Hare, San Jose; Lieut. William Friedberger, French Camp.

To University of California as cardiovascular examiner, Lieut. William J. Kerr, Sebastopol.

CANAL ZONE

To Camp Jackson, Columbia, S. C., Eighty-First Division, Major T. J. Leary, Cristobal.

To Camp Meade, Annapolis Junction, Md., with Seventy-Ninth Division, Major G. L. Qualles, Ancon.

To Camp Sevier, Greenville, S. C., for duty in connection with camp laboratory, Lieut. D. O. Smith, Culebra.

To command Base Hospital No. 24, Tulane University, New Orleans, Capt. C. E. McBrayer, Cristobal.

COLORADO

To Denver, for the purpose of enlisting the personnel of Red Cross Ambulance Co. No. 30, Capt. Thomas H. Hopkins, Denver.

To Schofield Barracks, H. T., Capt. Arthur J. Markley, Denver.

CONNECTICUT

To Fort Ethan Allen, Vt., as drillmaster and instructor for hospital corps, Lieut. M. H. Griswold, Kensington.

DISTRICT OF COLUMBIA

To Camp Hancock, Augusta, Ga., for duty, Lieut. Eugene Clarence Rice, Jr., Washington.

To Camp Meade, Annapolis Junction, Md., to duty at base hospital, Lieuts. George Von P. Davis, as roentgenologist, W. Van Sweringen, Washington.

To Fort Clark, Texas, with Ambulance Co. No. 30, Lieut. William H. Cade, Jr., Washington.

To Fort Oglethorpe, for a course of instruction, Lieut. William O. Wetmore, Washington.

FLORIDA

To Camp Dix, Wrightstown, N. J., Lieut. William A. Clark, Pine Barren.

To Fort Oglethorpe, for a course of instruction, Lieut. Walter J. Baker, Loughridge.

GEORGIA

To Atlanta, Ga., for assignment to Red Cross Ambulance Co. No. 20, Lieuts. L. P. Daly and E. D. Shanks, Atlanta; E. W. Allen, Milledgeville; Spencer A. Kirkland, Zirkle.

To Camp Grant, Rockford, Ill., for duty, Lieut. James J. Beaton, Waycross.

To Camp Wheeler, Macon, for duty, Lieut. Wilborn A. Upchurch, Atlanta.

To Fort Gordon, Atlanta, to duty at base hospital, Capt. H. H. Malone, Lieuts. T. L. Davis, Augusta; R. E. Foster, Carrollton; B. C. Bird, Colquitt; F. Bird, Valdosta.

To Fort Oglethorpe, for a course of instruction, Lieut. De Lamar Turner, Milledgeville.

ILLINOIS

To Camp Dodge, Des Moines, Iowa, as roentgenologist, Capts. W. G. Alexander, Evanston; to duty at base hospital, E. O. G. Frauing, Galesburg; Lieuts. W. C. Bisson, Charleston; W. H. Byford, A. W. K. Downes, Chicago; C. M. Cocu, Cornell.

To Camp Grant, Rockford, Ill., to duty at base hospital, Capts. J. Burry, A. R. Craig, W. Cuthbertson, Lieuts. H. G. Champlin, C. A. Jacobson, Chicago; C. C. Craig, Mount Carmel.

To Camp Hancock, Augusta, Ga., for duty with base hospital, Lieut. J. F. Miller, Palmer.

To Fort Benjamin Harrison, for a course of instruction, Lieut. George N. Pratt, Chicago.

To Fort Ethan Allen, Vt., as drillmaster and instructor for hospital corps, Lieut. M. L. Puffer, Downers Grove.

To Jefferson Barracks, Mo., for duty, Lieut. Robert B. Jack, Okawville.

INDIANA

To Camp Bowie, Fort Worth, Texas, for duty, Capt. Joseph K. Worthington, Indianapolis.

To Camp McClellan, Anniston, Ala., Lieut. Arthur F. Weyerbacker, Indianapolis.

To Fort Benjamin Harrison, for a course of instruction, Lieut. E. J. Dubois, Indianapolis.

To Fort Ethan Allen, Vt., as drillmaster and instructor for hospital corps, Lieut. O. A. Newhouse, Montezuma.

IOWA

To Camp Cody, N. M., for duty in connection with laboratory work, Lieut. Theodore W. Kemmerer, Davenport.

To Camp Dodge, Des Moines, in connection with venereal diseases, Lieut. A. H. Konigsmache, Missouri Valley.

To Camp Lee, Petersburg, Va., as roentgenologist, Capt. E. A. Merritt, Council Bluffs.

To Camp Travis, Fort Sam Houston, Texas, to duty at base hospital, Capts. B. R. Johnston, Cedar Rapids; L. B. Carson, Maquoketa; for duty, Lieut. Henry E. Kleinberg, Redfield.

To Fort Ethan Allen, Vt., for duty, Lieut. R. E. Robinson, Waverly.

KANSAS

To Camp Funston, Fort Riley, Kan., to duty at base hospital, Capt. P. Christmann, Parsons; Lieuts. J. B. Brickell, Americus; J. Welch, Herington; M. Newlon, Lincoln; I. B. Chadwick, Tyro; in connection with venereal diseases, Lieut. R. W. Hissem, Wichita.

To Camp Taylor, Louisville, Ky., to duty at base hospital, Lieut. W. H. Neel, Wellington.

KENTUCKY

To Camp Logan, Houston, Texas, as chief of surgical service, Capt. John H. Blackburn, Bowling Green.

To Camp Taylor, Louisville, Ky., Lieuts. William H. Neel, Bowling Green; Calude Wilson, Greenville; James A. Grider, Smith Grove; to duty at base hospital, C. B. Willmott, Lexington; E. T. Gallagher, Somerset; H. L. McLean, Willmore; in connection with venereal diseases, V. N. Meddis, Louisville.

To Fort Benjamin Harrison, for a course of instruction, Lieut. D. C. Donan, Morganfield.

To Fort Oglethorpe, for a course of instruction, Lieuts. John W. Stephenson, Ashland; J. H. Pritchett, Louisville.

To command Base Hospital No. 31, Youngstown, Ohio, Capt. A. E. Schlanzer, Fort Thomas.

LOUISIANA

To New Orleans, for duty, Major I. Dyer, New Orleans.

MAINE

To Camp Devens, Ayer, Mass., in connection with venereal diseases, Capt. G. A. Pudor, Portland.

To Camp Funston, Fort Riley, Kan., as roentgenologist, Lieut. E. S. Cummings, Lewistown.

To report in person to the commanding general, Southern Department, for duty, Capt. Edson E. Goodrich, Waterville.

MARYLAND

To Camp Doniphan, Fort Sill, Okla., as roentgenologist, Lieut. F. N. Hoffmeier, Hagerstown.

To Camp Meade, Annapolis Junction, Md., to duty at base hospital, Lieuts. E. F. Gott, A. Shelley, H. N. Sisco, Baltimore; Winter R. Frantz, Cumberland; Thomas J. Coonan, Westminster.

To Fort Bayard, N. M., for duty, Lieut. Cranfield H. Douthirt, Baltimore.

MASSACHUSETTS

To Camp Devens, Ayer, Mass., to duty at base hospital, Capts. C. O. Kepler, Boston; E. A. Darling, Cambridge; Lieuts. W. G. Stickney, Beverly; E. S. Winslow, Easthampton; Robert L. Jones, Lowell, J. M. Tracy, Springfield.

To Camp Green, Charlotte, N. C., as roentgenologist, Lieut. H. E. Carney, Boston.

To Camp Hancock, Augusta, Ga., as roentgenologist, Lieut. A. J. Horrigan, Springfield.

To Camp MacArthur, Waco, Texas, for duty in connection with laboratory work, Lieut. Leon S. Medalia, Boston.

To *Camp Shelby*, Hattiesburg, Miss., for duty, Lieut. William P. Boardman, Boston.

To *Fort Clark, Texas*, with Field Hospital Co. No. 28, Lieut. John F. McDonald, North Adams.

To *Fort Ethan Allen, Vt.*, for duty, Capt. H. E. Sears, Beverly; Lieut. R. C. Norris, Methuen.

To *Fort Sill, Okla.*, for a course of instruction at the Gas School, Lieut. N. W. Faxon, Stoughton.

MICHIGAN

To *Camp Custer*, Battle Creek, Mich., to duty at base hospital, Capt. W. E. Chapman, Cheboygan; Lieuts. W. A. Giffin, Deckerville; L. N. Tupper, Redford; for duty, Spencer Van Barnum, Coloma; in connection with venereal diseases, J. R. Coryell, Grand Rapids.

To *Detroit*, for the purpose of enlisting the personnel of Red Cross Ambulance Co. No. 28, Capt. Griffith A. Thomas, Detroit.

To *Flint*, for the purpose of enlisting the personnel of Red Cross Ambulance Co. No. 42, Capt. Floyd A. Roberts, Flint.

To *Memphis, Tenn.*, for the purpose of enlisting the personnel of Red Cross Ambulance Co. No. 45, Capt. Walter R. T. Sharpe, Romeo.

MINNESOTA

To *Fort Sill, Okla.*, for a course of instruction at the Gas School, Capt. J. C. Sessions, Minneapolis.

MISSISSIPPI

To *Camp Logan*, Houston, Texas, for duty in connection with camp laboratory, Lieut. E. R. Gordon, McComb.

To *Camp Shelby*, Hattiesburg, to base hospital as chief of the surgical service, Capt. Walter W. Crawford, as roentgenologist, W. R. Bethea, Hattiesburg.

To *Camp Travis*, Fort Sam Houston, Texas, to duty at base hospital, Lieut. C. C. Buchanan, Laurel.

MISSOURI

To *Camp Cody, N. M.*, for duty in connection with laboratory work, Lieut. Frederick A. Hecker, Kansas City.

To *Camp Dodge*, Fort Riley, Kan., in connection with venereal diseases, Capt. John Butler, Hawk Point.

To *Camp Funston, Kan.*, in connection with venereal diseases, Capt. W. L. McBride, Kansas City.

To *Camp Green*, Charlotte, N. C., for duty, Capt. James B. Clark, Springfield.

To *Camp Pike*, Little Rock, Ark., in connection with venereal diseases, Lieut. H. McC. Young, St. Louis.

To *Camp Travis*, Fort Sam Houston, Texas, in connection with venereal diseases, Capt. H. M. Moore, St. Louis.

To *Fort Clark, Texas*, with Field Hospital Co. No. 29, Lieut. Granvil L. Kerley, Kansas City.

To *Fort Ethan Allen, Vt.*, as drillmaster and instructor for hospital corps, Lieut. N. G. Hawley, St. Louis.

To *Kansas City, Mo.*, for the purpose of enlisting the personnel of Red Cross Ambulance Co. No. 24, Capt. Ernest W. Cavanness, Kansas City.

To report in person to the commanding general, Western Department, for duty, Capt. Frank D. Dickson, Kansas City.

NEBRASKA

To *Camp MacArthur*, Waco, Texas, for duty in connection with laboratory work, Lieut. Aldis A. Johnson, Omaha.

To *Fort Riley*, for instruction, Lieut. Samuel Earl Metheny, Cairo.

NEW HAMPSHIRE

To *Camp Pike*, Little Rock, Ark., as roentgenologist, Lieut. A. G. Straw, Manchester.

To *Camp Wheeler*, Macon, Ga., as roentgenologist, Lieut. A. F. Wheat, Manchester.

NEW JERSEY

To *Camp Dix*, Wrightstown, N. J., to duty at base hospital, Capt. J. N. Teeter, Englewood; M. J. Synott, Montclair; Lieuts. F. R. Corson, Atlantic City; B. A. Furman, Newark; W. A. Clark, Trenton; L. E. Poole, West Hoboken; as roentgenologist, J. B. Edwards, Leonia.

To *Camp Fremont*, Palo Alto, Calif., as roentgenologist, Lieut. J. L. Gariss, Trenton.

To *Camp Kearney*, Linda Vista, Calif., as roentgenologist, Lieut. H. B. Dean, Audubon.

To *Camp Sheridan*, Montgomery, Ala., for duty in connection with laboratory work, Lieut. Harrison S. Martland, Newark.

To *Fort Benjamin Harrison*, for a course of instruction, Lieut. Ambrose F. Dowd, Newark.

To *Fort Oglethorpe*, for a course of instruction, Lieuts. Martin W. Curran, Chatsworth; A. L. Ellis, Metuchen.

NEW YORK

To *Allentown, Pa.*, for duty, Lieut. W. G. Phillips, Jr., Brooklyn.

To *Camp Funston*, Fort Riley, Kan., to duty at base hospital, Lieut. R. J. Miller, New York City.

To *Camp Gordon*, Atlanta, Ga., to duty at base hospital, Lieut. C. E. Wills, New York City.

To *Camp Hancock*, Augusta, Ga., for duty, Capt. Joseph L. Donhauser, Albany.

To *Camp Logan*, Houston, Texas, for duty in connection with camp laboratory, Capt. T. H. Dexter, Brooklyn; as roentgenologist, Lieut. S. F. Weitzner, New York City.

To *Camp McClellan*, Anniston, Ala., for duty in connection with camp laboratory, Lieut. H. E. Melny, New York City.

To *Camp Meade*, Annapolis Junction, in connection with venereal diseases, Lieut. C. M. Williams, New York City.

To *Camp Sevier*, Greenville, S. C., Capt. Abram S. Clark, New York City; as roentgenologist, Lieut. C. W. Woodall, Schenectady; for duty in connection with camp laboratory, Lieut. T. W. Jenkins, Albany.

To *Camp Travis*, Fort Sam Houston, Texas, as roentgenologist, Lieut. D. S. Childs, Syracuse.

To *Camp Upton*, Yaphank, L. I., N. Y., to duty at base hospital, Capt. F. J. Cox, Albany; Lieuts. F. L. Barnum, Kingston, and A. J. Anderson, Long Island City; for duty, Lieuts. William J. Wansboro, Albany, and Russell LaF. Cecil, New York City.

To *Camp Wadsworth*, Spartanburg, S. C., as roentgenologist, Capt. U. S. Kann, Binghamton.

To *Fort Adams, R. I.*, to examine troops for tuberculosis, Lieuts. E. L. Draper and Clinton B. Hawn, Albany.

To *Fort Benjamin Harrison*, for a course of instruction, Lieuts. Reuben S. Simpson, Lyons, and S. Erdman, New York City.

To *Fort Ethan Allen, Vt.*, for duty, Capt. C. B. J. Mittelstaedt, Fisher's Island; Lieuts. F. Crouse, Albany; H. E. McGarvey, Bronxville; P. A. Reque, Brooklyn; J. A. Bennett, Elmira; I. W. Livermore, Gowanda; A. L. Tinkess, La Fargeville; R. S. Nelson and W. H. J. O'Brien, New York City; G. E. Stevenson, Penn Yann; G. J. Ganow, Fort Dickinson; D. Ramsey, Smithtown Branch, and W. H. McShane, Troy.

To *Fort Jay*, for duty, Lieut. L. J. Ladinski, New York City.

To *Fort Oglethorpe*, for a course of instruction, Capt. George Draper, New York City.

To *Fort Riley, Kan.*, for duty, Lieut. Harry T. Lay, Saranac Lake.

To *Madison Barracks*, New York, Capt. Wilson G. Wood, Madison Barracks.

To *New York*, to examine Second Infantry, N. Y. N. G., for tuberculosis, Capt. A. MacFarlane, Albany.

To *Rockefeller Institute*, New York City, to report in person to Major Simon Flexner, for duty as assistant, Capt. E. F. Butler, Yonkers.

To *Spartanburg, S. C.*, for duty in connection with laboratory work, Lieut. Lemuel W. Gorham, Albany.

To *Syracuse, N. Y.*, in connection with enlistments for Red Cross Hospital Unit G., Major E. S. Van Duyn, Syracuse.

Honorably discharged, Lieut. C. E. Tracy, Castleton.

NORTH CAROLINA

To *Fort Oglethorpe*, with the Red Cross Ambulance Co. No. 31, Capt. Charles S. Lawrence, Winston-Salem; Lieuts. William E. Brackett, Caroleen, and John T. Benbow, East Bend.

OHIO

To *Allentown, Pa.*, for duty, Lieut. William J. Jones, Columbus.

To *Army Medical School*, Washington, D. C., for duty, Capt. Charles Goodman, Cleveland; Lieut. Thomas R. W. Wilson, Bakersville.

To *Camp Doniphan*, Fort Sill, Okla., for duty, Lieut. Chelsea A. Coleman, Dayton.

To *Camp Green*, Charlotte, N. C., for duty in connection with camp laboratory, Lieut. J. C. Placak, Cleveland.

To *Camp Sherman*, Chillicothe, to duty at base hospital, Lieuts. G. M. Logan, Akron; W. C. Gates, Bucyrus; J. W. Sheetz, Columbus, and R. B. Thompson, Salem.

To *Fairfield*, and report in person to the commanding officer, Flying School, Aviation Section, for duty as post surgeon, and by letter to the commanding general, Central Department, Capt. Courtney P. Grover, National Military Home.

To *Fort Sill, Okla.*, for a course of instruction at the Gas School, Lieut. G. W. Brehm, Columbus.

To report by telegraph to commanding general, Southern Department, for duty, Lieut. C. T. Smith, Columbus.

To *Syracuse, N. Y.*, for duty, Capt. Samuel Hindman, Columbus.

OKLAHOMA

To *Fort Oglethorpe*, for a course of instruction, Major Bertram E. Duckwall, Fort Sill.

To *Fort Riley*, for a course of instruction, Capt. W. E. Harrington, Wakita.

To *Fort Sill, Okla.*, for a course of instruction at the Gas School, Capt. B. C. Cole, Whitefield.

To *South San Antonio*, Kelly Field, for duty, Lieut. Sims D. Bevil, Poteau.

OREGON

To report by telegraph to commanding general, Western Department, for duty, Lieut. Floyd D. Lewis, Silverton.

PENNSYLVANIA

To *Camp Beauregard*, Alexandria, La., for duty, Lieut. Lloyd Thompson, Homestead.

To *Camp Cody*, Deming, N. M., as roentgenologist, Lieut. L. S. Weaver, York.

To *Camp Custer*, Battle Creek, Mich., as roentgenologist, Lieut. T. L. McCullough, Homewood.

To *Camp Hancock*, Augusta, Ga., for duty, Lieut. Frank P. Strome, Scranton.

To *Camp Jackson*, Columbia, S. C., as roentgenologist, Capt. H. A. Greaves, Philadelphia; in connection with venereal diseases, Lieut. E. J. Braun, Farrel; to duty at base hospital, Lieuts. W. D. Gates, Indiana; E. T. Davies, Old Forge, and W. Van Korb, Philadelphia.

To *Camp Sheridan*, Montgomery, Ala., for duty in connection with laboratory work, Lieut. Charles B. Reitz, Allentown.

To *Camp Sherman*, Chillicothe, Ohio, to duty at base hospital, Lieuts. J. A. Shaffer, Toysburg, and A. B. Shatto, York.

To *Camp Sevier*, Greenville, South Carolina, for duty in connection with camp laboratory, Capt. A. C. Woods, Philadelphia.

To *Columbus Barracks*, Ohio, for duty, Capt. Alexander L. Gillars, Pottsville.

To *Fort Adams, R. I.*, to examine troops for tuberculosis, Lieut. J. P. O'Brien, Philadelphia.

To *Fort Benjamin Harrison*, for a course of instruction, Lieut. John R. Conover, Philadelphia.

To Fort Ethan Allen, Vt., for duty, Capt. W. T. McConville, Honesdale, and Lieut. W. R. Campbell, East Smithfield.

To Fort Oglethorpe, for a course of instruction, Capt. James K. M. Perrine, Pittsburg, and Lieut. Anthony S. Maciejewski, Philadelphia.

To Fort Sill, Okla., for a course of instruction at the Gas School, Capt. T. B. Appel, Lancaster.

To Spartanburg, S. C., for duty, Lieut. John D. Jungmann, Philadelphia; for duty in connection with laboratory work, Lieut. Robert A. Keilty, Lansdowne.

To Washington, for duty with the Council of National Defense, Major Henry D. Jump, Philadelphia.

SOUTH CAROLINA

To Camp Jackson, Columbia, S. C., to duty at base hospital, Lieuts. E. W. Barron, Manning, and J. H. Pratt, Ninety Six.

To Camp Lee, Petersburg, Va., to duty at base hospital, Capt. W. Hope, Union.

To Fort Ethan Allen, Vt., for duty, Lieut. J. D. Thomas, Loris.

To Fort Oglethorpe, for a course of instruction, Lieuts. George Walter, Orangeburg, and F. M. Harvin, Pinewood.

To Greenville, S. C., for the purpose of enlisting the personnel of Red Cross Ambulance Company No. 32, Capt. James E. Daniels, Greenville.

TENNESSEE

To Camp Sherman, Chillicothe, Ohio, in connection with venereal diseases, Lieut. C. E. Barnett, Newport.

TEXAS

To Austin, Texas, for duty, Capt. Albert F. Beverly, Austin.

To Camp MacArthur, Waco, Texas, Lieut. Richard M. Fancher, Houston; as roentgenologist, Lieut. E. V. Powell, Fort Worth.

To Camp Travis, Fort Sam Houston, Texas, to duty at base hospital, Lieuts. J. J. Gill, Lamasco, and B. F. Gibson, Lufkin.

To Camp Upton, Yaphank, Long Island, N. Y., to duty at base hospital, Lieut. E. C. Foster, Whitt.

To command Base Hospital No. 3 (Mount Sinai Hospital), New York, Capt. M. A. Dailey, Presidio.

To Fort Clark, Texas, with Ambulance Company No. 29, Lieut. Robert K. Lowry, Hubbard; with Field Hospital Company No. 30, Lieut. Levy S. Johnson, Richmond.

To Fort Sam Houston, for duty, Lieuts. A. L. Roberts, Myra, and Joseph A. L. Wolfe, Van Alstyne.

To report by telegraph to commanding general, Southern Department, for duty, Lieuts. Jackson S. Cooper, Dallas, and William H. Cooley, Sarita.

To South San Antonio, Kelly Field, for duty, Lieut. Jeffrey C. Michael, Houston.

UTAH

To Camp Meade, Annapolis Junction, Md., Lieut. George Von-P. Davis, Salt Lake City.

VERMONT

To Camp Dix, Wrightstown, N. J., in connection with venereal diseases, Capt. W. W. Townsend, Rutland.

To Fort Ethan Allen, Vt., for duty, Lieut. E. Bibby, Craftsbury.

VIRGINIA

To Camp Lee, Petersburg, Va., to duty at base hospital, Capts. S. B. Moore, Alexandria; E. M. Parker, Emporia, and Joseph W. Hope, Hampton; Lieuts. C. M. Easter, Chincoteague Island; P. C. Riley, Markham, and I. H. Goldman, Richmond.

To Newport News, Va., for duty, Lieut. Paul J. Parker, Hampton.

To Richmond, Va., for instruction in military roentgenology, Lieut. R. A. Davis, Newport News.

WASHINGTON

To Camp Fremont, Palo Alto, Calif., for duty in connection with camp laboratory, Lieut. P. C. West, Seattle.

To Camp Lewis, American Lake, Wash., to duty at base hospital, Capt. F. P. Gardner, Seattle; Lieuts. P. I. Carter, Port Townsend; E. L. Bickford, Seattle; W. B. McNerthney, J. S. Smeall and H. J. Whitacre, Tacoma.

To Camp MacArthur, Waco, Texas, for duty in connection with laboratory work, Lieut. Harry H. Robinson, Spokane.

WISCONSIN

To Camp Logan, Houston, Texas, Lieut. Albert G. Jenner, Milwaukee.

To Washington, D. C., in connection with preparation of a pamphlet on Plastic and Oral Surgery of the War, Capt. R. H. Ivy, Milwaukee.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Personal.—Dr. Judson D. Dowling, Birmingham, has been elected health officer of Jefferson County, succeeding Dr. F. E. Harrington, resigned to reenter the United States service.—Dr. Burdett L. Arns, chief bacteriologist of the Alabama State Board of Health, Montgomery, has been appointed director of the bacteriologic Laboratories of the Florida State Board of Health, Jacksonville, succeeding Dr. Edward G. Birge, M. R. C., U. S. Army.—Dr. George A. Mershon, Fairhope, has been appointed assistant surgeon of the Soldiers' Home, Marshalltown, Iowa.—Dr. Hawkins D. Westmoreland, Huntsville, has been appointed local surgeon for the Southern Railroad, succeeding Dr. Felix E. Baldrige, deceased.—Major Middleton H. Hagood, Brewton, is convalescent after a surgical operation.

CALIFORNIA

Typhoid in Modesto.—The seventh death in Modesto from typhoid fever since the opening of the epidemic occurred August 19.—Frank Holtham has been appointed sanitary inspector of Modesto, and is initiating an active clean-up campaign.

Venereal Diseases Controlled.—State Health Officer Sawyer has petitioned county supervisors to provide in their annual budget for hospital facilities for the care and isolation of patients suffering from venereal diseases. Governor Stevens has appropriated \$60,000 from the state war emergency fund for the control of this problem.

Will Require Intern Year.—The College of Physicians and Surgeons, the medical department of the University of Southern California, Los Angeles, announces that students matriculating in the session of 1918-1919 and thereafter will be required to take a five-year course before obtaining the M.D. degree, the fifth year to be spent as an intern in a hospital acceptable to the senior faculty, or have its equivalent in other advanced clinical training.

CONNECTICUT

Personal.—Dr. Simon R. Klein, formerly director of the Norwich research and experimental laboratory, has been appointed assistant superintendent, pathologist and roentgenologist to the Waldheim Park Sanitarium and Polyclinic, Oconomowoc, Wis.—Dr. Jeremiah D. Eggleston has been elected president of the board of trustees of the State School for Boys, Meriden.

GEORGIA

Personal.—Dr. Henry W. Terrell, La Grange, has been appointed a member of the state board of medical examiners to succeed the late Dr. Francis M. Ridley, La Grange.—Dr. Clarence M. Paine, Atlanta, is reported to be critically ill in a hospital at Rochester, Minn., following a surgical operation.

New Officers.—The annual meeting of the First Congressional District Medical Society was held in Savannah, August 3. Statesville was selected as the next place of meeting, and the following officers were elected: president, Dr. Robert L. Miller, Waynesboro; vice presidents, Drs. Luther A. De Loach, Glennville, and Antonio J. Waring, Savannah.

City Discontinues Drug Addict Treatment.—The City Health Department of Atlanta, which has been treating as many as 500 drug addicts every week for the last three months, has ordered that this treatment be discontinued, as many of the addicts, in spite of their promise that they would enter the hospital at Atlanta, which is maintained by the state for this purpose, would go, after receipt of treatment at Atlanta, to other cities, arouse the sympathy of city officials and obtain similar treatment there.

"The object of this war is to deliver the free peoples of the world from the menace and the actual power of a vast military establishment, controlled by an irresponsible government which, having secretly planned to dominate the world, proceeded to carry the plan out without regard either to the sacred obligations of treaty or the long established practices and long cherished principles of international action and honor; which chose its own time for the war; delivered its blow fiercely and suddenly; stopped at no barrier either of law or of mercy; swept a whole continent within the tide of blood—not the blood of soldiers only, but the blood of innocent women and children also, and of the helpless poor; and now stands balked but not defeated, the enemy of four-fifths of the world."

ILLINOIS

Sanitary Personnel Needed.—Major-Gen. George Bell, Jr., in command of Camp Logan, Houston, Texas, telegraphs to the Secretary of War, August 29, asking that Illinois Field Hospital Nos. 2, 3 and 4, and Illinois Ambulance Companies Nos. 1, 2, 3 and 4 be ordered to Camp Logan.

Tuberculosis Must Be Reported.—According to regulations issued by the state department of health, August 30, physicians, health officers, attendants, householders and parents who have knowledge of a known or suspected case of tuberculosis in the state are required to report it to the local health authorities.

Drugless Practitioners in Illinois.—An official register of drugless practitioners in Illinois, officially referred to as "Other Practitioners," has been issued by the Illinois State Board of Health. The list contains the names of 1,513 such practitioners who were licensed prior to July 1, 1917, when the licensing of all practitioners of healing was transferred from the state board of health to the new department of registration and education.

Chicago

Besley Unit Addition Leaves Chicago.—Nine physicians of Chicago and forty-seven civilians left for the East, September 2, en route for France. At the East port they will be met by the twenty Red Cross nurses who left Chicago, August 22.—Lieut. J. Roscoe Harry, M. R. C., U. S. Army, who has been on duty for several months in Chicago, left for France, September 1.

Gardner Goes to California.—Dr. George A. Gardner, one of the first of the dispensary physicians connected with the Chicago Tuberculosis Institute, who has been identified with the Stock Yards Dispensary ever since its foundation, and with the first open air school for children, and at Harlowarden camp at Joliet, has accepted a position on the staff of the sanatorium of Dr. Pottenger, at Monrovia, Calif.

INDIANA

Infantile Paralysis in East Chicago.—Seven cases of infantile paralysis, with three deaths, have been reported at East Chicago. The first case developed in July. It is now believed that the disease is under control.

Personal.—Drs. John E. McArdle and Edward J. McOscar have been appointed local physicians for the Fort Wayne and Northern Indiana Traction Company.—Dr. Royal H. Gerard, Crawfordsville, has been elected president of the National Fraternal Congress of America.

State Association Meeting.—The Indiana State Medical Association will hold its annual meeting in Evansville, under the presidency of Dr. John H. Oliver, Indianapolis, September 26-28. The sessions will be held in the new Coliseum. Dr. Edwin Walker is chairman of the committee of arrangements. The entertainment provided for the association includes an evening trip on the Ohio River, and a motor trip to New Harmony.

MARYLAND

To take Charge of Canadian Hospital.—Dr. Thomas B. Fitcher, visiting physician at Johns Hopkins Hospital, and member of the staff of the Medical School, will sail shortly for England, where he will be in charge of the Canadian Military Hospital at Orpington, Kent.

Ordered to Camp Meade.—Dr. Arthur M. Shipley, Baltimore, professor of surgery at the University of Maryland, received his commission as chief of the surgical staff of the University of Maryland Base Hospital Unit, has been detached from the unit by order of the War Department, and ordered to report immediately to Camp Meade as chief surgeon and surgical instructor at the camp.

Mrs. Thayer Dies.—Mrs. William S. Thayer, wife of Dr. William S. Thayer, Baltimore, died at the home of her niece, Mrs. Samuel Shoemaker Murray, at Pikesville, August 29. Mrs. Thayer was graduated from Johns Hopkins Training School for Nurses in 1892, the first class of the hospital. Sometime later she became superintendent of nurses at the hospital, and was for several years president of the alumnae association. Dr. Thayer is now in Russia.

War Against Tuberculosis.—The Maryland Council of Defense has appointed a strong committee for the purpose of making an investigation and report on the tuberculosis situation in this state, the present preventive needs of the state

and the extraordinary needs due to the war. This committee was named in response to the appeal placed before the council by Dr. C. Hampson Jones and H. Wirt Steele, executive secretary of the Maryland Association for the Prevention and Relief of Tuberculosis. Prof. Joseph S. Amos, Johns Hopkins University, is chairman of the committee.

MONTANA

Decrease in Tuberculosis.—Superintendent A. F. McDonald of the state sanatorium, Galen, reports that the crusade against tuberculosis in Montana is bearing fruit, and that for the first time since its opening, the sanatorium has vacancies for twenty-five patients.

Personal.—Dr. Alfred J. Willits, Anaconda, has been appointed temporary chief of staff of St. Ann's Hospital.—Dr. Alfred Blumberg, Butte, is said to have filed a suit in the federal court against Dr. Patrick H. McCarthy, health officer of Butte, claiming \$5,000 damages on account of alleged slander. The suit is based on a statement said to have been made by Dr. McCarthy at the recent state association meeting to the effect that Dr. Blumberg was a German spy.

NEW YORK

Dental Ambulances for New York Troops.—The preparedness League of American Dentists has been the recipient of a gift of \$10,000 from Mrs. William B. Thompson to equip five dental ambulances for the New York state troops. These ambulances will be tendered to the government through the American Red Cross Society. The League of American Dentists proposes to equip a large number of dental ambulances for the expeditionary forces.

Civil Service Examination for Medical Assistant, District Attorney's Office.—The civil service commission of the state of New York announces that a competitive examination will be held for the position of medical assistant, district attorney's office, Kings County. Applicants must have been physicians and surgeons for at least ten years, duly licensed to practice medicine in this state. The duties of the office include the examination of the dead body and of all the premises where it is found for the purpose of ascertaining all facts which will aid in elucidating the circumstances surrounding the death. The salary is \$3,000. Applications must be filed with the civil service commission, Albany, not later than September 26.

New York City

Treatment of Venereal Disease in Dispensaries.—The board of health has added an amendment to the sanitary code which has as its object the improvement of the standard of service rendered by dispensaries in the treatment of venereal diseases. This amendment includes a number of regulations providing for the keeping of proper records, a follow-up system, the discharge of patients, and requires that such dispensaries be open at least three days a week. These regulations require that in cases of syphilis, salvarsan or one of its analogues be administered in addition to the use of other approved methods of treatment. Microscopic examinations must be made, and in cases of gonorrhea the complement deviation test must be performed. Every dispensary treating these diseases must be provided with facilities for urethroscopic and cystoscopic work, and these facilities must be regularly employed by the physician in attendance.

Columbia War Hospital Renamed.—The Columbia University War Hospital, which was established on Columbia Oval in the Bronx, and was accepted as a war hospital by the government some time ago, has been designated as United States Army General Hospital No. 1. It is to be one of a series of hospitals where serious cases will be brought when treatment requires such time that the men cannot be kept in the field or other hospitals without clogging the machinery of caring for the wounded. The executive committee of the hospitals is composed of Dr. Samuel W. Lambert, dean of the College of Physicians and Surgeons; Dr. John B. Squier, Dr. William H. Bishop, surgeon to the Cumberland Street Hospital of the Department of Charities; Dr. Adrian V. S. Lambert, surgeon to the Presbyterian Hospital; Dr. Francis Carter Wood, director of the laboratories of St. Luke's Hospital; Frederick A. Goetze, treasurer of Columbia University, and Willard V. King, president of the Columbia Trust Company.

Amendments to Sanitary Code.—In order to make certain that all persons recognized by their physicians as being infected with a venereal disease shall be instructed as to the

nature of their infection and the measures to be taken to avoid its spread, the Sanitary Code has been adopted to read as follows:

It shall be the duty of every physician to furnish and deliver to every person found by such physician to be affected with syphilis or gonorrhea a circular of instruction and advice, issued or approved by the Department of Health of the City of New York, and to instruct such person as to the precautions to be taken in order to prevent the communication of the disease to others.

No person affected with syphilis or gonorrhea shall, by a negligent act, cause, contribute to, or promote the spread of such disease.

Another new addition to the Sanitary Code provides for the regulation of private laboratories by the department of health. These regulations provide that hereafter no laboratory offering facilities for the diagnosis of communicable disease shall be conducted or maintained in the city of New York without a permit therefor issued by the board of health, or otherwise than in accordance with these regulations. It is required that all specimens be properly numbered, that a record be kept showing the date of receipt of each specimen, the name of the physician submitting the specimen, the result of the test and the name of the person to whom the report was sent. The regulations require that laboratories be adequately equipped and that approved methods be employed. Applications for permits to conduct and maintain such laboratories must be made by those in charge of the laboratory on official blanks furnished by the department of health.

OHIO

Cincinnati

Dr. Reed's Condition Improving.—The many friends of Dr. Charles A. L. Reed, who suffered a cerebral hemorrhage in Atlantic City, August 23, will be glad to hear that he is now improving.

Personal.—Dr. John M. Adams was elected Surgeon-General of the Grand Army of the Republic at the annual encampment in Boston, August 23.—Dr. George A. Fackler is reported to be seriously ill at Christ's Hospital.

Dr. Ravogli Retires.—Dr. Augustus Ravogli, chief of staff of the dermatologic department of the Cincinnati General Hospital ever since its reorganization, has retired from the staff after a continuous service of twenty years, and has been succeeded by Meyer L. Heidingsfeld.

PENNSYLVANIA

Women Interns in Sanatorium.—On account of shortage of men due to war conditions, women interns have been attached to the staff of the State Sanatorium, Mont Alto.

Dysentery Epidemic.—State health officials are examining into an epidemic of dysentery which has broken out at Amsbry. There have been twenty-five cases of the disease, with two deaths.

Personal.—Dr. Wayne L. Shearer, Reading, who was operated on, June 14, at St. Joseph's Hospital, has recovered and resumed practice.—Dr. Adam L. Kotz, Easton, has resigned from the staff of St. Luke's Hospital, South Bethlehem, and has been appointed pathologist for the Easton Hospital.—Dr. John L. Mansuy, Ralston, was attacked by a highwayman near Ralston, August 15, and was shot and wounded in the arm.

Philadelphia

Women Commissioned in French Army.—Drs. Marie K. Formad and Laura Hunt have accepted commissions in the French Army, and will join the unit now being organized by women physicians of New York City.

Two Ambulances Given University Unit.—Two additional motor ambulances have been given to the University of Pennsylvania Base Hospital No. 20, one by Mrs. William McLean, in memory of her son who died in June at Fort Oglethorpe, where he was artillery instructor, and one from Mrs. Caleb F. Fox.

War Hospital Canvass.—A campaign to raise \$25,000 in West Philadelphia for the Jefferson Base Hospital No. 38 was started, August 28, when headquarters were opened in the Chevrolet Motor Car Company. One hundred thousand circulars will be distributed between the above date and September 14, when the final days' drive will be started.

Personal.—Dr. James A. Babbitt, physical director at Haverford College, will have charge of the American Friends' Reconstruction Unit, which leaves shortly for France to

engage in reconstruction work under the civilian branch of the American Red Cross Association.

VIRGINIA

Ambulance Presented to Richmond.—The Jefferson Club formally presented an ambulance to the Richmond Grays Battalion of the First Virginia Infantry. The presentation address was made by Mr. W. H. Schwarzschild, president of the club. Governor Stewart accepted the gift, and presented it to Major J. Fulmer Bright, commander of the battalion.

Infantile Paralysis.—Dr. Ennion G. Williams, Richmond, state health commissioner, in a letter to the Norfolk Board of Health, August 22, stated that there have been twenty-two cases of infantile paralysis in Rockingham County, with seven deaths. He points out the precautionary steps that should be taken, and urges that the cities proceed at once with a vigorous clean-up campaign. The city health board of Staunton, as a precautionary measure, has debarred adults from Rockingham County from visiting Staunton, and, August 18, ordered all churches and moving picture houses closed.

Base Hospital Staff Announced.—Dr. Stuart McGuire, Richmond, has announced the official and medical staff of the Medical College Base Hospital Unit No. 45: director, Dr. Stuart McGuire; adjutant, Dr. James H. Smith; registrar, Dr. Greer Baughman; assistant director and chief of surgical staff, Dr. W. Lowndes Peple; surgeons, Drs. Roy C. Fravel, Joseph F. Geisinger, Alvah L. Herring, Carrington Williams, Henry P. Mauck, all of Richmond, and Frank C. Pratt, Fredericksburg; assistant director and chief of medical staff, Dr. J. Garnet Nelson; staff physicians, Drs. William B. Porter, Joseph T. McKinney, Benjamin B. Dutton, Lot, and Junius E. Warinner; assistant director and chief of laboratory, Dr. E. Guy Hopkins; diseases of eye, ear, nose and throat, Dr. William B. Hopkins; neurologist, Dr. Paul V. Anderson; bacteriologist and pathologist, Dr. Charles Philips; roentgenologist, Dr. Frederick M. Hodges, and dentists, Drs. P. J. M. Hughes and J. D. Williams.

WASHINGTON

Military Surgeons Organize.—The Washington Association of Military Surgeons was organized, July 23, at the Field Hospital, American Lake Cantonment, and the following officers were elected: president, Dr. James B. Eagleson, Seattle, and vice presidents, Drs. James R. Yocom, Tacoma; H. Eugene Allen, Seattle, and Samuel E. Lambert, Spokane.

CANADA

New Sanatorium Opened.—The Duke of Devonshire, governor-general of Canada, formally opened a new sanatorium for tuberculosis at Weston, Ont., August 29.

Model Baby Clinic.—The Ontario Board of Health held a model baby clinic in connection with its public health exhibit at the Canadian National Exhibition held in Toronto, August 27 to September 8.

Bruce Report Deferred.—Sir Robert Borden, Canadian prime minister, has announced in the Canadian house of commons that the Bruce report in reply to that of Colonel Baptie would not be presented to the house at the present time.

Canadians in Hospital.—Aug. 28, 1917, there were 26,653 Canadians in hospitals in Canada and the United Kingdom; 8,840 being in Canada, and 17,813 in the United Kingdom. The tuberculosis cases in Canadian convalescent homes numbered 1,115.

Medical Editor Promoted.—Capt. Andrew Macphail, editor of the *Canadian Association Journal*, who has been in France almost since the outbreak of the war, but recently attached to the Canadian Medical Headquarters in London, has been promoted to take charge of the Third Army Medical Department, with the rank of major.

Public Health Association Meeting.—The sixth annual congress of the Canadian Public Health Association will be held in Ottawa, September 27 and 28, under the presidency of Dr. Joseph D. Page, Quebec. During the same week the Canadian Conference on Charity and Correction and the Canadian Association for the Prevention of Tuberculosis will hold their annual meeting.

Personal.—Capt. W. John O. Malloch, M.D., Toronto, who has been with the University of Toronto Base Hospital at

Saloniki, has been promoted to major and has returned to England.—The following Canadian physicians have been mentioned recently in despatches: Lieut.-Col. John A. Amyot, Toronto; Col. Ernest C. Ashton, Brantford, Ont.; Capt. G. C. Bonycastle, Toronto; Lieut.-Col. Perry G. Goldsmith, Toronto; Major Samuel H. McCoy, Toronto; Lieut. H. W. Cheney, Major O. K. Gibson, Capt. Thomas F. Graham, New York; Major W. H. Greene, Capt. H. C. Hall, Major R. M. Harcourt, Capt. J. E. Holmes, Lieut. G. H. Kennedy, Lieut.-Col. George L. Hume, Capt. T. W. Lawson, Capt. O. N. Leslie, Lieut.-Col. G. F. Macfarlane, Lieut.-Col. A. A. Magee, Capt. Frederick R. Mallory, D.D.S., Toronto; Capt. V. C. W. Marshall; Capt. G. V. Morton; Lieut.-Col. Richard Raikes, Capt. L. M. Rathbun, Major J. R. Roaf, Lieut.-Col. Robert D. Rudolf, Toronto; Major B. J. Saunders, Capt. L. P. Sherwood, Capt. H. A. Simmons, Capt. S. C. Snively, Lieut.-Col. Clarence L. Starr, Toronto; Capt. D. D. Wilson and Major Robert E. Wodehouse, Fort William, Ont.

GENERAL

Bequests and Donations.—The following bequests and donations have recently been announced:

The American Red Cross has been given a credit on the Ford factories of \$500,000 for automobiles, ambulances, parts, etc., as may be designated by the beneficiary.

Middlebury (Vt.) College, a trust fund of \$100,000, to be known as the Henry Freeman Walker Furlough and Emergency Fund, for the benefit of the faculty of the Middlebury College, by the will of Dr. Henry Freeman Walker.

Episcopal Hospital, and Philadelphia Home for Incurables, about \$10,000 each, by the will of Penelope Shepard.

Meeting National Safety Council.—The sixth annual meeting of the National Safety Council will be held in New York Sept. 10 to 15, 1917. According to the program issued there will be two general sessions, one for presidents and managers and one for young safety engineers. In addition there will be a general round table meeting, sixteen section meetings and the national safety exposition. There are 137 speakers on the program. Each of the sixteen section meetings will relate to some particular industry, and the papers and addresses will refer to some phase of safety in that industry. The health service sectional meeting will take up such subjects as "Industrial Hospitals and Dispensaries," "First Aid in the Industries. How Much?" "Treatment of Minor Injuries"; "The Need for Visiting Nurses in Industry"; "First Aid and Surgical Work vs. Medical Attention of Employees." General discussions will follow each paper.

FOREIGN

Honors for Medical Aviators.—Major L. Falchi and Capt. F. Rossi are medical officers connected with Italian aviator squadrons, and both are accomplished airmen. Each was recently awarded the silver medal for military gallantry on account of their air achievements and professional devotion. In some of the flights Rossi was commander of the squadron.

Italian Professors Reaching the Age Limit.—The seventy-fifth year automatically retires this year from their chairs in the universities Golgi, Novaro and Roster. Golgi and Novaro are both senators of the realm. The former is professor of general pathology at Pavia, and Novaro of surgery at Genoa. Roster is professor of hygiene at Florence.

Deaths in the Profession Abroad.—Major-Gen. T. Rosati, surgeon-general of the Italian navy, aged 57. He was formerly professor of ear and throat diseases at the University of Naples, and has published much on this specialty and on matters connected with the organization of the profession.—J. Veit, professor of obstetrics and gynecology at the University of Halle, aged 62. At one time he was privat docent at Berlin and later professor at Leyden, and has published numerous works on his specialty.

Compulsory Surgical Operations on Soldiers.—The Italian minister of war has refused to permit any operations on soldiers to render them fit for military service unless they consent thereto. Senator Chiesa protests against this ruling, saying that there are at least 100,000 recruits who are rejected on account of hernia who could be restored to clinically normal conditions by an insignificant operation. He says that so many prejudices have been modified by the necessities of war that it seems only fair that those who have some minor defect should have it corrected and thus give the army many thousands of valid recruits. If they do not consent to this voluntarily the prejudice against compelling them against their will should be set aside during the exigencies of warfare.

PARIS LETTER

PARIS, Aug. 2, 1917.

The War

INFREQUENT POSTOPERATIVE DRESSINGS AT THE FRONT

Dr. Chevassu recently addressed a communication to the Société de chirurgie de Paris on this subject. Dr. Chevassu has shown that when a fresh war wound has been operated on at the front in a proper manner, the primary adhesions having been broken up, reasonable excisions made and the splinters of the projectile removed as far as possible, the too frequent renewal of dressings is much more likely to prove a cause of new infection than the absence of perfect technic as regards disinfection at the time of operation. Chevassu is also of the opinion that the dressings of men operated on should not be touched until there is positive indication for removing them. The only positive indication is the belief that something wrong or abnormal is taking place under the dressings, that the wound is not developing in the simple manner expected. In that case the dressings should be changed in order to see what is going on. If the temperature and the pulse are watched carefully, one can usually tell whether the wound is progressing normally. It can usually be expected that every man operated on for leg or arm wounds will have some fever inside of twenty-four hours. If the fever persists at the end of thirty-six hours, it merits attention. If it has not subsided at the end of forty-eight hours, the dressings should be removed, especially if it is a question of wounds having their seat in dangerous zones commonly subject to gangrene, such as wounds of the buttock, the thigh, the calf and the arm. In the matter of gas gangrene, the study of the pulse is even more instructive than the changes of temperature. If, beginning with the twenty-fourth hour, the pulse becomes more rapid instead of slowing down, one should see what is going on.

The sudden appearance of sharp pains in the region of the wound, abnormal bleeding, or the soiling of the dressings, may be taken as evident indications that something is wrong. Except for these indications, Chevassu is of opinion that there is every reason to leave the original postoperative dressings in place for a week at least, which effects considerable economy in dressing material and saves the time of the personnel. This is all the more true as regards visceral wounds, for here the mobilization necessitated by the change of dressings is a process fraught with danger. With reference to cerebral wounds, Chevassu has carried the principle of infrequent dressings to its extreme limits, the postoperative dressings in such cases not being removed, if it can possibly be avoided, until about the twenty-fifth day. This practice, combined with the internal use of hexamethylenamin, produced for him last year, during the Battle of the Somme, immediate results which were particularly favorable, since, of seventy-seven patients suffering from cerebral wounds he was able to evacuate fifty-three, or two thirds of the total number, the evacuation usually taking place at the end of a month. But the principle of infrequent dressings is, of course, not applicable unless the wounds are properly treated at the outset. An ample excision of tissue along the path of the projectile without useless waste of substance (but yet opening up the wound sufficiently), which in the case of wounds located near large masses of muscle implies an incision practically equal in length to the depth of the path of the projectile, is the first condition for proper treatment. The extraction of the projectile is an excellent thing to do, but it is not absolutely indispensable, and it is well to know how to dispense with it when one is hard pressed by the vast numbers of wounded and has therefore little time to devote to it. After ample excision throughout the path of the projectile, Chevassu strongly recommends draining the wound by the moderate use of gauze wicks dipped in physiologic sodium chlorid solution. By the aid of this simple and economical fluid such a healthy, vivacious appearance of the wound is secured, and it heals so readily by second intention that Chevassu has never felt the need of using any other methods in the treatment of urgent operative cases at the front.

SUBSTITUTES FOR WHEAT

At a recent meeting of the Académie de médecine, Dr. Maurel, professor of experimental pathology at the Faculté de médecine at Toulouse, presented a communication on the subject of substitutes for wheat now used in the production of bread, and discussed these substitutes from the standpoint of alimentary hygiene. All the different kinds of flour which may be with the sanction of the government mixed with wheat flour have, according to Maurel, practically the same

food value, contain the same amount of carbohydrates, and furnish approximately the same number of calories. No objections on hygienic grounds may be raised against barley, buckwheat, sorghum, millet or beans. The researches undertaken by Maurel lead him to affirm that bread into which the foregoing substitutes enter as constituents will be healthful and, in spite of the great diversity of its components, will possess the same food value as bread made from pure wheat. He fears, however, that these substitutes, taken collectively, may not be sufficient to make up the existing deficit. In this case, it will be easy to remedy the insufficiency by having recourse to the colonial substitutes so called, the use of which is authorized by law, among which rice is entitled to first place.

A SPECIAL BADGE OF HONOR FOR NURSES

Justin Godart, undersecretary of state for the military medical service, has just issued an administrative order providing for a special badge of honor to be conferred on nurses who have especially distinguished themselves by their devotion and the value and length of their services among the sick and wounded military. This badge of honor consists of two palm branches intercrossed above a small red cross. It is attached by a white clasp and is worn on the left side of the hospital uniform, when this style of dress is used, and on the outside coat above the army nurse badge when the nurse is dressed in civil garb. The nurses who are members of the Sociétés d'assistance attach the badge to the ribbon from which is suspended the emblem of their society. This badge is made in three styles—of bronze, silver or gold. The nurses must have given twelve months of efficient service in order to be adjudged worthy of this badge of honor. The first year's service entitles one to the bronze badge; the second year's service makes one eligible to receive the silver badge, and after three years' service the gold badge may be bestowed.

In the hospital units recommendations are made by the chief surgeons. In the Sociétés d'assistance the chief surgeon makes recommendations either of his own accord or at the instance of the society. He adds critical notes of his own. In due time the recommendations are passed on through a chain of higher authorities, each one giving in a few words the reason for the action he takes in the matter. On the back of the recommendations is given a complete record of the candidate, including any honorable mention he may have received. The badge of honor is bestowed by the undersecretary of state for the military medical service, who sends an official notification to the candidate informing him of the action taken.

LONDON LETTER

LONDON, Aug. 16, 1917.

Exhaustion of the Supply of Medical Officers for the Army

The Central Medical War Committee has informed the government that, after a careful survey of the whole of England and Wales, it is of the opinion that no more physicians can be called on to take commissions in the Army Medical Corps without seriously endangering the supply of physicians for the treatment of the civil community, and that further depletion can be effected on the responsibility of the government only after carefully comparing the military with the civil needs. A few more appeals still remain to be heard before the last man considered available by the committee has entered the army, but from September onward it will be quite impossible under present powers and conditions to satisfy the large demands of the Army Medical Department.

In the overseas dominions a similar condition is approaching. In the Australian Commonwealth an appeal is made to physicians to offer their services at once. Young physicians are being sought in preference, but even those of maturer age may be accepted. It will probably be necessary to deplete the junior staffs of the large general hospitals, and senior practitioners who cannot be usefully employed by the country in any other manner are asked to lay aside pride and take on the young man's job during the time of stress. The Department of Defense will send to France every available physician within the next two months.

The position is similar in New Zealand. Hon. G. W. Russell, the minister of public health, recently said: "The medical profession up till the present has done splendidly in accepting the call to the colors, and many physicians have at great sacrifice thrown up their practices and joined the forces, either for work in this country at the camps, and on the medical boards, on the hospital ships, or with the forces in the field. As regards medical service for the civilian population, the position is now becoming very acute. From

various parts of New Zealand there is a call for medical service owing to the depletion of those districts of physicians. Up till the present there has not been any necessity to conscript medical men for military service, nor do I think there will be any need to consider the question in the future. Some of the leading hospitals have lately been reduced to the direst straits on account of the shortage of physicians. Recently we had to obtain the services of two medical students from Dunedin in order to carry on the work of the Christchurch Hospital. These facts, and the shortage of physicians in some of the country districts, point to the absolute necessity of the medical services in New Zealand being mobilized and some control exercised throughout the period of the war as to the location of physicians. So far as the large cities are concerned, owing to the large institutions they possess, they will probably be able to win through, although the physicians in practice in the cities are, of course, feeling the pressure of the large amount of additional work entailed on them owing to the absence of so many of their professional brethren. This is not at all the position in other districts. For example, the other day I received word from the Westland Hospital Board that there was only one physician on that part of the coast to cover 300 miles of country."

Economy in the Prescribing of Glycerin and Sugar

In THE JOURNAL, Sept. 1, 1917, p. 748, attention was drawn to the withdrawal from the British Pharmacopeia of a large number of preparations containing glycerin and sugar in consequence of the necessity to economize in these substances. The government issued a memorandum to physicians at the beginning of the year asking them to economize in the use of these substances; but this has not resulted in a sufficient diminution. The position has become more stringent, and the General Medical Council has now made fresh representations on the subject. It is pointed out that glycerin for medicinal purposes is no longer being manufactured. For such glycerin, therefore, as is required for the treatment of disease, the country must probably depend, until after the end of the war, entirely on existing stocks. These, it is believed, would suffice to provide what is necessary. But if they are drawn on unnecessarily, there is a danger that at a later stage glycerin will not be available for those purposes for which it is really required. Of sugar, on the other hand, a proportion of whatever supply is generally available will continue to be available for medicinal use. Physicians are reminded that, while sugar is of little use medicinally except as an adjuvant or excipient, it is of the greatest value as a food. It therefore ought not to be used for medicines unnecessarily. The following suggestions are made to physicians: As to glycerin: 1. Substances for which glycerin is ordinarily used as a solvent are usually sufficiently soluble for all practical purposes in other mediums. 2. Substitutes for sweetening and preservative purposes are also available, notably chloroform water. 3. Where demulcent action is needed, one of the various mucilaginous bodies, such as mucilage of tragacanth, will usually be found suitable. 4. As a laxative, it is anticipated that physicians will find few cases in which glycerin can be said to be indispensable. 5. For cases in which the physical effects of glycerin on mucous and skin surfaces have led to its use as an ingredient of douches and lotions, similar results can be attained by employing saline, alkaline or other solutions of varying strengths, selected to meet the particular needs of each case. As to sugar: 1. When sweetening is required, agents other than syrup or sugar, such as chloroform water, should be used. 2. Drugs that are ordinarily prescribed in sugar-containing combinations may usually be given without loss of efficiency in some sugar-free form. A preparation made according to the following formula has been found useful as a substitute for either glycerin or syrup: gum tragacanth in powder, 30 grains; chloroform, 40 minims; water to make 10 fluidounces.

The Control of Venereal Diseases in Tasmania

In THE JOURNAL, Sept. 2, 1916, p. 757, I described the very drastic act passed in Western Australia for the control of venereal disease. The legislatures of Tasmania and of Victoria have followed this example. The act for Tasmania is on very similar lines to that of Western Australia, but differs in details. The treatment of those suffering from venereal diseases is restricted to physicians. Every person suffering from venereal disease must obtain advice forthwith from a physician or must attend at a hospital or at a place prescribed for the treatment of these diseases. Until a certificate of cure has been received, the patient must attend

once in every four weeks. The physician consulted must inform the chief medical officer of the attendance without giving the name or address of the patient. When any patient fails to return for treatment for six weeks, the physician must send to the chief health officer a notice including the name and address of the patient, unless he has been informed by some other physician that the patient is under treatment. The chief health officer is given power to order the patient to obtain treatment from a physician. If the patient does not comply with the request of the chief health officer, a police magistrate may by warrant order the patient to be detained for any period not exceeding four weeks in any prescribed place, so that such clinical, chemical, bacteriologic and other examinations may be carried out to determine whether or not the patient is suffering from venereal disease. If the patient is found to be affected with venereal disease, the governor is given power to order a further period of detention on the report of the minister of health that detention is necessary in the interests of the patient or the public welfare. The right to appeal is given to the patient, and this can be exercised once every three months. Any person undergoing detention who can satisfy the minister that he can obtain and is prepared to undergo suitable private medical treatment, may be released. Every person detained in a place set apart for the care of patients suffering from venereal disease must be examined by two physicians once in every three months. Women have the right to be examined, when practicable, by women physicians. Prisoners under sentence who may be suffering from venereal diseases may be removed to a place set apart for the treatment of these diseases and detained for treatment. The parents and guardians of persons under 16 years of age must obtain treatment for such persons. Imprisonment for twelve months is the penalty for infecting knowingly any person with venereal disease. Hospitals lose their subsidy or portion of it, if they fail to provide for the care and treatment of sufferers from venereal diseases. Power is given to the minister to establish hospitals and dispensaries for the reception and treatment of patients, to arrange for treatment by physicians or at hospitals not receiving aid from the state, and to arrange for clinical, chemical and bacteriologic examinations and investigations free of charge to the patient. Following Western Australia, power is given to the chief health officer to act on the signed statement of any person in which it is asserted that some person is suffering from venereal disease. The chief officer may require the person mentioned in the statement to obtain treatment from a physician. If the order is not obeyed, a magistrate may commit the person to a place of detention for the purpose of an examination to determine the presence or absence of venereal disease. A penalty of \$250 is provided for furnishing a wilfully false statement to the chief health officer.

Marriages

LIEUT. JAY MARION READ, M. R. C., U. S. Army, Presidio of San Francisco, to Mrs. Louise Mae Schussler of San Diego, Calif., August 11.

ASST. SURG. CHARLES H. SAVAGE, U. S. Navy, Jackson, Ala., to Miss Helen S. Woolley of Guntersville, Ala., at Washington, D. C., August 18.

LIEUT. URBAN HENRY REIDT, M. R. C., U. S. Army, Jeanette, Pa., to Miss Kathryn Aloysius Donegan of Irwin, Pa., August 20.

ASST. SURG. GERALD SELBY, U. S. Navy, Baltimore, to Miss Florence Hawes of Bainbridge, Ga., at Baltimore, August 18.

LIEUT. WALTER N. KING, M. R. C., U. S. Army, Corvallis, Ore., to Miss Anna Hagen of Great Falls, Mont., August 7.

SAMUEL WHARTON RANKIN, M.D., Concord, N. C., to Miss Louise Evans Watkins of Flagstaff, Ariz., August 21.

ARTHUR FRANCIS MCGINN, M.D., Portland, Ore., to Miss Helen M. Dimick of Oregon City, Ore., August 17.

RHETT GOODE KORNIKER, M.D., McNary, La., to Miss Elizabeth Gokey of Houston, Texas, August 2.

RICHARD HARRISON PEAKE, M.D., Hot Springs, Ark., to Miss Ethel Nicholson of Norfolk, Va., July 25.

ALBERT NAPOLEON B. LEMOINE, M.D., Nelson, Neb., to Miss Myrle Kohen of Hebron, Neb., June 2.

ORVILLE D. JOHNSON, M.D., Brady, Neb., to Miss Ethel Potter of Gothenburg, Neb., July 19.

Deaths

Lieut. George Hiram Matson, Jr., M. R. C., U. S. Army, Columbus, Ohio; Ohio Medical University, Columbus, 1905; aged 47; a Fellow of the American Medical Association; professor of materia medica and pharmacy and assistant in therapeutics, and dean of the College of Pharmacy of his alma mater; for eleven years secretary of the Ohio State Medical Board; in 1910, elected secretary-treasurer of the National Confederation of State Examining and Licensing Boards; who was largely instrumental in the creation, in 1912, of the present Federation of State Medical Boards of the United States, was on the committee which drafted its constitution, and was elected its first secretary-treasurer; died suddenly, in the Union Station, Columbus, August 21, from heart disease.

Samuel Patton Hand, M.D., Demopolis, Ala.; Tulane University, New Orleans, 1884; aged 57; a Fellow of the American Medical Association; formerly president of the Marengo County Medical Society; a member of the National Association of Railway Surgeons; local surgeon of the Southern Railway system; founder and president of the Bailey Drug Company, and founder of the Hand and Bailey Infirmary; died at his home, August 13, from angina pectoris.

J. Morgan Sims, M.D., Collinsville, Ill.; University of Louisville, Ky., 1890; aged 48; a Fellow of the American Medical Association; for many years coroner of Madison County, Ill.; medical superintendent of state hospitals for the insane at Lakeland, Ky., and Little Rock, Ark.; while under treatment at the Alton (Ill.) State Hospital, August 16, committed suicide by jumping from the roof of a sun porch.

John Taylor Harbottle, M.D., Newark, Ohio; Starling Medical College, Columbus, 1900; aged 42; a member of the Ohio State Medical Association; for several years assistant physician at the Dayton State Hospital; died in Grace Hospital, Conneaut, Ohio, August 17, as a result of internal injuries received in an automobile accident near East Springfield, Ohio, nine hours before.

John Strother Pendleton, M.D., Scottsville, Va.; Medical College of Virginia, Richmond, 1862; aged 78; surgeon in the Confederate service during the Civil War; surgeon at the Virginia State Penitentiary Farm for several years; for twenty-five years a member of the board of directors of his alma mater; died recently at the home of his daughter in Richmond.

William H. Van den Burg, M.D., New York; New York Homeopathic Medical College, 1887; aged 55; a Fellow of the American Medical Association; professor of theory and practice of medicine in his alma mater; chief of staff of the Hahnemann Hospital, New York; died in that institution, August 22, from pneumonia, following an operation performed five days before.

Benjamin Archer Waddington, M.D., Salem, N. J.; University of Pennsylvania, Philadelphia, 1865; aged 75; formerly a Fellow of the American Medical Association; a member and once president of the Tri-County Medical Society, and Salem County Medical Society; one of the best known practitioners of South Jersey; died at his home, August 23.

John T. Cooper, M.D., Muskegon, Mich.; Grand Rapids (Mich.) Medical College, 1902; aged 55; a member of the Michigan State Medical Society; county physician of Muskegon County from 1912 to 1915; a member of the obstetric staff and chief of the hydrotherapeutic department of the Hackley Hospital; died at his home, August 19.

Joseph K. MacConnell, M.D., Cranford, N. J.; Starling Medical College, Columbus, Ohio, 1868; aged 80; formerly a member of the Medical Society of the State of New Jersey; and president of the Union County Medical Society; for many years town physician of Cranford; died in St. Elizabeth's Hospital, Elizabeth, N. J., August 15.

Bernard Palissy Evans, M.D., Quitman, Miss.; Tulane University, New Orleans, 1910; aged 40; a Fellow of the American Medical Association, and president of the Clarke-Wayne Counties Medical Society; a member of the Association of Southern Railway Surgeons; died at his home, August 19, from aortic insufficiency.

Charles Henry Thompson, M.D., Novato, Calif.; Homeopathic Medical College of Pennsylvania, Philadelphia, 1867; aged 75; formerly a member of the Medical Society of the State of California; a director of the Santa Rosa National

and Union Trust banks; died at his home, August 14, from heart disease.

Francis Frederick Markey, M.D., Seattle; College of Physicians and Surgeons, Chicago, 1899; aged 39; a Fellow of the American Medical Association; president of the Seattle Anatomical Club; died in the Providence Hospital, Seattle, August 17, from septicemia consequent on an operation wound.

Abner J. P. Julian, M.D., Lake City, Fla.; University of Maryland, Baltimore, 1883; aged 58; formerly a Fellow of the American Medical Association; a member of the Florida Medical Association; at one time a member of the state legislature of Florida; died at his home, August 14.

Lieut. Nehemiah Fay Tilton, M. R. C., U. S. Army, Marion, Ohio; Ohio Medical University, Columbus, 1901; aged 44; a member of the Ohio State Medical Association, and president of the Marion County Medical Society; died at his home, August 22, from nephritis.

Douglas Gray MacRobbie, M.D., Hamilton, Ont., Trinity Medical College, Toronto, Ont., 1899; aged 43; was found dead from skull fracture, August 20, in the office of an industrial plant at Hamilton. He is believed to have been beaten to death.

George Theodore Mundorff, M.D., New York; New York University, New York, 1895; aged 45; formerly a Fellow of the American Medical Association; a member of the staff of St. Francis Hospital, New York; died at his home, August 21.

Samuel Meyer, M.D., Louisville, Ky.; University of Louisville, Ky., 1891; aged 48; also a druggist; for several years a member of the Louisville school board; died in the Jewish Hospital, Louisville, August 17, from cerebral hemorrhage.

William Lowndes Wells, M.D., New Rochelle, N. Y.; College of Physicians and Surgeons in the City of New York, 1852; aged 88; surgeon of U. S. Volunteers during the Civil War; died at his home, August 17, from pneumonia.

Ernest J. Duncan, M.D., Olive Branch, Ill.; St. Louis College of Physicians and Surgeons, 1902; aged 38; was shot and killed at Olive Branch, August 25, by a lad who said that he and his sister had been mistreated by Dr. Duncan.

Thomas Crawford Parks, M.D., Akron, Ohio; Starling Medical College, Columbus, Ohio, 1883; aged 53; formerly a Fellow of the American Medical Association; died in the Massillon (Ohio) State Hospital, August 23.

Mary Starr Tudor, M.D., South Windsor, Conn.; Woman's Medical College of Pennsylvania, Philadelphia; 1892; aged 76; formerly a member of the Connecticut State Medical Society; died at her home, August 24.

Henry William Cronin, M.D., Worcester, Mass.; College of Physicians and Surgeons, Baltimore, 1893; aged 54; a member of the Massachusetts Medical Society; died at his home, August 20.

Joseph B. Walter, M.D., Solebury, Pa.; University of Pennsylvania, Philadelphia, 1868; aged 76; a member of the Medical Society of the State of Pennsylvania; died at his home, about August 18.

Robert McDowell Reid, M.D., Gastonia, N. C.; New York University, New York, 1890; aged 52; a Fellow of the American Medical Association; died at his home, August 14, from angina pectoris.

William Rowan Barron, M.D., Marion, Ala.; Medical College of Virginia, Richmond, 1863; aged 83; a member of the Medical Association of the State of Alabama; died at his home, July 22.

John E. Connell, M.D., Marshall, Mo.; St. Louis College of Physicians and Surgeons, 1889; aged 52; a member of the Missouri State Medical Association; died at his home, August 18.

James B. Summer, M.D., Bloomington, Neb.; University of Vermont, Burlington, 1879; aged 70; formerly a member of the Nebraska State Medical Association; died at his home, June 27.

Fred H. Hart, M.D., Louisville, Ky.; University of Louisville, Ky., 1897; aged 55; died in the Louisville City Hospital, August 11, from uremia.

Isaac Meyer Birkey, M.D., Newportville, Pa.; University of Pennsylvania, Philadelphia, 1865; aged 74; died at his home, August 16.

Ralph B. Griswold, M.D., Banksville, N. Y.; Eclectic Medical Institute, Cincinnati, 1857; aged 82; died at his home, August 17.

Robert H. Carter, M.D., Lynnville, Tenn.; University of Louisville, Ky., 1874; aged 70; died at his home, July 29.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

FERRIVINE, INTRAMINE AND COLLOSOL IODINE

Report of the Council on Pharmacy and Chemistry

E. Fougere & Co., Inc., New York, acting as agent for The British Drug Houses, Ltd., London, advertise "Ferrivine," "Intramine" and "Collosol Iodine" to the medical profession. A circular entitled "Ferrivine, The New Anti-Syphilitic Remedy" begins:

"FERRIVINE is the name given to ferric tri-para-amino-benzene sulphate. This iron compound was first prepared by Mr. J. E. R. McDonagh, F.R.C.S., by whom it has been both biologically and clinically tested. It is slightly soluble in water, the solution having an acid reaction.

"INDICATIONS

"According to Mr. J. E. R. McDonagh's researches, the phases of the *Leucocytozoon syphilidis* are killed by the lipoid-globulin molecules of the serum, which possess a stereo-chemical molecular configuration homologous to those of the lipoid-globulin molecules of the parasite. The process is one of absorption, a chemico-physical reaction which is in part dependent upon the supply of active oxygen. Active oxygen is formed directly by oxidation processes and the peroxide necessary for its formation directly by reducing processes. Oxidation is increased by metals and reduction by non-metals. The non-metal which acts in the body as the normal reducing agent is sulphur, hence the discovery of Intramine (see separate pamphlet). The metal which acts in the body as the normal oxidising agent, is iron, hence the discovery of Ferrivine."

A circular, "Intramine, a New Non-Toxic Compound for the Treatment of Protozoal and Chronic Bacterial Diseases," expounds Mr. McDonagh's ideas of the treatment of syphilis with Ferrivine and Intramine by means of the oxidising action of Ferrivine and the reducing action of Intramine and asserts:

"As the ultimate administration of oxidising and reducing agents will benefit almost any infection, it may be said that Intramine is indicated in all protozoal diseases, and in all chronic bacterial diseases, especially in tuberculosis, presumably in leprosy and possibly in malignant disease [cancer?]. To the administration of Intramine there are no contra-indications."

We are also told that:

"Intramine is useful injected into the urethra . . . in cases of chronic urethritis and perifolliculitis . . . invaluable as a local application to chronic ulcers . . ."

The Intramine circular includes a "Scheme of Treatment for Syphilis" which advises, in addition to Intramine, Ferrivine or salvarsan, mercury and iodids, the use of another proprietary called "Collosol Iodine." An inquiry addressed to Fougere & Co. in regard to the character and composition of this preparation, brought the reply that the firm had no knowledge of its identity.

This "scheme of treatment" is objectionable in that it advises the "stock" treatment of a disease which demands individualization and further in that whatever beneficial effects may result from the use of mercury and iodid is likely to be ascribed to the preparations "Intramine," "Ferrivine" and "Collosol Iodine."

The advertising for Ferrivine and Intramine sent out by Fougere & Co. contains no experimental or clinical data on which an estimate of their value may be based. Apparently in England, where these products were originated, little has been published regarding them.

There is, however, one report which may be accepted as a carefully controlled clinical trial. In the *Lancet* (June 17, 1916, p. 1214) L. W. Harrison, D.S.O., M.B., Ch.B.Glasg., and C. H. Mills, M.R.C.S., L.R.C.P.Lond., report on "The Effect of Ferrivine and Intramine on Syphilis." After briefly reviewing the theories which form the basis of McDonagh's proposed treatment of syphilis with his discoveries "Ferrivine" and "Intramine" the authors point out:

" . . . that Mr. McDonagh's biological discoveries . . . have not been publicly confirmed by any biologist of standing . . ."

While:

"... eminent chemists have confessed themselves unable to understand his chemistry."

The authors explain:

"Recognizing that this might prejudice our practical tests of Intramine and Ferrivine, we have taken particular care to guard against their influence, cross-checking our observations and submitting them to others for confirmation or otherwise."

Harrison and Mills chose for a test three ordinary cases of secondary syphilis, cases with well marked lesions, the clinical progress of which could easily be watched and from which it was easy to obtain specimens for microscopic examination. After a detailed account of the three cases—which records grave conditions resulting from the treatment and which shows the inefficiency of the drugs—they write:

"From the above account it will be seen that the local and general reactions which follow the injection of these preparations are by no means pleasant. In the case of Intramine the pain is undiluted torture, and lasts so for two or three days. One of us had previously treated four cases with Intramine and the same local reaction occurred in these. In two of them abscesses have burst outwardly, one of which is still discharging necrotic debris, ten weeks after the injection, and will take many more weeks to close. In those cases where no abscess has yet burst it is easy to feel by the gap in the muscles that considerable necrosis has occurred. None of these effects can be ascribed to sepsis, as most rigid aseptic precautions were taken. Further, particular care was taken to make the injections strictly intramuscular. The constitutional symptoms which follow immediately upon the injection of Ferrivine are distinctly alarming, and such as would cause one to hesitate before injecting this remedy into any but robust patients."

Harrison and Mills estimate the therapeutic effects of these drugs thus:

"1. That Ferrivine entirely failed to cause *S. pallida* to disappear from the lesions of three well-marked cases of secondary syphilis.

"2. After the failure of Ferrivine to cause the disappearance of *Spirochata pallida* from a mucous patch a single dose of 0.3 gm. salvarsan effected this in 18 hours, and the patch, which had hitherto been uninfluenced, had healed within 48 hours.

"3. Clinically we were unable to detect any influence of either or both these compounds on syphilitic lesions, although each of them was of the variety which heals in a week or ten days under salvarsan treatment.

"4. Further syphilitic lesions appeared immediately after the treatment in one of the two cases treated with both Ferrivine and Intramine. A mucous patch appeared on one tonsil as well as further syphilitic papules from which spirochetes were obtained. The other case developed nephritis, with albumin and epithelial casts; which was not present prior to the injections."

While from these cases the obvious conclusion was drawn that Intramine and Ferrivine "have no specific effect on early syphilis," these authors subsequently treated a case of tertiary syphilis with the drugs. An Intramine injection caused pain for several days but did not stop the progress of the disease. Ferrivine was then administered "not without a feeling of grave responsibility" in view of their previous experiences. They state that "the reaction which resulted in this instance was the most severe" they ever experienced after an intravenous injection of any of the antisiphilitic remedies with which they had previously worked. It is stated that "for a period of some minutes there was grave doubt as to the patient's survival." After resuscitation the patient passed a disturbed night, and rigors which ensued lasted until the following afternoon. The authors report that in this case also no clinical improvement occurred and that the Intramine-Ferrivine treatment was replaced by a course consisting of salvarsan, potassium iodid and mercurial inunction.

Ferrivine, Intramine and Collosol Iodine were declared inadmissible to New and Nonofficial Remedies.

The General Practitioner's Duty.—Preparedness for health in any state or community requires for the prevention of communicable disease, accuracy in early diagnosis by the family practitioner and such means and knowledge as to care and treatment as will shorten the period of communicability to the minimum and limit the contact between the sick person and the rest of the community to those who are insusceptible or to places where the conditions of residence and supervision will prevent exposure.—Haven Emerson, M.D., "Preparedness for Health."

Correspondence

"PATRIOTISM RAMPANT"

To the Editor:—Referring to Dr. Burr's letter in THE JOURNAL, Sept. 1, 1917, p. 751, it is true that Eucken declared that German Kultur was necessary to the spiritual preservation of mankind. But he did not say that the English language should be barred from Germany.

The Germans are still reading English literature, and are very frequently presenting Shakesperian plays, even more often than we are. And even England itself has not barred the German language. In the "Prospectus of University Courses in the Manchester School of Technology," Manchester, England, session of 1917-1918, you will find that all courses, namely, mechanical engineering, electrical engineering, municipal and sanitary engineering, and applied and textile industries, provide for the teaching of German. German textbooks are recommended for the use of the students, and no other foreign language is mentioned. Must we out-English the English?

One other question. If we discard the German language, should we not be consistent and refuse to make use of any of the German discoveries? For instance, would it not be unpatriotic to perform the Wassermann test, to administer salvarsan or to look for the gonococcus and the *Spirochaeta pallida*? For as you know, they all come from German sources.

WILLIAM J. ROBINSON, M.D., New York.

To the Editor:—Once more, please, something in answer to "Patriotism Rampant." Should we discard the German language we would have to dismiss about half of the English as well. Have we ever stopped to think how much alike these two languages are? There are many like words in the two languages modified only in form; their common origin can be recognized readily. This goes to show that we are of common stock belonging to the Low German race, from which came the Angles and Saxons. "Some historians, as Prof. Henry Morley, regard the distinction between Saxon and Angle as a mere accidental difference of name; the people themselves employing the name of Angles, while Saxon was a foreign designation by the Romans and Celts." The authority Bede says that the Angles were one of three tribes that passed over from the continent in the fifth and sixth centuries into England and formed the dominant element in its subsequent population. During the reign of William the Conqueror, a host of words of Latin-French or English form crept into the English, making the language a hodge-podge. It is hard to tell just how they ever got there, yet there also appear in the English language a number of Greek words, thus showing the language to be a veritable mongrel. However, be it as it may, the two peoples, the German and the English, have so much in common that they should be shaking hands instead of nursing discord and hatred.

ROBERT PETER, M.D., Chicago.

To the Editor:—If it was the intention to discredit or make ridiculous the subject matter of my letter in THE JOURNAL, September 1, by reprinting the caption "Patriotism Rampant," the object might have been better attained by following the lead of your lay contemporary, the Detroit *Abend Post* in employing "Hysterische Patriotismus."

I submit that it is necessary to put a crimp in the sort of propaganda detailed in my letter to the Detroit *Saturday Night*, which I enclose, and if any better method is known to this end than minimizing the importance of study in this country of a very much overestimated foreign language, it is somebody's duty to suggest it. The Teutonic plan of sneering at anything which bears the remotest resemblance to American patriotism is becoming more and more unpopular, and what is denominated in German printed papers in this country the "nativist" press, whether lay or medical, will soon discover it.

There are three ways of graduated effectiveness in dealing with a bully—cow, cripple or kill—and if a mischievous agi-

tator can be at least temporarily made aphasic, it may save a situation.

Two German papers which I read and from which the quotations in the *Detroit Saturday Night* were made are now squealing about "Hetze." Let them cease their own baiting, which they will do when they deem it expedient, but never before.

To discourage for the present at least the teaching of German in this country would be equivalent to extracting poison fangs from the copperhead. Tearing tributes to the kaiser from spelling books is not enough. In the language of a recent writer, it is more important to know who is responsible for their introduction there.

I have no distinct recollection of the resolution to which you referred in *THE JOURNAL* comment of August 18, but hereby proclaim aloud my approval of it, provided its terms are as you outlined.

C. B. BURR, M.D., Flint, Mich.

Member Michigan State Board of Registration in Medicine.

THE ROLL OF HONOR

To the Editor:—Kindly allow just a word regarding Capt. H. H. Roberts' misconception of "sacrifice" when in a letter published in *THE JOURNAL* (Aug. 18, 1917, p. 583) he refers especially to those physicians who, in accepting military commissions, have relinquished practices that yielded from "thousands of dollars" to \$100,000 annually. I trust that no one would have the temerity to assert that men in that financial class are not sacrificing heavily when they go to the front; but I do wish to emphasize that while their absolute monetary loss is in six figures, the real sacrifice involved is far smaller than that offered by men of meager earnings.

I ask, Which man gives more—he who has the reserve income that goes with a \$100,000 practice, whose family will suffer no financial deprivation, whose life is heavily insured, whose reputé is such that he can easily revive his practice after a long absence, or he who has had to live on a meager income of four figures, whose hard savings yield a negligible income, whose life insurance is small, whose practice evaporates during a six months' absence, whose family must suffer deprivation when his income is reduced, and who must again painfully climb the ladder from the lowest rung on his return?

I repeat that both are to be greatly admired for their patriotism and sacrifice. But let no man believe that the rich physicians are sacrificing more than, or perhaps as much as are the poorer ones.

EDWARD VON ADELUNG, M.D., Oakland, Calif.

END MONOPOLY ON SALVARSAN

To the Editor:—To the communication of Dr. S. Pollitzer (*THE JOURNAL*, July 28, 1917, p. 305) concerning the price of salvarsan in this country, I wish to add one thing, and I will ask a few questions.

In Athens, Greece, in 1913, I used to buy either salvarsan or neosalvarsan, the full dose, 0.9 gm., for 8 drachmas, or \$1.55, and the minimum dose, 0.45 gm., for 4.50 drachmas, or \$0.89, and the same drugs were sold to the hospitals for 20 per cent. less.

What then, makes the price of salvarsan in the United States so high? Does it pay duty? How much does the same thing cost in Germany? What is the price of arsenobenzol in comparison of that of salvarsan if "the chemicals that enter cost normally only a few dollars per pound"? Why pay \$3 per 0.3 gm. of galy, another arsenical, in this country?

G. KATSAINOS, M.D., Boston.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

LITERATURE ON DIET AND NUTRITION

To the Editor: Please supply me with information or advice as to the best work, that is, the most accurate work, dealing with nutrition and clinical dietetics, as the workers vary in their opinions concerning the food values and estimated calories to be found in the various kinds of foods.

The great number of such workers makes it difficult to select the best works that can be accepted as giving one the most accurate knowledge as to the work that has been carried out.

I feel that you can advise me without being influenced by any works which may have been put on the market by any of the numerous publishing companies.

THOMAS H. POTTER, M.D., Detroit.

ANSWER.—It is always embarrassing to attempt to select a best treatise on most subjects because many good books have individual features of merit that specially recommend them. The problem is somewhat like the one involved in the request to name the best breed of dairy cattle. That depends!

Our correspondent will find a thoroughly up-to-date presentation of the subject of nutrition both in health and in disease in the newest edition of Graham Lusk's "The Elements of the Science of Nutrition," Philadelphia, W. B. Saunders Company, 1917. It is in many respects one of the best general reviews of the scientific substratum on which present-day knowledge of the subject rests. Some of the debated aspects of metabolism are attractively presented by Otto von Fürth's "Problems of Physiological and Pathological Chemistry," translated by A. J. Smith, Philadelphia, J. B. Lippincott Company. Individual features are treated more exhaustively in a series of "Monographs on Biochemistry," published by Longmans, Green & Co., New York. This includes detailed expositions of such topics as the carbohydrates, the fats, the proteins, the nucleic acids, etc., and their behavior in the body. The volume by F. P. Underhill, "Physiology of the Amino-Acids," New Haven, Yale University Press, will introduce the reader to the significance of one of the most important fields in the science of nutrition. Various excellent treatises, such as Joslin's "Treatment of Diabetes" or H. G. Wells' "Chemical Pathology," deal with the intricacies of metabolism in disease. Among numerous books on dietetics, attention may be called to Friedenwald and Ruhräh's "Diet in Health and Disease," Philadelphia, and W. G. Thompson's "Practical Dietetics." In a category by itself is the excellent book by Mrs. M. S. Rose, "Feeding the Family," New York, Macmillan Company, which combines the latest contributions of physiology with practical directions for the dietary in a singularly effective and readable manner. Here, too, will be found a large collection of selected data on the calory values of foods, as well as rational guidance in the selection of foods for individuals of all ages. As a compilation of analyses, Bulletin 28, Office of Experiment Stations, U. S. Department of Agriculture, Washington, D. C. (for sale by Superintendent of Documents, Government Printing Office, Washington, D. C., price 10 cents) on "The Chemical Composition of American Food Materials" is *facile princeps*, and should be in the hands of every progressive physician. We also urge those interested to obtain a copy (without charge) of Farmer's Bulletin 808, U. S. Department of Agriculture, Washington, D. C., on "How to Select Foods, I, What the Body Needs." This gives a simple method of selecting and combining food materials to provide an adequate, attractive and economical diet. It also contains a long list of the excellent publications of that department of interest in connection with the subject. The newer aspects of nutrition study have been reviewed in *THE JOURNAL* in recent years by L. B. Mendel, "Nutrition and Growth" (May 8, 1915, p. 1539), and by E. V. McCollum, "The Supplementary Dietary Relationships Among Our Natural Foodstuffs" (May 12, 1917, p. 1379). To these may be added Graham Lusk's "The Fundamental Basis of Nutrition," New Haven, Yale University Press, 1914, and F. C. Gephart and Graham Lusk's "Analyses of Ready-to-Serve Foods," Chicago, The American Medical Association Press, 1915.

Typhoid in 1898.—In our war with Spain we had 20,738 cases, with 1,580 deaths, among 108,000 men, all occurring within three and a half months; one man in every six had the disease, while this proportion was increased to one in five among those regiments which never left the United States.—Keefer, Military Hygiene.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARIZONA: Phoenix, Oct. 2-3. Sec., Dr. John Wix Thomas, 306 Goodrich Bldg., Phoenix.

CALIFORNIA: Los Angeles, Oct. 9-13. Secretary, Dr. Charles B. Pinkham, State Capitol, Sacramento.

COLORADO: Denver, Oct. 2. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

DISTRICT OF COLUMBIA: Washington, Oct. 9-11. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington, D. C.

GEORGIA: Atlanta, Oct. 9-11. Sec., Dr. C. T. Nolan, Marietta, Ga.

HAWAII: Honolulu, Sept. 10-13. Chairman, R. W. Benz, 1141 Alakea St., Honolulu.

IDAHO: Pocatello, Oct. 2. Sec., Dr. Charles A. Dettman, Burke.

ILLINOIS: Chicago, Oct. 9-11. Superintendent of Registration, Mr. F. C. Dodds, Springfield.

IOWA: Des Moines, Oct. 9-11. Sec., Dr. G. H. Sumner, State House, Des Moines.

MASSACHUSETTS: Boston, Sept. 11-13. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.

MICHIGAN: Lansing, Oct. 9-11. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.

MINNESOTA: Minneapolis, Oct. 2-5. Sec., Dr. Thomas S. McDavitt, Lowry Bldg., St. Paul.

MONTANA: Helena, Oct. 2. Sec., Dr. William C. Riddell, Power Bldg., Helena.

NATIONAL BOARD OF MEDICAL EXAMINERS: Chicago, Oct. 10-18. Sec., Dr. J. S. Rodman, 2106 Walnut St., Philadelphia.

NEW JERSEY: Trenton, Oct. 16-17. Sec., Dr. Alexander MacAlister, 438 E. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 8. Sec., Dr. R. K. McClanahan, East Las Vegas.

NEW YORK: Albany, Buffalo, New York City and Syracuse, Oct. 2-5. Chief, Examinations Division, Harlan S. Horner, State Education Bldg., Albany.

OKLAHOMA: Oklahoma City, Oct. 9-10. Sec., Dr. Ralph V. Smith, 502 Daniel Bldg., Tulsa.

PORTO RICO: San Juan, Oct. 2. Sec., Dr. M. Quevedo Baez, San Juan.

RHODE ISLAND: Providence, Oct. 4-5. Sec., Dr. Byron O. Richards, State House, Providence.

UTAH: Salt Lake City, Oct. 1-2. Sec., Dr. G. F. Harding, Templeton Bldg., Salt Lake City.

Louisiana June Examination

Dr. E. W. Mahler, secretary pro-tem of the Louisiana State Board of Medical Examiners, reports the written examination held at New Orleans, June 7-9, 1917. The examination covered 11 subjects and included 100 questions. The percentage required to pass was 75. Of the 41 candidates examined, 34 passed and 7 failed. Two candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Chicago College of Medicine and Surgery	(1917)		87
Tulane University of Louisiana	(1916) 88.9; (1917) 79.1, 80.6, 84.7, 85.2, 85.3, 86, 86.1, 86.7, 87.2, 87.4, 87.4, 87.9, 87.9, 88, 88.6, 88.8, 89, 89.6, 89.7, 90.4, 91.4, 91.4, 92.9, 93.7, 95.4.		
University Medical College of Kansas City	(1896)		86.2
Meharry Medical College	(1916) 76.3; (1917)		77.3
Memphis Hospital Medical College	(1912)		79
Vanderbilt University	(1914)		89.8

College	FAILED	Year Grad.	Per Cent.
Chicago College of Medicine and Surgery	(1917)		69.8
Maryland Medical College	(1910)		32.9
Meharry Medical College	(1916) 63.7; (1917)		61
Memphis Hospital Medical College	(1911) 71.2; (1912)		55.6
University of Nicaragua	(1909)		62.2

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
College of Physicians and Surgeons, Chicago	(1907)		Illinois
Tulane University of Louisiana	(1915)		Mississippi

Florida June Examination

Dr. E. W. Warren, secretary of the Regular Board of Medical Examiners of the State of Florida, reports the written examination held at Palatka, June 19-20, 1917. The examination covered 7 subjects, and included 70 questions. The percentage required to pass was 75. Of the 30 candidates examined, 28 passed, and 2 failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Birmingham Medical College	(1915)		75
University of Alabama	(1914)		77.6
Atlanta Medical College	(1914) 75.3; (1916) 90.4; (1917)		79.4
Southern Medical College	(1897)		69.1*
Rush Medical College	(1906)		88
Kentucky School of Medicine	(1891) 62*; (1892)		74.6*

Louisville Medical College	(1875)	62*
Tulane University of Louisiana	(1910) 78; (1917)	83.1
Johns Hopkins University	(1909)	85.7
University of Maryland	(1884) 58*; (1916) 78.1, 86.1	77.3
University Medical College of Kansas City	(1901)	74.3*
University of the City of New York	(1880)	73.3*
Medical College of Ohio	(1900)	91.3
University of Cincinnati	(1911)	83.4
Jefferson Medical College of Philadelphia	(1901)	84.5
University of Pennsylvania	(1894)	90.3
Med. Col. of the State of South Carolina	(1915) 85; (1917)	82.4
Lincoln Memorial University	(1916)	84.3
Meharry Medical College	(1917) 76,	66*
Vanderbilt University	(1892)	

FAILED

Bennett Medical College	(1915)	65.4
Louisville Medical College	(1891)	49.7

* Credit allowed for years of practice.

Oklahoma January Examination

Dr. Ralph V. Smith, secretary of the Oklahoma State Board of Medical Examiners, reports the oral and written examination held at Oklahoma City, Jan. 9-10, 1917. The examination covered 11 subjects and included 100 questions. The percentage required to pass was 70. Six candidates were examined, of whom 4 passed, and 2 failed, including 1 osteopath. Twenty-six candidates were licensed through reciprocity and 5* were granted reregistration licenses. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Rush Medical College	(1916)		88
Harvard University	(1916)		86
University of Cincinnati	(1912)		82
University of Pennsylvania	(1908)		81

FAILED

Memphis Hospital Medical College	(1913)	64
----------------------------------	--------	----

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas	(1912)		Arkansas
Hahnemann Med. Coll. and Hospital of Chicago	(1900)		Nebraska
Rush Medical College	(1893)		Kansas
University of Louisville	(1907)		Mississippi
Tulane University of Louisiana	(1888) (1891) (1892)		Mississippi
Baltimore Medical College	(1896)		California
College of Physicians and Surgeons, Baltimore	(1886)		W. Virginia
American Medical College	(1909)		Arkansas
St. Louis University	(1906) (1912) (1914)		Missouri
University Medical College of Kansas City	(1911)		Missouri
Jefferson Medical College of Philadelphia	(1904)		Mississippi
Chattanooga Medical College	(1893)		Georgia
Memphis Hospital Medical College	(1888) (1901) (1905)		Mississippi
University of Nashville	(1901) (1906) (1908)		Mississippi
University of the South	(1899)		Mississippi
University of Tennessee	(1913)		Mississippi
Vanderbilt University	(1901)		Mississippi
Dallas Medical College	(1904)†		Texas

* Includes one whose name is not on the official list of the institution named—the Louisville Hospital Medical College.

† The name of this candidate does not appear on the official list of the graduates of this school for the year given.

Book Notices

MENTAL ADJUSTMENTS. By Frederic Lyman Wells. Cloth. Price, \$2.50 net. Pp. 331, New York: D. Appleton & Co., 1917.

In his preface, the author says, "To the individual, better self-understanding means better self-control, and wiser ordering of one's actions along the normal paths of happiness." He might have added that better self-understanding means better understanding of others; and understanding others is no inconsiderable part of the task of the physician. The book is a delightful presentation of some of the more recently acquired knowledge of ourselves. As Professor Jastrow says in the introduction, "Life remains a struggle and a conflict," but the original simplicity has long since departed. It is now intricately complex. Modern psychology has contributed much to our knowledge of the psychic and especially the affective factor in this complex struggle. The book deals with this factor, and because of its quality is a real contribution to the psychology of our daily life. In no sense is it a medical textbook, but any physician who is not blind to the fact that there are patients as well as diseases will read it with profit. If his work is with the nervous and unbalanced he should be quite familiar with much of it. But is he?

The subjects of the various chapters, mental adaptation, use and waste in thought and conduct, symbolic association, the continuity of emotion, types of dissociation, mechanisms in dissociated ideas, and experimental approaches and balancing factors, indicate the ground covered. Judging by this book, the attitude of the author may be said to be that of a modified freudian. The modification will be much to the taste of some readers. Whether a pill is coated with sugar or with asafetida may have nothing to do with its wholesomeness but much with its acceptability. From many of the freudian concepts the author (consciously or unconsciously) removes the coating of sexuality so distasteful for many (perhaps because sexuality is confused with sensuality), and substitutes the palatable one of natural history. To some ears "love-life" has a much nicer sound than "libido." Another illustration may be more apt. To go straight to the top of a steep hill is sure to be laborious; for some travelers impossible. But if one is led by winding, easy gradients he may scarcely realize that he is mounting until he has reached the summit. To inquire whether Dr. Wills has deliberately done this thing might be an impertinence; that he has done it seems to be apparent; that he has done it well is obvious. He is more than clever; he is able.

To review the matter in detail would exceed the limits of a book notice. A few indications must suffice. After explaining what mental adaptation is, in Chapter II the author tries to answer the question, "What are the general sources and characteristics of faulty adaptations?" that is, of failure: failure to attain a specific end or failure in life. The chapter on symbols, beginning with the simplest, passes by way of the more complex, especially those of language, to the symbolic associations of dreams. Chapter IV, on the continuity of emotion, considers affective displacement, transference, siphoning, sublimation, regression, etc., and leads to the generalization of "the persistence of affectivity independently of the idea to which it attaches." "Types of Dissociation" covers many of the manifestations of hysteria and dementia praecox, and Chapter VI is really an abbreviated exposition of the (somewhat modified) freudian tenets of the unconscious. We quote its conclusion:

Each mental process, habitual or incidental, leaves its mark upon the personality, sometimes conscious, mostly unconscious. The "memory of a good action" is precious long after the deed is forgotten. Man's special faiths, interests, hobbies, friendships, enmities, ambitions and infatuations are fashioned, not from the fraction of experience he can remember, nor yet from innate features of being he cannot control; but from a body of unconscious experience vaster than knowledge, which imparts to the objects of consciousness, by affective transference, their human values. This mighty and invisible potency of forgotten experience gives added import to all education, and sanction to each daily task.

From the last chapter we quote (p. 303):

Happiness is the conscious phase of mental adaptation. Mental adaptation consists in a balance between the energy the organism has to spend, and the outlets for expending it. The outlets useful for this purpose are balancing factors. . . . We saw that it might be sought in selfish, egoistic ways, or in unselfish, altruistic ways; but that it is more frequently found in the latter. We discussed the bearing of this upon the love-life, which reaches its fullest development in maintenance of family.

These excerpts might indicate that the text is technical and hard reading. It is neither. And it should be emphasized that the author constantly makes a commendable effort to render his psychology immediately utilitarian—a psychology of living as well as of life. Finally, a book that makes the reader think may not be a great book, but it is a good one. This is such a work.

PULMONARY TUBERCULOSIS. A Handbook for Students. By Edward O. Otis, M.D., Professor of Pulmonary Diseases and Climatology, Tufts College Medical School, Boston. Cloth. Price, \$1.25. Pp. 220, with 20 illustrations. Boston: W. M. Leonard, 1917.

This book is primarily intended for students of the third and fourth years of medical school. It is written in interesting, pleasing and simple style with a symbolic verse heading each chapter. The book contains only the main essential facts, but they are modern and complete. No time is wasted in discussing unimportant theories, and symptoms and signs are correlated and given due proportionate weight.

Medicolegal

Advertising Under Name Other than Own to Practice Medicine

(*People vs. Wilkes* (N. Y.), 163 N. Y. Supp. 659)

The Court of Special Sessions, New York County, says that the defendant was charged with having violated Section 174 of the public health law, which provides that any person who shall practice medicine or advertise to practice medicine under a name other than his own shall be guilty of a misdemeanor. As specification of the act constituting the offense, the information set forth, together with a translation into English, an advertisement published in the Russian language in a newspaper, as to which advertisement there was no question but it was one to practice medicine. The defendant by demurrer challenged the sufficiency of the formal charge against him. He contended that the advertisement was not one by him under a name other than his own; that no name of the advertiser, within the meaning and effect of the statute, was contained in the advertisement. In the heading of the advertisement appeared the words "Russian Medical Help, 56 Rivington Street, New York." At the foot of the advertisement, without any words of connection with the rest of the text, and as a distinct element of the paper so published, appeared the same words, "Russian Medical Help," and, under that, the words "Hours 10 a. m. to 10 p. m. First consultation free. Office, 56 Rivington street. Drug store, 34 Rivington Street, New York." The publication contained no other words of identification of the advertiser. In the body of the advertisement the advertiser was represented by the personal pronoun of the first person, sometimes in the singular and sometimes in the plural. The court is of the opinion that the words "Russian Medical Help," as used in the advertisement published by the defendant as set forth in the information, constituted a name, other than the name of the defendant, under which he was advertising to practice medicine, and hence that the information effectively charged a violation of the statute, and that the demurrer of the defendant to the information should be overruled. The word "name," in common usage for particular designation, is applied, not only to the conventional form, but to any word or combination of words used for individual identification, including forms which are descriptive, whether by direct expression of defining quality or by expression of related ideas, in the form of metaphor, metonymy, synecdoche or other figure of speech.

Limitation of Actions for Malpractice, Especially for Causing Argyria

(*Hahn vs. Claybrook* (Md.), 100 Atl. R. 83)

The Court of Appeals of Maryland says that this action was instituted, Sept. 20, 1915, by the plaintiff against the defendant to recover damages for alleged professional negligence and unskillfulness between the years 1902 and 1910, in that the defendant negligently prescribed for the use of the plaintiff argentic oxide, which was taken in such quantities by her as the patient of the defendant, under his direction and treatment, as to cause argyria or a chronic pigmentation or discoloration of the skin due to silver poisoning. At the conclusion of the testimony on the part of the plaintiff, the trial court directed a verdict for the defendant, on the ground that the plaintiff's suit was barred by the statute of limitations. In this there was no error, and the judgment of the lower court is affirmed.

The question of the defense of limitations in the class of negligence cases, such as was presented by the record in this case, is one not only of considerable interest, but also of importance. Under the Maryland law, if the plaintiff's right of action arose and accrued more than three years before the suit was begun, the relief here sought must be denied. This presented the controlling question on this branch of the case, which was, When did the act or wrong occur from which the plaintiff sustained the injury for which she sought damages in this case, and when did that injury become apparent, so as to give her a right of action, and to then

bring a suit? The general rule, as to when the statute of limitations begins to run, has been stated to be as soon as the cause of action accrues, whether or not it is the case of a trust; if it is a fit subject for a suit at law as well as in equity, the statute of limitations begins to run. The general rule, in cases of neglect of duty arising from contract and the breach of a professional duty by a physician, surgeon or an attorney is held to fall within this rule. In the case at bar, the court thinks the plaintiff, on any aspect of the proof, was clearly barred by the statute of limitations from maintaining the suit, because her cause of action arose and limitations began more than three years before the date when the suit was instituted.

The plaintiff testified that she employed the defendant as a practicing physician, and he prescribed for her from 1904 to some time in the year 1910; that she called on him for treatment about three or five times a year; that she consulted other physicians during that period, but that the defendant treated her for indigestion or stomach trouble; that she took his prescriptions as directed three times a day, half an hour before meals; that in the latter part of 1908 she noticed a change in the color of her skin. It would seem to be clear and to admit of no doubt that, according to the undisputed evidence in the case, the discoloration of the plaintiff began at least in 1908, and, as stated by her husband, "she commenced to get worse in 1908, kept getting worse all along up to 1913, when she was at the worst." The discoloration of her skin, of which she complained to her husband in 1908, was a sufficient indication of an injury to have put her on notice and inquiry, and it was clear from the evidence that if she had exercised ordinary care and diligence to have ascertained her rights, she could have discovered the cause of her alleged injury. The ground of the cause of action in this case was the discoloration of the plaintiff's skin by the use of argentic oxide, and the statute of limitations began to run from the time of the discovery of the alleged injury therefrom. As stated by the court below, when she began to be discolored that showed an injury, and that was the injury of which she had a right to complain. Then was her cause of action.

Injury to Physician Answering Call

(*Jones vs. Pennsylvania Coal & Coke Corporation (Pa.)*, 99 Atl. R. 1008)

The Supreme Court of Pennsylvania affirms a judgment for damages for the plaintiff for personal injuries sustained by him in attempting to use a telephone on the defendant's premises while there in answer to a call received through a boy who said that one Carroll had sent him for a doctor. There had been a severe electrical storm, and lightning had struck a power wire between the substation in which Carroll was the defendant's engineer and a mine shaft, breaking the wire and causing it to fall on the telephone wire. Carroll had been knocked down in trying to answer the telephone and had gone to the boiler house at the shaft, where he found the engineer dead or unconscious. He testified that he said nothing about a doctor, except that one would be of no use as the man was dead; but the jury found that he instructed the boy to summon a physician. The plaintiff testified that he responded immediately to the call and went to the shaft. He found no one in the boiler house except the man lying unconscious or dead on the floor not far from the telephone box. He examined him, but, being unable to determine certainly whether or not he was alive, turned to the telephone to summon aid, and was seriously injured by an electric current.

The plaintiff alleged that the defendant was negligent in the construction, maintenance and operation of the high-tension power line and the telephone line which resulted in his injuries, and the verdict of the jury established that the defendant was negligent, as alleged, while the plaintiff was free from fault. But the defendant denied the right of the plaintiff to recover damages for the following reasons: (a) He was a mere licensee on the premises; (b) if an invitee, he exceeded his invitation by attempting to use the telephone, and (c) the defendant had no knowledge, either express or implied, that the premises were in a dangerous condition, had

no time to repair, and did not know that the plaintiff contemplated going on the premises.

The court holds that the emergency and immediate necessity for prompt action to meet it, by summoning the physician, was authority for Carroll to act in the absence of the officers of the company and his inability to communicate with them. The emergency of an accident, or an unusual condition which requires prompt action, may invest the representative of the company, highest in authority, who is then present, with power to do such things as are reasonable to meet the emergency. In other words, holding, as the court does, that the plaintiff was an invitee on the premises at the time he was injured, it followed that it was the defendant's duty to keep the premises in a safe condition that he might not be injured while he was there professionally in response to the invitation. The court does not determine, as it was not involved in the case, that Carroll had implied authority to bind the defendant for professional services rendered by the plaintiff to the injured employee, but simply that he had the authority to invite the plaintiff on the premises for the purpose of rendering aid to the employee, and that the plaintiff went on the premises by express invitation, and not as a licensee.

The court was not favorably impressed with the argument that the plaintiff exceeded his invitation by attempting to use the telephone. It certainly could not be so declared as a matter of law. He did not leave the spot where the body lay to make use of the telephone, and was therefore clearly within the space to which the invitation referred. The telephone was one of the means he attempted to use to carry out the purpose of the invitation. Nor was there any merit in the defendant's contention that there could be no recovery because it had no knowledge or notice that the premises were in a dangerous condition and no time to repair, and did not know that the plaintiff contemplated going on the premises, for the negligence complained of and shown was the defective construction of the power and telephone lines and failure to safeguard against a broken uninsulated power wire falling on the telephone wire.

Liability of Corporation Undertaking to Treat Hernia—A "Plas-tr-pad" Case

(*Weller vs. Plapao Laboratories Incorporation (Mo.)*, 191 S. W. R. 1056)

The St. Louis (Mo.) Court of Appeals reverses a judgment rendered in favor of the defendant, remands the case for further proceedings, and denies the defendant a rehearing, in this action brought by the plaintiff to recover damages for the death of her husband from strangulated hernia after using the defendant's plas-tr-pads. The court says it appeared that the plaintiff's husband had been suffering from hernia for a number of years and had been wearing steel and elastic trusses. Acting for him, the plaintiff wrote in his name, from their home in Tennessee, to the defendant at St. Louis, that, having seen the defendant's advertisement, he wrote for a trial treatment of the defendant's plas-tr-pads for rupture. In response, he received a blank printed slip and book of testimonials, together with some ointment. He, or the plaintiff, filled up the blank and returned it to the defendant with a postal order for \$6.75. He then received three plas-tr-pads and directions for applying them. This was in the afternoon of the fifteenth of the month, and the plaintiff applied them to her husband, the appliance consisting of a pad and a belt, the pad containing medicinal matter, as it was said, and intended to press into the hollow and over the protruding intestine, which was to be pushed back, that part of the pad being covered with plaster so that on being affixed to the body of the patient it adhered. After applying this pad, the plaintiff's husband, who was an engineer on a switch engine, went to work and the day after the intestine protruded, he was taken to a hospital, and it was found that he had a case of "locked bowels," resulting from strangulated hernia from which he died on the nineteenth.

Certain cases, while not altogether applicable here, are illustrative of the proposition that a case of this kind falls under the classification of actions for negligence; applied in

one case to a sale of an article containing poisonous fluid; in another, to a case of malpractice. True, the defendant here—a corporation—was not holding itself out as a physician or surgeon, but there was testimony tending to prove that it did undertake, as evidenced by its literature sent to the plaintiff's husband, to treat and cure hernia, and a cure is more than any reputable physician or surgeon usually guarantees. That it undertook to treat the plaintiff's husband for his affliction by mail or correspondence and without a personal inspection and visit, was immaterial. It did undertake to cure him of his affliction, if he used its pad. While the defendant did not hold itself out as a practicing physician and surgeon, when it undertook to treat and even cure hernia or rupture, it surely was under the like obligation of a physician and surgeon to do so with all due care for the life of the patient, or, as here, its customer, and that it exercise the care required to do no injury or furnish no harmful appliance. Failure to do that is actionable negligence; and if injury results, and the party treated dies, then the act of the defendant was a wrongful act. The defendant had no right to send out this appliance unless it knew, or had reason to believe, that it was reasonably safe.

Regarding this as an action to recover damages for negligence, for a wrongful act causing death, the court thinks it was maintainable under either the laws of Tennessee or those of Missouri. The evidence in it was of such a character as rendered it peculiarly one for the determination, in the first instance, by a jury, so the court finds no reason to hold either that the petition failed to state a cause of action, or that the trial court erred in submitting the cause on the evidence to the jury; but for errors in the instructions given the jury, the judgment of that court must be reversed.

Society Proceedings

COMING MEETINGS

- Amer. Acad. of Ophthal. and Oto-Laryng., Pittsburgh, Oct. 29-30.
American Association of Railway Surgeons, Chicago, Oct. 17-19.
Am. Assn. Obstetricians and Gynecologists, Newark, N. J., Sept. 17-19.
American Electro-Therapeutic Association, Atlantic City, Sept. 11-13.
American Roentgen Ray Society, New York, Sept. 20-22.
Colorado State Medical Society, Colorado Springs, Sept. 25-27.
Delaware State Medical Society, Middletown, Oct. 8-9.
Indiana State Medical Association, Evansville, Sept. 26-28.
Kentucky State Medical Association, Louisville, Oct. 16-18.
Medical Association of the Southwest, Kansas City, Oct. 15-17.
Minnesota State Medical Association, St. Paul, Oct. 10-12.
Mississippi Valley Medical Association, Toledo, O., Oct. 9-11.
Missouri Valley Medical Society, Lincoln, Neb., Sept. 20-21.
Nevada State Medical Association, Reno, Oct. 18-19.
New Mexico Medical Society, Las Cruces, Oct. 4-6.
Pennsylvania State Medical Society, Pittsburgh, Sept. 24-27.
Utah State Medical Association, Salt Lake City, Sept. 12-13.
Vermont State Medical Society, Barre, Oct. 11-12.
Virginia State Medical Society, Roanoke, Oct. 23-26.
West Virginia State Medical Association, Fairmont, Oct. 2-4.
Wisconsin State Medical Society, Milwaukee, Oct. 3-5.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Roentgenology, New York

August, IV, No. 8

- 1 *Pelvic Colon and Rectum—Roentgenologically Considered. J. T. Case, Battle Creek, Mich.—p. 373.
- 2 Roentgenologic Interpretation of Accessory Sinus Variations. H. J. Prentiss, Iowa City, Iowa.—p. 390.
- 3 Practical Points on Interpretation of Accessory Sinus and Mastoid Plates. F. M. Law, New York.—p. 398.
- 4 Roentgen Ray Findings in Skull in Cases of Brain Tumors, with Special Reference to Foramen Acusticus. G. L. Carr, Boston.—p. 405.
- 5 Roentgen Department in War Times. W. A. Wilkins, Montreal, Canada.—p. 414.
- 6 Dental Roentgenography. W. H. Mick, Omaha.—p. 416.

1. See THE JOURNAL, Nov. 11, 1916, p. 1470.

Annals of Surgery, Philadelphia

August, LXVI, No. 2

- 7 *Clean and Comfortable Method of Treating Erysipelas Patients. S. M. Milliken, New York.—p. 129.
- 8 *Nature of Postoperative Leukocytosis in Dog. E. B. Krumbhaar, Philadelphia.—p. 133.
- 9 *Value of Leukocyte Count in Diagnosis and Prognosis of Acute Appendicitis. H. W. Hewitt, Detroit.—p. 143.
- 10 *Tumors of Gasserian Ganglion; Report of Operated Case. E. Sachs, St. Louis.—p. 152.
- 11 *Bone Transplantation from Scapula for Defect in Skull. B. L. Jones, Walla Walla, Wash.—p. 160.
- 12 Value of Bone and Cartilage Transplants in Rhinologic Surgery. W. W. Carter, New York.—p. 162.
- 13 Factors Bearing on Mortality in Operations for Biliary Obstruction by Calculus. F. T. Van Beuren, Jr., New York.—p. 169.
- 14 *Etiologic Relations of Sequelae to Gastro-enterostomy, Together with Description of Simple Operative Technic. P. Gronnerud, Chicago.—p. 177.
- 15 Postoperative Paralytic Ileus. O. S. Fowler, Denver.—p. 184.
- 16 Fractures Occurring in Gold Mining Industry. Study of 311 Cases. J. W. Freeman, Lead, S. D.—p. 193.
- 17 *Nature of Neuropathic Affections of Joints. L. Eloesser, San Francisco.—p. 201.
- 18 *Anatomic Substitute for Female Breast. W. Bartlett, St. Louis.—p. 208.

7. **Clean and Comfortable Method of Treating Erysipelas Patients.**—The following is suggested by Milliken as making the patient most comfortable during the disease, thereby conserving his energies and perhaps hastening nature's cure. The patient is cleansed and put to bed. Rest is enforced during the acute fever and for two days after the temperature reaches and remains below 100. At the start calomel and salts are given and diet allowed according to the patient's appetite. Fluids are forced during the fever. Sedatives or stimulants are given if indicated. Whenever ichthyol has been applied previously, as so frequently happens, it is removed as thoroughly as possible. Then, if no wound demands local dressing, the entire region attacked by the disease is thickly dusted with powdered stearate of zinc which is reapplied as it falls or is brushed off. If a wound exists, it is treated as a similar wound would be treated in the absence of erysipelas. Thus, the face of a patient with abscess in the eyelids is powdered freely and the eyes kept moist with small compresses renewed from a basin of cold boric acid, a drop or two of 20 per cent. argyrol is placed on the conjunctivae from two to five times in twenty-four hours, according to the local irritation evident. If, in leg cases, periphlebitis or cellulitis develops, an incision is made as soon as fluctuation appears, and then wet dressings of boric acid or magnesium sulphate or dilute alcohol are applied.

8. **Nature of Postoperative Leukocytosis in Dog.**—Krumbhaar's experiments showed that the leukocytosis that followed splenectomy in dogs only differed from other postoperative leukocytoses in the somewhat slower return to normal. Postoperative leukocytosis, and the lesser degrees of leukocytosis that follow narcosis and hemorrhage, Krumbhaar says, are chiefly due to the summoning of new and younger forms of polymorphonuclear cells from the bone-marrow into the peripheral blood stream. The appearance of "intermediate" forms in the blood stream after operation suggests that a relationship exists between the polymorphonuclear leukocyte and so-called transitional cells.

9. **Leukocyte Count in Appendicitis.**—Hewitt points out that the polynuclear count alone is, in the great majority of instances, a reliable index in diagnosis. The correlated absolute and polynuclear counts are of greater value than either count taken alone, especially as regards prognosis. A high absolute count with a high polynuclear count means usually good prognosis (e. g., absolute 35,000, polynuclear 95 per cent.). A high absolute count with a moderately low polynuclear (e. g., absolute 30,000, polynuclear 80 per cent.) means usually a very good prognosis. A low absolute count with a high polynuclear count (e. g., absolute 7,000, with polynuclear 95 per cent.) indicates a grave prognosis (speaking generally). A low absolute count with a low polynuclear count means (e. g., absolute 7,000 with polynuclear 65 per cent.) usually no infection, or that the acute condition is due to anatomic or mechanical causes, in other words, that the infection, if one be present, has not stimulated the resisting powers of the body sufficiently to produce a leukocytosis.

10. Tumors of Gasserian Ganglion.—The history of Sachs' case is that in December, 1914, the patient began to have pains along the distribution of the ophthalmic division of the left fifth nerve. This pain gradually spread and two months later involved all three branches and was continuous. At no time was there any cessation of pain. Drugs, climatic conditions, local applications in no way influenced the pain. About this time the woman complained of double vision on looking to the left. Soon after this an impacted molar was removed, but afforded no relief. Some months later her sphenoid and ethmoid sinuses were opened without any improvement in her symptoms. The pain continued without any interruption and with great severity. Stereoscopic roentgenograms showed no abnormality and none of the signs of intracranial pressure. No destruction of bone in the region of the middle fossa could be made out. In the region of the ganglion a smooth tumor about the size of a large cherry was exposed, which lay in a cavity in the floor of the skull about 1 cm. deep. It had apparently completely replaced the ganglion. With great care the tumor was dissected free and in this procedure what were taken to be the third and sixth nerves were exposed on the median side of the tumor. When the patient became conscious she had a complete third and sixth nerve paralysis and a complete motor aphasia with very slight weakness of the right hand. The motor aphasia cleared up at once and had completely disappeared on the fourth day after operation. The grip was normal on the second day. By the ninth day there was no trace of the third nerve paralysis and the sixth nerve paralysis improved steadily, so that finally a month after operation there was no longer any double vision. Another unusual feature and one difficult to explain was that after the third nerve recovered, the pupil which had been dilated (third nerve paralysis) became contracted. In about six or seven weeks the patient returned complaining again of severe pains. The twelfth nerve paralysis was still present. The tumor was again attacked, but was found quite unoperable. A small piece was removed for diagnosis and showed the same histologic picture as the original tumor—endothelioma.

11. Bone Transplantation from Scapula for Defect in Skull.—A defect in the skull, measuring approximately 3 cm. by 5 cm., was covered by Jones by placing over it a piece of the wing of the left scapula slightly larger than the opening in the skull.

14. Etiologic Relations of Sequelae to Gastro-Enterostomy.—Gronnerud does not use clamps and his suture material is catgut. He describes his technic as follows: The hand is placed on the anterior stomach wall, with the omentum and transverse colon gathered up between the thumb and forefinger pushing the stomach against the mesocolon. The mesocolon is now opened with a blunt forceps, and the tear extended until an elliptical opening about $2\frac{1}{2}$ inches long results; the edges are then attached to the posterior wall of the stomach by four stitches, the end stitches being left long and used as temporary guides. If the mesenteric attachment of the bowel is far enough to the right, bring the bowel straight up in prolongation of the duodenum; if not, turn the bowel from left to right, otherwise a kink at the duodenojejunal junction will result, with the probability of obstruction. The bowel is now brought up into juxtaposition with the stomach and guides placed at each end, the first guides being now cut. An over-and-over Lembert suture is then used. The assistant now exerts steady traction on the guides, thus preventing leakage, and the stomach and bowel are opened. The same suture is used to whip over and over with a through-and-through stitch, so as to coaptate the mucous surfaces. With a Cushing stitch, the anterior stomach and bowel walls are coaptated, and the operation finished with a Lembert suture, making two rows of sutures all the way around. Number 1 pyoktanin catgut is used exclusively.

17. Nature of Neuropathic Affections of Joints.—Eloesser found that bone and joint lesions corresponding to those found in tabes dorsalis may be induced experimentally in the limbs of cats by severing the posterior nerve roots (the sensory fibers) leading from the limb. Severing the posterior roots causes no atrophy of the bone. Tabic fractures and

arthropathies have been produced in healthy animals, hence they cannot be ascribed primarily to lues or other infectious causes. The course of a deforming arthritis is not characteristically altered by the addition of an analgesic factor, hence the cause of the Charcot joint is not to be sought in a simple deforming arthritis occurring in a tabetic. Nothing in these experiments gives proof of the existence of trophic nerves. Of three animals whose joints were subjected to operative trauma after having previously been rendered anesthetic by resection of posterior roots, all rapidly developed Charcot lesions. Trauma in a limb rendered anesthetic and analgesic experimentally leads to grotesque lesions of the bone and joints, which are in every way the counterparts of tabic fractures and arthropathies; trauma and lack of the warning sense of pain are the cause of most tabic bone and joint lesions.

18. Anatomic Substitute for Female Breast.—The operation described by Bartlett is most frequently indicated in cases of chronic fibrocystic mastitis, which is generally admitted to be a precancerous condition; hence Bartlett shells out the entire gland-bearing area with the cautery, leaving the skin covering intact. Cosmetic considerations have led him to fill out the defect with fat taken from other portions of the patient's body. The various steps of the operation are given in detail, namely: 1. With patient in the sitting posture, the affected breast is lifted and a mark made in the fold which will be hidden by the pendent organ when it is allowed to assume its normal position. 2. Patient is covered with two sterile sheets, attached to the skin in such a manner as to expose two areas; one revealing the affected breast, the other, the lower abdomen or thigh on the same side. 3. A crescentic incision is made below the breast following the line marked out in Step 1. The breast is lifted off the chest wall, all attachments being divided with the cautery and the pocket filled with a pack. 4. The skin covering the gland is peeled back with the cautery, while downward traction is exerted on the mass to be removed. 5. From the anterior abdominal wall, the outer aspect of the thigh, or the buttocks, enough subcutaneous fat is removed to constitute a mass approximately 50 per cent. larger than that which has been extirpated, thus allowing for shrinkage which always takes place. This is to be stuffed into the breast defect and allowed to conform to its new surroundings. The operation has been performed successfully on six patients.

Archives of Internal Medicine, Chicago

August, XX, No. 2

- 19 *Error in Electrocardiogram Arising in Application of Electrodes. H. E. B. Pardee, New York.—p. 161.
- 20 *Studies in Protein Intoxication. Blood Coagulation. H. F. Shattuck, New York.—p. 167.
- 21 *Emetin Diarrhea—Clinical and Experimental. A. R. Kilgore and J. H. Liu, Shanghai, China.—p. 178.
- 22 *Oxidase Reaction of Cells in Normal and Leukemic Blood. H. Rosenthal, New York.—p. 184.
- 23 *Relation of Pellagra to Location of Domicile in Spartan Mills, S. C., and Adjacent District. J. F. Siler, P. E. Garrison and W. J. MacNeal, New York.—p. 198.

19. Error in Electrocardiogram Arising in Application of Electrodes.—The error discussed by Pardee consists in the fact that when a constant difference of potential is applied at two points of the circuit containing the galvanometer and the patient, the resulting deflection of the string takes the form of a quick jump, as quick as the instrument can make, followed by a slow partial return toward the base line. The return takes the form of a curve and has a duration of from 0.1 to 0.4 second in different instances, being short when the overshoot is small, longer when it is large. When the string reaches this new level the deflection remains constant, the movements due to the heart's currents being superposed on this new base line as they were on the former one. The overshooting and slow return are usually evident to the eye of the observer in the process of standardization which is carried out before taking each lead of the electrocardiogram. To avoid this source of error the most important measure has been found to be the application of a hot bandage. The salt solution should be hot, preferably about 105 F., so that it

stings the hand of the person applying the bandages. Of lesser importance has found to be a thorough rubbing and wetting of the skin of the extremity before the bandage is applied. This alone will not usually suffice, but is an important accessory measure.

20. Studies in Protein Intoxication.—Shattuck studied the coagulation time of the whole blood, the prothrombin time and antithrombin content in two cases of serum sickness following the injection of antipneumococcus serum in cases of lobar pneumonia, and cases of urticaria before and after treatment with autogenous or heterogenous serum. The blood of patients suffering from serum sickness showed a marked delay in the coagulation time of the whole blood, and of the prothrombin time during the serum sickness, with a later fall to nearly, but not entirely, normal figures for both after the disappearance of the serum sickness. The results with the antithrombin content were inconclusive. Studies of the blood of patients suffering with chronic urticaria showed a delayed coagulation time and prothrombin time in four out of five cases, with an approach to normal figures after the patients had been treated intravenously with autogenous or heterogenous serum in three cases out of four.

21. Emetin Diarrhea.—Three cases are reported by Kilgore and Liu in which the diagnosis of emetin diarrhea produced in the course of treatment for amebic dysentery, is reasonably certain. Recovery was prompt on discontinuing the emetin. The authors have seen a fourth case, terminating fatally, in which the same diagnosis was made, but have not reported this case in detail on account of failure to secure a necropsy. All of these cases were in children and all had received doses considerably larger than would be proportionate on a basis of 65 mg. (1 grain) for an adult. This fact is especially interesting in view of the opinion not infrequently held that children are more resistant to emetin than adults. The authors give doses of 65 mg. (subcutaneously or intravenously) to adults and to graduate doses for children proportionately, watching carefully for any increase in the diarrhea which might be due to emetin. Experiments of others and those reported by Kilgore and Liu furnish abundant evidence of the tendency of emetin to produce in dogs a hemorrhagic gastro-enteritis with hemorrhages in the lymph glands, spleen, kidneys, thymus, etc., ultimately resulting in death, even if the emetin be stopped as soon as definite symptoms are observed.

22. Oxidase Reaction of Cells in Normal and Leukemic Blood.—Rosenthal says that morphology, with good polychromatic staining of the blood cells, is of greater importance in the identification of the leukemias than the oxidase reaction.

23. Relation of Pellagra to Location of Domicile.—The studies recorded in this paper are said to support the authors' previous conclusion that pellagra is an infectious disease, which spreads slowly, attacking only a small proportion of the population residing in the immediate vicinity, and further, that its spread is especially favored by insanitary methods for the disposal of human wastes.

Archives of Pediatrics, New York

July, XXXIV, No. 7

- 24 Acidosis in Infancy and Childhood. A. D. Smith, Brooklyn.—p. 483.
25 *Etiology of Mongolian Imbecility. C. Herrman, New York.—p. 494.
26 *Acute Ileocolitis in Infancy. J. Aikman, Rochester.—p. 504.
27 *Deficient Bone Development of Congenital Origin. C. J. Bloom, R. E. Stone and A. Henriques, New Orleans.—p. 512.
28 Heat and Infant Mortality. C. C. DuBois, Warsaw, Ind.—p. 516.

25. Etiology of Mongolian Imbecility.—Herrman is of the opinion that there is no positive evidence that worry, emotional shock, illness during pregnancy or congenital syphilis are important or essential factors in the causation of mongolian imbecility. The evidence that mongolian imbecility is a unit character and recessive, although not conclusive, is regarded as being suggestive.

26. Acute Ileocolitis in Infancy.—Fifty-four cases of ileocolitis are analyzed by Aikman. Twenty-seven were under 6 months of age, eight between 6 and 12 months, and twelve

between 1 and 2 years, and all occurred in the summer or early fall. Few gave a history of any previous diseases. There were but four breast-fed children in the series and nine fed on modified milk. Fourteen had been fed on condensed milk formulas previous to admission and several on barley water mixtures of little or no food value for a considerable length of time. Insanitary home conditions, poverty, and general carelessness in food preparation acted as etiologic factors. The total mortality for the series was 33.3 per cent. The younger the child the worse the prognosis. A child under 6 months of age, who is poorly nourished and has been fed on condensed milk, has very little chance for recovery if his temperature is over 102 F., if he is vomiting, and has eight liquid, green stools with much mucus and a little blood daily, even if the pulse is slow and the abdomen shows nothing. He has no chance if he is having convulsions. The duration of the cases studied averaged fifteen days, those recovering were sick about three weeks and those who died averaged nine days. If the child survives the first week, Smith says, his chances for recovery are much better. This series demonstrated the danger of infection and also that the convalescing child may infect others, especially younger children. This makes prophylactic measures of greatest importance. It is best to omit all milk from the diet for a few days. As a substitute give cereal water with or without sugar. Sugar should be omitted if the stools are of a frothy character. Barley water is used by many but rejected by a few. Fresh weak tea has considerable value as a substitute for milk. The returning to a milk diet should be done gradually and carefully, first adding sugar, later skimmed milk and then whole milk. One of the commonest faults is to give too large feedings. Very small amounts should be used frequently, especially if there is vomiting. Bismuth subnitrate in 10-grain doses, precipitated sulphur, 1 grain, and salol may be of value. Dover's powder or paregoric is also used. Some claim that small doses of castor oil will help to control the diarrhea. Serums are of little value and bulgaricus bacillus cultures cannot be depended on in very many cases. Local treatment consists of high rectal irrigations given through a No. 25 French catheter. Large quantities, a gallon or more, may be used if a free return flow is allowed. One or two irrigations a day are enough and they should be stopped if there is an increase in the number of stools. The after-care consists of careful supervision of the diet, observation of the stools and frequent records of the temperature.

27. Deficient Bone Development.—The authors report one case of congenital absence of condyles of the femur (syphilis) and two cases of congenital absence of coccyx and congenital backward deviation and shortening of coccyx.

Boston Medical and Surgical Journal

August 16, CLXXVII, No. 7

- 29 Industrial Benzol Poisoning in Massachusetts. T. F. Harrington, Boston.—p. 203.
30 Essential Shrinking of Conjunctiva in Acute and Chronic Pemphigus; Report of Two Cases. F. A. Conlon, Lawrence.—p. 206.
31 *Intestinal Adhesions and Peritoneal Bands in Epileptics. II. Caro, Palmer.—p. 208.
32 Comparative Study of Feeble-mindedness and Psychopathic Personality Among Offenders in Court. V. V. Anderson, Boston.—p. 210.
33 Hearing Tests from Practical Standpoint. G. L. Richards, Fall River.—p. 213.
34 Epidemic of Dysentery at Boston State Hospital, Due to Member of Paratyphoid-Enteritidis Group. M. E. Morse and G. Hyron, Boston.—p. 216.

31. Intestinal Adhesions and Peritoneal Bands in Epileptics.—In a review made by Caro of 775 necropsy protocols of patients in a general hospital, the incidence of intestinal adhesions and peritoneal bands was found to be relatively the same (18.3 per cent.) as in a series of 280 necropsies on epileptics. Hence, Caro believes that the constipation of epileptics cannot be said to be due to factors differing from those usually considered in the colonic stasis of other patients. Intestinal adhesions and peritoneal bands are due to congenital defects, acute inflammatory processes, or mechanical causes. Such processes are no more frequent in epileptics than in nonepileptics. Intestinal anomalies are not present in any greater proportion in epileptics than in other persons.

Colorado Medicine, Denver*August, XIV, No. 8*

- 35 Chronic Appendicitis and Its Gastric Relations. H. A. Black, Pueblo.—p. 213.
- 36 Rupture of Abdominal Viscera Due to Nonperforative Force. W. T. H. Baker, Pueblo.—p. 216.
- 37 Social Health Insurance. J. M. Shapiro, Denver.—p. 220.
- 38 Cystoscopy in Insane. P. Work, Pueblo.—p. 225.

Delaware State Medical Journal, Wilmington*April, VIII, No. 4*

- 39 Ethyl Chlorid Anesthesia. J. S. Keyser, Wilmington.—p. 5.

May, VIII, No. 5

- 40 Serum Therapy of Pneumonia. E. Mayerburg, Wilmington.—p. 5.

June, VIII, No. 6

- 41 Appendicitis as Complication of Pregnancy. A. P. Heineck, Chicago.—p. 3.
- 42 Hypopyon-Keratitis. R. B. Hopkins, Milton.—p. 6.

July, VIII, No. 7

- 43 New Treatment for Status Epilepticus. W. Held, Chicago.—p. 3.

Iowa State Medical Society Journal*August, VII, No. 8*

- 44 Disease of Internal Ear in Its Relation to General Medicine. G. E. Shambaugh, Chicago.—p. 291.
- 45 Eye-Strain and Higher Education, Iowa City.—p. 296.
- 46 Review of Recent Literature on Congenital Syphilis. F. S. Clarke, Omaha.—p. 301.
- 47 Intestinal Origin of Epilepsy; Report of Case. L. A. Baldwin, Riverton.—p. 304.
- 48 Treatment of Acute Tonsillitis by Enucleation. I. S. Buzard, Waterloo.—p. 305.
- 49 Recent Ideas of Iridocyclitis with Special References to Focal Infection; Report of Cases. J. E. Reeder, Sioux City.—p. 305.
- 50 Case of Sporotrichosis from Northern Life Country. C. F. Wahrer, Ft. Madison.—p. 307.

Journal of Biological Chemistry, Baltimore*August, XXXI, No. 2*

- 51 Light Production at Low Temperatures by Catalysis with Metal and Metallic Oxid Hydrosols. B. C. Gross, Princeton, N. J.—p. 271.
- 52 Blood Fat in Domestic Fowls in Relation to Egg Production. D. E. Warner and H. D. Edmond.—p. 281.
- 53 Tritico Nucleic Acid. B. E. Read and W. E. Tottingham, Baltimore.—p. 295.
- 54 *Proteoclastic Tissue Enzymes of Spleen. M. Morse, Chicago.—p. 303.
- 55 Comparative Metabolism of Certain Aromatic Acids. C. P. Sherwin, New York.—p. 307.
- 56 Studies on Bioluminescence. Mechanism of Production of Light During Oxidation of Pyrogallol. E. N. Harvey, Princeton, N. J.—p. 311.
- 57 Structure of Purine Mononucleotides. W. Jones and B. E. Read, Baltimore.—p. 337.
- 58 Similarity of Action of Salts on Swelling of Animal Membranes and of Powdered Colloids. J. Loeb, New York.—p. 343.
- 59 *Metabolism of Sulphur. Influence of Small Amounts of Cystine on Balance of Nitrogen in Dogs Maintained on Low Protein Diet. H. B. Lewis.—p. 363.
- 60 *Nutrition Investigations on Cottonseed Meal. A. E. Richardson and H. S. Green, Austin, Texas.—p. 379.
- 61 Availability of Energy of Food for Growth. C. R. Moulton, Columbia, Mo.—p. 389.
- 62 *Chemical Differentiation of Central Nervous System. Relative Amount of Sheathing Substance in Corpus Callosum and Intradural Nerve Roots (Man and Dog). W. Koch and M. L. Koch.—p. 395.
- 63 Effect of Different Salts on Ammonia Formation in Soil. G. P. Koch, New Brunswick, N. J.—p. 411.
- 64 Behavior of Chickens Restricted to Wheat or Maize Kernel. E. B. Hart, J. G. Halpin and H. Steenbock, Madison, Wis.—p. 415.
- 65 *Studies in Calcium and Magnesium Metabolism. Effects of Base and Acid. M. H. Givens and L. B. Mendel, New Haven, Conn.—p. 421.
- 66 *Id. Effect of Diets Poor in Calcium. M. H. Givens, New Haven, Conn.—p. 435.
- 67 *Id. Effect of Fat and Fatty Acid Derivatives. M. H. Givens, New Haven, Conn.—p. 441.
- 68 Relation of Quality of Proteins to Milk Production. E. B. Hart and G. C. Humphrey, Madison, Wis.—p. 445.
- 69 *Study of Effect of Hydrochloric Acid on Mineral Excretion of Dogs. R. L. Stehle, Philadelphia.—p. 461.
- 70 *Relation of Epinephrin Hyperglycemia to Decreased Alkali Reserve of Blood. J. P. Peters, Jr., and H. R. Geyelin, New York.—p. 471.

54. **Proteoclastic Tissue Enzymes of Spleen.**—Although other investigators have shown that an enzyme or enzymes exist in the spleen, capable of hydrolyzing peptone and also

fibrin, Morse found that the proteins of the spleen itself, however, autolyze only in neutral or acid, not in alkaline solution. The most rapid autolysis was observed in the most acid solution tested. Therefore, from the standpoint of necrosis, the α -protease of Hedin can scarcely be operative since there is no evidence that it affects native proteins. Morse suggests that it is probable that the α -protease of Hedin is not an autolytic enzyme, but rather a heterolytic one, resident in the white blood cells, for such an enzyme has been described, definitely, for such cells.

59. **Metabolism of Sulphur.**—Lewis found that the addition of small amounts of cystin to the diet of dogs on a low protein diet diminished the loss of nitrogen from the body and favorably influenced the nitrogen balance. This is interpreted to be the result of a specific demand for cystin for metabolic purposes, since tyrosin and glycocoll added to the diet under like conditions of experimentation did not diminish the nitrogen loss or influence the condition of nitrogenous equilibrium.

60. **Nutrition Investigations on Cottonseed Meal.**—According to Richardson and Green, 20 per cent. of the water extract of cottonseed flour dried on starch, equivalent per gram to 2.5 gm. of cottonseed flour, i. e., 50 per cent. cottonseed flour in the diet, contains sufficient water-soluble food accessory for normal growth. Four and thirty-five hundredths per cent. of the ether extract of cottonseed flour equivalent per gram to 11.5 gm. of cottonseed flour, i. e., 50 per cent. cottonseed flour in the diet, does not contain sufficient fat-soluble food accessory for normal growth, but 12 per cent. of the ether extract appears quite as efficient in supplying enough of the fat-soluble accessory for normal growth as does an equivalent amount of butter fat. Eighteen per cent. cottonseed protein when supplied with adequate amounts of all other necessary nutritive factors induces practically normal growth in the male rat, and better than average growth in the female, and fairly normal reproduction, with high mortality among the second generation. At the age of 148 days the male of the second generation is about four-fifths average size and the female slightly under size. Twelve per cent. cottonseed protein does not induce perfectly normal growth. On this diet one female has borne three young, all of which are alive at the age of 269 days, although below average size. Normal growth has not been obtained on 9 per cent. cottonseed protein but at the age of 155 days one animal, No. 310, has borne a fine looking litter of eight young, all of which she devoured. Very little growth has been obtained with 6 per cent. protein, the average gain in weight during 108 days being 8 to 9 gm. With only 4 per cent. cottonseed protein rats have fallen off in weight when first placed on this diet, but have almost successfully maintained their weight for fifty days thereafter.

62. **Chemical Differentiation of Central Nervous System.**—The Kochs found that the quantity of the sheathing substance appears to be nearly the same in the callosum fibers of man and of the dog. Moreover, the amount of sheathing substance of the fibers of the intradural nerve roots is in the dog like that found in the callosum, although a higher percentage of phosphatide and a lower percentage of water-soluble phosphorus appear to be characteristic for the nerve roots in both man and the dog. In man, however, the intradural nerve roots appear to have somewhat less sheathing substance, possibly a species difference, possibly due to some other cause. The approximate similarity in the amount of sheathing substance formed on the peripheral and on the central nerve fibers (though the latter are devoid of neurilemma) in two of the higher mammals, and the fact that the amount of sheathing substance in the callosum of man is similar to that in the callosum of the dog—and in the case of the intradural nerve roots not so very different—are the large results to which attention is especially directed.

65. **Studies in Calcium and Magnesium Metabolism.**—The observations made by Givens and Mendel demonstrate that the administration of base or acid produced no significant effect on the balance of nitrogen, calcium, magnesium, and phosphorus in the dog. Administration of hydrochloric acid increased the urinary excretion of calcium and thereby altered the relation of calcium to magnesium in the urine.

The calcium contained in milk was more effective than soluble calcium lactate in producing calcium retention. Administration of large doses of alkali bicarbonate to a human diabetic did not decrease the urinary output of calcium.

66. **Effect of Diets Poor in Calcium.**—From the data submitted by Givens it is evident that diets poor in calcium are not conducive to positive calcium balance even when an abundance of nitrogenous food is available.

67. **Effect of Fat and Fatty Acid Derivatives.**—Here Givens shows that poor utilization of fats or fatty acids may increase the excretion of lime in the feces and prevent the storage of calcium even when the calcium intake is comparatively abundant.

69. **Study of Effect of Hydrochloric Acid on Mineral Excretion of Dogs.**—The administration of hydrochloric acid by mouth to the dog caused an increased excretion of calcium and magnesium as well as of sodium and potassium, but in the case of the latter a compensatory retention makes the loss apparent rather than real. If, Stehle says, an analogous condition holds in human diabetes the resulting calcium loss may be something to take into consideration in the treatment of diabetic patients in whom the excretion of hydroxybutyric acid has reached a significant figure.

70. **Relation of Epinephrin Hyperglycemia to Decreased Alkali Reserve of Blood.**—The hyperglycemia produced by Peters and Geyelin by subcutaneous injection of epinephrin in three cases of diabetes and two normal individuals was accompanied by simultaneous diminution of the alkalinity of the blood. This taken in conjunction with other experimental evidence strongly suggests that decreased alkalinity of the blood plays a very important rôle in the production of hyperglycemia of this type. Vasoconstriction as demonstrated by peripheral hypertension was not of prime importance in producing the changes noted.

Kansas Medical Society Journal, Topeka

August, XVII, No. 8

- 71 Treatment of Heart Failure Based on Diagnosis of Function of Heart Muscle That Is at Fault. P. T. Bohan, Kansas City, Mo.—p. 207.
- 72 Relation of Gallstones to Cancer of Gallbladder; Report of Cases. L. F. Barney, Kansas City.—p. 213.
- 73 Private Hospital as Investment. T. A. Jones, Hutchinson.—p. 216.

Medical Record, New York

August 18, XCII, No. 7

- 74 U. S. Pharmacopeia, IX. H. C. Wood, Jr., Philadelphia.—p. 265.
- 75 Rationale, Indications, and Contraindications of Nauheim Bath. C. W. Lieb, Watkins, N. Y.—p. 268.
- 76 Presenile Gangrene. C. Goodman, New York.—p. 275.
- 77 Balanced Diet Analyzed. R. H. Rose, New York.—p. 276.
- 78 Stages of Tabes Dorsalis, Based on Study of 240 Cases. M. Grossman, New York.—p. 278.
- 79 Some Possibilities in Treatment of Tuberculous Insane. N. B. Burns, North Wilmington, Mass.—p. 280.
- 80 Some Reflections on Surgery of War, Viewed After Three Years. C. G. Cumston, Geneva, Switzerland.—p. 283.

Medicine and Surgery, St. Louis

August, I, No. 6

- 81 Some Ethical Problems in Gynecology and Obstetrics. W. A. N. Dorland, Chicago.—p. 565.
- 82 Organotherapy of Menstrual Disorders. E. Novak, Baltimore.—p. 576.
- 83 Treatment of Eclampsia. (Toxemias of Pregnancy). R. W. Holmes, Chicago.—p. 586.
- 84 Leucorrhea. H. Schmitz, Chicago.—p. 496.
- 85 Combined Rectovaginal Examination. F. L. Adair, Minneapolis.—p. 601.
- 86 Cancer of Rectum in Female. F. G. DuBose, Selma, Ala.—p. 607.
- 87 How Great Men Are Produced. C. L. Redfield, Chicago.—p. 612.
- 88 Amenorrhea, Dysmenorrhea, Sterility and Endometritis as Rule Relieved by Silver Stem Pessary when Other Treatments Fail. J. H. Carstens, Detroit.—p. 617.
- 89 Varicocele in Female. W. E. Darnall, Atlantic City, N. J.—p. 624.
- 90 New Shoe for Wear During Pregnancy. J. Grossman, New York.—p. 631.
- 91 Cyst of Femur Treated by Tibial Bone Transplant. F. Warner, Columbus, O.—p. 636.
- 92 Hematuria. J. T. Windell, Louisville, Ky.—p. 643.

New York Medical Journal

August 11, CVI, No. 6

- 93 Present Day Aspects of Laryngeal Tuberculosis. H. Arrowsmith, Brooklyn.—p. 245.
- 94 Primitive Medicine Man's Virtues. (Concluded.) J. Wright, Pleasantville.—p. 248.
- 95 Diagnosis of Early Cancer of Stomach. A. Bassler, New York.—p. 252.
- 96 Diagnostic Teeth. P. W. Roberts, New York.—p. 256.
- 97 Prophylactic Inoculation in Tetanus. J. Rudis-Jicinsky, Chicago.—p. 259.
- 98 Functional Neuroses. A. Stern, New York.—p. 261.
- 99 Island Flaps. J. F. S. Esser, Vienna.—p. 264.
- 100 Hallux Valgus; New Operative Procedure. J. E. Fuld, New York.—p. 265.
- 101 Case of Double Strangulated Femoral Hernia. W. J. Woolston, Chicago.—p. 367.
- 102 Use of Inexpensive Drugs in Practice. (To be continued.) L. T. de M. Sajous, Philadelphia.—p. 280.

August 18, CVI, No. 7

- 103 Relationship of Syndrome of Anaphylaxis to Vegetative Nervous System. F. M. Pottenger, Monrovia, Cal.—p. 293.
- 104 Erysipelas as Complication of Mastoiditis. H. Hays, New York.—p. 297.
- 105 Nasal Obstruction Factor in Production of Disease. W. P. Poreher, Charleston, S. C.—p. 301.
- 106 Scope and Utility of Fluoroscopy. I. S. Hirsch, New York.—p. 303.
- 107 Refractive Errors Causing Retardation in School. W. M. Carhart, New York.—p. 309.
- 108 Paraffin Wax Treatment for Burns. C. A. Behney, Philadelphia.—p. 312.
- 109 Etiology and Treatment of Bronchial Asthma. M. J. Gottlieb, New York.—p. 313.
- 110 Race Retrogression. R. H. MacNair, Springfield, Mass.—p. 315.
- 111 Case of Blindness and Focal Infection Due to Ethmoiditis: Cured. H. Rodman, New York.—p. 316.
- 112 Medical Department of United States Army. General Organization of Army. W. W. Reno.—p. 317.
- 113 Comment on Exemption Boards. J. M. Mabbott, New York.—p. 318.

New York State Journal of Medicine

August, XVII, No. 8

- 114 *Present Status of Serum Therapy. R. I. Cole, New York.—p. 347.
- 115 *Present Status of Vaccine Therapy. W. B. Stone, Schenectady.—p. 357.
- 116 *Present Status of Drug Therapy. W. Coleman, New York City.—p. 361.
- 117 *Present Status of Physiologic Therapy. J. J. Levy, Syracuse.—p. 363.
- 118 *Early Diagnosis of Poliomyelitis. W. D. Ayer, Syracuse.—p. 368.
- 119 Defective Nutrition in Early Life. E. H. Bartley, Brooklyn.—p. 375.
- 120 Hospital Surgeon: His Economics and Standardization of His Work. W. L. Duffield, Brooklyn.—p. 379.
- 121 *Complete Avulsion of Scalp. F. H. Flaherty, Syracuse.—p. 382.
- 122 Present Food Problem. E. S. Haswell, Albany.—p. 384.

114. **Present Status of Serum Therapy.**—Cole presents his conception of the present state of serum therapy, the advantages as well as the pitfalls associated with it. He says that if we disregard all the chaff and consider only those forms of serum therapy in which the value is well proved, we must believe that this form of therapy has been of the greatest good to mankind. He advises that the practicing physician should keep close to earth and employ only that which has been tried and found to be of value.

115. See THE JOURNAL, June 9, 1917, p. 1777.

116. See THE JOURNAL, June 2, 1917, p. 1656.

117. See THE JOURNAL, June 2, 1917, p. 1656.

118. **Early Diagnosis of Poliomyelitis.**—One hundred and two acute cases are analyzed by Ayer. Fever was present in every case. The average temperature observed was 102.2, the highest range being 104.8. Headache was noticed in all but one of the cases. Rigidity of the neck was found in ninety-eight cases and was quite characteristic. Drowsiness was found in ninety cases. Tremor and muscular twitching was noted in forty-two cases and described by the parents in twenty others. Vomiting was described in the attack, in forty-one cases. In thirty-nine cases constipation was obstinate, resisting all medication. Difficulty in urination was present in sixty cases; sweating in twenty-two cases. This accompanied the severer types, and was noted in ten of the cases going on to bulbar involvement. No distinctive

disturbances of the reflexes were observed. In twelve early cases they were exaggerated, in twenty-nine the patella, abdominal or cremasterics were absent. The pupillary reflex was retained in all cases. Diplopia was present in eight cases. The kernig was not constant—a definite kernig was observed only in eighteen instances. Pain was a finding of indefinite character, pain in the back and limbs being mostly complained of. A persistently severe pain in one or more extremities often preceded the appearance of paralysis in that location. Redness of the throat and heavily coated tongue were common findings. Of the forty-two cases developing paralysis, eleven were of the true bulbar type, ten of whom died from respiratory paralysis. Of the thirty remaining cases fourteen showed paralysis of an entire extremity or more, with five deaths. Six cases developed facial paralysis and ten show partial and slight involvement of an upper or lower extremity. Ayer believes that the early stage of poliomyelitis is characterized by a distinct clinical picture and that, in the presence of an epidemic, any case presenting with headache, fever and rigidity of the neck should be considered a case of poliomyelitis until proved otherwise.

121. See THE JOURNAL, June 9, 1917, p. 1778.

Northwest Medicine, Seattle

August, XVI, No. 8

- 123 Medical Man in Military Service. C. S. Moody, Hope, Ida.—p. 223.
- 124 War Experiences in England and France. (Concluded.) R. D. Forbes, Seattle, Wash.—p. 227.
- 125 Clinical Methods for Studying Kidney Functions. C. S. Wilson, Tacoma, Wash.—p. 231.
- 126 Discussion of Urologic Cases. H. Partridge, San Francisco.—p. 234.
- 127 Practical Hints in Urinalysis. E. L. Whitney, Portland, Ore.—p. 236.
- 128 Some Points in Treatment of Acute Gonorrhea by General Practitioner. L. G. Johnson, Marshfield, Ore.—p. 238.

Tennessee State Medical Association Journal, Nashville

August, X, No. 4

- 129 Symptomatology and Diagnosis of Empyema of Accessory Sinuses of Nose. H. Wood, Nashville.—p. 135.
- 130 Treatment and Prognosis of Catarrhal and Suppurative Inflammations of Nasal Accessory Sinuses. H. Ezell, Nashville.—p. 139.
- 131 Fecal Fistulas. G. R. West, Chattanooga.—p. 149.
- 132 *Non-Specific Measures in Treatment of Certain Infections. J. O. Manier, Nashville.—p. 153.
- 133 Chronic Indurative Pancreatitis. Pancreatectomy. Presentation of Specimen. W. B. Burns, Memphis.—p. 160.
- 134 Cystoscope in Diagnosis and Treatment of Disease of Urinary Tract. J. E. Hall, Nashville.—p. 164.

132. See THE JOURNAL, April 28, 1917, p. 1286.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Surgery, Bristol

July, V, No. 17

- 1 Interrelation Between Roentgenography and Surgery of Gunshot Wounds of Head. H. E. Gamlen and S. Smith.—p. 17.
- 2 *Repair of Injuries to Skull by Thin Perforated Silver Plates. A. B. Mitchell.—p. 40.
- 3 *Reparation of Cranial Defects by Means of Cartilaginous Grafts. H. L. W. Woodroffe.—p. 42.
- 4 *Septic Peritonitis: Treatment by Cecostomy. A. J. Nyulasy.—p. 53.
- 5 Ulceration of Colon in Neighborhood of Gunshot Wounds. J. S. Dunn and H. Drummond.—p. 59.
- 6 *Early Treatment of Gunshot Fractures of Thigh. C. M. Page and A. B. Le Mesurier.—p. 66.
- 7 Splints for Treatment of Gunshot Fractures of Long Bones. J. H. Pringle.—p. 100.
- 8 Carrel Treatment of Wounds. G. Barling.—p. 116.
- 9 Treatment of Hemorrhage Caused by Gunshot Wounds of Face and Jaws. V. H. Kazanjian and H. Burrows.—p. 126.
- 10 Oral and Plastic Surgery and Prosthetic Appliances. A. C. Valadier and H. L. Whale.—p. 151.
- 11 Case of Myeloma of Tendon Sheath. F. C. Pybus.—p. 172.
- 12 Case of Thrombosis of Considerable Portion of Superior Mesenteric Vessels without Any Discoverable Cause. O. L. Addison.—p. 173.
- 13 Localized Traumatic or Direct Gangrene. A. W. Nuthall.—p. 175.
- 14 Case of Fibroid Tumor of Stomach. E. W. H. Groves.—p. 176.
- 15 Case of Intraperitoneal Perforation of Ulcer of Urinary Bladder. H. S. Newland and H. Rayson.—p. 177.

2. Repair of Injuries to Skull by Thin Perforated Silver Plates.—For some time past Mitchell has been in the habit of repairing gaps in the skull by the use of very thin perforated silver plates. The silver is rolled out a little thinner than an ordinary visiting card, and is then punched with holes one eighth of an inch in diameter, as close together as possible. This is said to have the following advantages: 1. Being very thin, the plate can be readily adapted to the convexity of the skull. 2. The perforations have the advantages that they lighten the plate; they admit of the escape of blood or other fluid, so as to avoid compression by accumulation between the plate and the dura or brain; and they provide a simple means of fixing the plate in position. The plate is applied as follows: A large flap of scalp is turned down. The opening in the skull is explored, any foreign body is removed, adhesions are freed, and bleeding is arrested. The periosteum is now carefully raised from the skull for about half an inch all round the gap. The plate, cut the necessary size and shape (half an inch in diameter larger than the opening it is desired to close), is now slipped under the reflected periosteum and fixed in position by a series of catgut sutures which, by the aid of a fully curved needle, are carried through the periosteum and out through any of the perforations in the plate which are most convenient. In this way the plate is securely fixed in position and cannot slip. The scalp flap is now sutured in position, and a drainage tube inserted at the most dependent angle for twenty-four hours—otherwise a hematoma is very likely to form. Needless to say the most rigid asepsis must be observed.

3. Reparation of Cranial Defects by Means of Cartilaginous Grafts.—The grafts used by Woodroffe are taken from the sixth, seventh and eighth costal cartilages, and for convenience are cut from the same side as the head wound. The usual incision is one parallel to and a little above the costal margin. A vertical incision, two finger-breadths outside the edge of the sternum gives equally good access; can more easily be extended if necessary; the hemorrhage is less; and it has the great advantage of splitting instead of cutting across the upper fibers of the rectus. The cartilages having been thus exposed, shavings are taken of about half their thickness. Care should be taken not to cut through the entire thickness of a fixed cartilage. Each graft, as cut, is dropped into warm saline solution. The chief difficulty is to keep these from slipping. A very simple and rapid method is that of Villandre. One end of a fine catgut stitch is passed through the pericranium, and tied. It is then passed through the pericranium on the other side of the gap, and taken backward and forward in a zigzag manner till the hole is covered in with a trellis. In the case of a very large gap it is wise to supplement this network by a second, at right angles to it, and to insinuate the grafts between the two layers. This gives a small chamber bounded by the dura, the edges of the skull and the trellis, into which the grafts can be slipped with forceps. It is advised to apply the perichondral surface to the dura, in order to avoid adhesions; in any case it is easier, as the grafts curl when cut, the perichondrium being in the concavity. They should overlap everywhere, and may well be doubled, as some slight recession always takes place, and those cases give the best final result which, at the end of the operation, show a slight boss. When the frontal or temporal regions are involved, it is well carefully to study the sound side before operating; it is then possible to restore almost exactly the symmetry of the forehead.

4. Septic Peritonitis: Treatment by Cecostomy.—In Nyulasy's series of cases, as soon as the opening into the cecum was made, the feces usually came out under high pressure, in one instance rising up in a stream over 8 inches high. He suggests, therefore, that if the cecum had contained this fluid before it had been opened, we may reasonably assume that the fluid would have been forced along the colon to the anus. Since this had not happened, it seems likely that these feces had not yet reached the cecum, but were held back in the ileum, and that the opening of the cecum relieved the obstruction. He suggests, therefore, that the

efficacy of cecostomy may depend on a possible power to relax ileocecal spasm, and thereby release virulent feces pent up in the small intestines.

6. Early Treatment of Gunshot Fractures of Thigh.—The authors are convinced that the Thomas knee splint is the most suitable apparatus available for use in the transport of cases of fracture of the femur. The same splint can give excellent results as regards alinement and length in fractures in the middle third of the femur. Good alinement cannot be attained by the use of the Thomas splint in the case of fractures occurring in the lower third of the femur; but if the splint be modified by bending it at the knee joint level to form a skeleton double inclined plane, the results are good. Fractures in the upper third of the femur can generally be well treated in a Hodgen splint. Adhesive extension attachments are satisfactory for most cases, and are well suited to the conditions of active service. Transfixion of the bone is useful in special cases, and when the procedure is carried out at a distance from an infective focus. Cases reported demonstrate the importance of periodical prophylactic injections of antitetanic serum.

British Medical Journal

August 4, II, No. 2953

- 16 *Investigation of Significance of Disorders and Diseases of Heart in Soldiers. T. C. Allbutt.—p. 139.
- 17 *Gunshot Injuries of Chest. J. R. Bradford.—p. 141.
- 18 Factors in Field Ambulance Work Which Help Work in Casualty Clearing Stations. K. M. Walker.—p. 146.
- 19 Dermatitis Due to Explosives Used in Air Raids. J. H. Sequira.—p. 148.
- 20 Statistics of Defective Vision Obtained at Recruiting Medical Board. C. F. Harford.—p. 149.
- 21 *Method of Supination by Plaster. P. J. Verrall.—p. 150.
- 22 Simple Means of Ascertaining if Sterilizing Hut Is Hot Enough to Destroy Lice and Nits in Clothing or Blankets. A. Bacot.—p. 151.

16. Investigation of Significance of Disorders and Diseases of Heart in Soldiers.—One main result of Allbutt's investigation is to strengthen the opinion which, before these researches were established, was gaining ground, namely, that "heart strain," a phrase a few years ago in common use and application, is a rare event. The fretful heart, known as the "soldier's heart," is not cardiac strain. For the term "soldier's heart" Allbutt suggests ponopalmosis, a compound word which means palpitation on effort. Heart strain, Allbutt says, is generally a result of some infection, is relatively infrequent, and does not constitute the bulk of the cases invalided from the army as "D. A. H." In "D. A. H." the form of the heart is unaltered and the dyspnea seems not to depend directly on the heart. A thrill must be very carefully placed and timed, for in many of these irritable hearts a systolic thrill can be felt; perhaps in most of them if some effort be made just before examination. It is short but often very distinct to the touch. It is not felt about the base of the heart, and is therefore not due to a slack aorta. How the thrill is generated it is not easy to say. Very often in these cases a systolic murmur at the apex is recorded, an alteration of the first sound, more like a prolongation of it with some change of quality than like a definite murmur of mitral regurgitation. Allbutt suggests that in these cases the papillary muscles and their chords may be a trifle slack, so that the mitral sheets shiver a little in the current, as a sail shivers when the boat gets near the wind. Such a quaver would be transmitted to the ventricular wall, and thence to the thoracic. In such a condition there might well be a minute, inconstant, and insignificant regurgitation also; though ordinarily in mitral regurgitation there is no thrill.

17. Gunshot Injuries of Chest.—Hemothorax is the most common result of a chest wound; both pneumohemothorax and pneumothorax are relatively rare, and in a series of 328 cases of gunshot wounds only eight cases of the former and four cases of the latter were observed by Bradford. In sterile hemothorax, Bradford says, if the amount of the bloody effusion is small, there is no need for any special active treatment; such cases do well, although their progress may sometimes be slow. If the effusion is at all large in amount—that is, the dulness reaching above the angle of the

scapula—the fluid should be removed by aspiration about the end of the first week after the wound. In a few cases earlier aspiration may be required to relieve distress arising mechanically from the amount of fluid present. Aspiration with oxygen replacement is better than simple aspiration; all the fluid present in the chest can be removed at one sitting. Free drainage is required in all cases of infected hemothorax, and this should be provided as early as possible, as the organization of the deposit of lymph on the visceral pleura produces a great impediment to the rapid expansion of the lung after the removal of the fluid, and this organization proceeds rapidly in cases where delay in operating takes place. The inflammation in the pleural sac and the septic clots must be treated by the local application of some efficient antiseptic. If the cavity is treated by washing out, care must be taken to avoid arising the intrapleural pressure. Septic clots, often of considerable size, can be removed with success by this method. Care must be taken in selecting the site for excision of a portion of rib to provide really efficient drainage, and the fact that the diaphragm is abnormally high in these cases must be borne in mind, as otherwise the opening will be made too low down. In some instances the wound of entry or exit communicates more or less directly with the pleural cavity and fluid in variable quantity drains from it; this drainage is rarely satisfactory or sufficient, and such cases require a counter opening in a suitable situation to really drain the effusion.

21. Method of Supination by Plaster.—The plaster is applied over felt (previously stitched together around the limb) and consists of two parts. A few temporary stitches hold the two portions of felt together while the plaster is applied, and are then cut. The upper piece reaches from the middle of the arm to the middle of the forearm; the lower from the middle of the forearm to just above the heads of the metacarpal bones, a hole being left for the thumb to protrude. On either side of the interval between the two portions pieces of metal are incorporated in the plaster. These consist of metal strips $\frac{3}{4}$ inch wide and 3 inches long, one inch of which is turned up at a right angle and the other two inches notched to ensure firmer incorporation in the plaster, the notched corners being turned up to form spikes. One of these is fixed into the radial and another into the ulnar side of the lower part, and two other pieces are similarly inserted into the inner and outer aspects respectively of the upper part. When the plaster is firmly set (next day) pieces of rubber tubing are stretched round these two pairs of metal pieces and gradually tightened from day to day, supination being complete when the two pairs are opposite one another. If desired, pronation can be obtained by reversing the process. It is necessary to put extra felt padding over the head of the second metacarpal, over the lower end of the radius, and over the ulnar border of the hand. When supination is complete the arm should be kept in this position for at least three weeks to prevent relapse before massage is begun. This method is suited to cases of adhesions in the upper and lower radio-ulnar joints, fractures of the forearm where there is danger of cross union, and disability due to contracture of soft parts.

Edinburgh Medical Journal

August, XIX, No. 2

- 23 Need of Future: Efficiency Based on Moral Responsibility. W. Russell.—p. 78.
- 24 Etiologic Classification of Deformities of Female Pelvis. D. B. Hart.—p. 82.
- 25 Nasal Neuroses, Regarded as Sensitizations of Respiratory Tract; Résumé of Recent Literature. J. S. Fraser.—p. 91.
- 26 Cases of Vascular Injury. F. C. Pybus.—p. 108.
- 27 Arteriovenous Aneurysm of External Iliac Artery. N. Maclay.—p. 112.

Medical Journal of Australia, Sydney

July 14, II, No. 2

- 28 Occurrence of Fractures. J. G. Edwards.—p. 25.
- July 21, II, No. 3
- 29 Early Operative Treatment of Chronic Discharge from Middle Ear. R. G. Brown.—p. 43.
- 30 Relationship of Opticians to Profession and to Public. J. L. Gibson.—p. 47.
- 31 Unusual Case of Occupation Neurosis. J. C. Verco.—p. 50.

Tropical Medicine and Hygiene, London

August 1, XX, No. 15

32 *New Thrush Parasite. A. Pijper.—p. 169.

33 Tropical Diseases Met with in Balcanic and Adriatic Zones. (Continued). A. Castellani.—p. 170.

32. **New Thrush Parasite.**—Pijper cites the case of a child of four months, in very bad condition due to underfeeding and exposure to cold, exhibiting the usual symptoms of thrush, but for the color of the patches. These were distinctly not white or whitish, but yellowish. A whole patch was taken off (slight bleeding followed) and planted. Better care and alcoholic paintings soon restored the child to health. The cultures showed that the parasite causing this sore throat was the fungus known as *Monilia rugosa* Castellani.

Archives des Maladies du Cœur, Paris

June, X, No. 6, pp. 257-304

34 *Device to Ensure Precision in Heart Tracings. C. Laubry and A. Mougeot.—p. 257.

35 *Aviator's Sickness. G. Ferry.—p. 275.

36 *Shrapnel Ball in Left Iliac Region Passes through Inferior Vena Cava to Right Auricle. C. Pezzi.—p. 285.

34. **Precision in Heart Tracings.**—Laubry and Mougeot give an illustrated description of the sliding gage attachment which records with mathematical accuracy the different phases of the heart action. They expatiate also on the points to be learned from this greater precision in the findings.

35. **Aviator's Sickness.**—Ferry has been studying on others and on himself the cardiovascular reactions in aviation. He here describes in detail the cardiovascular reactions observed in an aviator of 33 who had been discharged from the army on account of symptoms of Bright's disease. These had subsided under rest and dieting, all except the albuminuria. The findings in this case indicate that 1 gm. albumin is the extreme limit permissible, even in a young aviator, and only then when the kidneys seem to be behaving well otherwise. If the kidney functioning is defective, whatever the amount of albumin, the candidate should be rejected.

36. **Projectile in the Heart.**—Pezzi calls attention to a case recently reported by Ascoli in which a shrapnel ball entered the back in the iliac region and its course was traced by radioscopy along the vena cava and into the right auricle where it seems to be harmlessly sojourning. The symptoms at the time of the wound and while the projectile was in the vein were quite severe, but since it entered the heart there has been no appreciable disturbance. It has probably become coated with fibrin, and as it is tossed about in the blood stream pouring through the heart, it probably gets no chance to come in contact with the walls of the auricle, and the retrograde current as the valves close keeps it away from the valves likewise. In ten cases on record of a projectile in the heart, an attempt was made to extract the projectile. Four of the patients died, but the operation was a success in six cases. But even in these favorable cases there were threatening heart and pulmonary disturbances. Ascoli does not advise any operation in his case as the lungs are diseased and the general health poor. The case confirms the prevailing physiologic conceptions as to the mechanism of the action of the atrioventricular valves.

Journal de Médecine de Bordeaux

July, LXXXVIII, No. 8, pp. 145-168

37 *Tardy Extraction of Projectiles in the Thorax and Pelvis. Charbonnel.—p. 147.

38 *Traumatism and Pleuropulmonary Tuberculosis. Carles and Charrier.—p. 155.

39 Technic for and Advantages of Intravenous Quinin Treatment of Malaria. R. Le Dentu.—p. 159.

40 What Has Been Done for Tuberculous Soldiers. E. Leuret.—p. 161.

37. **Extraction of Projectiles in the Thorax.**—Charbonnel has performed 128 operations to extract projectiles after the wound had healed. This includes thirty-four cases of a projectile deep in the thorax or in the region between a horizontal line passing through the fourth lumbar vertebra and a line connecting the lesser trochanters. He summarizes the details of each and the lessons learned from his experience.

38. **Traumatism and Tuberculosis of Pleura or Lung.**—Carles and Charrier state that in 104 cases in their service of war wounds of the chest, in only one instance a pleuropulmonary tuberculous process has developed for which the traumatism seemed to be responsible. The young man had been robust and exceptionally healthy; the first symptoms of tuberculosis developed about six weeks after a shell wound of the right lower chest and proved fatal in less than three months.

Paris Médical

July 21, VII, No. 29, pp. 61-76

41 *Pleuropulmonary Tuberculosis and Military Service. C. Laubry and L. Marre.—p. 62.

42 *The Intestinal Preoccupations of the Aged. P. Merklen.—p. 66.

43 Horehound in Treatment of Bronchitis. H. Leclerc.—p. 69.

44 Improved Apparatus for Continuous Extension, Especially of the Hip Joint. Chabannas.—p. 71.

July 28, No. 30, pp. 77-92

45 *Features of Malaria Acquired in Macedonia. P. Carnot.—p. 78.

46 *Beneficent Secondary Pleurisy with Pulmonary Tuberculosis. C. Murard and H. Marotte.—p. 85.

41. **Pulmonary Tuberculosis and Military Service.**—In concluding their study of this subject, Laubry and Marre say that in dubious cases in which the man has been given leave of absence for the usual three months, he should go to the hospital for a week for thorough examination before his case is finally passed on. The greater their experience the more exceptional they find actual recuperation after a man has been sent back from the front on account of pleuropulmonary tuberculosis. But many of the men recuperate enough for the auxiliary service and can prove very useful as guards for prisoners, for bridges, and other light duty.

42. **The Intestinal Preoccupations of the Senile.**—Merklen comments on the way in which the senile become slaves to their bowel, convinced that they are constipated and applying all kinds of measures against the dreaded constipation. He warns the physician not to be misled by their statements and complaints. If the physician is duped by them, they use his statements and authority to back them up in their erroneous practices, and the vicious circle becomes more and more confirmed. A factor that frequently cooperates is their forgetfulness; they do not remember when they have been to stool and may honestly believe that days have elapsed since their last passage.

45. **Macedonia Malaria.**—Carnot says that the plasmodia found in the men returning with malaria from Macedonia are of the usual tropical and tertian types, but they seem to be peculiarly resistant to quinin. Some of the men and physicians returned from Macedonia still have their attacks or series of attacks every two or four weeks, notwithstanding that they have been taking quinin regularly for more than a year, some with great system and perseverance. Even by the intravenous route, the attacks are only postponed a little, not broken up completely, except the one attack in course, without warding off attacks later, sometimes very violent. Arsenobenzol is equally ineffectual so far as a permanent cure is involved, but this aids in building up the general health. A combination of these two drugs seems to be the best we can do at present, he says, giving them together or in turn. The spontaneous acquirement of immunity seems to be the only reliable means of finally exterminating the hematozoa, and our chief aim should be to favor these biologic reactions.

46. **Beneficent Secondary Pleurisy with Pulmonary Tuberculosis.**—Murard and Marotte report in detail three cases all showing the arrest and tendency to sclerosis of a progressive primary tuberculous lung process after an intercurrent pleurisy with a moderate effusion, left unmolested. In each the pleurisy came on with a sudden onset, the symptoms so stormy that the clinical pictures resembled those from a spontaneous pneumothorax. In a fourth case the effusion was evacuated and the symptoms became at once seriously aggravated, until the effusion had collected again. The secondary pleurisy in such cases is probably due to the bursting of some minute superficial tubercle, opening into the pleura and pouring into it a few tubercle bacilli, only enough

to start an immunization process from the serofibrinous effusion. Similar benefit has been observed from the pleurisy noticed in the course of treatment with artificial pneumothorax. In both, the effusion starts a kind of immunization process.

Gazzetta degli Ospedali e delle Cliniche, Milan

June 14, XXXVIII, No. 47, pp. 689-696

- 47 *Hemorrhagic Spirochetosis among the Troops. P. D. Siccardi.—p. 691.

June 17, No. 48, pp. 697-712

- 48 *Bony New Growths Consecutive to Multiple and Repeated Contusions. A. Mori.—p. 697.

47. **Hemorrhagic Spirochetosis.**—Siccardi has already reported on 700 cases of an infectious cutaneous hemorrhagic syndrome among the troops in his division. One of the two types has certain features suggesting typhoid; the other developed only after frostbite, and resembled seury. In this latter group he encountered a few cases which were caused by the icterohemorrhagic spirochete described by Inada and Ito, and he was able to reproduce the disease in guinea-pigs. Even at the seventh generation it killed guinea-pigs in from three to twelve days. This spirochete is eliminated mainly in the urine, even after clinical recovery. The large rats common in the trenches eat human excreta, and they probably represent the intermediate host or at least the conveyors of the virus. The epidemic appearance in certain months of the year and the complete subsidence as winter comes on suggest a possible transmission to man by insects. This assumption is rendered more plausible by the fact that the intravenous is the elective route for infection.

48. **Bone Growths from Occupational Trauma.**—Mori insists that the tendons, periosteum, bursae and the bone itself are liable to react to multiple and repeated slight contusions with a new growth, just as the soft parts react with hard edema. In four cases here reported an actual bone growth developed, independent of the skeletal bone below. It could not be ascribed to any periostitis changes. It starts with the coagulum. Metaplasia follows and as connective tissue, cartilage and bone have a common embryonal origin, it is easy to understand how one may become transformed into the other.

Policlinico, Rome

July 22, XXII, No. 30, pp. 925-948

- 49 *Rolling the Head during Sleep. B. Masci.—p. 925.
50 The Enterococcus as Cause of Severe Intracranial Complications of Otitis and Mastoiditis; Three Cases. P. Caliceti and R. Vaglio.—p. 929.
51 *Emergency Treatment of Wounds of the Thorax and Lung. E. Morelli.—p. 930.
52 Suggestions for Improving the Organization of the Field Surgical Service. G. Bartolone.—p. 932.

49. **Rolling the Head from Side to Side During Sleep.**—Masei's patient is a young soldier who has been in the hospital for five months for treatment of frozen feet, complicated with a severe burn owing to loss of sensation in the feet. During this entire period he has had a habit of rolling his head from side to side during slumber, the head describing a complete half circle from shoulder to shoulder. The rhythm is almost as regular as a pendulum's swing, from seventy-five to eighty complete turns per minute. The man sleeps lightly but wakes refreshed, without headache or dizziness, and never ceases to sleep during the day. No modification was observed under tonics or sedatives until he was given 2 gm. doses of chloral. Under the influence of the chloral he slept quietly, the head lying normally still. As this was only a palliative, Masei discontinued the chloral and the rolling movements began again as before. There are no cramps or contracture in any other muscles, and the man seems normal otherwise. He was not aware of his trouble until he heard the doctors discussing his case. He had taken a very active part in the war at the front from the beginning. The tendency to the movements probably exists during the waking hours also, but the inhibition exerted unconsciously by the will prevents its manifestation. Masei remarks that treatment would be undertaken with confidence if the movements occurred awake, but "how can psychotherapy and immobilization do any good when the trouble appears only when the

man is unconscious in sleep?" Probably it will spontaneously subside when the strain of trench life is over.

51. **Wounds of the Chest.**—Morelli refers to the immediate emergency measures for wounds of the thorax, saying that the outcome depends on prompt clearing out of the wound and keeping up the intrathoracic pressure. The danger of infection from the air of a pneumothorax is less imminent than the danger from a hemothorax. His experience with hundreds of chest wounds has convinced him that a spontaneous pneumothorax is the most fortunate thing that can happen to a man wounded in the thorax. In order to maintain the pneumothorax it is usually necessary to close the opening into the chest, and he uses for the purpose a long, soft rubber bag that can be introduced between the lips of the wound. When inflated, it plugs the opening airtight. The shape of the bag with its inflating tube is somewhat like the outline of a small violin. He has them of different diameters to fit different sized openings, and sometimes more than one has to be used when the projectile tore its way out again. In one case the pressure within the thorax was 4 cm. water after these bags had been introduced and it rose later spontaneously to 12, showing the hermetic closure. The closure of the wound is experienced by the patient as a great relief. After danger of hemorrhage has passed, the wound can be closed by surgical measures.

Revista de la Asociacion Medica Argentina, Buenos Aires

June, XXVI, No. 151, pp. 595-965

- 53 *Serums and Vaccines in Treatment of Puerperal Septicemia. J. A. Beruti.—p. 595; N. P. Costa.—p. 774.
54 *Radium Treatment in Gynecology. C. A. Castaño.—p. 613; E. A. Fox.—p. 643; E. Pouey.—p. 835.
55 *Management of Contracted Pelvis with Infected Uterus and Living Fetus. J. A. Gabastou.—p. 666.
56 Roentgen Treatment in Gynecology. J. Iribarne.—p. 689.
57 *Sign of Advanced Extra-Uterine Pregnancy. J. C. Lascano.—p. 728.
58 Cesarean Section in Northern Argentina. J. C. Lascano.—p. 740.
59 Forceps Extraction Guided with One Hand. Lorient.—p. 756.
60 The Multiple Peritoneal Complications of Criminal Abortion. M. L. Perez.—p. 804.
61 *The Pediatricist in the Maternity. A. F. Puyol.—p. 846.
62 Advantages of Surgical Measures for Puerperal Septic Uteropelvic Thrombophlebitis. A. Turenne.—p. 853.

53. **Vaccine and Serum Treatment of Puerperal Septicemia.**—Beruti concludes from his own experience and the published data, that antistreptococcus serotherapy in puerperal septicemia generally fails. He declares further that the intravenous route is irrational, as also large doses and attempts to use antistreptococcus serum in prophylaxis. Better results have been realized with nonspecific serotherapy. Normal horse serum has given excellent results in the hands of Pouey and Turenne of Montevideo, among others. In one case the leukocytes rose from 4,500 to 25,000 under it, and in another case peritoneal septicemia retrogressed. Beruti has had a number of notable recoveries under intravenous injection of normal horse or beef serum, the single dose not over 20 c.c. It is his impression that the serum is more potent therapeutically when the animal has been previously bled. The effect is much the same as with the specific serums, but surpasses it. His conclusions as to specific vaccine therapy are that it has not sustained its promise. Vaccines made with other bacteria have proved unexpectedly effectual in the hands of some, especially in Argentina, with Enriquez, Kraus, Mazza and others, and Werner at Vienna has reported excellent results with a colon bacillus vaccine in puerperal fever. Beruti himself used an extract of colon bacilli, instead of a vaccine, applying it in a number of very serious cases of puerperal septicemia and with constantly unfavorable results. The intense reaction that followed the intravenous injection was unmistakably deleterious. In order to ascertain the physiologic bases for this heterotherapy, he experimented on dogs and rabbits. What he observed convinced him that there was something more involved in these formidable medicinal reactions than the mere action of albuminoids and colloids. But why they are so decidedly beneficial in some cases and so decidedly the reverse in others is still a mystery. It is like shaking a clock that has stopped; it may start it to going perfectly thereafter, or it may have

no effect or an injurious one. Costa regards the reaction to nonspecific vaccine as a kind of anaphylactic shock, liable to do harm.

54. Radium Therapy in Gynecology.—Castaño urges the founding of a radium institute at Buenos Aires like the one already in operation at Montevideo. He admits that radium is not a panacea, but pleads that it should be given a trial before proceeding to mutilating operations. For epithelioma it seems to be the only effectual treatment known to date. Fox presents the present status of radium therapy as gathered from the literature. The main reliance on it is as a prophylactic measure after resection of cancer. Pouey reports fifteen cases which confirm the lack of effectual action from radium on deep-lying cancer and its admirable action on superficial malignant disease.

55. Management of Contracted Pelvis.—Gabastou discusses the preferable procedure with an infected uterus and living fetus according to the various degrees of contracted pelvis.

57. Sign of Advanced Extra-Uterine Pregnancy.—Lascano calls attention to a peculiar sensation of elasticity in a certain area in the supposedly gravid uterus which he noted in three women. Each had borne other children and was supposed to be at about the sixth or last month of a new pregnancy. This area of soft, cyst-like elasticity seemed to be separate from the rest of the uterus, and it proved to be the placenta of an extra-uterine pregnancy. The placenta palpated through the wall of the uterus never is so soft and elastic as he found it in these three cases, and the discovery of such a cyst-like area justifies the assumption of extra-uterine development of the fetus. The special features of the three cases are described, with the necropsy or laparotomy findings.

61. The Pediatricist in the Maternity.—Puyol is chief of the pediatric service at the Maternity at Montevideo, and he expatiates on the great benefit of such work in connection with the lying-in department. As a rule all the attention is paid to the mother and the babe is apt to be overlooked to a certain extent unless there is a pediatricist on hand. He insists on the children being brought back for regular inspection and consultations, and he points with pride to the fact that during the year 1916, with 1,646 childbirths, thrush and ophthalmia were unknown, and artificial feeding was not required for even one infant.

Semana Medica, Buenos Aires

June 7, XXIV, No. 23, pp. 643-670

63 Spontaneous Tumors in Wild Rats. M. Beatti.—p. 643.

June 14, No. 24, pp. 671-726

64 *Operative Treatment for Acquired Megacolon. G. B. Arana.—p. 671.

65 *Subcutaneous Injection of Oxygen in Treatment of Neuralgia. A. Cetrangolo.—p. 709.

66 Evolution of Obstetrics in Argentina. A. D'Alessandro.—p. 710.

64. Colectomy for Megacolon.—Arana gives an illustrated description of the preferable technic for colectomy with acquired megacolon, with details of thirteen cases. He insists that improved technic has reduced the gravity of the operation but that it should not be attempted with advanced age or serious lesions of internal organs, and a palliative operation should be the rule until the acute phase is past.

65. Oxygen Treatment of Neuralgia.—Cetrangolo reports a typical case to emphasize the benefits from subcutaneous injection of oxygen in treatment of sciatica and other forms of neuralgia, especially intercostal. The woman of 39 had complained for some time of neuralgia in the right arm, accompanying a tuberculous lesion in the right lung. The pains grew worse each time as the temperature rose. By exclusion he assumed that the neuralgia was the work of tuberculous toxins and injected oxygen into the subcutaneous tissue at the root of the arm, massaging afterward to spread the oxygen. By the next day all pain had disappeared and there has been no recurrence during the months since. This oxygen therapy has been applied to date mostly by Spanish, French and Argentine physicians, and they have reported good results with it in neuralgia and also in gangrene, weeping eczema, suppurations, anemia, tuberculosis and infections of gastro-intestinal origin, such as typhoid.

Siglo Medico, Madrid

July 21, LXIV, No. 3319, pp. 525-544

67 *Radiotherapy of Tuberculous Glands. J. and S. Ratera.—p. 526.

68 *Nontuberculous Suppurative Processes in the Kidneys. S. Pascual.—p. 530. Commenced in No. 3318, p. 506.

69 *Vacuum Aspiration Extraction of Cataract in the Capsule. D. J. Wieden.—p. 533.

70 Experimental Study of Length of the Passage with a Bullet Wound. A. Lecha-Marzo.—p. 534.

71 Splenomegaly and Infantilism. F. J. Asua.—p. 535.

67. Radiotherapy for Tuberculous Glands.—Ratera has treated thirty patients with tuberculous glands by exposures to the Roentgen rays, and has been impressed by the prompt cure under this form of radiotherapy. He declares that it is so effectual that it can be relied on to differentiate ordinary tuberculous glands from Hodgkin's disease, as in his five cases of Hodgkin's disease not the slightest benefit was apparent. It even seemed in some of the cases as if the disease had been whipped up by the exposures.

68. Present Status of Nontuberculous Suppurative Processes in the Kidneys.—Pascual remarks that the diagnosis of suppuration in the kidney is easy when the pain in the lumbar region, fever and turbid urine occur during or following a pregnancy, influenza or typhoid. But there may be nothing to attract attention to the kidneys, merely slight fever with vague general symptoms suggesting rather gastro-intestinal trouble. In regard to the nature of the suppurative process, inoculation of guinea-pigs is the only reliable criterion. Nothing but catheterization of the ureters and analysis of the urine from each kidney separately will decide the treatment to be applied. In pyelonephritis or pyonephrosis without retention, with or outside of a pregnancy, general treatment should be given: restriction to a milk diet, diuretic drinks and drugs to combat infection in the urinary passages and intestines, and if the disturbances keep up, the pelvis should be rinsed out, as also when there is retention. All medical measures should be given a thorough trial before operating. When both kidneys are affected and there is much distention there is little hope from any measures, medical or surgical. When an operation is inevitable, he advises nephrectomy rather than nephrotomy as the latter is liable to entail an interminable fistula.

69. Vacuum Aspiration Extraction of Cataract in the Capsule.—Wieden remarks that the extraction in the capsule, according to the method of I. Barraquer, is most important progress in ocular surgery. With other technics more or less of the lens and parts of the capsule are left behind, entailing complications. Barraquer regards the cataract as a cyst with degenerated contents, which explains the virulence of post-operative iritis, and emphasizes the necessity for removing all the contents and the enclosing capsule. With the Smith forcible technic there is liable to be loss of vitreous. This is avoided with the Barraquer method, as pressure does not have to be applied. Iridectomy is rarely needed with it. The operation is reduced to the incision of the corneoconjunctival flap; after this the lens is drawn out by suction with a kind of cupping glass. Wieden relates that he recently was present when Barraquer extracted six cataracts at one session. Some were hard senile cataracts, other were soft, and in one case there had been dislocation of the lens into the anterior chamber. The extraction proceeded successfully in all, without iridectomy; the pupils were left normally centered and black. In some cases the eye had an anterior chamber within a few minutes. The extraction is complete in about three seconds, and it is most impressive to see the cataract slide out, clinging to the cupping instrument, merely from being gently sucked out. The cupping instrument fits over the anterior surface of the crystalline lens, through the pupil, without the slightest injury to the iris, and the cataract comes out with it when the instrument is gently withdrawn. With all other methods, extraction of the cataract in the capsule exposes to the danger of hernia of the vitreous, but Barraquer's method guarantees against this. He has applied it to date in 127 cases of all kinds of cataract and has never had any operative mishaps with it. In conclusion, Wieden prophesies that this new Spanish method is destined to supersede Smith's Indian method entirely. (It was described in THE JOURNAL, 1917, 68, 1789.)

Russkiy Vrach, Petrograd

XVI, No. 12, pp. 265-288

- 72 Sulphur Mineral Waters: Action of Hydrogen Sulphid on the Organism. B. I. Slotvsoff.—p. 265.
73 *Typhus in Guinea-Pigs. N. T. Gamaliya.—p. 270.
74 Organization of the Hospital Trains. N. N. Anitchkoff.—p. 271.
75 *Ether-Oil General Anesthesia by Way of the Rectum. T. I. Protopopoff.—p. 275; N. V. Markoff.—p. 278; V. A. Yakovenko.—p. 283; Y. Y. Kramarenko.—p. 284; V. A. Meshtchersky.—p. 285.

73. **Further Light on Typhus.**—Gamaliya describes the infection of guinea-pigs with typhus, and calls attention to the fact that the blood of the infected guinea-pigs proved infectious during the very beginning of the infection. If this is the fact also in man, the persons infected would be dangerous from the point of view of infecting others, even when they were apparently still entirely well. Another point to which attention is called is the difference between the behavior of the typhus germ and other invisible microbes (smallpox and rabies). The latter are not damaged by glycerin, and glycerin is often used to clear their vaccines of foreign microbes. But the typhus microbe is extremely susceptible to the action of glycerin. Typhus organs subjected to the action of 80, 50 or even 30 per cent. glycerin lose their infectious power after twenty-four hours. Even with 20 per cent. glycerin, although the organs are not entirely sterilized, yet they are only weakly infectious thereafter. This sterilizing action of glycerin on the typhus microbe is so pronounced, it is said, "it justifies the administration of glycerin internally in treatment of typhus, especially as we know it is harmless." Another peculiarity of the typhus microbe is its susceptibility to low temperatures. Organs exposed to freezing temperatures lose their infecting power. This fact intimates that winter temperatures will eradicate the infection in clothing, etc. Moreover, it indicates a special fragility of the typhus germ, as not only the other invisible bacteria but also many other ordinary bacteria bear without injury even very low temperatures. The facts here related seem to suggest, he adds, that if typhus is transmitted exclusively by the bite of the louse, it is because the microbe is too frail to be conveyed in any other way.

75. **Ether-Oil Anesthesia by Way of the Rectum.**—Protopopoff concludes from his experience with this rectal method of general anesthesia in fifty-six cases that it has a number of advantages in certain cases, especially for operations on the head and neck, and when the one to give the anesthetic is inexperienced. The simplicity and ease of the rectal technic are remarkable, while with it, general anesthesia for one, two or three hours can be counted on. He declares that it is safer than any other method for general anesthesia, and should be selected when it is desirable to keep the patient long under the influence of the anesthetic. He found the narcosis and the relaxation of the muscles more complete than with any other technic. The method also offers peculiar advantages when an emergency operation has to be done at night with poor illumination. A minor advantage is that the patient is relieved from the dread of the mask. He makes a point of rinsing all the ether-oil mixture out of the intestine as soon as the desired effect has been realized. Any further absorption of the drug is unnecessary and can do only harm. He found it better to rinse out the bowel with only a little of the soapsuds at a time, from two to four cupfuls, letting this run out again before pouring in more, but he uses a total of four or six pitcherfuls for the rinsing, or until the water comes away without the slightest odor of ether. The patient sleeps on tranquilly just the same after the ether has been rinsed out. He goes under in thirty or forty minutes as a rule, but often in ten or fifteen minutes; only rarely an hour may elapse before the sleep is profound. It lasts always an hour, usually for two or three hours and sometimes for five or six. In his fifty-six cases he never saw any signs of the pulse growing weaker or the respiration flagging. Two of the fifty-six patients died, but the details he gives of the cases show that other causes were responsible. He used equal parts by weight of ether and oil, allowing 50 c.c. of ether for each *pood* of the body weight. (A *pood* is 36.11 avoirdupois pounds.) This proportion is for a well nourished person of sound constitu-

tion. For the debilitated, he reduced the amount to 40 or 30 c.c. as also when the operation was to be on the legs or pelvis, as the effect of the ether given in the rectum is naturally most pronounced in the vicinity of the rectum and below. There was vomiting in 10 or 15 per cent. of the cases and hiccup in 5 or 10 per cent.

75. **Ether-Oil Anesthesia.**—In Markoff's thirty cases, two men with far advanced spesis from war wounds died, but the anesthetic could not be incriminated. In his experience the heart action was occasionally somewhat depressed, the pulse growing faster and weaker, sometimes increasing by twenty beats to the minute. He used a total of 185 gm. ether to 100 gm. oil; attempts to get along with less always failed. The quicker and stronger the odor of ether appeared in the breath, the better the anesthesia. It came on profound in from three to twenty-eight minutes, the average interval being seventeen minutes, and it lasted on an average for four hours. There was early vomiting in two cases and on waking in seven, but other factors may have been responsible as many of the operations were on the head. A phase of agitation was noted in about half the patients before they yielded to the anesthetic.

75. **Ether-Oil Anesthesia.**—Yakovenko reports twenty-two cases. He used 1 gm. each of ether and of sunflower oil for each nine-tenths of a pound of body weight. The pulse was full and slow, the respiration regular and deep, as a rule, but he reports one case in which the respiration center evidently became paralyzed, and artificial respiration was required for a full half hour. Another complication liable is the dropping back of the tongue, which compels close surveillance until the patient rouses, which may not be for three or five hours. As the patient dropped off, there was liable to be vomiting or hiccup, but none occurred during his operations.

75. **Ether-Oil Anesthesia.**—In this fourth article in this symposium, Kramarenko cites twelve Russian authors who have reported a total of 378 cases in which ether has been administered by the rectum. He says that all expatiate on the advantages of the technic and scarcely mention unfavorable by-effects, but one other surgeon has reported a fatal case. The dosage is still undetermined; some use three parts ether to one part oil, while others give more oil, down to a mixture of only 0.9 parts ether to one of oil. In eighteen of the cases more ether had to be given by inhalation to get the patient under. Other drawbacks are the impossibility of controlling the narcosis and the varying susceptibility of different patients to the ether. He further reports in detail a case in which the operation had to be interrupted as there was such profuse secretion from the bronchi, threatening suffocation, until it was arrested by subcutaneous injection of atropin. All writers on the subject advise and give a preliminary injection of morphin, but he insists that it should be accompanied by injection of atropin. In a second case, which he reports in detail, respiration stopped, the pulse ran up from 100 to 140, and the operation had to be suspended while artificial respiration was applied and continued for an hour and a half. The rectum was rinsed clean in the meanwhile. When natural respiration was restored, the operation was then successfully completed.

75. **Death Following Ether-Oil Anesthesia by the Rectum.**—Meshtchersky's patient was a young soldier with a fibromyxosarcoma in one side of the nose, which was removed without difficulty under the rectal anesthesia, and the patient was returned to his bed. About five hours later, while still sleeping profoundly, the pulse began to flag and in spite of all measures continued to drop, the man succumbing three hours later. Necropsy disclosed that the sarcoma extended back into the ethmoidal sinus, but nothing was found to explain the fatality. No mention is made of the suprarenals, but the other organs seemed approximately normal. The nurses and intern had been watching over the case with special care when the collapse developed. Notwithstanding the stimulants and other measures applied, it proved impossible to restore the patient to consciousness, nothing having any effect in arresting the cumulative action of the ether. The dose had been 150 gm. ether to 100 gm. oil of sesame,

and after the operation had been concluded the rectum was drained, large amounts of the oil mixture coming away. Meshtchersky adds that notwithstanding the seriousness of this mishap, the hospital has not given up the use of this extremely convenient method of anesthetization, especially for operations on head and neck, but the dose of ether has been reduced to 100 gm. If more is found to be needed, it is given by inhalation. Each of the five writers quotes extensively from Gwathmey. A description of his technic was given in *THE JOURNAL*, Dec. 10, 1913, p. 2274.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

June 16, I, No. 24, pp. 1923-1998

- 76 *Echinococcus Disease of the Brain. J. T. Peters.—p. 1927.
- 77 White Bread or Whole Grain Bread. E. C. van Leersum and J. Munk.—p. 1942.
- 78 Unilateral Paresis of Certain Cranial Nerves after Traumatism. H. Bolten.—p. 1946.
- 79 Chalk Cures Warts. A. B. J. Wong Lun Hing.—p. 1950.
- 80 Beriberi and Vitamins. J. de Groot.—p. 1952.
- 81 Medical Impressions of America. C. W. F. Winckel.—p. 1975. Continuation.

76. **Echinococcus of the Brain.**—Peters cites statistics to show that the brain is affected once to the liver's twelve times, as a rule, but in the sixty-three operative cases in the last five years in the Netherlands, there was no case of brain echinococcus disease. He recently encountered a case as a necropsy surprise, and urges the application of the serum sediment test with hydatid fluid (Ghedini-Weinberg) in every case of suspected brain tumor, applying the test to the cerebrospinal fluid. A history of having much to do with dogs and living in a region where echinococcus disease is known to be prevalent, may also aid in differentiation.

Svenska Läkaresällskapets Handlingar, Stockholm

June 30, XLIII, No. 2, pp. 345-504

- 82 *Cancer of the Prostate. B. Floderus.—p. 345.
- 83 *Recklinghausen Tumor of Wolffian Body. (Urnjuren's utbredning och återbildning). H. Forssner.—p. 389.
- 84 *Fractures Below the Knee. A. Troell.—p. 439.

82. **Cancer of the Prostate.**—Floderus insists that cancer of the prostate should be suspected whenever an elderly man complains of disturbance in urination or pains in the lower abdomen, or sciatica, and also whenever the prostate is enlarged. He is convinced that it is much more frequent than generally recognized; both cancer and adenoma may exist side by side. He has encountered ten cases of this combination; at first, and possibly for years, the clinical picture may be merely that of hypertrophied prostate. In one such case cystostomy was done nine months before death which occurred from pyelonephritis. Necropsy disclosed cancer tissue in the prostate with metastasis in some of the pelvic glands. The prostate was regularly enlarged and of an even, elastic, soft consistency, without perforation of the capsule at any point. In another case the prostate trouble was of nine years' standing; four years before death its cancerous nature had been surmised from involvement of the seminal vesicles and inguinal glands.

In Floderus' 800 cases of manifest neoplasm in the prostate, there were eighty malignant cases, that is, in 10 per cent. The ages ranged from 50 to 85. In his cases the seminal vesicles were involved twice as often as has been reported in the older statistics; Young, alone, has encountered this complication in 80 per cent. Floderus found cancer nodules in the bladder at five out of eleven necropsies. If the ureter mouth is compressed, hydronephrosis may develop comparatively early. Metastasis occurs generally by way of the blood or urine, as the prostate capsule resists so tenaciously the encroaching cancer. Metastasis in bones is more common, judging from his experience, than in other tissues. The liver, lungs and pleura are the organs most frequently affected; next in order come the peritoneum, dura mater, kidneys, suprarenals and pancreas. Quite exceptionally metastasis has occurred in intestines, heart, brain, spleen, thyroid, the eye or bronchial mucosa. Secondary cancer in the prostate is known after cancer of the rectum, bladder and seminal vesicles. Palpation of the prostate through the rectum should never be omitted when the prostate is supposed to be enlarged. Before attempting any operation on a can-

cerous prostate, the bones should be examined with the Roentgen rays to exclude metastasis. The Bottini method of galvanocauterization of the prostate has given great relief in some cases known to be absolutely inoperable. Prostatectomy is most promising in the dubious, still incipient cases, but it has ensured a permanent cure in some fully manifest cases. Transvesical enucleation seems the best technic in the early cases, especially when there is much enlargement of the prostate. The typical perineal prostatectomy makes more demands on the patient, but it can be adapted better to the conditions encountered. In the more advanced cases, Young's operation or sacral prostatectomy should be considered. With inoperable cancer of the prostate, a palliative perineal prostatectomy is better than transvesical, but it should be supplemented by radium treatment. He pleads for the more general use of radium with cancer of the prostate both after operations and in the inoperable cases. The clinical course ranged from two and a half months to eleven years in his series. In the eight cases in which it was over five years, the primary disturbances were evidently due to adenomatous enlargement. More than with cancer in any other organ, he declares, the patient's fate depends on an early diagnosis. The prostate sometimes enlarges more rapidly than with simple hypertrophy, while in some cases the prostate scarcely enlarges at all. Sometimes the prostate may be the seat of simple congestion; in one such case the acute nonsuppurative prostatitis caused great increase in size, but all subsided under bed rest, laxatives, catheterization and massage of the prostate. The resistance of the capsule is greater at the lower pole so that as the cancer develops it is upward, forming a rounded tumor projecting into the bladder. As the posterior commissure increases in size, the median sulcus becomes partially or entirely smoothed out. This is a characteristic finding when the prostate is palpated through the rectum over a metal sound in the bladder. With simple hypertrophy the reverse occurs; the median sulcus is exaggerated. The cancerous prostate is liable to lose its sharp outlines and blend more with the surrounding tissues, or with some part protruding, and it is liable to be fastened to the wall of the pelvis. Any local tenderness in the glands in the vicinity may prove instructive. He applied epicystostomy in twenty-two cases and with invariably good results; some of the patients survived for more than fourteen months. It requires only a few minutes, and the incision after the introduction of the retention catheter may close up spontaneously. He has had no recurrence in any of his fifty cases in which the hypertrophied prostate was enucleated through the bladder (four deaths). In his three cases of a palliative perineal prostatectomy, the pains were relieved, micturition facilitated and the patients survived for eleven, six and one month. This intervention relieved the pelvic nerves from the pressure of the cancerous masses, and the benefit was marked. It also avoids the depressing influence of the fistula into the bladder so that he commends it as the best palliative measure when the patient is able to stand it and severe and radiating pains demand relief. Radium treatment through the incision should follow.

83. **Evolution and Retrogression of the Wolffian Body.**—Forssner gives three plates to show the findings in his research on embryos only 15 or 20 mm. long, and also nineteen illustrations in the text tracing the development of the wolffian body in the growing fetus. He compares the published data with his own findings, discussing in particular the so-called Recklinghausen tumors.

84. **Fracture of the Leg.**—This comprehensive study of 114 cases of fracture below the knee is accompanied by 137 excellent roentgenograms and a bibliography of 176 titles. The details of each case are given at the time of treatment and from one to four years later. The leg could be used in one or two months with simple fracture of the fibula alone, but four months were required for an abduction fracture and bimalleolar fracture; about six months for fracture of the shaft of the tibia, and fifteen months for fracture of the tibia condyles. Good anatomic healing was realized in 98 per cent. and good functional healing in 93.5 per cent. A plaster cast was applied in all but about 5 per cent.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXIX, No. 11

CHICAGO, ILLINOIS

SEPTEMBER 15, 1917

THE RELATION OF LARYNGOLOGY, RHINOLOGY AND OTOTOLOGY TO GENERAL MEDICINE*

FRANCIS P. EMERSON, M.D.

Assistant Surgeon Massachusetts Charitable Eye and Ear Infirmary
BOSTON

As this section is only one unit of a great national body representing every department of medicine, it seems appropriate to spend a short time in reviewing our relation to general medicine.

A glance at the annual programs covering the last five years gives us some conception of the range of our specialty, as we are called on to deal directly with specific problems.

The following lists of special and general diseases, which may originate from some focus, or have their incidence in the nose or throat, bring home to us the importance of laryngology and rhinology to general medicine and the indirect problems which we must meet as consultants. In compiling these lists, I have not presumed to represent the opinion of internists, or workers in other specialties.

Each list, therefore, was submitted to an authority in his respective department and received his endorsement.

I have attempted only to arrange in some sequence what is already known, and also to emphasize the fact that we are being drawn into more intimate relations with internal medicine rather than away from it.

One cannot be a good specialist without having his outlook on general medicine broadened. His special study becomes the objective point to which he brings all correlated facts and differentiates them.

OPHTHALMOLOGY

The diseases of the eye arising from foci in the nasopharynx have been added to each year, until now the etiology of the following list is conceded. For example:

Retrobulbar neuritis from infection in the ethmoids and sphenoids.

Acute edema of the lids and congestion of the conjunctiva from the ethmoids.

Pain and photophobia from acute congestion in the anterior ethmoid region.

Iritis from a focus in the tonsils, teeth or sinuses.

Blocking and infection of the tear duct from obstructions of the nasal end of the duct.

Orbital cellulitis from the ethmoids.

Optic atrophy from the pressure of tumors in the ethmoid region.

Ocular displacement and diplopia from pressure in the ethmoid region, and the supposed connection of phlyctenular keratitis to infected tonsils and adenoids.

SKIN

We may have the following skin lesions which may be primary in the nose or throat, or arise from some focus:

Impetigo from septic discharges from the nose or ear.

Erysipelas from erosions, or discharge from the nose or ear.

Lupus, extension from the nose.

Lepra from the nose.

New growths from the throat, nose or ear.

Angioneurotic edema.

Lymphangioma, extension from the tongue or cheeks.

Syphilis may be primary in the nose, throat or ear.

Tuberculosis may be primary in the nose or throat.

Scrofuloderma secondary to tonsillar infection.

Noma, primary in the nose.

Scarlet fever, incidence in the throat.

Measles, incidence in the throat.

Erythema from infection of the nose or ear.

Urticaria from septic discharges.

Cellulitis from septic discharges from the nose or ear.

Lichen planus in the throat as a neurotic manifestation.

Leukoplakia, primary in the soft palate.

Keratoses, primary in tonsils, pharynx and base of tongue.

Pemphigus, primary in palate, pharynx, tonsils and buccal surfaces.

Actinomycosis, primary in pharynx and tonsils.

Glanders, secondary in the nose.

ORTHOPEDICS

In the department of orthopedics, we have the arthritides, acute, subacute and chronic, in which the nasopharynx is supposed to share the honors with the gastro-intestinal tract, as an etiologic factor. It is still an open question, however, whether the gastro-intestinal disorder may not itself be secondary to a focus in the nasopharynx.

DISEASES OF CHILDREN

Nasopharyngeal conditions in children may be manifest as:

Syphilis, primary in the nose, throat or ear.

Tuberculosis, primary in the nose or throat.

New growths, primary in the nose, throat or ear, especially epidermoid cancer and lymphosarcoma.

Measles, incidence in the throat.

Scarlet fever, incidence in the throat. (Dr. Place calls attention to the fact that in those cases in which one tonsil has been removed and the other not, on the operated side the evidence of scarlet fever is almost nil. The course of the disease seems to be milder. Dr. Place also thinks that pigeon and funnel shaped chests in children are due to nasal obstruction, and that rickets play a secondary rôle.)

Vincent's angina, primary in the tonsils.

Streptothrix, primary in the tonsils.

*Chairman's address, read before the Section on Laryngology, Otology and Rhinology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

Rheumatism, from focus in nose, throat or teeth.
 Endocarditis, from focus in nose, throat or teeth.
 Nephritis, from focus in nose, throat or teeth.
 Arthritis, from focus in nose, throat or teeth.
 Bronchitis, secondary to adenoid or tonsil infection.
 Pneumonia, secondary to adenoid or tonsil infection.
 Abscess, retropharyngeal or peritonsillar.
 Mycosis, primary in tonsils and pharynx.
 Herpes, primary in the fauces and pharynx.

DUCTLESS GLANDS

The relation of focal infections in the nasopharynx to diseases of the ductless glands remains unsolved.

Beebe remarks that there is no complicating factor in goiter, which is more troublesome or more dangerous to the patient than tonsil infections to which they are subject. This observation is significant, as repeated tonsillar infections at more or less regular intervals are usually exacerbations of a chronic focus and not fresh infections.

That thyroid conditions are made worse by toxemia originating in the nose or throat is conceded. What rôle such infections play in the etiology of goitrous conditions is a problem particularly for those of our fellows living where ductless gland disease is endemic.

GENERAL MEDICINE

Infection as a cause of general diseases is as old as the history of medicine. That such infection has its origin at the beginning of the respiratory tract as a chronic focus with acute exacerbations is recognized by clinicians in an increasingly large number of general diseases.

In 1894 many writers, including Pasteur, Frankel, Martin, Selmi and Bouchard, pointed out the danger to individuals from autointoxication caused by ptomains, which were formed by the action of bacteria on organic matter and distinguished between the toxic and the nontoxic. The one invariable circumstance, however, surrounding the development of ptomains was the part played by bacteria.

It is common knowledge that under normal conditions streptococci, staphylococci, *Micrococcus catarrhalis*, pneumococci, diphtheria, and pseudodiphtheria bacilli, meningococci, tubercle bacilli and many other pathogenic bacteria are to be found in the nasopharynx. Many of these we associate with the most dangerous clinical symptoms. But it is also known that the same organisms may be nonpathogenic until conditions arise that increase their virulence. No one believes that such organisms are swallowed, or enter the lymph or blood currents nonvirulent, pass Nature's protective secretions and then from the lowered resistance of the host, or any other cause, become manifest as an active arthritis, endocarditis, nephritis, or other pathologic condition.

On the other hand, we know that in the nasopharynx and teeth we may have all the conditions present to cause a toxemia, septicemia or pyemia with acute, subacute or chronic manifestations in distant organs, that is, specific organisms in patients at an age when the resistance is often lowered, organs undergoing involution, disintegrating organic matter, temperature, moisture, etc., which means that we may have virulent chronic foci, as well as acute local infections.

These facts were called to the attention of the medical profession by Arkovy of Budapest during the period from 1878 to 1898, and were substantiated by the painstaking microscopic findings of Miller of Ber-

lin from 1884 to 1894, and by the clinical experience of William Hunter of London, who published his results in the *Practitioner* in 1900. Recently these findings have been emphasized by Billings, Rosenow, Davis, Mayo and others.

Miller of Berlin, who was educated as a physician and also as a dentist, showed bacteriologically that focal processes in the teeth, tonsils or sinuses kept up a low grade infection of the adjacent tissues, and during exacerbations this might extend by continuity, or directly by way of the lymphatics or blood stream to neighboring or remote organs. Haskins since 1894 has repeatedly called attention to toxemia and septic conditions starting in the alveolar process.

It is known to laryngologists that a large number of people carry for years a constant streptococcus focus in one or all of these localities, and that so-called repeated infections are only exacerbations of a chronic process, as evidenced by the fact that so-called colds start in the following way:

For years, a patient will be subject to sore throat, and then the infection goes up or down, or as a cold in the head, which then goes down; but the clinical symptoms seldom alternate, showing that the focal processes have a period of quiescence and are then subject to acute exacerbations.

Certain clinical manifestations of a general character are recognized, as resulting from such foci, arthritis, myositis, endocarditis and nephritis being the more common, with acute or chronic symptoms. In addition, many clinicians include pneumonia, bronchitis, secondary anemias, duodenal and gastric ulcers, cholecystitis, appendicitis and chorea. The clinical manifestations are often worse coincidentally with an exacerbation of the focal process.

The relation between this focal process and the syndrome is often overlooked because of the stormy character of the exacerbations. It is not safe to trust to the history of the patient. Many patients have only a slight pharyngeal irritation, particularly in the morning, which they ascribe to smoking, indigestion, etc. The onset of the exacerbation to them is a fresh attack of their malady. More than this, if there is an enclosed abscess in connection with the teeth or tonsils, it may discharge directly into the lymphatics. It is necessary, then, for the clinician on recognizing symptoms of toxemia to remember that there may not be much local evidence to confirm his diagnosis.

The number of diseases whose etiology may depend on some focus in the nasopharynx is sufficiently formidable to show (1), the service which our speciality can render the internist; (2), our relation to other specialities, and (3) that foci in the nasopharynx and teeth may be manifest only by remote general symptoms; but when such symptoms indicate toxemia, such foci should be suspected.

Rarity of Eclampsia in Germany at Present.—The *Nederlandsch Tijdschrift*, quoting the *Deutsche medizinische Wochenschrift* of recent date, states that since the war began the number of cases of eclampsia in connection with pregnancy has dropped very low. The hospitals call attention to this in their reports. Warnekros accepts it as the result of the lesser consumption of fat and albumin, imposed by war conditions, and urges that all pregnant women from the sixth-month onward should be restricted to a vegetarian diet. Grumme protests against this, saying that as only one woman in five hundred, at the utmost, presents eclampsia, it would be like trying to drive out the devil with Beelzebub.

PROGRESS IN TEACHING PSYCHIATRY*

ADOLF MEYER, M.D.

BALTIMORE

The request of our secretary for a contribution to this meeting suggested to me an extension of my discussion¹ on the psychobiologic level of medical facts (presented two years ago in San Francisco and published in *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*, 1915), a consideration of my present plan of teaching psychopathology and psychiatry and of some principles characteristic of the plan. No real physician is altogether specialist and no real specialist fails to define his share as part of the great problem of helping the sick and troubled patient. The psychiatrist may at last say that he has found himself. Instead of being singled out from the rest of physicians as what used to be called an asylum man, pure and simple, he has found his sphere in the special study of the *patient as a person*, the special study of the total activities and total behavior, the kind of thing which cannot be singled out as merely the function of any one detachable organ, not even of the brain by itself.

In the medical curriculum the student is led to take man apart and to study the structure and function of these parts; it then falls to the brain physiologist, and ultimately to the psychologist and psychiatrist, to show the student how these parts and functions are integrated into that whole which we know as the personality of the patient, the subject of the life history, the entity to which we as physicians appeal when we give advice and map out a routine of helpful behavior and adjustment; that entity which we try to bring into health- and success-bringing relations with ourselves, the environment, and personal life problems. We deal not only with organs but also with the integrated and integrating personality and its functions. The psychiatrist thus deals with a wide range of facts usually left to untrained common sense, but now available as a more and more organized body of facts, methods of study and methods of therapeutic procedure.

An important advance in teaching comes from this gain in a more natural *definition* of the field. As I outlined two years ago in my contribution to the San Francisco meeting, the second year student gets an introduction into the methods of the taking of a life-history, a study of the assets and determining factors, a general discussion of the intelligence tests, the usual mental status, the method needed in examining a case of aphasia and the principles of getting at the dynamic determining factors of the patient's life, with a study of the orientative activity, the associative processes and resources, the affective assets, and habit-formation.

With this preparation, the student begins his third year with a study of the principal reaction-types which he has to learn to understand and distinguish from one another. We may begin with the organic reaction-types with their memory and judgment defects (very specifically brought out in the parenchymatous brain syphilis or paresis, in senile dementia and in the Korsakoff reaction) and the epileptic and epileptoid reactions. The epileptic and the Korsakoff reactions

lead over to the delirious-hallucinatory reactions, which are either mainly toxic as in the drug and alcoholic deliria, or lead over to reactions with a more constitutional ground work, as in the acute and chronic hallucinoses.

The next reaction-type discussed is the affective one, either tending to appear in attacks constituting the manic-depressive and cyclothymic disorders, or leading over to the substitutive less diffusely affective disorders of hysteria and psychasthenia, and the deeper substitutive disorders of the schizophrenic type with its more benign and its graver forms. Next we find the paranoic disorders, and the constitutional disorders of balance or perversion, and the developmental *defects* such as idiocy, imbecility, etc.

SUGGESTIONS AS TO METHODS OF STUDY

The student is told from the outset that while each reaction-complex tends to have its own structural etiologic and prognostic implications and meanings, the various types are not necessarily exclusive of each other in one and the same patient and that we must learn to recognize combinations.

Each patient is studied specifically for the etiologic factors (exogenic, somatogenic, neurogenic, psychogenic and constitutional); and, for therapeutically responsive features, so that ultimately the patient stands before us as an experiment of nature, sometimes simple, sometimes complex, not an entity deriving light or meaning from the pigeon-hole of some classification, but an orderly *set of facts* inviting the physician to recognize more or less clean-cut problems of adjustment: the somatic therapy, the rest-treatment and graded reeducation, and the study and readaptation of psychogenic and constitutional problems. The third year course thus familiarizes the student with the essential *types* and *problems*, so that in the fourth year the student is prepared to meet the rank and file of the outpatient and house cases and is able to follow the more detailed discussions of the psychopathologic, cerebral, general somatic and endocrine components of the cases as they are met, and also the problems of management, of commitment, etc. No student is admitted to the final examination without having personally examined and reported in writing a minimum of six cases.

The most fundamental departure from current tradition is the emphasis not on the question whether the patient presents one or the other of a set of diseases, but rather on the question how many facts and conditions enter into the state of the patient, what reaction-complexes are recognizable as relative entities and what psychopathologic, cerebral, general somatic, endocrine, toxic and infectious components; in other words, we take the same attitude which modern pathology has assumed in general medicine. We get away from the dominant notion of classification of each patient as having just one exclusive disease, and that usually a rather artificial traditional entity but rarely realized completely in any one case; we prefer to urge the student to consider whatever group of facts and factors he actually finds in the patient before him. We certainly would not classify our necropsy cases according to one single cause of death, and neglect to do justice to the other facts and factors present; and why should we not train the student of psychiatry to learn to appreciate and trust the facts and factors by themselves and in combination as

* Read before the Section on Nervous and Mental Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Meyer, Adolf: Objective Psychology or Psychobiology with Subordination of the Medically Useless Contrast of Medical and Physical, *THE JOURNAL A. M. A.*, Sept. 4, 1915, p. 860.

actually found? It is absolutely essential that he learn to use all the means of general medicine at his disposal and also to work safely with the psychobiologically integrated part-phenomena and functions, as well as with the frequently more or less artificial units of nosologic disease entities.

Our general medical, clinical and necropsy diagnoses no longer fail to specify the combination of facts to be dealt with; and psychopathologic and psychiatric diagnoses are at last reaching the same principle. We may have a right to speak of manic-depressive psychoses, and of dementia praecox types of mental disease in order to designate certain broad categories similar to the terms used when we speak of Bright's disease, or of valvular disease; but such terms would hardly be regarded in modern medicine an adequate and sufficient "diagnosis." For the practical purposes of today, articular rheumatism is no longer a complete diagnosis, but a suggestion in the direction of a proper search for infectious sources and their working. Similarly we have to train the student of psychiatry and psychopathology to heed the structural facts, the toxic and endocrine and serologic facts, and the constitutional and psychogenic facts, and to learn to work with them, individually and in combination. Even the simplest general diseases, the acute infections, are no longer viewed as an issue of the mere presence of a microbe; they present an infection plus a problem of constitution, or of more or less immunity; and similarly the disorders of the psychobiologic adaptive processes must be viewed as the resultants of a group of facts and factors, and by accepting this view, we get on a natural working basis.

SUMMARY

To sum up the present trend of teaching psychiatry:

1. Psychiatry cannot limit itself to the traditional asylum-diseases. It has become the medical study of all types and forms of disorders or involvements of the total behavior and mentation, from the simplest, we might say normal, defects and difficulties of adaptation to the more sweeping affections, some of which may disqualify the patient for being his or her own safest guide and adviser and then may enter the category or temporary phase of committable disorders.

2. The second year course of the medical student includes the methods of recording a medically useful biography, of using the standard tests of intelligence and motor performance, of making out the principal facts and determining factors of a normal individual's make-up and reactive tendencies.

3. The third year course deals with the standard reaction-types or reaction-complexes of psychopathology and the factors entering into them.

4. The fourth year course takes up the general routine of cases, and the study of special problems and an individual study of at least six cases by each student.

5. The principal departure from tradition is the inclusion of normal psychobiologic adaptive problems, and the getting away from the dogmatic notion of "one person one disease" dictated by a classification-ridden tradition, and from a nosology which neglects too many points important for the understanding and treatment of the actual patient.

6. Hence, we should say that the student is led to recognize the facts and factors entering into the simple entities and combining in the more complex disorders, so that he may get a dynamic as well as a

structural conception of the patients whom he is called on to treat.

One of the principal consequences of this mode of instruction is that the students frequently find patients in other divisions of the hospital who, according to their impressions, should be referred to the psychopathologic or psychiatric department, especially many of those patients who, according to the internist or surgeon "have nothing the matter with them," but who should not be sent away without a study of their psychobiologic adaptation. It is probably not practicable to transfer all these patients; hence, why not get accustomed to *use* the psychologic training wherever it is needed? We have to realize that in all branches of medicine, physicians are expected to apply psychopathologic methods, just as modern psychiatrists make use of all the methods and experience presented by the other departments of medicine, even if the patients have mainly psychopathologic problems.

Another consequence is that quite a few students begin to see, in conditions which are looked on as normal or as merely nervous, possibilities of readjustment which may become of inestimable value to the patient and in the interest of preventive medicine and hygiene because the worker is put into the position which enables him to deal with the component factors before the full-fledged traditional pictures have established themselves, and have begun to overawe both patient and physician.

ABSTRACT OF DISCUSSION

DR. E. ZUEBLIN, Cincinnati: From the standpoint of general medicine we feel the necessity of a closer study of conditions classified under the category of neurasthenia. In using this term we frequently underrate the influence of the mind on functional disorders, and often, on account of an erroneous interpretation of symptoms, we fail in our treatment. The student as well as the medical practitioner must be instructed by close observation of many nervous and psychiatric patients how to differentiate psychogenic symptoms from those arising from organic lesions. Dr. Meyer's plan of instruction means a decided step in advance as a help to understand and analyze the patient's attitude, as a better way of interpretation and treatment of the morbid manifestations. The student having an opportunity for psychiatric training according to Dr. Meyer's plan can be congratulated.

DR. TOM A. WILLIAMS, Washington, D. C.: The objection might be raised by some of the members that Dr. Meyer's suggestions are a "counsel of perfection," and only possible when three years can be given to specially well prepared men to profit by such a course. This feeling must be in the minds of many, so I would explain that it is not necessary to give a course of three years in order to impart knowledge of practical utility, nor is it necessary to have highly gifted students. At Harvard University there is only a one-year course of two sessions a week. By means of the principle set forth at the conference on medical education at the Atlanta session of the Southern Medical Association, the results are astonishing as regards the insight of the students, in spite of the fact that they are not men of extraordinary capacity and that they have comparatively little preliminary and medical training. The clinical material, too, is often scanty and poor. In spite of all these drawbacks, there is a most satisfactory gain in pragmatic clinical power through the acquisition of the psychiatric attitude toward the patients. Therefore, we need not think that we teachers are not able to do more with the conditions that pertain greatly to improve the training in psychiatry and neurology in the average medical school.

DR. ADOLF MEYER, Baltimore: At Johns Hopkins Medical School we have in the third trimester in the second year two hours a week, and the same in the first trimester of the third year. In the fourth year we have three hours a week during

one trimester. We do not feel that we are reaching perfection, but simply using our opportunities so as to give the student a better chance for digestion by spreading the obligatory work over the three years; in addition to this, we provide elective work for those who have more time and special inclination.

THE TECHNIC AND AFTER-TREATMENT OF HEMI-LARYNGECTOMY AND TOTAL LARYNGECTOMY*

JOHN EDMUND MacKENTY, M.D.

NEW YORK

Laryngectomy is a time-consuming operation even in the most expert hands, making the question of anesthesia of major importance. Some operators are so fearful of the lethal effect of general anesthesia that they have gone to the extreme of doing the entire operation, including the block removal of the neck tissues, under local anesthesia. From my observations, the brutality of such a procedure is unjustifiable. I believe that the combination of both kinds of anesthesia gives us the only present solution of the problem. From the standpoint of anesthesia, the operation may be divided into three stages: (1) the skeletonization of the larynx and trachea; (2) the removal of the larynx, and (3) the closure of the wound.

The first and last of these stages may be done under novocain and the second under general anesthesia. Thus the period of sleep should not continue longer than twenty or thirty minutes. I have employed this method in my later cases with very satisfactory results. The superficial cervical plexus is blocked on both sides, the skin is infiltrated along the line of incision, and a few deep injections are made laterally on both sides of the larynx, trachea and thyrohyoid membrane. A 2 per cent. novocain-suprarenin solution is used and from five to ten minutes allowed for its full effect. Morphin alone is employed as a sporic one hour prior to the beginning of the operation.

The operation here detailed for hemilaryngectomy is my own. Its radical departure from the accepted method of Gluck makes me put it forward with some hesitation. It has been done in six cases with six surgical recoveries. The operation for total laryngectomy is essentially the accepted method of the one-stage operation with some modifications in technic and in the after-treatment. In total laryngectomy I prefer the one-stage operation for various reasons. When a preliminary tracheotomy is done and the trachea surrounded with gauze to establish peritracheal adhesions, the object aimed at is the prevention of extension of infection to the mediastinum. This possible good, in my opinion, is outbalanced by the fact that at the second stage we are forced to operate in a well established septic field. Another objection is that a primary union between the skin and tracheal mucous membrane is seldom possible when the trachea has been mutilated and the surrounding tissues infected. A clean union here means that the patient may eventually dispense with the tracheal cannula. To wall off the trachea at the first stage and to leave it closed would be a more logical procedure in the two-stage operation.

When the arytenoid on one side is involved, a total extirpation of the larynx is the safer procedure.

Indeed, the removal of the neck tissues on the involved side should be seriously considered if the disease extends to the posterior part of the arytenoid, since then it is quite possible that the lymphatics have carried the cancer cells beyond the larynx. In several cases, I have removed the anterior portion of the esophagus where it lies in juxtaposition to the larynx, and for one third of its caliber, without impairment of its function.

Primary union is the exception in total laryngectomy. The wound infection in all my cases began above at the pharyngeal closure, manifesting itself between the second or fourth days. Liberal opening with drainage prevents or retards its spreading downward to the danger zone behind the tracheal stump. This retardation is an important factor in the prevention of mediastinal infection, giving the retro-tracheal region time to become walled off. Wound infection with sloughing may not, after all, be an unmitigated evil, since it may, by the eradication of disseminated cancer cells tend to retard or prevent recurrence. I believe it has done so in two of my cases.

Prior to the operation every endeavor should be made to put the mouth into as clean a condition as possible by the extraction and treatment of diseased teeth.

I would lay stress on the following points in the management of the operation and of the after-treatment:

1. The technic should be so planned as to prevent the entrance of blood into the trachea. The hemostasis employed in other surgical work is not sufficient in this operation. Before the trachea is opened, an absolutely dry wound is imperative. When the trachea is cut across, all small bleeding points must be secured at once, and a snug fitting tracheal tube must be at hand for immediate insertion. If blood escapes into the trachea, it should be sucked out by negative pressure before it has time to pass the bifurcation.

2. Wound contamination from the open trachea and pharynx should be minimized by quickly closing the former with the breathing tube and by plugging the latter with a piece of gauze large enough to fill the pharynx and mouth.

3. Drainage wicks should be placed in two danger zones, namely, under the pharyngeal closure and behind the tracheal stump. The latter drain lies across the direct pathway of mediastinal infection.

4. A properly balanced diet is given from the start. This is accomplished by the use of a feeding tube introduced through the nose into the esophagus during the operation and left in place as long as required.

5. Strict attention must be given to drainage when infection occurs. Suction does much here to cleanse the wound of pus and tenacious mouth secretions.

6. The absence of lung complications in my cases was partly due, in my opinion, to the use of intertracheal suction, applied through a catheter, introduced as far down as the bifurcation and, at times, below. This catheter is used, as indicated by the amount of tracheal secretion, at least from two to four hours for a few days following the operation. Two physiologic principles underlie the expulsion of secretions from the trachea, namely, normal ciliary action and normal cough. By normal cough I mean the compression of air behind the closed glottis and its expulsion by a sudden release of this closure. In the open trachea normal cough is impossible, and, following operative traumatism, the ciliary action of the tracheal mucous membrane is, at least temporarily, in abeyance. Hence there is a tendency for tracheal secretions, much increased after laryngectomy, to enter the lungs, producing well known consequences.

7. If it cannot be decided whether a hemilaryngectomy or a total laryngectomy is indicated, the larynx should be split and

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

its interior carefully inspected. If still in doubt, I would strongly advocate the more radical procedure.

It may be stated as an axiom that the surgeon is given but one opportunity to eradicate cancer wherever found.

When, owing to the extent of the disease, a block dissection of the neck is indicated, the procedure is as follows: An incision from the chin to the sternal notch is made, including all the tissues down to the deep fascia. From the upper end, extending laterally on one or both sides, a second incision is carried outward across the sternomastoid muscle just under the mastoid process. The third incision begins at the lower end of the first one and is carried outward and downward, crossing the clavicle near its outer third. The object of this technic is to make the flap as wide at its base and as thick as possible. My experience with the rectangular flap generally used has been that the inner edge is prone to slough from lack of nutrition. Much time is often wasted in trying to save the sternomastoid muscle. It is my custom to remove it entirely, thus gaining an immediate and good exposure of the deep structures of the neck. It may be detached below and with it all the underlying gland and lymphatic bearing tissues removed *en masse*.

OPERATION FOR HEMILARYNGECTOMY

Through a short incision a very low tracheotomy is done. To insure against asphyxia from cannula displacement, the edges of the opening into the trachea are transfixed by two traction sutures. These are laid one on each side of the neck. Traction on them opens the slit in the trachea. In low tracheotomy, cannula displacement may be troublesome if not dangerous, as the depth of the wound and the postoperative edema may make it almost impossible to find the opening in the trachea. The anesthetic is given through a tube inserted through the tracheal cannula.

A second incision, beginning under the chin, in the median line, and extending down to just below the cricoid cartilage, exposes the thyroid and cricoid cartilages and the thyrohyoid membrane. A bridge of tissue about 1 inch wide is left between this and the tracheotomy incision. All of the tissues attached to the diseased side of the larynx are dissected away in one flap, care being taken not to injure the under surface lying in juxtaposition to the thyroid cartilage. When turned out, this flap should have a smooth fascial lining which later is to form the lateral wall of the new larynx. The cricoid and thyroid cartilages are cut through longitudinally in the center line; the thyrohyoid membrane and trachea are slit anteroposteriorly on the diseased side. The loosened half of the larynx is retracted well away from the healthy side, exposing the interior of the larynx. Cocain and epinephrin are applied to the larynx and trachea as far down as the cannula. The trachea is packed with gauze, and, through the now open hypopharynx, a large piece of gauze is forced into the pharynx and mouth, thus walling off the operative field at both ends. If the mucous membrane covering the posterior commissure and arytenoid is healthy, it is saved and carefully dissected away from the cartilage. This dissection is carried backward over the posterior surface of the arytenoid and downward to the point at which it becomes continuous with the anterior aspect of the mouth of the esophagus. The diseased half of the larynx is removed, being careful to preserve the flap outlined in the foregoing, which remains attached

to the anterior edge of the esophageal mouth. All bleeding points are controlled by catching only the vessels and by tying with iodized catgut. Stress should be laid on careful and nontraumatic hemostasis. I will digress at this point to state that rough handling of tissues, so frequently seen in general surgery, is out of place in this operation. In the ultimate result, much depends on gentleness.

The next step in the operation is to endeavor to cover with mucous membrane as much as possible of the raw surface left by the hemilaryngectomy. For this purpose the flap mentioned previously is brought downward and forward. It may sometimes be further enlarged by splitting the mouth of the esophagus. A considerable part of the raw surface left by the removal of half of the larynx may thus be covered. Stitches of fine iodized gut are placed so as to hold the flap in its new position, care being taken that tension is avoided. The tracheal packing is now removed and the trachea cleared of blood clot down to the cannula. A long $\frac{3}{4}$ inch, folded, strip of petrolatumed gauze, thoroughly impregnated with bismuth, is packed into the trachea, filling it from the cannula to its open end. This strip should be folded back and forth in the trachea, so that its removal may be more easily accomplished, and it should be packed in tight and even. To prevent the lower end of the gauze from falling into the trachea and to facilitate tight packing, a drawing string is run through the gauze and attached to its lower end. When the packing is in place, this string is drawn up, thus approximating the two ends of the gauze. The trachea is thus corked from the secretions and drainage from above. The end of the strip is brought out at the lower end of the laryngeal incision. The larynx is packed loosely with a strip of iodoform gauze, the end of which is brought out at the same point as the tracheal packing. The gauze in the pharynx is removed from the mouth, and the feeding tube is inserted through the nose and directed into the esophagus.

CLOSURE

The mesial edge of the pretracheal muscles (the undersurface of the lateral flap) is now united to the mucous membrane of the healthy side of the larynx, along its anterior median aspect, fine iodized gut being used. The skin edges are united with silkworm gut. The wound is left open at its lower angle, wide enough to give drainage room for the gauze end. Two provisional stitches are placed here to be tied after these strips are removed, thus entirely closing the larynx. A sheet of rubber tissue, covered on both sides with gauze, is glued with collodion by its lower edge to the neck, across the bridge of skin separating the two wounds. This attachment should extend laterally half way around the neck. Its object is to act as a barrier between the laryngeal wound and the tracheal cannula, keeping the drainage of the one away from the other. The quantity of drainage coming from the laryngeal wound saturates several pads of gauze a day and makes one feel that, if only a fraction of this fluid should find its way into the lung through an open trachea, pneumonia might well be the result. The bismuth in the tracheal plug keeps it clean and odorless for days, and with the petrolatum effectually turns the drainage out toward the surface.

When the laryngeal drain should be removed depends on the amount of drainage. It should be kept in place as long as the serous flow continues. In my

limited observation, this flow lasts from two to four days. I remove the tracheal plug later for the reason that the blood and serum which flow into the larynx when disturbed by the drainage removal is thus prevented from entering the trachea. The tracheal plug may remain from three to five days. The tracheal cannula should be removed just as soon as the new larynx is open for comfortable breathing. If there is much tracheal secretion, tracheal drainage is best served by keeping the cannula in position and using suction.

OPERATION FOR TOTAL LARYNGECTOMY

At the cancer age, clean mouths are the exception. Carious teeth and pyorrhea alveolaris make this cavity a veritable cesspool into which our operative field must extend, and out of which must come almost unavoidable infection. Before operation, this condition should be remedied as far as time will allow. Chronic sinusitis must be endured, since it would be quite impossible to correct it in the time given. Any effort in this direction would but change a chronic into an acute process with added risk of wound contamination.

If the patient will consent, the preliminary part of the operation may be done under local anesthesia, carried as far as the tolerance of the patient and the skill of the operator permit. When the larynx is filled with carcinoma and the breathing is obstructed, local anesthesia obviates the danger of suffocation and of an emergency tracheotomy during the early stage of the operation. Such a tracheotomy would mutilate the tracheal stump, making the subsequent skin and tracheal union defective. It is quite possible to skeletonize the larynx and upper portion of the trachea without pain. At this point it is better to begin the general anesthesia rather than attempt the removal of the larynx by the local method, since gagging, vomiting and coughing hinder the surgical procedure and add another infective factor.

If morphin has been given, great care in the administration of the general anesthetic must be taken to guard against respiratory failure. I am inclined to use as little as possible such noisy adjuncts as the insufflation anesthesia apparatus, which interfere with the close observation of the patient's respiration. The removal of the larynx and closing of the pharynx is done under light ether anesthesia. The remaining steps of the operation are better done under local anesthesia, with an occasional whiff of ether if needed.

The incision extends from the chin to the sternal notch in the median line of the neck. From its upper end two incisions are carried laterally for about 1 inch. This wide opening on top gives better access in the work of closing the hypopharynx. In patients with long thin necks the operator may dispense with the lateral incisions. The thyroid bridge is tied and cut. In three cases I have been obliged to remove a portion of the thyroid gland overlying the trachea. The larynx and trachea are skeletonized and the thyroid membrane exposed. The greater wings of the thyroid cartilage are cut and left in position. All vessels are tied and the wound made perfectly dry. The trachea is cut across just below the cricoid cartilage, care being taken to secure all bleeding points so that no blood enters the trachea. A rubber tube 10 inches long and large enough to fit tightly is inserted into the trachea. Through this tube the anesthesia is continued. The cleavage plane between the larynx and esophagus is now found and the larynx separated

upward as far as is compatible with the extent of the growth. If the cancer extends backward into the esophageal mouth, that portion of the latter lying in juxtaposition to the larynx must be removed. The larynx is now allowed to drop back into position and the thyrohyoid membrane is cut across, opening the hypopharynx—a large piece of gauze, either of iodoform or wrung out of a 1 per cent. neutral solution of chlorinated soda, is crowded into the pharynx, filling it and the mouth. The larynx is removed, either taking or leaving the epiglottis. The hypopharynx is closed with two lines of fine chromic gut sutures. Before the first line is entirely closed the gauze is removed from the mouth and a feeding tube of suitable sized rubber is passed through the nose and guided into the esophagus to a depth of 5 or 6 inches. I have seen persistent vomiting caused by inserting the tube too far. Two lines of drainage are indicated—one just below the hypopharyngeal closure and the other behind the tracheal stump. The drains may be inserted through stab wounds in the flaps. If a gland dissection has been done, a third drain is placed in the lower, outer angle of the wound. The wound is then closed in layers with No. 2, iodized gut, or it may be closed *en masse* with silver wires piercing the tissues deeply and clamped with large shot.

The tracheal stump is pulled forward and two or three retention sutures of silkworm gut or silver wire are passed around the third or fourth ring with a sharply curved stout needle. The ends of these sutures are plunged through the tissues and brought out about 1 inch from the central incision on either side and below the trachea. They are tied around pieces of gauze, sufficient tension being exerted to hold the stump forward. A cuff of mucous membrane is made at the tracheal end by removing the cartilage of the first ring. The subcutaneous fat is removed from the skin in the immediate vicinity of the stump, to facilitate bringing the skin and mucous membrane together. Union is made with horse hair on the front and sides of the stump, and with silkworm gut behind. Tension due to a sagging trachea must be avoided in joining the skin and mucous membrane. A large cannula wound with iodoform gauze and smeared with petrolatum is inserted into the trachea, fitting its caliber snugly. An 8 inch square of rubber dam perforated in the centers is snapped over the exposed end of the inner tube of the cannula. Behind this apron the wound is dressed in the usual way. The cannula inserted as above described effectively corks the trachea, preventing secretions from being coughed up over the tracheal skin union. The rubber apron catches the tracheal secretions and serves as a barrier between the end of the cannula and the wound in the neck.

AFTER-TREATMENT

Of paramount importance in these cases is a liberal and supporting diet. Without the use of the esophageal tube it is impossible to give enough food to support those patients through the important days of convalescence. The diet I prescribe is: oatmeal thoroughly cooked and strained, mixed with milk. To this may be added lactose and raw eggs, and occasionally melted butter. Six ounces of this thick mixture are forced through the tube with a piston syringe every four to six hours, followed by 4 ounces of water. Fruit and vegetable juices are later added. The esophageal tube may be retained for weeks without injury, providing it is washed out after each feeding

as previously mentioned. Rectal feeding, in my opinion, should not be relied on. It is merely an effective way of pretending to do something.

In some cases, tracheal and bronchial secretions are much increased. In one patient, a diabetic, crusts and plugs of inspissated mucous formed in the trachea and primary bronchi and had to be removed with bronchoscope and forceps twice a day to obviate suffocation. A negative pressure pump is used to unload the trachea as often as indicated. Strong suction may do much injury to the mucous membrane, and should be avoided.

As wound infection is the rule in total laryngectomy, its proper surgical management is, perhaps, the most difficult and most important part of our task. Infection begins, as a rule, at the hypopharyngeal closure. To delay too long in opening the upper part of the wound is a fatal error, since the virulence here encountered is high and spreads rapidly. After the wound is opened, the packing should be changed every two to four hours and the field cleared of secretions by suction. The continuous or intermittent use of hypertonic salt solution or neutral solution of chlorinated soda (0.5 per cent.) does much to promote exosmosis and thin the discharges. If the infection extends to the tracheal region, constant attention on the part of the surgeon and nurses is required to prevent the inhalation of pus and septic extension along the trachea to the mediastinum. All burrowing pockets are carefully followed, frequently packed and cleansed by suction. At no other point in the body is uncontrolled infection more serious than in the neck.

Such success as has been attained in my work has been, I believe, due to the time and pains taken in the after-treatment, to the use of little general anesthesia, and to a constant effort toward the elimination of traumatism from the operative technic.

REPORT OF CASES

CASE 1.—M. W., woman, aged 56, in whom a cancer completely filled the larynx, was operated on (tracheotomy) two months prior to entering the hospital. There was a severe cough and the operation—total laryngectomy with resection of the glands on both sides of the neck—was done, December, 1914, for the purpose of relieving her suffering without any hope of cure. The anterior wall of the esophagus was removed with larynx. There was an infection in the wound above the tracheal union with the skin. Primary union of trachea and skin occurred and the wound closed by plastic operation eight weeks after operation. Eighteen months later there was no recurrence, the patient could whisper distinctly and her weight had increased 40 pounds. No tracheal tube was needed. Twenty-two months later there was a recurrence of the disease, causing the death of the patient, June, 1917.

CASE 2.—W. O. L., man, aged 52, farmer, had a cancer which involved the right cord to the arytenoid cartilage and, crossing the anterior commissure, extended over the anterior third of the left cord. In July, 1915, total laryngectomy was performed with resection of the gland-bearing tissue on both sides. Patient had cardiovascular disease with blood pressure of 210. Extensive suppuration in the wound followed but the tracheal union with the skin held and ten weeks later a plastic operation was done with good result. There has been no recurrence, no tracheal cannula worn, patient can whisper fairly distinctly and can be understood by members of the family.

CASE 3.—C. B., a woman, aged 52, was operated on—total laryngectomy—in January, 1916, for cancer involving one cord, but with free arytenoid. The gland-bearing tissue was not resected. The patient left the hospital in six weeks with closed wound and one month later returned with a fistula on which a plastic operation was done with good result. Patient

made no effort to speak and she died in July, 1916, of nephritis.

CASE 4.—O. E., a man, aged 46, is a mechanic, physically large and powerful and in splendid general health. The larynx was so filled with cancer that tracheotomy was done to prevent asphyxia. The cancer had extended to the neck on the right side. Total laryngectomy and block dissection of the neck on both sides was performed, October, 1915, and 1 inch on the anterior wall of the esophagus was removed with the larynx. Infection and extensive suppuration occurred in the wound. The trachea and skin held, but six weeks after the operation the pharynx was wide open, the esophageal mouth was just above the tracheal opening and food was given through the open esophagus in the neck. Two weeks later a plastic operation was done and after ten days the patient was taking solid food by mouth. Present condition: The patient has gained 20 pounds in weight, has had no recurrence, and is working as an automobile mechanic, wearing the tube only while at work. He has a remarkable whisper which any one can understand at short range, and there has been no recurrence to date, June 17, 1917.

CASE 5.—D. S., man, aged 64, merchant, had a cancer which involved the right cord and extended well over the arytenoid to the esophageal mouth and was rapidly growing. An operation was performed, June, 1912—total laryngectomy with gland-bearing tissue. One gland was found enlarged and malignant, but good recovery ensued and the wound closed in five weeks. There was a recurrence in the neck, September, 1912, and the patient died in January, 1913.

CASE 6.—J. B., man, aged 49, plumber, who was addicted to alcoholic excesses, had a cancer of the left cord, arytenoid and anterior end of the right cord. After three weeks' treatment and abstention from alcohol, an operation was performed, October, 1912. A total laryngectomy was done, but the glands were not resected because of the weakened condition of the patient. Primary union took place and the patient returned to work in six weeks. He did not report for observation, but I learned by letter that he relapsed into his old alcoholic habits and died eight months later from cancer of the neck.

CASE 7.—T. V., man, aged 56, mechanic, had a cancer of the larynx involving the anterior half of the larynx on both sides. Total laryngectomy was done, January, 1914, but gland-bearing tissues were not resected. Good recovery followed with spontaneous closure of the wound after considerable suppuration. One year later the cancer reappeared in the old scar and operation was advised, but the patient disappeared. I learned through a friend that he died six months later of cancer of the neck.

CASE 8.—S. M., man, aged 49, clerk, was a syphilitic and had hoarseness for one year which was probably specific in nature. When first examined a chronic laryngitis was present with a well circumscribed cauliflower mass forward of the right posterior commissure and a piece removed and examined microscopically proved the growth to be malignant. September, 1914, total laryngectomy was performed, but the gland-bearing tissue was not removed. Eight months later the glands in the right side of the neck became enlarged. A block dissection was done and the glands proved to be non-malignant. At present there is advanced cardiovascular disease with myocardial degeneration, but no recurrence of the cancer in the neck or throat and the patient does not find it necessary to wear the tube. This patient will probably die before the time limit for nonrecurrence is reached. In June, 1917, the patient was still living, his general physical condition was the same and no recurrence of the growth had appeared.

CASE 9.—P. R., was operated on, July, 1916, and the larynx and esophagus removed just above the level of sternum for cancer which involved both. Recovery occurred after considerable sloughing and with the help of a plastic operation two and a half months later. The patient's condition improved, there was a gain in weight with entire disappearance of the pain in neck and temporal regions of head (cancer of esophagus frequently produces pain in the temporal and mastoid regions). Patient was under observation until April, 1917, and no recurrence had taken place up to that time. Since then

I have learned that the patient died, but could not ascertain the cause of death. This patient was too far advanced to hope for no recurrence.

CASE 10.—J. B., man, aged 46, clerk, had a cancer of the right cord involving the arytenoid. A total laryngectomy was done, November, 1916, also a block removal of the tissues on the same side. The wound eventually closed without a plastic operation and no recurrence had taken place up to June, 1917.

CASE 11.—S., man, aged 52, watchman, had a cancer of the larynx involving both sides and encroaching on the anterior part of both arytenoids. On account of sugar and epithelial and granular casts in the urine, operation was at first deemed unwise, but later under treatment by Dr. James Dwyer, the sugar disappeared from the urine and the kidney condition seemed improved. The patient was a large, strong and seemingly healthy man, and urged that the operation be performed. It was undertaken in December, 1916, very little general anesthesia being used. The immediate recovery from the operation was uneventful, but the tracheal secretions were dry and troublesome and on several occasions it was necessary to enter the trachea and primary bronchi with a bronchoscope and remove the accumulated scales in order to prevent suffocation. The wound sloughed extensively, but at the end of second week began to granulate. An ischiorectal abscess developed at the beginning of the third week, the surrounding tissues became gangrenous, and the patient died of sepsis at the end of the third week.

CASE 12.—U., man, aged 54, for about a year had a cancer of the larynx involving both sides and arytenoids. Breathing was obstructed and he had lost about 25 pounds in weight and was in a weakened physical condition. A total laryngectomy with removal of the anterior portion of the esophagus was done, January, 1917. Patient had a serious time during operation from respiratory failure, and every effort to restore breathing failed, until it occurred to me to distend the lungs forcibly with air. Air was forced into the lungs through the open trachea almost to the point of rupture, then suddenly released, and this powerful stimulus at once restored breathing. On account of the feeble condition of the patient, a block dissection of the neck was not done. After a plastic operation, complete recovery followed and no recurrence has taken place to date, June, 1917.

CASE 13.—T. V., man, aged 60, for six months had a slowly growing, nonulcerating cancer of the larynx involving the right side and extending across the anterior commissure. There was cardiovascular degeneration with a blood pressure of 180 and a few granular casts and albumin in the urine. Complete laryngectomy was performed, October, 1916. A troublesome acidosis occurred which lasted a few days, also some infection in the upper part of the wound. The wound closed spontaneously at the end of the third week and no recurrence had appeared to June, 1917.

CASE 14.—J. L. D., man, aged 60, had had symptoms for four months. On examination, a very small carcinoma was found in the anterior commissure of the larynx involving one fourth of the right cord and one eighth of the left cord. Hemilaryngectomy was done, July, 1913, and the upper rim of the right thyroid cartilage and a flap of mucous membrane from the right arytenoid were retained. The remainder of the right side of the larynx and a liberal notch from the anterior part of the left side were excised. On the second day the patient became very drowsy and the temperature reached 102 F. On the third day the packing was removed; the patient was up on the fifth day and on the seventh day the tracheal tube was withdrawn. The condition, as described by letter, June, 1917, was: breathing not obstructed, speaks in a loud whisper and not easily fatigued, no cough, no recurrence.

CASE 15.—J. C., woman, aged 46, had symptoms for eight months. The carcinoma involved the left cord and part of arytenoid, had grown slowly and spread out well above and below the cord. Hemilaryngectomy was done, September, 1911, and no mucous flap was obtainable in this case, since resection included the mucosa well down on the mouth of the esophagus. The resection was carried beyond the middle line behind in the arytenoid region. The temperature varied between 100 and 104 F. until the fifth day, and considerable

local reaction appeared. The packing in the larynx was removed on the third day and the packing in the trachea on the fifth day. The tracheal tube was withdrawn on the twentieth day, but the feeding catheter was left in place for three weeks. Six weeks later a careful resection of gland-bearing tissue of neck was done on account of some palpable glands, which proved to be benign. In December, 1915, the voice was a loud whisper, the opening in the larynx looked small but was sufficient for breathing, and there had been no recurrence. Granulation tissue gave some trouble in this case, but was removed under suspension and cauterized with pure silver nitrate. Recurrence of the cancer appeared in 1916 and the patient died. In the light of present experience, I should have performed a total laryngectomy on this patient.

CASE 16.—M. G., man, aged 60, gave a syphilitic history and had had hoarseness for one year. The Wassermann test was positive. A mass the size of bean was present on the left cord and extended upward along the lateral wall of the larynx. Six weeks' treatment for syphilis was given with no result and a piece of the growth which was removed, proved to be carcinomatous. Hemilaryngectomy was done, January, 1912, although a thyrotomy was contemplated. The mass so involved the cartilage beneath, that the procedure was changed to a hemilaryngectomy. The packing in the larynx was removed on the second day, the tracheal packing on the fourth day and the cannula was withdrawn on the seventeenth day. The esophageal tube was kept in place for twenty days. Prior to operation the patient had a chronic bronchitis and the secretion from the lung became much increased, necessitating the use of suction through the tracheal cannula every hour, day and night, for five days after the operation. This procedure, I am quite sure, saved the man's life. In June, 1917, the voice was remarkably good (hoarse but sonorous), chronic bronchitis caused some annoyance, there were attacks of soreness in the larynx due, no doubt, to the excessive secretion from below, and to the cough. There has been no recurrence.

CASE 17.—M. S., man, aged 53, had had chronic laryngitis for years with hoarseness increasing for four months. There was a peculiar brawny induration of the right side of the larynx, without well defined limitations. The patient was observed for one month and as the center of the mass was increasing an operation was determined on. A total laryngectomy was advised, but the patient refused, stating that he would prefer death to absence of voice. Hemilaryngectomy was done, June, 1913, with subsequent resection of the glands of the neck on the same side. The patient was somewhat irrational on the second day and pulled the catheter out of the esophagus and, as repeated attempts to replace it failed, a gastrotomy was immediately performed under novocain and a little chloroform. Tracheal suction was used every hour, day and night, for three days, to unload excessive secretion. The laryngeal packing was removed on the third day, the tracheal packing on the fifth day and the cannula was withdrawn on the fourteenth day. There was a rise in temperature and prostration for one week, recovery eventually occurring. In June, 1915, the voice was hoarse but strong. At the last examination I found a suspicious nodule in the neck and a thickening on the operated side on suspension, which I feared was a recurrence. The nodule proved to be a recurrence, causing death five months later.

CASE 18.—D. G., man, aged 48, complained of hoarseness for five months and stated that ten years previous he had had a papilloma removed from the larynx, but could not remember from which side. The mass was involving two thirds of the cord, leaving the ends free. Thyrotomy was attempted but the mass was firmly adherent to the lateral wall of the thyroid. Hemilaryngectomy was done, June, 1913, which was followed by an uneventful recovery. The packing in larynx was removed on the third day and the tracheal packing on the fourth day. Considerable edema in the larynx necessitated keeping the tracheal cannula in position for three weeks and the feeding tube was withdrawn on the twentieth day. Patient has a remarkably good sonorous voice when effort is made, but he generally speaks in a loud whisper. At the latest report, June, 1915, no recurrence had taken place.

CASE 19.—R. C., woman, aged 58, for years had a large goiter with tracheal and laryngeal distortion and also had cough and hoarseness, due to a left partial laryngoplegia. The hoarseness and cough had been increasing for several months, and the examination revealed a complete obliteration of the true and false cord by a well circumscribed fungating mass. Microscopic examination showed positive signs of carcinoma. Hemilaryngectomy and hemithyroidectomy were performed, July, 1914. In this case I was forced to modify the procedure and I removed half of the thyroid through a transverse incision on a line below the bridge of the thyroid. The trachea was then opened as low as possible and the tracheal tube inserted through a buttonhole in the lower flap. The pre-tracheal muscles could not be used for the laryngeal wall, as they had become attenuated from stretching over the enlarged thyroid; consequently, they were carefully removed, exposing the deep cervical fascia. This flap was used to form the new laryngeal wall on the ablated side, and as it was redundant, being composed of skin, superficial and deep fascia, and some fat, it was trimmed down. Its anterior edge was carefully united to the mucosa of the larynx and to the skin in the anterior median line, and also to the exposed half stump of the trachea below. The endeavor was to close off the larynx and trachea from the neck wound, with the hope that the infection, which was certain to come, might be kept outside the larynx. The rest of the wound was left open and packed with a 0.5 per cent. iodoform gauze. Infection occurred from the trachea and spoiled the union between the trachea and the flap, but did not seriously affect the median union. Healing required one month, the tracheal tube being worn for one month and the feeding tube for twenty-six days. Condition, July, 1916, was as follows: voice a loud whisper, considerable tracheal contraction below larynx, causing some discomfort, normal breathing is audible a few feet from the patient on account of this stricture. There had been no recurrence to July, 1916.

NOTE.—Report has just been received that the patient died of cancer of the neck, January, 1917.

43 West Fifty-Fourth Street.

ABSTRACT OF DISCUSSION

DR. D. CROSBY GREENE, Boston: In these days the tendency is, in early operable cases in carcinoma of the larynx, for many physicians to encourage their patients to try radium treatment where operative treatment may give reasonable hope of a cure. There have been some cases of apparent cure by radium. Up to date, however, the results of radium treatment have not been as successful as the operative treatment in early cases. I, therefore, think it is of great importance that the operative technic of the surgery of the larynx should be developed, as it has been by Dr. MacKenty. Cancer of the larynx presents one of the most serious problems with which we have to deal, but it is one in which relief may be afforded by operation in many cases in which cure is not obtained. The argument is made sometimes that total laryngectomy and hemilaryngectomy leave the patient in worse condition after operation than before, and I think that was true in the early stages of the surgical treatment of this disease; but if we use such a technic as Dr. MacKenty has presented, it seems to me there is nothing lost and there is possibility of great gain in all except those cases which are obviously inoperable. I have not done anything comparable to what Dr. MacKenty has in this line. My work has been largely with earlier cases, and I have performed partial laryngectomy in a number of cases involving a much less radical operation. But I think the essential points in his operation apply not only to operations of the more radical, but to those of the less radical type.

I have found that there is great advantage to be obtained by posture after operation, if we take advantage of what we know of the anatomy of the trachea, referring especially to the backward inclination of the trachea below the larynx. With the patient in the dorsal position, the natural tendency is for fluids in the trachea to gravitate backward into the chest. If we reverse this position and place the patient face

downward with a pillow under the chest, the patient can be made comfortable and drainage from the trachea will be much facilitated. By this procedure I have had absolutely no difficulty with chest complications.

I would request Dr. MacKenty to make a little more clear just how he segregates the trachea from the larynx during the operation.

DR. HENRY W. HORN, San Francisco: At the International Congress of Surgeons in London, in 1914, there was an interesting discussion on the value of hemilaryngectomy, and the consensus of opinion seemed to be that the limitations for this operation were very well marked indeed. Now, the fact that Dr. MacKenty is unable to determine whether a hemilaryngectomy should be performed or not is pretty good indication to my mind that if hemilaryngectomy should be performed it should be easily diagnosed before the operation, because, although in this paper Dr. MacKenty has not quoted any statistics on the subject, it seems to me if any doubt whatever existed from the examination preliminary to the operation as to the necessity of hemilaryngectomy or total laryngectomy, the physician would be decidedly in favor of a radical operation.

Another point is the term which Dr. MacKenty applied to operation on these patients by local anesthesia, which he called "brutality." Now I differ most decidedly on that point. The total extirpation of the larynx by means of a local anesthetic can be accomplished without any brutality, and in certain cases is distinctly indicated. Block dissection can be carried on and the whole larynx can be extirpated by the Gluck method under local anesthesia, and in a case I have in mind we used nitrous oxid anesthesia for not over fifteen to twenty seconds just at the end of the operation to separate the larynx from the pharynx. The more or less complicated details which Dr. MacKenty has gone into prove to my mind that he very much fears complications, and, as a matter of fact, complications are to be feared. I think that those who have worked with Professor Gluck know that his bugbear was operations, and naturally, when one returns after such an experience, one contrasts the method in America, and I know men who have operated by the Crile method with a preliminary blocking of the neck or a preliminary tracheotomy who have found the operations much more difficult. There are innumerable details which I would take exception to, not as a personal matter, but as a student and admirer of Professor Gluck.

DR. JOSEPH C. BECK, Chicago: As to doing the operation under a local anesthetic, I do not believe the statement should be made as broad as Dr. MacKenty has made it. I have operated by this method and I saw no evidence on the patient's face or on the faces of those who looked on that the operation was brutal. I anesthetize the posterior surface of the larynx by inserting a flexible bougie, using gauze wet with a strong solution of cocain, and leaving it there during the entire operation. That anesthetizes the posterior portion completely. Then, of course, I use morphin in good sized doses (and that is a general anesthetic) without resorting to ether or gas. Of course, we will make use of nitrous oxid if necessary.

Another point was in reference to hemilaryngectomy or complete laryngectomy. I should like to know in what way Dr. MacKenty can assure himself that the excision of the half larynx in the case of cancer will insure a cure. When I make a positive diagnosis of cancer of the larynx I urge a total laryngectomy. My experience (which follows Dr. MacKenty's description of hemilaryngectomy, although his results are far superior to anything I have heard of) with that operation is that I have the recurrences just the same. Are there any patients living after these hemilaryngectomies, not one or two years, but some length of time? We should expect the patient to be cured of carcinoma following laryngectomy when the process is confined to the larynx.

Another point referred to, is the closure of the fistula. The voice is the thing the people object to losing, and if we can leave an opening in the pharyngeal region, if we can give them a whispering voice through the trachea into the pharynx, and use an artificial larynx, such as I have

described, it is a long way in advance of the ordinary methods.

DR. LAFAYETTE PAGE, Indianapolis: At the last meeting of the Indiana State Medical Association I reported fourteen cases of laryngectomy for cancer of the larynx, including five thyroidectomies, five hemilaryngectomies and four complete laryngectomies. Since then I performed one complete laryngectomy, about ten days prior to this meeting. The results in the majority of my cases have been most encouraging. [Photographs were presented.] As to the anesthetic, which is most important, after using most of the anesthetics which have been suggested I have found scopolamin and morphin with chloroform the most satisfactory. In some cases novocain with scopolamin and morphin were used with excellent results.

After the larynx has been stripped and the trachea severed, the Trendelenberg-Rose position is used to prevent the flow or aspiration of blood or mucus into the lungs. The suction apparatus is often of use in keeping the field clear. In none of my cases have I performed a preliminary tracheotomy, although Dr. Crile has presented good reasons for the procedure. The only objection that occurs to me is the liability to cancer infection of the cut surface in a preliminary operation.

As to the value of hemilaryngectomy as compared with the complete, I am thoroughly convinced that there is a certain percentage of cases in which the disease is completely localized for a long time on one side of the larynx, with a low degree of virulence, in which hemilaryngectomy is infinitely to be preferred. I have had two cases of this type and the patients are in excellent condition, one after ten years and one after thirteen years, with two others who have just as promising an outlook. We can never be sure, from a laryngoscopic examination, how extensive is the growth. Before determining positively if a hemilaryngectomy is indicated, the larynx is partially stripped and split and the interior thoroughly examined. My technic is somewhat different from that described by the essayist. After the median incision the tissues are pushed aside; after elevating the perichondrium, the poles of the thyroid are ligated and cut between the ligatures. In pushing the tissues aside the risk of injuring the nerves and large vessels as well as the esophagus is greatly lessened. In complete laryngectomy, after anchoring the end of the trachea, I turn the skin in and line the end with a dermal covering instead of mucous membrane. The esophagus is well anchored to the subcutaneous tissue to avoid infiltration and fistulas.

DR. JOHN E. MACKENTY, New York: The chest position after larynx operations seems to me logical and was first brought to my attention this winter by Dr. Greene. Dr. Greene wished to know how to segregate the trachea during the operation. In hemilaryngectomy the trachea is segregated by packing it with gauze during the operation. The cannula is inserted at the point where the trachea emerges from the chest and the lumen of the trachea above is filled with gauze. In a total laryngectomy we safeguard it by having a series of rubber tubes which fit the open trachea almost as tightly as a cork fits a bottle. A suitable sized one is inserted into the trachea just as soon as possible after the separation of the trachea from the larynx. Before opening the trachea thorough hemostasis must be secured. A suction pump is at hand for use in case the blood should escape into the trachea.

I agree with Dr. Horn when he says that a hemilaryngectomy is seldom indicated. There are, however, cases in which hemilaryngectomy is indicated. The patient sometimes governs the choice; some absolutely refusing a total laryngectomy and preferring death to a voiceless existence. I have seen no total laryngectomy with block dissection of the neck without pain. I have often heard surgeons assert that such extensive operations can be made painless, but the patients failed to corroborate the statements when later questioned. I have a strong conviction that the use of a little general anesthesia is less injurious to the patient than the harrowing experience of having his trachea cut and his larynx removed. Such moments in life are best covered by

unconsciousness. The free use of strong cocaine solutions in the pharynx and esophagus when combined with such a severe operation is far from being devoid of danger. I am glad I have support on the question of the one-stage operation. I have been against the two-stage operation, but a great many good surgeons have been for it. I see no necessity for two when one operation seems to serve the purpose. I have had no mediastinitis. In one case the man died three weeks after the operation of an ischiorectal abscess. As to incising the larynx for inspection, it should be done only in very limited cancers. If the disease is seen from above to cross or even encroach on the median line, no surgeon would be fool enough to open the larynx for inspection, since in such a condition a total laryngectomy must be done.

If there is any question about the method of procedure, the more radical should be adopted. Dr. Beck speaks of the advantages of a fistula for the attachment of a speaking apparatus. It might give considerable trouble, and I fail to see how food and saliva could be prevented from passing through it.

Dr. Page's remarks convince me that he has had considerable experience in this work. I am afraid of scopolamin, after having had some rather narrow escapes with it and morphin combined. I prefer to give enough morphin to produce the desired effect. Chloroform is an excellent anesthetic, but I dislike some of its after-effects, such as persistent vomiting, which in this operation is both distressing and dangerous. I object to stripping the tissue from the whole larynx in hemilaryngectomy, since it reduces the nutrition of the part left behind, increases the danger of infection and predisposes to subsequent cartilage necrosis.

PERSISTENT TREATMENT OF EPILEPSY *

HOWELL T. PERSHING, M.D.

DENVER

The late Dr. S. Weir Mitchell, in a presidential address to the American Neurological Association a few years ago, suggesting the inclusion of certain practical subjects on the program, said, "I would like to learn from some of you what you are doing for your epileptics." He was addressing specialists in neurology, many of whom, besides treating their own epileptic patients with skill and care, had enriched the world's knowledge of the subject. But had the question been, What does the average physician do for his epileptic patients? I fear the answer would have to be, "Almost nothing." At any rate, in taking histories of epileptics I have only very rarely found that any line of treatment had been effectually carried out.

This, I am sure, is not because physicians in general are ignorant of the disease or of the kind of treatment generally recommended. It is rather because they do not expect sufficient benefit from treatment to make them undertake it with the care and perseverance that are necessary for even partial success. A prescription for bromid is given, but with no special effort to fit it to the individual patient and with no explanation as to the need of continuing it. The diet is often severely and irrationally restricted. As a result, the patient sooner or later modifies the treatment to suit his convenience or his whims, and then stops it. Attacks return, and nothing has been gained.

* Read before the Section on Nervous and Mental Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

My thesis is that by means of the familiar bromid treatment, with certain not very irksome hygienic precautions, a great reduction in the number of attacks can generally be obtained, and that in a not insignificant proportion of cases the attacks may be prevented for years without deterioration of general health.

For clinical convenience we ought, of course, to distinguish between the epilepsy which is symptomatic of a recognizable organic disease and that which is idiopathic. In pathology, however, I do not believe that the distinction is radical. Any organic disease of the brain from a massive tumor to the smallest recognizable spot of softening or sclerosis may so increase the irritability of the cortex as to cause epileptic attacks. Similar attacks occur in cases in which no organic cause can be demonstrated, and we call them idiopathic. But in idiopathic, as in organic epilepsy, one of the most constant characters is the tendency of the attacks to recur and form a series, so that each one seems to facilitate the occurrence of the next. Even after a long interval of freedom we rightly expect attacks to return, unless something special is done to prevent them. Now this persistent tendency to recurrence suggests an equally persistent underlying cause which is probably organic, as has been well argued by Dr. M. Allen Starr. I do not, therefore, regard idiopathic epilepsy as merely a functional disorder of the brain, such as migraine, probably is, and still less as merely a toxic eclampsia, such as a uremic convulsion is, but as practically like organic epilepsy, in which the lesion is not progressive and is comparatively slight. And as it is beyond our power to remove the underlying cause of the cortical irritability, we do not expect, strictly speaking, to cure epilepsy. Even when an organic cause is known and is apparently removed by treatment, the attacks generally continue, and bromid must be given. This need not discourage us, provided we make the treatment as persistent as the disease, and keep fitting it to the individual patient.

The favorable cases for treatment are those in which the health is otherwise good, the attacks being of the major form only, beginning late rather than early in life, and the total number remaining small. Very frequent minor attacks, together with occasional major attacks, are especially unfavorable, and minor attacks alone are generally worse than major attacks alone.

The first essential to successful treatment is to tell the patient of the tendency to recurrence, even after apparent cure, and of the need of faithful continuous cooperation on his part. Any legitimate encouragement should be given as an incentive, and the word "epilepsy" need not always be used. If only a few attacks have occurred, it may be said that the disease is not epilepsy until the attacks have become habitual, and that this must be prevented. What should be understood and agreed to is that treatment must be extended over many years, perhaps over a lifetime, even though the attacks are arrested. The patient must form the habit of taking his medicine at the regular time, without rebelling or wondering when he can stop, just as he brushes his teeth, or combs his hair. If the treatment is ultimately to be kept up merely as insurance, so much the better. The prescription must be modified from time to time to fit it more exactly to the needs of the patient, but only by the physician, and it is never to be discontinued even for a day except by express order of the

physician. Such an order should not be given unless the reason is overwhelming, as in some acute disease in which the bromid would be distinctly harmful. In many cases a discontinuance intended to be for a short time is prolonged, as no bad effect is at first apparent, and then, when least expected, the attack comes and all concerned must start again, much discouraged, at the foot of the hill.

The diet of the epileptic should be generous and varied, but he should learn to moderate his desire for excessive quantities of food. The big holiday dinner is especially dangerous. A written list of articles permitted and prohibited should be given. Those permitted should include the ordinary fresh meats, poultry, fish, eggs, cooked vegetables, cooked fruits, wheat bread, light cakes, tea and coffee.

In the list of prohibited things should be included oatmeal, cornmeal, bran bread, popcorn, hominy, most breakfast porridges, and, in general, the bulky foods that are so much recommended as laxatives. These foods are laxative because they mechanically irritate the intestine and thus indirectly irritate a sensitive skin or a sensitive nervous system. Moreover, they generally contain the wrong kind of protein and a great excess of starch. Nuts are especially harmful, and should be absolutely prohibited. Salt is to be restricted to a small amount; therefore salt meats are to be avoided. Certain raw fruits, especially apples and bananas, are dangerous. Pastry, heavy puddings, very rich dishes and unusual mixtures must be avoided. Alcohol and tobacco are not for the epileptic.

In giving bromid the aim, of course, is to find such a dose, so combined with other remedies, that attacks will be prevented and yet the patient not seriously suffer from its prolonged administration. My average beginning dose for an adult is 20 grains three times a day in a liquid mixture. If that prevents attacks, but bromism appears, the medicine is not interrupted at all, but reduced 10 or 15 per cent. at a time, until a dose that can be tolerated is found. Toleration may be increased by adding about 10 minims of tincture of nux vomica to each dose and also by adding arsenic, preferably as sodium cacodylate, from 0.002 to 0.005 gm. (from $\frac{1}{30}$ to $\frac{1}{12}$ grain). A laxative is often necessary, and the aromatic fluidextract of cascara can be added to serve this purpose. If the amount of bromid is inadequate to restrain attacks, it is to be increased cautiously. When a dose is found which is sufficient and is well tolerated, it is to be continued for a long time and then cautiously reduced. Dropping from three doses a day to two of the same strength is too great a change to make at one time, but one might change from three doses of 20 grains to two of 25 grains.

But here is a matter of detail which may seem too simple and elementary for the attention of this section, but which is so vital and so commonly neglected that it is necessary to emphasize it. The physician must not only know how much bromid by weight he wishes to give the patient but he must know just how much the patient actually gets. Eighteen grains may be too little and 22 grains too much. It not infrequently happens that a ready-made mixture of bromid is prescribed, without memory of its exact strength, with the direction to take a teaspoonful (which may mean anything from half a dram to 2 drams) and so the patient gets a dose somewhere between 5 grains and 40 grains without any certainty as to the exact amount.

Now suppose this dose is not just right and an increase or decrease of 10 per cent. is desirable, how is it to be accomplished? Is it any wonder that bromid gets the reputation of being ineffective, or of being so poisonous that its effects are worse than those of the disease?

The remedy, of course, is simple, that is, for the physician to write the prescription giving the exact amount of each ingredient and then to have the patient measure the dose, which is usually a fluidram, in a small graduate glass, which will measure from 10 to 60 minims exactly. But vigilance is necessary. It is wonderful how much perversity patient and druggist can show in defeating the plan to have the dose accurately measured.

In case the major attacks are held in check, but the minor ones remain as frequent as before, it will do little or no good to advance to large doses of bromid. Instead, from 5 to 10 minims of tincture of digitalis or half a grain of spartein added to each dose may be of distinct service. Or, if there is much nervous irritability, from 2 to 4 minims of the deodorized tincture of opium with a corresponding increase in the laxative may be better. Occasionally, especially of late years, I have used small doses of thyroid with advantage, and some patients with low blood pressure might profit by the addition of pituitary substance; but I have not tried the latter in this disease. If status epilepticus supervenes, instead of trying to control the convulsions by increasing the amount of bromid, one should keep this at the usual amount and give chloral in 15 grain doses every two hours, for the first few doses, or even every hour. If this does not quickly reduce the frequency of attacks, inhalations of chloroform should be used. If respiration is threatened, atropin and strychnin should be given hypodermically in the usual doses.

For many years past I have followed the treatment here outlined in all of my private cases and have carefully recorded the clinical course in each. The results have been very gratifying, and although I have not undertaken to put them in statistical form, I wish to give some illustrations.

CASE 1.—A girl, aged 13, was seen in March, 1901. Her father's mother and sister had been mentally diseased. The patient had four convulsions in her second year. She had three typical major attacks in January and February, 1901. Her general health was good. She received bromid treatment. Sept. 18, 1901, there was a severe convulsion, the interval being seven months. Bromid was increased but, May 10, 1902, she had a very severe convulsion and her teeth were injured in falling. The interval was nearly eight months. Bromid was again increased, and, April 18, 1903, she had a light attack, after an interval of eleven months. She has had no attacks since, but treatment is still kept up, though gradually reduced to one dose at night. The interval is now more than fourteen years. The patient's general health is excellent.¹

CASE 2.—A girl, aged 14, was seen in March, 1905. Two of her mother's sisters died of melancholia. One of her father's uncles died insane. The patient was born in difficult labor. Rickets seemed indicated, doubtless due to proprietary food. She walked first at 20 months. Cleft palate was successfully operated on at 5 years of age. She was always lacking in vigor. Somnambulism was present in childhood. The first known epileptic attack was in September, 1901, in which there was dizziness with probable unconsciousness. In November, 1901, she was seized with a fit of staring and became unconscious. Aug. 3, 1902, she had a light convulsion and a similar one in November, 1902. Then she took bromid steadily by order of another physician, and had no attacks

for two years, when bromid was discontinued. In December, 1904, during an exciting revival meeting, she suddenly stood up, turned round and sat down; she was unconscious, but there was no convulsion. She had similar attacks in February and March, 1905. Menstruation was regular, but her general health was frail. She was put on careful, continuous bromid treatment. She was troubled by acne, which was fairly well controlled by sodium cacodylate internally and ointment of yellow mercuric oxid. Up to June, 1909, after an interval of four years and three months, there were no attacks whatever, and both mental and physical health were greatly improved. Indirect information from time to time indicates that the treatment has been continued and that there have been no attacks, with maintenance of improved general health.

CASE 3.—A man, aged 36, when seen in June, 1909, stated that his general health had always been good. In November, 1907, he had a nocturnal convulsion, and two others at intervals of ten and four weeks; the next occurred in November, 1908, all being nocturnal. In January, 1909, he fell from his chair with a cry, convulsion and frothing. Then followed more nocturnal attacks; once he fell out of bed. He had about ten major attacks in all, the last, May 31, 1909, after an interval of one week. Minor attacks were very numerous. Persistent bromid treatment was given. There have been no attacks of any kind during an interval of eight years. The patient works hard, and his general health is perfect. He has been taking only one dose daily, and is now careless about that. He will be warned to continue regularly, as the danger is doubtless still present. This case belongs to a type which is generally to be regarded as unfavorable, both major and minor attacks having been numerous for many years, and an organic change no doubt being present. Yet the result of treatment has been very gratifying.

CASE 4.—A boy, aged 8, was seen in October, 1900. His father has some kind of nervous spells. His father's cousin and niece were epileptic. His mother was tuberculous. His mother's father had "neuralgia of the heart," and was probably hysterical. An older sister was very nervous. The patient had rickets in infancy. At 5 years of age, the patient had a convulsion at the beginning of a cold and again in a few weeks at the onset of measles. In December, 1898, and in January, 1899, he had repeated violent falls, said to be without unconsciousness, but he often struck his head violently, and once he broke his teeth. In February, 1899, status epilepticus occurred, there being fourteen attacks with frothing and unconsciousness in one day. He was then put on bromid, and had no attacks for a year, when the dose was cut down and the attacks returned, averaging one a month. He sometimes injured his head in falling. Oct. 2, 1900, I put him on systematic treatment. Nov. 23, 1900, there was an attack of unconsciousness probably due to overeating of apples. Dec. 10, 1900, there were three attacks. In January, 1901, there was one attack. Then there were no more attacks for more than eleven years, treatment being continuous but with many modifications because of frail general health, which, however, gradually improved. In May, 1912, he had a contusion of the head and a gap in memory, probably due to an attack, but possibly the result of a blow by thugs. He now omitted medicine, and his general health was not so good. In April, 1913, he had a spasm immediately following a severe reproof by his parents. After this the blood pressure was low, with faintness and palpitation, although he was able to work. Very little improvement resulted from addition of digitalis to nux vomica. In December, 1915, he had an attack on the way home at night. He lay in the street for some hours, and slept heavily afterward. There have been no attacks since. He is able to work, and his general health is fair.

CASE 5.—A man, aged 37, when seen in October, 1912, had his first attack at 20, which was nocturnal, and a second at 23, which was similar. Then he had five or six major attacks each year; later they came on monthly. There were minor attacks of mental confusion almost daily; sometimes many times in one day. He had had 15 grain doses of bromid irregularly, and minor attacks were especially frequent when

1. This patient had two major attacks, July 4 and 5, 1917, showing the single daily dose of 30 grains to be inadequate.

it was omitted. Systematic treatment began, Oct. 28, 1912. He had four minor attacks on successive days after five weeks' freedom. He has had no attacks of any kind since, during an interval of more than four years. In June, 1916, an attack of iritis and a positive Wassermann test showed the patient to be syphilitic, and appropriate treatment was added. The date of the original infection was not determined.

CASE 6.—A man, aged 47, was seen in February, 1914. An older brother had an aphasic form of migraine. His sister was very nervous. At about 10 years of age he had four or five "fainting spells." In the last ten years he has had four or five spells of momentary unconsciousness, twice with injury in falling. The last attack came on at breakfast, Feb. 19, 1914. He suddenly lost consciousness and fell forward, cutting his face on a glass. Although systolic pressure was only 105, there was a diagnosis of epilepsy instead of syncope. Bromid in rather small doses, but continuously, was prescribed, together with tonics and a laxative. He did well. There was possibly an attack in October, 1914, after unusual indulgence in candy and port wine. Then he remained actively at work with no sign of attack until Feb. 22, 1917, when he fell unconscious shortly after a very early rising. He had traveled with jolly companions in an automobile about 200 miles since noon the day before. He had eaten luncheon and supper at unusual hours, and of coarse and unusual food. Supper was followed by a late card game with cigars and whisky. Renewed cautions were given, and no attack has occurred since.

CASE 7.—A man, aged 43, a railroad station agent, seen in December, 1912, had had typhoid at 17. For about a year afterward he had hemianopic attacks and very brief but severe headaches, apparently migrainous. The tongue and the cheek were occasionally found on waking to have been bitten during the night. In November, 1912, he had a major nocturnal convulsion with passage of feces and a similar one three days later. Another major attack occurred, Dec. 15, 1912. His general health was good. Syphilis was regarded as fairly excluded without a Wassermann test. He was put on the usual treatment. After two years with no sign of attack, medicine was reduced to two doses daily. In June, 1916, the patient had neglected the medicine, had taken an automobile trip and eaten an unusually big dinner when excited and fatigued. A nocturnal convulsion resulted and the tongue was bitten, the interval being three years and six months. Medicine was resumed with renewed exhortation. There has been no trouble since.

CASE 8.—A laboring man, aged 33, seen in May, 1916, had had spasms in infancy and has always stuttered. His health is generally good. He has had about fifteen major and fifteen minor epileptic attacks in the last two years. The usual bromid treatment was perfectly well borne. There have been no attacks of any kind during an interval of over one year.

CASE 9.—A man, aged 40, a cigar maker, seen in April, 1914, was a neurasthenic, with dyspepsia, constipation, emaciation and despondency. The conditions of his life were bad, owing to poverty and limited opportunity and capacity to work. A major epileptic attack occurred in February and again in April, 1914. He was given a small dose of bromid which had to be further reduced. Distinct improvement as to the neurasthenic condition followed the addition of three minims of deodorized tincture of opium to each dose. There have been no attacks in an interval of three years and two months. The patient's general health is better.

CASE 10.—A woman, aged 37, was seen in October, 1913. Her father was hypochondriacal. She had severe typhoid at 16. She has borne three healthy children. About 1903 she began to have attacks of tachycardia with dyspnea and cyanosis, lasting from a few minutes to several hours without disturbance of consciousness. About 1908 she began to have convulsions with absolute unconsciousness, always nocturnal. She had about twelve of these up to July, 1911. Then there was no attack for a year and eight months, during most of which time she was in a sanatorium under ideal conditions, except that the diet was vegetarian. In February, 1913, conditions remaining the same, a nocturnal convulsion caused profound discouragement. In June another convulsion

occurred, in August three in one night and in September three in one night. All of these were preceded by fatigue or emotional strain. The treatment was difficult on account of anorexia, emaciation, indigestion and constipation with indicanuria, rheumatic disturbances and pyorrhea. The lungs, heart and kidneys were normal. Ten grains of bromid morning and noon, with 20 at night, were not tolerated, and the amount was reduced. A course of salol with small doses of calomel was given two days in each week. The teeth were treated; one with pus at the roots was extracted. After two years' residence in Denver, where she was free from attacks and better in every respect, except for slightly diminished weight, she returned to her home in a distant state. Here, while tired and nervous, impelled by an abnormal appetite, she ate an excess of salted nuts. A nocturnal attack occurred, the interval being two years and three months. Since then she has been in Denver often enough to permit careful regulation of diet and medicine. The teeth are still a menace, and their necessary treatment is a tax on endurance; but their condition is greatly improved. There has been no further attack, the interval now being one year and six months.

Metropolitan Building.

ABSTRACT OF DISCUSSION

DR. L. PIERCE CLARK, New York: In my thirty-four recovered cases of epilepsy whose records of arrest of attacks run from three to twenty years, only one arrest was brought about by the use of bromids. The successful plan of treatment was in part by dietetic methods, but more that of mental treatment. The keynote of the latter was to teach the epileptic an adaptation to the life stresses; to thoroughly objectivate the patient into a useful and interesting life of play and work. The use of bromids to bring about this serenity and balance of mind is, I believe, a mistake. The bromids dull the energy and interest and often disarrange many or all of the bodily functions. Three criteria in future should be considered in marking any case as a permanent arrest from attacks. These are (1) cessation of attacks; (2) general improvement in conduct and working capacity, and ability to stand the various ordinary life stresses without epileptic reactions; and (3) a precise psychometric testing for the absence of deterioration or that which may have been overcome. The latter test should show an enriched and flexible emotional response to word tests, no great delay in time reactions and the absence of perseveration, the tendency to react by the same word or idea to a series of unrelated ideas given in the test. I quite agree with Dr. Pershing's title, that the only kind of treatment for epilepsy should be persistent; it is the only one that has been at all successful in the past and when one comes to understand the nature of epilepsy, and especially the mental makeup of the epileptic, one will comprehend why even this plan of treatment so often fails to produce an arrest or cure.

Recently I have thoroughly examined the character makeup of twelve hemiplegic epileptics, and in all there was a neurotic heredity not dissimilar to ordinary idiopathic epilepsy. All the individuals had the epileptic constitution or personality before their epileptic attacks began, or even before their palsy, showing that the cerebral insult probably makes mandatory a sequential epilepsy in all cases of infantile cerebral palsy, which accords with the clinical facts as we know them. The absence of the epileptic constitution or its mental stigma, though convulsive attacks may be in evidence from various causes, warrants our withholding a diagnosis of essential epilepsy in any case. The mental factor, therefore, is the important element in diagnosis as well as treatment.

DR. W. J. G. DAWSON, Sonoma State Home, Calif.: Fifty years ago there was established an epileptic hospital on Blackwell's Island. We were then just beginning treatment with bromids. This was probably the first hospital in America set apart for the treatment of epileptics. We expected to make many cures by the bromid treatment, and there were improvements at first, but at the end of six months the patients were about the same as at the beginning. The result of our bromid treatment in California is just the same as the

results after six months' treatment on Blackwell's Island. I do not believe that any bromid will cure epilepsy. It will suppress the spasms, but I doubt if it will cure. We know so little about the cause of epilepsy. I saw an abdominal operation on Randall's Island the other day on an epileptic boy 19 years of age, and they found intestinal adhesions. They said they had done all they could and then "turned him over to the plumber" to remedy conditions. We certainly do not know much about the cause. It is a complex disease; the combined conditions may result from different causes, sometimes of the brain, sometimes of the intestinal canal. How often in private practice we find spasms in children caused by eating too much cake, candy, pies or puddings, and in epilepsy the trouble is much the same. The cause may yet be found in the abdominal organs. We have 330 cases in our Home, and we have used almost everything, even snake venom (crotalin), and we find nothing does any permanent good but regular diet and regular habits.

DR. W. H. KIDDER, Oswego, N. Y.: That epilepsy is a complex instead of a definite entity seems somewhat doubtful. There is a physical and psychic picture that is very definite. It is different from the convulsions of children's illnesses. The use of bromids is so general that one must be familiar with it. If one approaches the use of bromids from the psychic standpoint, more good will be accomplished than if they were used merely to suppress convulsions. If used with proper care and to produce a feeling of serenity in the patient, a good result will be obtained. If they are used merely to control convulsions we shall not get good results. I believe that bromids help us to produce a mental attitude that we want to get in the patient, and it will thus help to change environment by giving the patient a more serene state of mind.

DR. N. A. PASHAYAN, Schenectady, N. Y.: I have seen 174 cases in the last twelve years. Three cases in adults started late in life. The Wassermann test was positive. The cases were idiopathic epilepsy and they all responded to antisyphilitic treatment.

DR. L. M. CRAFTS, Minneapolis: I rarely have had occasion to use bromids and never more than a 5-grain dose. I think the speaker referred to the psychic effects of the bromids. That is true as far as quieting the patient is concerned. They are not only quieting, they are depressing. The most important thing, however, is a regular régime and complete regulation of the life of the individual, helping digestion, eliminating all meats, aiding bowel, kidney and skin elimination and keeping the patient free from strain and excitement. That is the way to get results. Persistence is important, and it is often found that from two to five years' treatment must be given before results are obtained. I have had many cases show complete subsidence of attacks with this method. I think dependence on bromids is archaic and should be abandoned. They cloud the results and often are clearly harmful.

DR. E. D. FISHER, New York: I make a distinction between the essential form of epilepsy and that occurring in later life. In early life we have a condition of mental change, but in later life we do not find the mental changes that occur in children. It is natural that this should be so. Epilepsy in childhood is associated with an undeveloped brain, and we must look for an etiologic factor which can never be the same as in adult epilepsy. I refer to epilepsy of circulatory origin. The disease can be helped by bromids, which we must use to alleviate the symptoms, with strict attention to the intestinal tract and the diet.

DR. H. T. PERSHING, Denver: I agree that mere suppression of the attacks would be of little avail; we must have a discontinuance of attacks along with improvement in physical and mental health. But the attacks themselves are a very serious disadvantage to the individual, and if we can give the patient long intervals without any attacks we thus do a great deal to effect his readjustment with his world. Most of my patients are able to work. We can judge by the condition of the patient if he is able to do things better than before, and this is the test of the treatment, rather than the mere suppression of the attacks. Skilful use of the bromids will help a

great deal in attaining this end. I do not think that Dr. Dawson is right in applying to these cases the results of treatment on Blackwell's Island. Private cases of epilepsy are much more favorable than institutional ones. The serenity of the patient in these cases is undoubtedly of great importance, and every epileptic should be treated from the psychic standpoint as well as from the physical; but the utmost one could do by mental treatment alone would not accomplish nearly as much as the combination with proper medication. In a small proportion of my cases I have had evidence of syphilis, with a positive Wassermann. Antisyphilitic treatment has been added, but I do not expect to cure epileptic attacks with the latter treatment, even when syphilis was the original cause.

A STUDY OF ARTERIAL SOUNDS*

STEWART R. ROBERTS, M.D.

Professor of Medicine, Emory University School of Medicine
ATLANTA, GA.

This study was undertaken in order (1) to gain evidence for the transmission of the heart sounds in the arteries; (2) to secure evidence of the cause of the sounds heard in the brachial artery in taking blood pressure; (3) to determine whether or not any relation exists between arterial sounds and blood pressure, or between arterial sounds and arteriosclerosis, and (4) to determine whether or not arterial sounds have clinical and diagnostic value. Two hundred cases have been taken in regular order, some being persons in good health, some private patients, and some ward patients. In each case the name, age, sex, and diagnosis were recorded; then the pulse rate, and systolic, diastolic and pulse pressure were registered; the condition of the arteries was classified as normal or arteriosclerotic, and the heart sounds were classified as clear, split or murmurs. The stethoscope was applied *without pressure* over the right and left carotids, subclavians, brachials and femorals. The presence, absence and character of the sounds and murmurs in the arteries were noted and recorded. The acuteness of one's hearing increased and the sounds became more clear as the work progressed.

Little work has appeared in English on this subject. Laennec¹ was the first to notice the existence of arterial sounds and murmurs, and speaks of the "bruit normal." Corrigan² discovered that an arterial murmur developed in a tube or an artery at the point of pressure and constriction, or where the fluid flows from a narrow to a wider part. Hamernyk² described the two sounds usually heard in the carotid and subclavian arteries. Kiwisch,² Theodore Weber,² and Chaveau² agreed with Corrigan, and further showed that the murmur due to constriction and the resulting vibrations follow the blood stream. Conrad² first raised the question as to whether the sounds arose in the arteries or were transmitted from the heart; and Marey² noticed that sounds occur in the arteries in aneurysm and in diseases of the heart.

Richardson² claimed that blood is a poor sound conductor, and all subsequent work since his time has credited this premise, which is probably entirely wrong. Friedrich² finally concluded that the first sound in the artery was due to arterial tension, or was arterial in origin; and the second sound is cardiac

* Read before the Section on Practice of Medicine at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Laennec: *Mediate Auscultation and Diseases of the Chest*, pp. 706-707.

2. Quoted by Weil: *Auskultation der Arterien und Venen*, 1875.

in origin. Shoder² denied even that any of the arterial sounds were transmitted from the heart. Niemeyer² first seems to have grasped the idea that "a stream of fluid producing pressure may carry sound due to vibrations originating from valvular defects. . . . The vibrations observed for example in cases of mitral defect must therefore take place in the ventricle if there is insufficiency, in the auricle if there is stenosis." Traube³ thought that hyperpressure and arterial sounds were related, and that in hyperpressure there were no sounds in the femoral arteries. This study proves the reverse to be true. Weil's² work, published in 1875, is the most exhaustive on the subject, and he concludes that the first and second sounds heard in the carotids and the subclavians are transmitted from the heart, and that arterial murmurs originate in the vessel.

Much confusion and many variable conclusions exist in the literature, due in large measure to the failure to separate terms accurately, and a certain inexplicable hesitancy to admit the evidence that proves the two arterial sounds are transmitted from the heart. As noted by Weil and Frank,⁴ and accented by Wiggers,⁴ neither the heart sounds and murmurs nor the arterial murmur can be classified musically, but all belong to the category of murmurs. The Germans have classified the sounds in the arteries that are short, sharp and quick ending as "Töne," and those that are prolonged and less sharply defined as "Geräusche." These in English would be tones and noises, but modern usage would call the first, sounds; and the indefinite, swishing and blowing vibrations, murmurs. Every noise in the artery is therefore either a sound or a murmur. The murmurs may be further classified as (1) pressure murmurs due to the constriction of an artery at any point from external pressure, as from a stethoscope; (2) natural murmurs that originate in the arteries without external pressure, as in the right subclavian or the dynamic or slack abdominal aorta, and (3) the valvular murmurs, fainter and swishing, the transmitted blows of cardiac murmurs. The last are more blowing and less vibratory in type than the first two. They are of the same pitch, but softer than when heard over the heart.

Sounds and murmurs in the heart and arteries conform to the laws of the physics of sound, which may be summarized as follows: All sound is due to vibration, whether occurring in air, fluid, or solid mediums. Sound takes time to travel, needs a material to travel through, and is a disturbance of the wave kind.⁵ The heart sounds may be transmitted through any of the surrounding mediums; both through the blood and down the blood stream by means of the vibration of its particles, aided also by the blood movement; and through the tissues because the vibrations continue through the wall of the heart, the soft parts, the bones, the skin, and the air to the ear. Indeed, Cattani,⁶ under the title of "The Arterial Fremitus or the Vibrating Pulse," describes the intense thrill frequently felt by palpating along the pulsating artery, his "vibrante pulso," or vibrating pulse.

I have been unable to find the rate of the transmission of sound through the blood or tissues. Such

transmission through different mediums is determined by their rigidity and their density; rigidity increasing the rate, density decreasing it. Liquids have much higher rigidity in proportion to their density than gases, and carry sound at much higher velocity. Water confined in tubes does not carry sound waves at the same velocity as a loose bulk of the liquid in which the propagation is unrestrained by the walls of the tube. The rate is increased by a rise of temperature, and solutions carry more rapidly than pure solvents. The calculation of the velocity of sound through a large, free bulk of human blood would not be difficult; but confined in arteries of varying elasticity, the rate would be affected not only by the density of the stream, but by the character of the soluble matter, and the tone of the arterial wall. Practically, however, the channel distances being in meters, or less, the actual time required for sounds from the heart to reach exposed sections of the arterial tubing would differ very little from that of a salt solution of the same density and temperature, or at the rate of 1,550 meters per second, as against 1,435 meters per second in bulk water. Dissolved gases retard the rate of propagation. In the short distance between the heart and the carotids and the subclavians, the heart sounds would be transmitted practically instantaneously.

Sahli⁷ states that "two sounds are heard over the carotids and subclavians, a systolic from the systolic tension of the vessel wall, and a diastolic transmitted from the aortic valves." Weil, however, noted that abnormal sounds in the heart were transmitted to the carotids, but he called them sounds, rather than murmurs. The evidence is clear that the first sound is not due to the systolic tension of the vessel wall, but rather is transmitted from the mitral closure, just as the second is transmitted from the aortic closure.

The following facts prove that both first and second sounds are transmitted from the heart, and that mitral and aortic murmurs, both direct and indirect, are also thus transmitted. The mitral closure as transmitted to the carotids and the subclavians is duller and fainter, as a rule, than the aortic closure.

1. These sounds occur in orderly sequence at the same rate, and apparently at the same time intervals, and of similar tone as the heart sounds. In Case 86 of our series with a double, bigeminal pulse and a pause, four sounds occurred in rapid succession in the carotids and the subclavians, followed by the same pause. In Case 166 with mitral regurgitation and myocarditis the sounds of premature contractions in the heart were transmitted and plainly heard in the carotids and subclavians.

2. A clear, normal mitral closure occurred in seventy-five cases, and was heard in the carotids and subclavians seventy times, or 93 per cent.

3. An accented mitral closure in the heart is heard as an accented heart closure in the carotids and subclavians three times in three cases, or 100 per cent.

4. A split mitral closure occurred in forty-eight cases in our series and was followed by a split first sound in the carotids thirty times, or 62 per cent.; and in the subclavians twenty-five times, or 52 per cent.

5. Mitral regurgitation murmurs occurred in fifty-eight cases, and were heard fifty-one times, or 90 per cent., in the carotids; and fifty-two times, or 90 per cent., in the subclavians.

6. Loud murmurs of the mitral valve, either presystolic or diastolic, often replace the clear mitral closure in the carotids and subclavians. Case 116, a negro boy, aged 4 years, with loud, blowing presystolic and systolic mitral murmurs, with a loud ringing mitral closure between, had transmitted to

3. Traube, cited by Ziemssen: *Cyclopaedia of the Practice of Medicine*, 6. Rosenstein: *Diseases of the Circulatory System*, pp. 135-141.

4. Wiggers: *Circulation in Health and Disease*, Philadelphia, 1915, p. 174.

5. Article on Sound, *Encyclopedia Britannica*, 25, 437.

6. Cattani, G.: *Il Fremito Arterioso o Polso Vibrante*, *Pensiero med.*, 1913, 3, 561-568.

7. Sahli: *Diagnostic Methods*, p. 348.

his carotids and subclavians the loud, blowing, presystolic murmur, then the pause, during which the sharp mitral closure occurred, followed by the loud, blowing, mitral regurgitant murmur. This one case is proof of the transmission and transmissibility of the mitral closure and of murmurs at the mitral orifice.

7. Six presystolic mitral murmurs were heard five times in the carotids and subclavians, or 84 per cent.

8. The clear, aortic closure occurred ninety-five times, and was heard in the carotids and subclavians ninety-five times, or 100 per cent.

9. The aortic second sound was accentuated in forty-nine cases and was heard in the carotids and subclavians forty-seven times, or 96 per cent.

10. The aortic second sound was split in sixty-two cases, and was in the carotids fifty times, or 80 per cent., and in the subclavians forty-seven times, or 71 per cent.

11. There were twenty-six cases of aortic regurgitation, of which twenty-five were heard in the carotids, or 96 per cent., and twenty-four in the subclavians, or 92 per cent. Often an impure aortic closure may show a lisping or a leaking second sound in carotids and subclavians.

12. The aortic first bruit occurred in ten cases, and was heard nine times in the carotids and subclavians, or 90 per cent.

13. The murmurs of aortic stenosis, as is well known, are transmitted into the subclavians and vessels of the neck. In Lynch's⁸ case this murmur was heard over the right radial

failed to notice this, and Matterstock is probably in error in attributing this to the double closure of the ventricle. In our experience these split sounds in the arteries all have a split aortic closure or a split mitral closure in the heart. These split closures are due not only to the separate closure of the two valves of different sides, but far more frequently to the different time closure of the segments of one valve. The latter is transmitted from the heart. Sixty-two of the 200 cases showed a split, or duplicated aortic closure, and this split closure was heard as a split second sound fifty times in the carotids and forty-seven times in the subclavians. In Case 54 it was heard in the brachial artery before the application of the cuff. In twelve cases this split closure was heard in the brachial artery in the second, third and fourth phases, never in the first or fifth phases of pressure readings.

In no case was the split sound heard in the brachial in taking pressure where there was not a split aortic closure in the heart. As the air escapes from the cuff, a murmur and a sound develop. The murmur is usually heard first and in the first and second phases, and often disappears before the sound. The murmur is due to the passage of blood through the narrow opening into the wider space of lower pressure and diminished peripheral resistance below. Bard¹⁰ has

TABLE 1.—ARTERIAL SOUNDS. CLASSIFICATION OF CASES STUDIED BY DISEASES AND SEX

Diagnosis	Age, Males										Age, Females										Total Men and Women
	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	Total	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	Total	
Good health.....		2	6	1	4	....	2	....	....	15	....	....	7	8	....	....	2	....	....	17	32
Pregnancy.....										0	....	6	10	2	....	....	....	....	....	18	18
Nervous diseases.....		1	....	....	4	1	1	2	....	9	....	....	....	4	2	1	1	....	....	8	17
Renal diseases.....						1	2	....	....	3	....	1	....	3	5	4	....	....	....	13	16
Respiratory diseases..	1	1	....	1	....	....	....	1	....	4	....	....	5	3	1	....	....	....	....	9	13
Anemias.....		1	....	1	....	....	....	....	....	2	....	2	2	1	1	....	....	....	....	6	8
Syphilis.....		1	3	3	....	1	....	....	....	8	....	....	2	2	....	....	....	....	....	4	12
Circulatory diseases..	1	2	6	6	8	6	1	....	....	30	....	....	2	4	3	7	4	1	1	22	52
Acute infections.....			2	....	....	2	....	....	....	4	1	1	3	2	....	....	....	....	....	7	11
Digestive diseases.....				4	1	1	....	....	....	6	....	....	2	3	....	....	....	....	....	6	12
Miscellaneous.....				1	....	....	....	1	....	2	....	1	3	2	1	....	....	....	....	7	9
	2	8	17	17	17	12	6	4	0	83	1	11	37	34	13	12	7	1	1	117	200

at the wrist and wholly masked the succession of sounds during the systolic reading of the pressure.

14. In Case 89, a sharp, short, blowing murmur occurred between the mitral and aortic closures with no relation to either. This was probably a congenital defect in the inter-ventricular septum; with the passage of blood apparently from the left to the right ventricle during the latter two thirds of systole, clear mitral and aortic closures occurred in the carotids and subclavians.

15. Mitral presystolic murmurs with the vibrations passing through the ventricle and aortic valves are heard plainly in the carotids and subclavians; but Austin Flint murmurs due to the spraying blood passing backward into the heart through the opening in the aortic valves are not heard in the carotids and subclavians. This is plainly demonstrated when we compare Case 116, already noted, with Case 120, in which a mitral regurgitation and an A¹ bruit and an A² regurgitation were heard in the carotids and subclavians, but a most beautiful, loud, spraying Austin Flint murmur heard plainly in the fifth space at the apex was not heard in the long pause in the vessel.

16. Experimental proof in the laboratory by tearing a segment of aortic and mitral valves would probably be very easy.

Matterstock,⁹ in 1878, first called attention to the split diastolic arterial sound, which he thought was due to a double contraction of the ventricle. Weil

shown that if a cuff be applied below over the forearm and the pressure raised above the systolic pressure and held, and blood pressure is taken from a second cuff applied over the arm, no murmurs are heard in the brachial artery. With the forearm cuff applied, the condition of wider area, lower pressure, and diminished peripheral resistance below is absent because the arteries are distended.

The sound heard on taking the pressure is next to be accounted for. It is often clear and loud, may be split, and usually ceases with the diastolic pressure, or when the artery is open again. Murmurs may originate at the point of constriction in an artery, but sounds hardly originate at such a point. We know that the aortic closure sound is transmitted anteriorly through the chest wall and into the carotids and subclavians, and throughout the blood stream. This brachial sound:

1. Occurs at the same rate of the pulse.
2. Usually disappears when the lumen of the brachial is open after diastolic readings.
3. Is split only when the aortic valve is split.
4. Occurs usually in the second, third or fourth phase.
5. Is probably the transmitted sound from the closure of the aortic valve.

8. Lynch, O. B.: Queries and Minor Notes, THE JOURNAL A. M. A., March 31, 1917, p. 995.

9. Matterstock, G. K.: Die Auscultatorischen Erscheinungen der Arterien mit besondere Berücksichtigung der Herzkrankheiten, Deutsch. Arch. f. klin. Med., 1878, 22, 507-549.

10. Bard, L.: De l'appréciation des résistances périphériques par l'auscultation des souffles artériels, Arch. d. mal. du cœur, 1915, 8, 105-111.

6. The same sound is heard in the upper third of the brachial artery above the cuff. In this upper area it was heard in one case when the cuff was inflated, whereas the systolic pressure was only 96. It occurred above at 68 to the minute, the same as the patient's pulse rate, and disappeared at the same instant that blood passed through the brachial artery covered by the cuff, or at the instant of the systolic pressure. This subject of the upper cuff sound needs investigation. Subcutaneous fat, experience in auscultation, and the proper placing of the cuff low enough down on the arm are factors in hearing this upper sound clearly.

TABLE 2.—SUMMARY OF CARDIAC SOUNDS AND MURMURS AND PERCENTAGE HEARD IN THE ARTERIES

Heart	No.	Carotids		Subclavians		Brachials		Femorals	
		No.	%	No.	%	No.	%	No.	%
Mitral sound.....	75	70	93	70	93				
Mitral split.....	48	20	62	25	52				
Mitral regurgitation....	58	51	90	52	90				
Mitral stenosis.....	6	5	84	5	84				
Aortic second sound....	95	95	100	95	100	28	29	46	48
Aortic second accented..	49	47	96	47	96				
Aortic second split.....	62	50	80	47	71				
Aortic regurgitation....	26	25	96	24	92				
Aortic first bruit.....	10	9	90	9	90				

7. This sound is also heard when the stethoscope is applied with pressure. It is evident, therefore, that it is not due, as is so commonly stated, to the resonance of the cuff, and that its cause must be proximal to the cuff, since it is heard above it, rather than distal because it is heard below it.

8. It is probable that when an artery is open this transmitted aortic closure sound passes through the brachial artery, and is restrained by the walls of the tube; whereas when the artery is partially or entirely closed the sound vibrations cannot continue easily down the blood stream, but pass unrestrained through the walls of the artery. When a rock is thrown on the smooth surface of a pond, many ripples follow each other in concentric circles to the shore; but when the same rock is thrown on the running waters of a small river, the ripples are so faint and few and move such a short distance that they are often not noticed. The surface ripples are destroyed by the momentum and motion of the river water. The blood is of greater density and under greater pressure than the river water, and is moving at a more rapid rate, and sound vibrations are more apt to pass down stream when the channel is open, or to pass laterally when the channel is narrowed or closed.

Dehio,¹¹ in 1913, gave twelve cases of febrile disease, anemia, heart lesions and exophthalmic goiter in which he heard spontaneous sounds in the femorals. He states that these sounds occur in cases of hypopressure in the majority of cases, and, as a rule, when the diastolic pressure is very low and the pulse pressure high. His theory is that in such cases there is an abnormally low blood pressure with defective filling of the artery, and these sounds are due to vibrations of the vessel wall, and the murmurs to the swirling of the fluid in the vessel. This is the first attempt to show a relation between arterial sounds and blood pressure, but twelve cases are probably too few in number to permit a conclusion. He seems to fail to consider that the femoral sound may be a transmitted aortic sound. Indeed, the difficulty is to prove that what he calls a spontaneous femoral sound exists at

all. It is true that murmurs are due to the vibrations of the vessel wall, but it is difficult to account for the sounds in the vessels unless we consider them transmitted from the heart.

In our series for the purpose of determining whether any relation exists between blood pressure and arterial sounds, 97 cases were divided into 3 groups. Group 1 consists of fifty-one cases with a systolic pressure of 10 and below (Table 3); Group 2 includes thirty-seven cases with a systolic pressure between 125 and 175; and Group 3, nine cases, with systolic pressure of 200 and above. Between Group 1 and Group 2 are omitted the cases of systolic pressures between 100 and 125; and between Groups 2 and 3 are omitted those cases with systolic pressures between 175 and 200. These omissions permit clearer conclusions because of their breaks.

In the ninety-seven cases in the three groups, the first and second sounds in the carotids and subclavians are equally and easily transmitted, and are not affected by pressure. However, when we reach the brachials and the femorals, we find that in Group 1, 10 per cent. were heard in the brachials and 24 per cent. in the femorals, and in two cases sounds which we call M¹ and which we assume were transmitted mitral closures, were heard in addition in the femorals. In Group 2, 5 per cent. were heard in the brachials and 22 per cent. in the femorals. In Group 3, 77 per cent. were heard in the brachials, and 33 per cent. in the femorals. This would seem to indicate on the basis of the transmission of the brachial and femoral sounds from the heart: (1) the higher the pressure, the greater the transmission in arteries more distant from the heart, and (2) in those arteries near the heart there is no relation between arterial sounds and blood pressure.

The natural arterial murmurs occurred in sixty cases, fourteen times in the carotids, with an average pressure of 118-65-53; forty-four times in the subclavians, with an average pressure of 109-66-43, and twice in the femorals, with an average pressure of 107-66-41. However, the extremes of systolic pressure vary between 107 and 90, and the extremes of

TABLE 3.—LACK OF DEFINITE RELATION BETWEEN ARTERIAL SOUNDS AND BLOOD PRESSURE

Blood Pressure	Cases	Average		Average Blood Pressure	1		2		1		2		2		1	
		Age	Pulse		M in C.	A in C.	M in S.	A in S.	M in A.	A in A.	M in B.	A in B.	M in F.	A in F.	M in F.	A in F.
I.—100 and below	51	29	83	96-59-37	50	51	46	48	5	12	2					
II.—125-175 inclusive	37	46	84	145-83-62	34	36	34	36	2	8						
III.—200 and above	9	84	57	227-127-100	8	9	7	9	5	3						

diastolic pressure between 95 and 30. In taking many of these cases, I gradually came to feel that the natural arterial murmurs were more frequent in the normal or low pressures, though they certainly do occur in the highest pressures. They probably occur in very high pressures in cases of irregularity and calcification of the intima in advanced arteriosclerosis. It is often impossible, except occasionally over the aorta, to prove such conditions. It is probably true, therefore, that:

1. Natural arterial murmurs occur chiefly in the carotids, subclavians and femorals in 30 per cent. of our cases.

2. As a rule they occur in pressures of a low normal.

3. They are found occasionally in high pressures.

Arteriosclerosis seems to have no effect on the easy transmission of the heart sounds through the arteries,

11. Dehio, K.: Ueber das pulsatorische Tönen der Arterien, St. Petersburg. med. Ztschr., 1913, 38, 259-263.

according to Table 5. The sounds were plainly heard in the vessels in sixty-three cases of arteriosclerosis, and in 137 normal vessels, or 100 per cent. of the series. In sixty-three cases of arteriosclerosis there were thirty-two with cardiac murmurs, of which thirty-one murmurs were heard in the vessels, or 97 per cent. In normal vessels there were forty-three with cardiac murmurs of which forty-one were heard in the vessels, or 95 per cent. This difference of 2 per cent. is hardly sufficient to indicate any marked difference in the transmission of murmurs from the heart in arteriosclerotic vessels as compared with normal vessels.

TABLE 4.—ARTERIAL MURMURS

	Cases	Average Age	Average Pulse	Average Blood Pressure	Highest Blood Pressure			Lowest Blood Pressure		
					Sys-tolic	Dias-tolic	Pulse	Sys-tolic	Dias-tolic	Pulse
Carotids....	14	31	88	118-65-53	170	80	70	94	30	40
Subclavians	44	28	83	109-66-43	170	95	70	90	30	15
Femorals....	2	43	93	107-66-41	110	78	55	105	55	27

The murmurs and sounds that occur in the femoral artery have been the battle ground in arterial sounds since Duroziez¹² first discovered his double murmur in 1861. In 1867 Traube¹³ described his two peculiar phenomena in the femoral artery associated with aortic insufficiency. The first is a double murmur of which the second blow comes from pressure on the femoral artery. The second is a double sound in the femoral artery, and is not, as Traube thought, pathognomonic of aortic insufficiency, but occurs in other conditions. Of Weil's² 600 cases he found only seven with Duroziez's double murmur, and only two with Traube's double femoral sound; and both of these were in cases of mitral stenosis and aortic regurgitation. Many explanations of these two series of phenomena have been given, but a discussion of all of these would occupy another paper. Suffice it to say at this time that probably the true explanation of the pistol shot sound is the transmission of the aortic second sound in aortic insufficiency, and of the double sound of Traube is the transmission of the mitral and aortic sounds from the heart through the blood stream. Natural arterial murmurs may originate in the femorals as in the carotids and subclavians, and pressure simply produces a pressure murmur in the femorals as elsewhere. Certainly none of these are pathognomonic of aortic insufficiency as has been asserted. Dehio,¹¹ Heynsius,¹⁴ François-Franck,¹⁵ Schultz¹⁶ and Friedreich¹⁷ have all written extensive papers in an attempt to explain the femoral phenomena. The femoral sounds are interesting theoretically, but are of little value clinically, except as interesting clinical phenomena.

It is evident that the transmission of sounds of the left heart to the carotids and subclavians gives four additional places for diagnosis in addition to auscul-

tation over the precordial area. The arrhythmias may be noted in the vessels, particularly premature contractions, bigeminal pulse, sinus arrhythmia, and to a less extent auricular fibrillation. In three cases of emphysema the vessel sounds were clear and better than over the heart. Weil four times found them in this disease rather than sounds at the base of the heart. It is difficult sometimes to distinguish between the mild aortic stenosis and a simple A¹ bruit, and the vascular sounds help to a correct conclusion. The murmurs are often transmitted to the vessels with such clearness that I have had hospital interns who had never listened over carotids hear them the first time. In myocarditis and hearts in a gallop rhythm one often hears a clearer sound in the vessels than over the heart. It is always well to remember that it takes a good heart muscle to make a clear heart sound or a strong murmur. In cases of syphilitic aortitis with fine, high, faint closure of the aortic valves, or the older cases with clanging, tympanic closure confirming evidence is heard, particularly in the carotids. As a rule, the sounds in the left carotid and left subclavian are clearer than in their fellows, because the former vessels originate more directly from the aorta without the interposition of the innominate. The sounds in the right subclavian are also of less value because of the greater frequency of the natural arterial murmur in the right subclavian, due probably to natural pressure in systole from the right rib together with its snugness to the right lung, particularly during inspiration. Too often we take a cardiac murmur as a status quo affair and fail to remember that it is an evolutionary and progressive condition, which begins maybe with an accentuation of the valves, followed by a splitting, and then a murmur; or it begins with an endocarditis and inflammation. Valve destruction, the regurgitation, perhaps followed by mitral stenosis may develop finally. These finer details in the evolutionary pathology of a valve lesion are often clearer in the left carotid than over the heart.

CONCLUSIONS

1. Sounds and murmurs originating at the mitral and aortic valves are transmitted throughout the arterial system, and are heard usually in the carotids and

TABLE 5.—SOUND AND HEART MURMURS TRANSMITTED

	Sounds			Murmurs		
	Cases	Number	Per Cent.	Cases	Number	Per Cent.
Arteriosclerosis.....	63	63	100	32	31	97
Normal vessels.....	137	137	100	43	41	95
Total.....	200	200	Av. 100	75	72	Av. 96

subclavians, only sounds more rarely in the brachials and femorals.

2. There is little evidence of a relation between arterial sounds and blood pressure, except that the higher the pressure and the greater the pulse amplitude, the more apt are sounds to exist in the femoral arteries.

3. It seems that sounds and murmurs from the heart are transmitted practically as well in arteriosclerotic vessels as in normal vessels.

4. Sounds in the femoral arteries are of little, if any, clinical value, and are not pathognomonic of aortic insufficiency.

5. It is probable that the murmur over the brachial artery heard in taking blood pressure is due to the

12. Duroziez, P.: Du double souffle intermittent crural, comme signe de l'insuffisance aortique, Arch. gén. de méd., 1861, Series 5, 17, 417-443; 588-605.
13. Traube: Ueber zwei eigentümliche Phänomene bei Insufficienz der Aortenklappen, Berl. klin. Wehnschr., 1867.
14. Heynsius, A.: Die Töne und Geräusche im Gefässsystem, Leyden, 1878.
15. François-Franck: Essai sur la mode de production des souffles artériels en général et du double souffle crural en particulier, Arch. de physiol. norm. et path., 1899, Series 5, 1, 659-666.
16. Schultz, Werner: Ueber Doppeltonbildung an den Cruralgefässen, Deutsch. med. Wehnschr., 1905, 31, 1381-1383.
17. Friedreich, N.: Ueber Doppelton an der Cruralarterie, sowie über Tonbildung an den Cruralvenen, Deutsch. Arch. f. klin. Med., 1877-78, 21, 205-258.

constriction of the artery, and that the sound is due to transmission from closure of the aortic valve.

6. The arterial sounds in the carotids and subclavians, particularly the left, often have additional clinical value in the study of the heart.

Candler Building.

ABSTRACT OF DISCUSSION

DR. A. E. ROUSSEL, Philadelphia: The essayist fails to tell us whether the louder murmurs are carried through in a louder degree than the faint murmurs. It seems to me that the faint murmurs would be carried to a less distance than the loud ones. Another point is whether the arterial tension has not had much to do with the transmission of the murmurs; with high arterial tension the murmurs should be transmitted better than with low pressure. Those working in tuberculosis work occasionally see cases in which the degree of consolidation in the lungs is not marked, but in which a systolic murmur is heard somewhere over the lung area. This is due to constriction of the artery by tuberculous masses. I have been particularly interested recently in working out the oculo-cardiac reflex, which is obtained by pressure over the eyeball, maintained for a period of two minutes. This will cause a diminution in pulse frequency in most persons and an increase in some others. The neurologists claim that an acceleration or retardation of ten beats or more is indicative of some trouble in the central nervous system, as in disseminated syphilis. I have noted an additional sign which, as far as I know, is original, and which I take pleasure in recording here. In a case of chronic myocarditis in which I only suspected the presence of a murmur, pressure on the eyeball for two minutes gradually brought out this murmur in a very decided amplitude. Since then I have been studying this sign in over 200 cardiac cases, and I can say now that continued ocular pressure as directed in faint murmurs will markedly accelerate those murmurs and bring them out, and in cases of functional murmurs the results would seem to be the opposite. Functional murmurs seem to disappear or diminish and organic murmurs to increase. This is a simple test, easily applied and I believe will prove to be of real value. I am carrying out experiments with the electrocardiograph and polygraph and hope to try the new phonocardiograph before the publication of a paper on this subject.

DR. R. A. BATE, Louisville, Ky.: Since the basis of the paper seems to depend on the contractions of the heart itself, I should like to ask Dr. Roberts what part he thinks the variation in the causes of the heart contraction plays in the various heart sounds? All of us have observed that some heart murmurs disappear, and I wish to ask if the explanation on the internal secretion basis is right. McKenzie has shown that the heart will act for days when taken out of the body, and certain conclusions have been drawn from this. We know that whatever excites this contraction is not conveyed through the nervous system. On the internal secretion basis, this must be in the heart itself, like secretin in the alimentary tract. Does the quantity of this secretion, which possibly is formed in the heart itself, or whatever excites cardiac contractions, play any part in the making of the murmurs? It has been shown pathologically that many murmurs are not due to changes in the valves.

DR. STEWART R. ROBERTS, Atlanta, Ga.: We attempted to investigate the relation between arterial sounds and blood pressure. We found in those arteries more distant from the heart in hyperpressures of 200 mm. and above, that the sounds seemed better transmitted to the femoral artery than in cases of hypopressure. The cases were divided into three groups according to the blood pressure: (1) those of 100 mm. and below; (2) those of 125 mm. to 175 mm., inclusive; and (3) those cases of 200 mm. and above. In the hypopressure cases we came to feel that the murmurs occurred in the artery more frequently, as distinguished from the sounds in the femoral artery in hyperpressure. Murmurs seem more common in the hypopressure cases, and the sounds in the hyperpressure cases. The cardiac murmurs, on the other hand, if found in the heart are found in the vessels, and vice versa. There are exceptions

to this, however. In emphysema with a distended lung overlapping the heart, in pericarditis with effusion, and in fibrinous pericarditis in which the sounds of the heart are ruined by the friction sounds, the heart sounds are heard better in the carotids and subclavians. I cannot speak as regards the relation of the ductless glands and the arterial sounds. It seems to me that as a problem it is speculative, and that we have no facts on which to base a conclusion. In this research it was all we could do to train our ears to hear the sounds and murmurs in the arteries and we had no time for speculative philosophy.

INDICATIONS FOR THE MASTOID OPERATION IN ACUTE OTITIS MEDIA *

EDWARD BRADFORD DENCH, M.D.

Fellow of the American College of Surgeons

NEW YORK

Involvement of the mastoid is ordinarily regarded by the laity and, I am sorry to say, by a large proportion of the medical profession, with an undue amount of terror. If physicians would remember, and explain to their patients, that the mastoid is simply one part of the middle ear, and that every case of acute middle ear inflammation is really a mastoiditis, this false impression would probably, to a large extent, be corrected. A middle ear acutely inflamed and properly drained by free incision of the drum membrane recovers spontaneously. This is really a case of mastoiditis recovering with a minimum of surgical interference. If this drainage—either on account of the severity of the inflammatory process, the particular topography of the mastoid in the individual case, or the extreme virulence of the infecting organism—is insufficient, then a mastoid operation is indicated, that is, it is necessary to drain the middle ear through a posterior incision rather than by an incision through the drum membrane.

INDICATIONS

Certain signs and symptoms indicate insufficient drainage as the result of incision of the drum membrane, rendering imperative drainage by posterior incision, and this term will be used hereafter in this paper as synonymous with the complete mastoid operation.

Pain.—The indication for operative interference which most influences the patient is the symptom of pain. The persistence of severe pain after incision of the drum membrane is, in some cases, an indication for the mastoid operation. After free and, to the surgeon, satisfactory incision of the drum membrane, if spontaneous pain in the ear persists for from twenty-four to forty-eight hours and is sufficient to require the administration of the opiate, pain alone is a sufficient indication for opening the mastoid. I have had a number of these cases, as has any physician who has followed a special practice for several years, and it has been my experience, almost invariably, that in patients in whom spontaneous pain is the only indication for operation, the mastoiditis is of the hemorrhagic variety and that the mastoid cells are extensively developed.

Temperature.—I mention this indication merely in order to dismiss it with a few words. Some of the

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

worst cases of mastoiditis that I have seen have run an absolutely afebrile course. The temperature is apt to be more elevated in infants and young children than in adults. A persistent high temperature, or a remittent temperature with exacerbations, naturally calls for exploration. The point that I would emphasize is this, that many of these cases run an afebrile course and that the absence of temperature is no contraindication to operation.

Local Tenderness.—This is one of the most valuable signs. It must be remembered, however, that in cases in which the mastoid is well developed and of the pneumatic type, and when the cells are superficially located, the mastoid may be exquisitely tender within twelve hours after the inception of an acute otitis. This early tenderness is not an indication for operation. It means merely either a hemorrhagic mastoiditis or a very pneumatic mastoid with the cells filled with serum. Many of these cases, which are tender for a few days after the inception of the attack, recover without operation. The situation of the tenderness depends entirely on the particular topography of the mastoid in the individual case. Large cells at the tip will be exceedingly tender in a few hours. After tympanic drainage has been established, this tenderness will gradually disappear. Antrum tenderness is a much more valuable sign. One sign which I consider particularly significant is a recurrent tenderness; that is, the initial tenderness following the middle ear attack disappears. This tenderness is first found at the tip, and is most severe here. Antrum tenderness is insignificant. Then the mastoid becomes practically insensitive to pressure. In the course of a few days, the tenderness returns and then the tenderness is most marked over the antrum. This is a very significant sign, and ordinarily indicates an involvement of the mastoid which will be relieved only by posterior drainage.

Otoscopic Examination.—The signs found on instrumental examination are, to my mind, the most important of all. These consist of evidence of insufficient drainage of the tympanomastoid space through the small incision in the drum membrane and narrowing of the canal at the fundus, that is, in a persistent bulging of the upper and posterior portion of the drum membrane, together with a sinking of the corresponding adjacent meatal walls. This sign, present ten days after the inception of the acute infection has, in my experience, been an almost pathognomonic indication for operation. Of course, there are exceptions to all good rules, and occasionally this rule has gone wrong in my own experience. I should state, however, that the exception has not occurred in more than 1 per cent. of my cases.

Bacteriologic Examination.—Much information can be obtained by studying the bacteriologic content of the discharge. When the discharge is already present, or in early cases in which an incision of the drum membrane has been performed, it is my invariable practice to make a smear of the aural discharge. While, of course, such a smear shows many organisms, it is usually possible to determine the predominating organism which must come from the middle ear. To cite a case in point, suppose we have a smear with the following report: staphylococci, a large number of bacilli, diplococci, and an occasional chain. This condition would undoubtedly mean one of two things: either a streptococcus infection, or a pneu-

mococcus infection. The staphylococci and the large bacilli are undoubtedly canal contaminations and are consequently disregarded. In every case the bacteriologist should be directed to stain the smear so as to determine the presence or absence of a capsule surrounding the existing organisms. The *Streptococcus capsulatus* is always a dangerous organism and one which almost invariably demands operative interference by the posterior incision. I have already reported thirteen cases of *Streptococcus capsulatus* infection in the middle ear in which the mastoid operation was necessary only in two. Most of these cases however, were drained at a very early date by incision of the drum membrane. All of these cases were in private patients and have been under subsequent observation for years, so that I know that subsequent operation was not necessary in any of these cases. It should be taken, however, as an invariable law that a *Streptococcus capsulatus* infection must be watched with exceeding care and that no such case should be considered safe until the middle ear has returned to a perfectly normal condition, the hearing returned to the standard previous to operation, and all canal signs have absolutely disappeared. I have seen many cases of this kind, both in hospital and private practice, which came to mastoid operation from two to six months after the drum membrane had healed. In these cases the otoscopic picture was sufficient at the time of examination to indicate the necessity of operative interference. In many of my own cases mentioned in the foregoing, drainage through the drum membrane was sufficient to render such interference unnecessary.

The amount of discharge in any doubtful case is an indication for operation. The sudden cessation of discharge, with the canal signs indicative of sudden interference with drainage, is an indication for immediate operation. On the other hand, a very profuse discharge persisting for more than three weeks after incision of the drum membrane is also an indication for operative interference. An acute inflammation of the middle ear which is going to recover after incision of the drum membrane will recover within three weeks from its inception, and usually within ten days. A profuse discharge lasting more than three weeks has, in my experience, always been indicative of the fact that tympanic drainage was insufficient and that the case would do better if posterior drainage were established.

Duration of the Inflammatory Process.—The length of time that the middle ear inflammation has continued is also a valuable factor in determining the necessity for operation. As stated in the previous paragraph, an acute otitis media demanding incision of the drum membrane should clear up within ten days to two or, at the utmost, three weeks. If there is a history of spontaneous rupture of the drum membrane and a purulent discharge lasting for four or five or six weeks, it is much safer to establish posterior drainage at once, rather than to take a possible chance of the process being controlled by milder measures. It is true that some of these patients will recover, that is, that the discharge will stop and the opening in the drum membrane will close. Most of these patients, however, are not cured. There are apt to be subsequent attacks, and an operation will probably be necessary at a later period.

Course Following Acute Symptoms.—The date of the primary attack of acute inflammation in the mid-

dle ear is also important in certain cases seen after apparent recovery has taken place, that is, after all discharge has ceased and the patient comes complaining of certain indefinite symptoms, such as headache, general malaise, loss of flesh, indefinite muscular pains, and other symptoms which seem to indicate an unexplained toxemia. The hearing in these cases is ordinarily much impaired, the ear feels full, and there may be some slight disturbance of equilibrium. The canal signs here are extremely valuable. Those indicated under the previous heading of canal signs will almost invariably be seen in these cases. It is interesting to note that the history of the attack of acute otitis media may be very indefinite. I have seen old cases of this kind, and by that I mean, cases extending over six or seven months, in which the primary earache was slight and the discharge almost negligible, and yet the patient had never been well since the acute otitis. In this class of cases, the duration of the middle ear inflammation, and the symptoms of the patient from the inception of the attack to the time that he is seen by the surgeon, constitute the important facts in the history.

I know of no better means of making a diagnosis in these cases than by taking the history in conjunction with the otoscopic appearances. A middle ear that does not clear up after an acute otitis is a focus of disease—no matter if the drum membrane has healed—and the appearance on otoscopic examination will almost invariably demonstrate this fact. Those cases with few symptoms are frequently cases of *Streptococcus capsulatus* infection and, as in many cases seen in consultation, the bacteriologic character of the discharge has not been determined at the time of the primary attack, this fact should always be borne in mind. I have been so impressed with the importance of cases of this character that it has become my invariable practice in doubtful cases to recommend an exploratory operation. My experience has been, invariably, that this operation was not exploratory, but really was an emergency operation. In other words, I have never failed in a single doubtful case of this character to evacuate pus from the mastoid.

History of Repeated Incisions.—I see, each year, a certain number of cases giving a history of three, four or five weeks' duration, or sometimes three or four months' duration, in which there is a persistent discharge, some pain, and a history of repeated incisions of the drum membrane. It may be taken as a rule to which there are few exceptions that in a case of acute otitis media one single competent incision of the drum membrane will drain the middle ear and adjacent structures perfectly if such drainage is possible through such a small opening. The moment that it is necessary to repeat these incisions, the indication for posterior operation becomes imperative. Repeated incisions of the drum membrane simply relieve temporarily the tension within the tympanomastoid space. This temporary relief is really a great menace to the patient, because hereby the important symptoms of pain and temperature are masked, and both patient and surgeon are deluded into believing that the disease is mending, while in fact the inflammatory process is steadily attacking the deeper structures. I have only one word for repeated incisions of the drum membrane, and that is a word of absolute condemnation.

Impairment of Hearing.—I have said nothing up to this point about the impairment of function of the ear as an indication for operation. Whenever, in a case of acute middle ear inflammation, either with or without solution of continuity of the drum membrane, we find a persistent profound impairment of function, this is in itself an important indication for operative interference. The middle ear, being a small space, should be easily drained by incision of the drum membrane, or, in the milder cases, the secretion resulting from the inflammatory process should be absorbed after a moderate interval of time. If there is sufficient involvement to cause profound impairment of hearing persisting for two or three weeks, this is an indication that the mastoid cells have become so involved that the middle ear drainage alone is not sufficient; consequently posterior drainage is indicated.

Involvement of the Static Labyrinth.—Symptoms indicative of this complication call for prompt operative interference. These symptoms are vertigo and spontaneous nystagmus—usually toward the diseased side, more rarely toward the opposite side. Such symptoms may occur without actual labyrinthine involvement. They usually mean, however, a rather extensive infiltration of the bony structures immediately surrounding the labyrinthine capsule, and operative interference in all such cases is indicated.

Meningeal Symptoms.—Certain symptoms referable to the meninges may occur in obscure cases. By this I mean localized headache—usually indicating an extradural abscess, or severe general headache—a much more dangerous symptom. Spinal puncture helps us in diagnosis in these cases. It should be remembered that a spinal fluid under pressure, with an excess of globulins, and a failure to reduce Fehling's solution, is not necessarily an indication of a general meningitis. Moreover, I have seen a very high cell count in the spinal fluid where a simple mastoiditis alone was present. These signs are an imperative indication for a complete mastoid operation and also for the exposure of a large area of dura about the mastoid wound. They are not necessarily, however, indications of a diffuse meningitis.

Roentgenoscopy.—In all my cases of mastoiditis, roentgenoscopy has been of great value. This is particularly true in those cases in which the history is indefinite—when there is a history of acute otitis occurring several months prior to the time of seeing the patient, then an almost complete cessation of the aural symptoms, and yet on examination the canal presents certain well defined changes. Invariably, in cases of this character, roentgenograms in conjunction with the roentgenographer have enabled me to locate a distinct focus of suppuration within the mastoid, and at operation we have never failed to find the pus in the location shown in the roentgenogram. The value of roentgenograms in the earlier cases is perhaps not as evident. Cases of acute otitis will show a cloudy mastoid within the first ten days. In doubtful acute cases it is only by the study of roentgenograms, taken at intervals of a week or ten days, that we are able to arrive at a definite diagnosis. In the doubtful cases, however, and especially in cases in which the acute symptoms have been slight and when we suspect a *Streptococcus capsulatus* infection (and this has, incidentally, been determined at operation in most of these doubtful cases), the roentgenograms have been of the greatest value.

15 East Fifty-Third Street.

ABSTRACT OF DISCUSSION

DR. JOHN F. BARNHILL, Indianapolis: The variations from the classical course which many mastoid patients take often interest us most, sometimes puzzle us most, and it is of these I wish chiefly to speak. Mastoiditis cases may be divided into three or four classes. One class develops rapidly, often acts very ugly, such as those that sometimes follow an acute infectious disease where the ossicles are swept away, the temperature is high, the hearing is greatly impaired, and the tenderness is marked over the mastoid. There should be no difficulty in the diagnosis of this class. Then we have that more common class of cases which come on following, let me say, a severe attack of tonsillitis, adenoiditis or rhinitis, with earache, rupture and discharge. But the patient does not get on just right. The ear goes on discharging too long. At the end of ten days or two weeks, which the essayist put as the limit, it has not ended in a cure and we begin to ask why, especially, if the discharge is excessive. I agree with Dr. Dench that in any case continuing ten days or two weeks, if the discharge is excessive, it is a positive indication for mastoid operation. So much pus as we frequently see at the end of ten days or two weeks could not possibly come from so small a cavity as the tympanum, but must come, of course, from the mastoid antrum and cells. Then again, we have the class of case that has some, possibly much, discharge from the ear, in which the patient looks septic, his strength is not up to par, he is not able to do the things that he wishes to do. His temperature may be entirely normal; he may sleep seven or eight hours, but often he will waken after midnight with a dull, achy indefinite pain back of the mastoid, which he does not always narrate, but admits on questioning. With the history of continued discharge, of septic appearance of the patient, of increased leukocyte count, the bacteriologic findings in the aural secretion, clearly there is mastoiditis and it is proper to open the mastoid.

Then we have the class of case that we designate anomalous, in which there has not been any discharge from the ear at all, but some aural affection has been going on for quite a while and symptoms have arisen that are not always clear. There often is doubt, but if, with all these symptoms, and with all the tests that we are now able to make, we still have some doubt, it is undoubtedly good surgical practice to perform an exploratory operation.

There are cases in which the differential diagnosis is most important of all. For example, it sometimes is difficult to distinguish between so simple a thing as otitis externa and mastoiditis. I have recently seen such a case.

DR. GEORGE W. MACKENZIE, Philadelphia: In looking over the classical indications we find mentioned pain, temperature, local tenderness, canal signs, bacteriologic examination, amount of discharge, duration of discharge, and so forth. Now, as mentioned by Dr. Barnhill, there are cases in which the temperature runs normally, where there is no tenderness present, where there are practically no canal signs, where the bacteriologic examination of the discharge is impossible because of an intact membrane. These are atypical cases, and are prone to occur in those instances in which the external corticalis is so thick that it is quite impossible for the external periosteum to become affected; hence there occurs no tenderness. In those cases with very thick and resistant external wall we find the greatest variety of complications. How are we to recognize the presence of pus in the middle ear and mastoid in this class of cases, and especially when the membrane is intact? Let us look at the right normal membrane; the anterior margin of the hammer handle is quite sharp, while the posterior margin is not so sharp, because it lies more deeply and not in contact with the membrane. Furthermore, in the case of a normal membrane we are able to distinguish more or less distinctly the long process of the anvil. In the presence of fluid in the cavity, this is not seen. Furthermore, the normal membrane is highly polished and reflects a brilliant cone of light. In the case of secretion behind the membrane, the membrane is rough on the surface, so that we get a dull reflex; there is narrowing of the hammer handle, as the posterior edge of the hammer is obscured by the opaque secretion. An incision of the

membrane in these cases will usually permit of the escape of secretion sufficient for bacteriologic examination.

Two other points I would like to mention. A long time ago I was taught that in case of doubt one should operate. Since then it has become axiomatic with me, so that I might say in nine cases out of ten one will be rewarded by finding sufficient evidence to have warranted the operation. The other point is that if one decides to operate, the operation should be done thoroughly, for in those cases terminating fatally, the necropsy shows that all the sources of infection had not been reached at the time of the operation.

DR. GEORGE F. KEIPER, Lafayette, Ind.: Dr. Dench has given us all the means of diagnosis which we ordinarily use, but there is one which he did not mention, and that is the transillumination of the mastoid by the use of the closed speculum with a window in its side near its tip. This is of great value in arriving at our diagnosis of the condition of the mastoid. I would not, however, rely absolutely on the speculum in order to decide as to the extent of the inflammation. Here comes the question of exploratory operation. Sometimes the otologist is undecided whether to make an exploratory operation. The abdominal surgeon does it every day and feels justified. Why should not we do the same thing? It is an axiomatic conclusion which they have come to—when in doubt they make their diagnosis clear by an exploratory operation, and it is true that 50 per cent. of the patients operated on at the great Mayo clinic are not diagnosed at all until the abdomen is opened.

I want to mention a case in which an exploratory operation was perfectly justifiable. This patient came in complaining of intense tenderness back of the ear. This was before the day when we directed so much attention to pyorrhea alveolaris. I observed the case closely, made a blood examination and had roentgenograms made, and finally, with all the symptoms of a classical case of mastoid trouble, I recommended an exploratory operation. We found an absolutely clear mastoid. What was the matter? We were somewhat chagrined, and yet we had guarded ourselves by saying that this would be an exploratory operation. A few days after that one of the first articles on pyorrhea alveolaris came out, and after reading it I went to this patient and had his teeth examined, and had one tooth extracted, and in a few days the trouble promptly cleared up. In other words, some of our mastoid cases may be due to conditions within the mouth and our examination of our patient should not be complete until we have used all the means of diagnosis to which attention has been directed.

DR. C. R. HOLMES, Cincinnati: I agree that the limit of ten days is all that we should give in mastoid trouble where the symptoms continue as indicated by Dr. Dench. I have taken occasion to experiment by making an exploratory operation early, even down to the third day, and have found that the mastoid was involved, at that early date, although the symptoms were not positive enough for operation. There is no doubt that the mastoid is involved in a very large percentage of all acute ear infections, just the same as the nasal sinuses are involved. We know that in many cases the passage from the middle ear to the antrum is very large. In cases like that the drainage will be free and the trouble may clear up without operation. But we have cases in which there is a small opening, where the mucous membrane itself is closed off, and bacteriologic infection goes on; then, of course, a different procedure will be indicated. The point I wish particularly to call attention to is that early exploratory operation with ordinary aseptic precautions is free from danger and should be performed.

DR. E. B. DENCH, New York: With reference to Dr. Barnhill's remarks, I think sleeplessness is a good point. A patient may present no other symptoms indicative of involvement of the mastoid except that he does not sleep well. In my experience that has been almost always indicative of extradural abscess. It is not invariable, but still it is a valuable symptom.

I am glad the discussants have spoken so favorably about exploratory operations. I think we should perform them more frequently than we do. Dr. Barnhill spoke of the differ-

ential diagnosis between an otitis externa and mastoiditis. I think often the Roentgen ray will clear up the diagnosis.

What Dr. MacKenzie said about the luster of the membrane is perfectly true. In almost all cases that is one of the classical symptoms. The lusterless drum is as surely indicative of acute otitis as the red drum. One discussant spoke of secretion in the middle ear and incision of the drum membrane for diagnostic purposes. The presence of fluid in the middle ear can be determined by catheter inflation quite as well as by incision. In these doubtful cases also, the Roentgen ray will clear up the diagnosis.

As to transillumination, I do not think it is of any use at all. The Roentgen ray does give valuable information, and I think any man would hesitate to operate because the transillumination was cloudy, if he did not confirm that by the Roentgen ray. In all cases in which I have performed operations of this kind and found pus, the Roentgen ray has told me it was there.

As to the teeth in connection with this trouble, I remember that one of my medical students was extremely angry at me because I would not operate on his sister for mastoiditis because she complained of a pain in both ears; but I sent her to a dentist and he found two impacted wisdom teeth. The teeth certainly constitute an important factor in these cases, and I think we should clear them up before we perform any operation. I quite agree with Dr. Holmes as to early operation. I have operated on the second day. It is my experience that in an operation on the mastoid I get more rapid healing if I operate after the cells are thoroughly involved, than if the patient is operated on earlier.

TYRAMIN AS AN ADJUNCT TO MORPHIN IN LABOR *

HENRY GRAY BARBOUR, M.D.

Assistant Professor of Pharmacology, Yale University School of
Medicine

NEW HAVEN, CONN.

The employment of morphin in labor has become frequent in recent years, probably owing to the "twilight sleep" propaganda more than to any other influence. Briefly, morphin exhibits in this connection three important effects, the first desirable, the other two untoward, namely, analgesia, respiratory depression in the child, and delay of labor.

It is unnecessary to review in detail the interesting history of scopolamin-morphin anesthesia, including its rather haphazard introduction by Schneiderlin,¹ its development in obstetrics by the untiring enthusiasm of Gauss,² and its modification by the pharmacologic critique of Bürgi³ (pantopon [pantopium hydrochloricum]), and of Straub⁴ (a morphin-narcotin mixture, used by Siegel,⁵ Libby⁶ and others). Today its practice, so far as justified, is limited to a few who are fortunate enough to possess the combination of unusual facilities and almost superhuman patience.

Since Hatcher⁷ seven years ago pointed out the almost complete lack of theoretical justification for the employment of scopolamin in this connection, little if any new evidence has been introduced in its favor, nor has our knowledge of its obscure pharmacology been very appreciably increased. This is due in part to

unusual difficulties, especially the varied manifestations of scopolamin action, not only in different species but also in different individuals. The unstable character of the alkaloid has further increased the confusion.

In our laboratory, attempts have been made to throw more light on the relation of scopolamin to the three actions of morphin enumerated above.

To study the cerebral effect, Dr. J. F. Cobey has made a number of experiments on mice by the method of Fühner⁸ and found evidence of some synergic action of the two drugs in this respect, supporting the results of Kochmann,⁹ Bürgi¹⁰ and their pupils. The respiratory effects of the scopolamin-morphin combination were tested by Dr. L. L. Maurer on an extensive series of rabbits, but we failed to convince ourselves that morphin depression of respiration is constantly affected by its combination with scopolamin. In a small number of cases the depression was delayed or preceded by acceleration.

Finally, as regards the action of scopolamin and morphin on the uterus itself, Mr. N. H. Copenhaver¹¹ and I were able to show no effect of either or both drugs on that organ, either isolated or in intact anesthetized animals, in doses at all comparable to those which are employed clinically. In unanesthetized animals, however, we¹² were able to show ultimately that small doses of morphin, by an effect definitely located in the cerebrum, tend to inhibit the rhythmic action of the uterus. This point has not been followed with respect to scopolamin.

From the results noted above it will be seen that we could contribute no new theoretical considerations in support of the employment of scopolamin-morphin anesthesia.

The value of morphin itself in labor has, however, been acknowledged by those best fitted to pass judgment. In view of this it would seem that a substance having actions more clearly understood and more desirable than those of scopolamin might be found which could be suitably combined with morphin. Particular effort should, of course, be directed to antagonizing the two most untoward effects of morphin.

The use in this connection of tyramin (para-hydroxy-phenyl-ethyl-amin hydrochlorid) or some related substance was suggested by the studies of Bry.¹³ She pointed out the rather prolonged respiratory effect which tyramin and other phenylethylamin derivatives produce in mammals, and called attention to their oxytocic action which, however, had been noted by Dale and Dixon¹⁴ in their studies of tyramin. Thus the two desired effects, respiratory and uterine stimulation, are exhibited by one substance.

Tyramin is an active principle of ergot, being derived by bacterial action on tyrosin-containing proteins. Its power to raise the blood pressure (associated with a close chemical relationship to epinephrin) has been made use of in therapy in connection with shock, for example by Clark¹⁵ and Hoyt.¹⁶ This point deserves more attention because of the advantages which this substance possesses over epinephrin in

* The researches reported in this paper were encouraged by grants from the Committee on Therapeutic Research of the Council on Pharmacy and Chemistry of the American Medical Association.

1. Schneiderlin: *Aerzt. Mitt. a. und f. Baden*, 1900, **54**, 101.
2. Gauss, C. J.: *Arch. f. Gynäk.*, 1906, **78**, 579.
3. Bürgi, E.: *Deutsch. Ztschr. f. Chir.*, 1913, **125**, 211-256.
4. Straub, W.: *Biochem. Ztschr.*, 1912, **41**, 419.
5. Siegel, P. W.: *München med. Wehnschr.*, 1913, **60**, 2280.
6. Libby, W. E.: *Scopolamin and Narcophin Seminarcosis During Labor*, *THE JOURNAL A. M. A.*, May 22, 1915, p. 1728.
7. Hatcher, R. A.: *Scopolamin and Morphin in Narcosis and in Childbirth*, *THE JOURNAL A. M. A.*, Feb. 5, 1910, pp. 446-516.

8. Fühner, H.: *Deutsch. med. Wehnschr.*, 1913, **39**, 143.

9. Kochmann, M.: *Ztschr. f. exper. Path. u. Therap.*, 1913, **12**, 328.

10. Bürgi, E.: *Deutsch. med. Wehnschr.*, 1910, **36**, 20.

11. Barbour, H. G., and Copenhaver, N. H.: *Jour. Pharmacol. and Exper. Therap.*, 1915, **7**, 529, and Barbour, H. G.: *Ibid.*, 1915, **7**, 547-555.

12. Barbour, H. G., and Copenhaver, N. H.: *Proc. Soc. Exper. Biol. and Med.*, 1916, **13**, 159.

13. Bry, G.: *Ztschr. f. exper. Path. u. Therap.*, 1914, **16**, 186.

14. Dale, H. H., and Dixon, W. E.: *Jour. Physiol.*, 1909, **39**, 25.

15. Clark, A.: *Biochem. Jour.*, 1911, **5**, 236.

16. Hoyt, D. M.: *Am. Jour. Med. Sc.*, 1912, **144**, 76.

eliciting a more prolonged response and in lending itself readily to subcutaneous injection.

In seeking a morphin antagonist we first investigated a series of phenylethylamin derivatives in the hope of finding one even more suitable than tyramin. Dr. L. H. Nahum found, however, that tyramin hydrochlorid is but one tenth to one fifth as toxic as the hydrochlorids of phenylethylamin itself, and its simpler benzyl derivatives (kindly prepared for us by Prof. T. B. Johnson of Yale).

Adopting tyramin, therefore, as the most promising substance available, Dr. Cobey studied its effect on morphin narcosis in mice, and concluded that any influence which it might have on the cerebral action of this drug was probably negligible.

Dr. Maurer¹⁷ then investigated the respiratory volume and the condition of the respiratory center in rats subjected to various doses of tyramin and morphin, alone and combined. He was able to demonstrate very clearly an antagonism between the two substances which was best exhibited when they were administered in the ratio of approximately three parts of tyramin to one of morphin. Most significant was the observation that the respiratory action of the morphin often remained in abeyance during a period when marked analgesia was present.

We next transferred these studies to man, and have, in collaboration with Dr. W. C. von Glahn,¹⁷ corroborated the antagonism in five normal individuals. We concluded that doses of from 40 to 50 mg. of tyramin administered simultaneously with a therapeutic dose of morphin (16 mg.) will completely antagonize the depressant action of morphin on the respiration. The respiratory stimulation produced by tyramin is probably indirect and due to an augmentation of oxidative processes, for the drug has a tendency to increase the respiratory exchange.

The uterine action of tyramin, which has been elicited in laboratory animals by Dale and Dixon,¹⁴ Guggenheim¹⁸ and others, was first demonstrated on the excised human uterus by C. C. Lieb.¹⁹ Hitherto it has not been satisfactorily investigated in the obstetric clinic. Heimann,²⁰ Zimmermann,²¹ Jäger²² and Krosz²³ all employed doses which were far too small (maximum 2 mg.) to be effective. In the last three cases the issue is confused by the combination of tyramin with histamin. Even Kehrer's²⁴ employment of from 10 to 20 mg. intramuscularly, and Sharp's²⁵ use of 30 mg. subcutaneously may scarcely be considered a fair test.

The employment of tyramin-Roche in effective doses as an adjunct to morphin is now under investigation by Dr. C. L. Deming on carefully selected cases of normal labor in the obstetric clinic of Dr. J. M. Slemons at Yale. The number of cases thus far has been too few to justify broad statements. It may, however, be said that the laboratory data are being well corroborated. The dosage employed is 16 mg. of morphin sulphate given hypodermically in solution with 40 mg. of tyramin. In the absence of contraindications, this injection is given when discomfort becomes marked in the first stage of labor.

Analgesia appears to be as complete as though the same dose of morphin were given alone.

The respiratory rate of the mother becomes slightly increased rather than decreased, and usually remains somewhat accelerated throughout. The condition of the children has been quite satisfactory, no tendency to asphyxia having been observed. In every case the frequency of the uterine contractions has been increased within five minutes after the injection, and this augmented activity maintained throughout. The increase has usually been from five minute intervals to intervals of about two minutes with an augmentation, temporarily at least, in the strength of individual contractions. Forty mg. of tyramin produce a temporary rise in blood pressure usually amounting to 20 to 25 mm.; this seems to be negligible in normal cases, but should be borne in mind and followed closely.

It is hoped that more complete data can soon be offered, but there seems in the meanwhile no objection to the employment of tyramin and morphin by those obstetricians, and only those, who are thoroughly versed in the use of morphin in labor.

A STUDY OF LOW BLOOD PRESSURES ASSOCIATED WITH PEPTONE SHOCK AND EXPERIMENTAL FAT EMBOLISM *

J. P. SIMONDS, M.D.

CHICAGO

Two very widely used methods of inducing a condition of low blood pressure in animals, simulating that observed in surgical shock in man, are peptone poisoning and fat embolism. It may not be amiss at this time to emphasize certain fundamental differences in the character of the low blood pressures brought about by these two methods. The details of the experiments which have been made on dogs in this laboratory will be published later.

1. After the injection of peptone, the fall in the blood pressure is very rapid, the lowest level being reached usually within thirty seconds. In fat embolism, even when relatively large amounts (up to 50 c.c.) of olive oil are rapidly injected into the femoral vein, the fall in blood pressure is much more slow, frequently requiring several minutes to reach the minimum.

2. If a nonfatal dose of peptone has been injected, recovery of the animal and the rise of blood pressure to its normal level are much more rapid than in the case of fat embolism, even when small amounts of olive oil are used.

3. In fat embolism, the toxic effect of ether appears to be markedly intensified. The continued administration of an amount of ether which, before the production of fat embolism, just suffices for thorough general anesthesia, causes, after the injection of olive oil, the respiration to become increasingly shallow and slow. Unless the ether is greatly reduced in amount or withdrawn entirely for a few minutes, the animal quickly dies of respiratory failure while the heart action is still relatively strong. This phenomenon has not been observed in peptone shock.

4. In peptone poisoning, the greater part of the blood is accumulated in the liver and in the veins of

17. Barbour, H. G.; Maurer, L. L., and von Glahn, W. C.: *Jour. Pharmacol. and Exper. Therap.*, 1916, **8**, 124.

18. Guggenheim, M.: *Therap. Monatsh.*, 1912, **26**, 795.

19. Lieb, C. C.: *Am. Jour. Obst.*, 1915, **71**, 209.

20. Heimann: *München. med. Wchnschr.*, 1912, **59**, 1370.

21. Zimmermann, R.: *München. med. Wchnschr.*, 1913, **60**, 2675.

22. Jäger, F.: *München. med. Wchnschr.*, 1913, **60**, 1714.

23. Krosz: *Zentralbl. f. Gynäk.*, 1913, **37**, 1507.

24. Kehrer, E.: *München. med. Wchnschr.*, 1912, **59**, 1831.

25. Sharp, J. G.: *Proc. Roy. Soc. Med.*, 1911, **4**, 114.

* From the Department of Pathology of Northwestern University Medical School.

the splanchnic area. The right side of the heart is not distended with blood. In fat embolism, on the other hand, the right auricle and ventricle are dilated. There is a general venous stasis. The accumulation of an excessive amount of blood in any one region or organ is apparently due largely to the effect of gravity. Thus, if the foot of the board to which the animal is fastened is elevated, the intracranial sinuses are found at necropsy to be greatly distended with blood. This can be demonstrated by attempting to remove the brain before opening the thorax and abdomen.

This difference in the distribution of the blood in the body is to be expected. In peptone shock, the low blood pressure is due to a loss of tonus in the vessels of the splanchnic region, the vascular area of the lungs being undiminished. In fat embolism, the passage of the blood through the lungs is mechanically interfered with, the vascular tonus in the splanchnic region and elsewhere remaining normal.

5. Edema of the lungs appears to be a fairly constant accompaniment of fat experimental embolism, but has not been encountered in any marked degree in peptone shock.

6. In previous papers,¹ attention was called to the exaggerated reaction to nicotin frequently observed in dogs in peptone and anaphylactic shock. This marked rise in blood pressure was obtained only when the nicotin caused a temporary dyspnea. It was suggested in explanation of this phenomenon that the rise was due to the mechanical effect of respiratory suction on the reservoir of blood in the liver, and not to any direct action of the nicotin on the vasomotor apparatus itself. It was also suggested that this mechanical effect of dyspnea might be of value in the treatment of any condition of low blood pressure in human patients in whom there was a large reservoir of blood in the liver. Blood accumulated in this organ can be drawn into the right side of the heart by respiratory suction because the veins involved do not readily collapse. The walls of those in the liver are better supported than those in the neck, for instance. The distance between the right auricle and the point of entrance of the hepatic vein into the inferior vena cava is short. The vena cava here is wide, and its walls are supported and prevented from collapsing by the central tendon of the diaphragm through which it passes and to which it is attached.

Porter² has observed that in fat embolism, the induction of deep and rapid respiration brought about by increasing the carbon dioxid in inspired air leads to a rise in blood pressure of from 15 to 30 mm. of mercury. Although I have not used carbon dioxid, I have, in a number of experiments, observed such a rise in blood pressure when the rate and depth of respiration were increased from any cause.

Hence in both peptone poisoning and experimental fat embolism, dyspnea causes a rise in blood pressure. But there are certain important differences in the character of the rise in the two conditions. 1. In peptone shock, the rise is sharp, and the pressure tends to drop almost to its former low level as soon as the respiration becomes normal; in fat embolism, the rise is gradual and more sustained. 2. In fat embolism, the same rise in blood pressure is seen as a result of the rapid respiration, which can hardly be called dyspnea, that follows removal of the anesthetic and

the partial recovery of the animal from its effects. 3. A rise is also readily induced by vigorous artificial respiration by means of a bellows, an operation which actually produces a positive intrathoracic pressure. Neither of these methods has produced a rise in pressure in any animal in a condition of peptone shock.

In view of these marked differences in the character of the rise in blood pressure that follows the induction of dyspnea in peptone shock and experimental fat embolism, respectively, it may be suggested that the mechanism in the two cases is quite different. The probable mechanism in peptone shock has been set forth in the papers referred to.¹ There is evidence, which will be presented in detail later, that, in fat embolism, dyspnea and vigorous artificial respiration (with a bellows) act by aiding in the mechanical dislodgment of fat droplets from the capillaries of the lungs. This increases the vascular area available for the passage of blood from the right to the left side of the heart and thence into the general circulation. This may not always be an unmixed advantage, however, for it may lead to fat embolism of the brain, and death.

SERUM THERAPY FOR TRICHINOSIS*

BENJAMIN SCHWARTZ, B.A., M.A.

WASHINGTON, D. C.

In a recent paper, Salzer¹ records some observations and experiments with reference to trichinosis. Among other things he reports successful results with serum therapy and states emphatically that the injection of immune serum has both a prophylactic and a curative value. Briefly stated, Salzer's claims with respect to "immune serum" are as follows:

1. Animals fed with infected meat later than twenty-four hours after the administration of serum from a convalescent animal prove to be immune.

2. Infected meat mixed with immune serum does not produce trichinosis in animals to which it is fed.

3. Immune serum injected into animals suffering with the disease produces a curative effect.

The first two statements are fairly clear and easily subject to experimental verification. The last statement is obscure. One might suppose a curative action would involve destruction of the parasite. The author, however, does not indicate that the parasite itself is destroyed, and rather gives the impression that the curative effect is to be judged by the disappearance of the principal symptoms of the disease, a criterion not yet shown to be applicable in cases of experimental trichinosis.

In order to procure data on the effects of supposed immune serum on the resistance of animals to trichinosis, I performed the following experiment:

Serum was obtained from a rabbit about four months after the disease had been experimentally produced. A postmortem examination of the animal after the drawing of the blood revealed a moderate infection with encysted trichinae. The blood drawn from the rabbit was placed in an ice-box, and on the following day two guinea-pigs were injected subcutaneously with 1 c.c. and 2 c.c. of the serum, respectively. Forty-eight hours after the injection, the animals were for-

* From the laboratory of the Zoological Division, Bureau of Animal Industry, United States Department of Agriculture.

1. Salzer, B. F.: A Study of an Epidemic of Fourteen Cases of Trichinosis with Cures by Serum Therapy, *THE JOURNAL A. M. A.*, Aug. 19, 1916, pp. 579, 580. Salzer also presented a report of his experiments at a meeting of the New York Academy of Medicine, the minutes of which are published in the *Medical Record*, New York, 1917, 91, 261.

1. Simonds, J. P.: A Study of Low Blood Pressure Not Associated with Trauma or Hemorrhage, *Arch. Int. Med.*, December, 1916, p. 848; *Anaphylactic Shock in Dogs*, *Jour. Infect. Dis.*, 1916, 19, 746.

2. Porter, W. T.: *Boston Med. and Surg. Jour.*, 1917, 176, 699.

cibly fed small quantities of trichinous meat. A salad consisting of lettuce and infected meat was also fed the following day. Fifteen days after the first feeding one of the animals was killed, and its diaphragm was compressed between two thick slides and examined microscopically. Numerous larvae were found in the fluid surrounding the muscle, showing conclusively that the serum had no effect on the normal migrations of the larvae. The second guinea-pig was killed twenty-nine days after the first feeding, and the muscles were found to be heavily infested.

Another experiment bearing on the prophylactic effect of immune serum was performed as follows:

Blood was drawn from a guinea-pig two months after the first feeding with trichinous pork. After the drawing of the blood, the animal was examined and the musculature found to be heavily infested. The day following the drawing of the blood, 2 c.c. of the serum were injected subcutaneously into a sound guinea-pig. Two months later this guinea-pig was fed trichinous meat. The animal died twenty-one days after feeding, and on examination the muscles showed a heavy infestation with the parasites.

From the foregoing results it is evident that the administration of serum from a convalescent animal did not produce any prophylactic effects, but, on the contrary, animals after injection with serum readily became infested when fed trichinous meat, and the life cycle of the parasite did not deviate from its usual course.

In order to determine whether "immune serum" has any effect on the development of the parasites when administered after the feeding of trichinous meat, the following experiment was performed:

Two guinea-pigs were fed trichinous meat, and two days after feeding, injected subcutaneously with 1 c.c. and 2 c.c. of serum, respectively, from the rabbit mentioned in the first experiment. The serum was injected three days after the drawing of the blood from which it was obtained. It was kept in an ice-box until used. One of the animals died twenty days after the feeding, and its muscles were found to be heavily infested with trichinae. The second animal was killed thirty-one days after feeding, and yielded similar results.

If Salzer's contention with regard to the prophylactic value of immune serum is to be sustained, it would seem that animals convalescent from the disease should not be liable to a fresh infection.

I exposed rats suffering with trichinosis to a supplementary infection by feeding them a second time with trichinous meat about thirty-five to forty days after the first feeding. In order to make absolutely certain that there would be no confusion between the parasites of the first and second infection, the animals were killed within five days after the second feeding, and the intestinal contents were examined. In all cases it was found that the parasites of the second infection had increased in size, and in some cases had already copulated, and that the uteri of the females were full of eggs. The intestinal parasites from the first infection could readily be distinguished from the more active younger parasites by their sluggishness, and by the presence of larvae in the uterus of the females.

Salzer's contention that infected meat mixed with immune serum does not produce trichinosis in animals to which it is fed was tested a number of times, serum being used from animals at various stages of the disease. The experiments are described below:

EXPERIMENT 1.—A guinea-pig was bled fourteen days after an experimental infection with trichinosis. A postmortem examination revealed numerous parasites in the blood. The serum from the blood kept over night in an ice-box was thoroughly mixed with trichinous meat and lettuce in the form of a salad and fed to two guinea-pigs. The animals

were killed a month after feeding, and though one was negative, the other showed a very heavy infestation. As the two animals were kept in one cage, one of them probably failed to eat any of the salad and thus escaped the disease.

EXPERIMENT 2.—Twenty days after experimental infection, blood was drawn from a rabbit and mixed with trichinous pork. Subsequent postmortem examination of the rabbit revealed a heavy infection. The meat mixed with serum was fed to two rats, one of which died nineteen days after feeding and was found to be heavily infested. The second rat died fifty days after feeding and was likewise found to be very heavily infested.

EXPERIMENT 3.—Serum was obtained from a rabbit seven weeks after infection and after it was kept over night in an ice-box was mixed with trichinous meat. Subsequent postmortem examination of the rabbit revealed a heavy infestation. The meat mixed with serum was fed to four rats kept in one cage, and only one of the rats became infected. This one showed a very heavy infestation. The negative result with the other rats, as in the case of the guinea-pigs referred to in Experiment 1, was probably due to a failure to eat the meat.

EXPERIMENT 4.—Serum was obtained from a guinea-pig two months after experimental infection, and, after it had been kept over night in an ice-box, was mixed with trichinous meat. Subsequent postmortem examination of the guinea-pig revealed a heavy infestation. The meat mixed with serum was fed to three rats, all of which became infested.

In the foregoing experiments it was found that serum from an animal during the active stage of the disease, or during convalescence when mixed with trichinous meat which is fed to a suitable host, had no effect on the parasites and did not interfere with their developmental cycle. This appears to be directly contrary to Salzer's assertion that trichinous meat mixed with immune serum fails to produce trichinosis.

The direct effect of serum on the larvae was tested a number of times. Trichinous meat was subjected to artificial digestion, and the parasites freed from their cysts were washed in a physiologic sodium chlorid solution, taken up in a capillary pipet and placed in pure serum and in mixtures of serum with various physiologic sodium chlorid solutions. In no case did the serum have any ill effect on the larvae as far as could be ascertained by direct examination. When kept at room temperature, the larvae in the serum succumbed more readily than larvae kept in a 0.7 per cent. sodium chlorid solution, but this was undoubtedly due to the development of bacteria in the serum. The results were similar with "immune" and normal serum. When subjected to a higher temperature (37 C.) in an incubator, the larvae in the serum and salt solution mixture showed even greater resistance than the larvae in a salt solution without serum, and were still alive and active when the latter were dead. This was doubtless due to the more favorable environment offered by the serum and salt solution mixture.

SUMMARY

1. Serum from animals convalescent from trichinosis when injected into other animals did not produce immunity to trichinosis in the latter.

2. Trichinous meat mixed with serum from animals during the active or convalescent stage of the disease proved to be still capable of producing the disease.

3. Animals once infected and harboring trichinae in their muscles were not immune to further infection when fed trichinous meat.

4. Serum from a trichinous animal had no observable ill effects on the larvae freed from their cysts by artificial digestion.

5. None of the results of the experiments appear to be in harmony with the assertions made by Salzer (1916, 1917) concerning the value of serum from convalescent animals as a prophylactic or curative agent in trichinosis.

THE NECESSITY OF A PURE RAW MILK*

HENRY DWIGHT CHAPIN, M.D.

NEW YORK

Goethe once remarked that blood is a very peculiar juice. We can say the same of milk. Modern physiologic researches have shown that certain glands and secretions of the body have much larger functions than have hitherto been assigned to them. We need only refer to the internal secretions of various glands, formerly unrecognized, that are now known to exert a marvelous influence not only on physical life, but on mental development as well.

These facts have led us to give a closer scrutiny to the more familiar fluids of the body, of which milk is one of the best known, as it constitutes the universal food for the young of all mammalia. From a nutritional standpoint it is recognized as a complete food, containing in itself all the elements required to support life.

While each species of mammalian young is perfectly nourished by the milk of its own mother, the food elements are present in varying proportions in different species, this depending largely on the rapidity of growth of the offspring. But milk is a complicated fluid, with more than one function to perform. This must always be borne in mind when heat or other agents are brought to bear on it. *As a general rule, the less milk is manipulated and the closer it is kept to its natural state, the better it will serve the ends for which it is intended.* Any factor that tends to alter in any way the physical or vital character of milk must be considered as important, and possibly, under certain conditions and in certain ways, may not be of advantage. Some of Nature's foods are evidently intended to be taken in a raw state, as is shown by a certain failure in nutrition which follows when they are subjected to prolonged drying or heating.

There is one familiar but remarkable characteristic of all milks. When collected from the mother they are always in fluid form, but as soon as taken into the stomach of the young, they become more or less solid. This is due to a process of coagulation that takes place in only one of the ingredients—the casein—but which thus always alters the form of the ingested milk. While the carbohydrates and fats in their composition and reaction to the digestive secretions are a good deal alike in different milks, the proteins are essentially different. It is further to be noted that coagulation of the protein of milk takes place in different degrees in the different species.

We are now led to two queries: (1) What is Nature's object in presenting a fluid that always coagulates in the stomach receiving it, and (2) Why do the milks of different species coagulate in different ways? An answer will be found in studying the relation between the milk and the digestive tract that is destined to receive it. While a certain portion of the protein

of all milks coagulates on coming in contact with rennin or rennin and acid, the manner and extent of the coagulation will stand in a direct relation to the proper evolution of the digestive tract of the animal.

Although there are many grades of coagulability in the milks of different animals, we may for practical purposes distinguish three of these grades and consider their significance. The protein may coagulate in a solid, gelatinous or flocculent manner. In the ruminant, herbivorous animals, such as the cow, sheep or goat, the protein coagulates in tough, solid masses that cannot readily escape from the stomach. In these animals, digestion is always largely gastric and the stomach forms 70 per cent. of the digestive tract. Later on, this stomach will be called on largely to digest tough, stringy masses of hay and straw, and the previous exercise on the tough curds of milk develops it for this future work.

In the nonruminant herbivora, such as the mare and the ass, the protein coagulates in gelatinous masses that can easily leave the stomach. There is an object in thus passing the curds quickly along, as in this class of animals digestion is largely intestinal, and the intestine forms about 90 per cent. of the digestive tract. Later on, grasses and grains must be largely digested in the intestinal portion of the tube, and the curd is here also especially adapted to develop a certain part of the intestinal tract for its future work.

In human milk the curd is thrown down in flocculent masses, a form intermediate between the solid and gelatinous types of curd previously noted. While digestion begins in the stomach, it is largely carried on and completed in the intestine, and the stomach forms only about 20 per cent. of the digestive tract. The curd is thus adapted to start the development and motility of the stomach, and finishes by instituting these functions in the bowel, which is destined to play a prominent part in digestion. Here again the curd, as far as *form* is concerned, furnishes, to a certain extent, an analogue and precursor of the future food of the infant. The curd forms small, flocculent masses, and the food must be separated later into small particles by chewing before digestion can take place to the best advantage.

It thus seems to be a law that the coagulation of the protein of milk always takes place in such a manner as most readily to adapt the digestive tract for its future work, as this function needs special preparation. While a certain amount of protein is present in the milk of all animals and is necessary for tissue building and growth, this protein must not only be coagulable, but must curd in a certain specific way in each species of animal for the proper evolution of their digestive tracts.

To realize what a divergence in the digestive functions has been taking place during the suckling period, imagine an infant, a kitten and a calf all being fed successfully on cow's milk. Here it is evident that at the very beginning of life the difference in their digestive processes is not very great; but wait a year until all three have passed the suckling period. The infant will be just beginning to eat soft food, the kitten will have developed so that it can eat flesh and bones, and the calf will be thriving on grass and hay. In one short year the development and divergence of their digestive tracts has been so great that the natural food of the calf is then wholly unsuited to the kitten or the infant, yet the chemist will find that the food of all three at this time contains the same basic nutritive elements as

* Read before the American Association of Medical Milk Commissions, Brooklyn, June 2, 1917.

it did at birth. Milk is thus a food especially adapted for a digestive tract that is rapidly changing in form and function, and the differences in the digestive properties of the milks of various species are for real and specific purposes.

As nutrition is the basis of all physical life, we see how important a function milk performs at the very beginning of existence in developing and preparing the digestive tract of each species so that it can digest and assimilate food that must nourish it in later life. We must thus emphasize the fact that milk through one of its proteins has a *developmental* as well as a nutritive function to perform.

In addition to the curding protein, an interesting fact in reference to the other protein of milk has recently been discovered: that lactalbumin has the power of increasing the efficacy of other proteins when combined with them. This forms another example of the power of one physiologic substance to activate another.

Since the discovery of the importance of the amino-acids, whose combination forms the various kinds of proteins, much study has been devoted to investigating the part each one plays in nutrition. It has been found that the albumin of the milk contains substances which cause growth, and that as small a proportion as 25 per cent. of milk albumin added to a protein that does not produce growth has the power of inducing normal growth, while one-half casein is incapable of producing such normal growth. It is important to appreciate the recent discovery that not all proteins are growth producers. Thus lysin and tryptophan are amino-acids essential to growth, which will not take place in their absence. Corn proteins will not in themselves produce growth. The astonishing fact has been established that of two mixtures containing the same quantities of protein and the same number of calories, one may produce twice the amount of growth in the same time that the other mixture will produce, if from one fourth to one third of the mixture is milk albumin. Soy bean protein and milk albumin are nearly alike in this growth-producing effect.¹

We must recognize the fact that "protein" is an indefinite term and that the same amount of protein and the same number of calories from different sources may have very different food values, and that the form or physical condition of the food may at times be as important as its composition and caloric value. It has been found that young animals cannot thrive unless their food has a certain bulk, and the food on which the young not only fail to do well but which causes death quickly becomes suitable if wet blotting paper is fed with it. In other types of animals, chopped straw added to the feed produces the same good effect.

In the giving of cow's milk to infants as a substitute food, we must consider the physiologic effects of any changes that may be effected by heat or other agents. Milk is a physiologic fluid, not merely a mixture of fats, proteins, carbohydrates, mineral matter and water, or a combination of protein matter and calories. As more is learned of its properties, the greater will be the demand for raw milk in the treatment of various nutritional defects. We must always remember that physical changes may interfere with some physiologic function. Pasteurization of milk, or boiling it, not only destroys bacteria but also produces a different type of curd and changes the form of the lactalbumin. These results may be beneficial, or at least not harm-

ful in many cases, but physicians are called in to manage the minority that frequently require special adaptation of their food, and it is for just such cases that a supply of good raw milk may be of benefit. The effect of heat on the curd will depend on the temperature, and time of subjection to various degrees of heat. Prolonged heat may not only coagulate the albumin but also destroy the vitamins. For this reason it is wise to add fruit juices to the diet when heated milk is given to the infant for a long time. Many babies who do not thrive, or cease to thrive, on heated milk do well on a change to raw milk.

The desirability of pasteurizing milk that is handled carelessly or in large bulk is not here called in question. It is a safeguard that should be generally applied. While the mass of population is entitled to a supply of milk for ordinary household purposes that is free from contamination and from pathogenic bacteria, and while heating or pasteurizing milk will destroy these bacteria, it is going much too far to insist that all milk shall be thus treated and that no raw milk shall be available for use because it may be dangerous under some circumstances. Granting that raw milk may become dangerous, it does not necessarily follow that it may not be employed with advantage, or that its use may not be properly controlled.

It is true that the best raw milk can be quickly contaminated by careless handling in the home. The same is true, only in greater degree, of pasteurized milk. A false sense of security may lead to absence of all precautions, and very harmful changes may take place in such milk without any very objectionable manifestations, such as souring, to give warning of the change. In not a few cases there is no proper oversight of pasteurization, which may be very imperfectly performed and the protection may thus exist largely in name only. The medical profession and the milk producers and dealers should combine in a campaign of education of the public as to the proper handling of milk in the home. This would in itself solve a good part of the milk problem. The housewives should be impressed with the necessity of keeping milk of all grades both cool and clean. The importance of this subject should be emphasized by this association, as the full benefits of certified milk will not be obtained unless extra care is employed all along the line.

Many of the data regarding the necessity of pasteurizing all the milk supply have been derived from European sources. Ice has always been scarce in Europe, and hence the icing of milk is not the usual practice. Milk is thus unfit to give unless heated, as this is the only practical way of keeping it. Milk that is clean and cool from the start and kept in this condition until it reaches the consumer is a different proposition. There is a large and widening field for milk produced and handled in this way. It occupies a field of its own that cannot be displaced by any other kind of milk.

The constantly broadening knowledge of nutrition that is resulting from chemical studies and from animal feeding experiments should be a warning against passing laws that will prevent progress, and no regulations should be tolerated that will put normal, physiologic milk beyond the reach of physicians and the public at large. Certified milk, produced with scrupulous care, under the oversight of a reliable medical commission, and then properly handled in the home, is the ideal solution of the milk problem, at least as far as the delicate infant or invalid is concerned.

1. Osborne, T. B., and Mendel, L. B.: Jour. Biol. Chem., 1917, 29, 69.

A CASE OF SYRINGOMYELIA

WITH REPORT OF OPERATION *

EDWARD D. FISHER, M.D.

NEW YORK

History.—J. P. M., man, aged 35, American, a clerk by occupation, whose mother died of carcinoma, denied venery and alcoholism, and does not remember of having been ill.

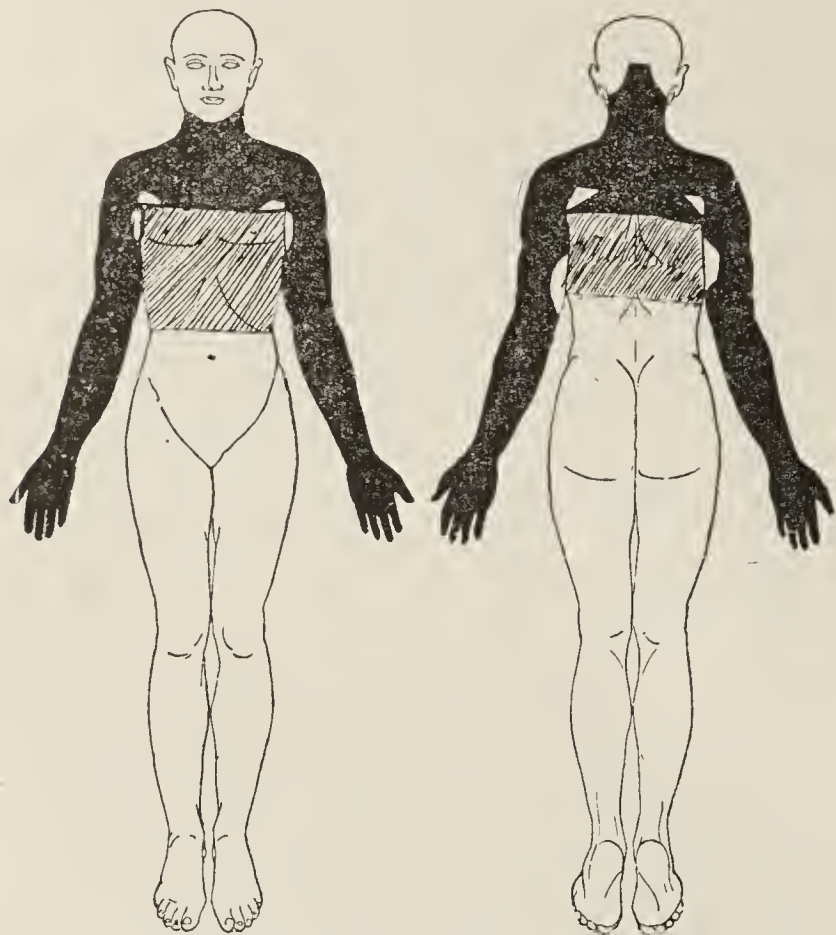


Fig. 1.—Anterior aspect before operation: dark shading, loss of pain and temperature sense; light shading, hypalgesia and therm-hypesthesia.

Fig. 2.—Posterior aspect before operation: dark shading, loss of pain and temperature sense; light shading, hypalgesia and therm-hypesthesia.

In 1905 he was thrown heavily to the ground in a football game, being rendered unconscious for sixteen hours and sustaining a fracture of the right femur. There was no escape of arachnoid fluid from the ears, nose or mouth. After having been eight weeks in bed and attempting to get about, he noticed that he could not walk on account of a paretic condition in his legs. At that time there was no subjective sensory disturbance in the lower extremities. Soon, however, a numbness and tingling sensation made their appearance in the upper extremities and back of the left ear. There was no perceptible impairment of the motor power in the upper extremities. The paresis in the legs improved within a few days, and the sensory disturbances in the arms disappeared within two months, while that behind the left ear remained, and still persists. In this fair condition of health he remained until 1910, when paresthesias in the arms appeared, culminating soon in complete loss of sensation, gradual loss of power, with wasting, especially in the muscles of the forearms. During 1911 he had a series of six epileptiform seizures within two days, with complete loss of consciousness and biting of tongue. No aura preceded the attacks. So far as the patient is able to learn, the attacks were generalized throughout the whole body. The convulsions lasted from ten to fifteen minutes. After a week's interval he again had an attack and one week later another one, similar to the original ones. Immediately after these attacks he became hypersensitive to touch and pain between the shoulders. The numbness, wasting and loss of power in his arms gradually grew worse till 1914, when he became completely paralyzed in both upper extremities. Early in

1915, a motor weakness manifested itself in his legs, his gait became somewhat spastic and staggering, especially pronounced when under mental stress as a result of fright. He would then experience great difficulty in walking. Yet there was no subjective sensory disturbance.

Examination.—Feb. 7, 1916, he was admitted to Bellevue Hospital to the service of Dr. George D. Stewart. Examination revealed a complete flaccid paralysis of the upper extremities with considerable wasting of the muscles of the forearms; there were some spasticity and motor weakness in the lower extremities. None of the cranial nerves were involved.

The reflexes of the upper extremities were abolished; those of the abdomen and lower extremities were markedly exaggerated, and there was a double ankle clonus and Babinski's reflex.

Sensation was tested, April 24, 1916, and is outlined in Figures 1 and 2. There was complete loss of touch, pain and temperature sense in both upper extremities and chest and neck up to the fifth ribs, corresponding to the lower six cervical and first, third and fourth dorsal segments of the cord. There was also a zone of hypalgesia and hypesthesia on both aspects of the chest between the fifth and eighth ribs, corresponding to the fifth, sixth, seventh and eighth dorsal segments. In addition, there was a line of marked hyperesthesia of about 2 inches in width along the vertebral columns between the sixth cervical and eighth dorsal vertebrae.

The Wassermann test of the blood serum gave five units, February 12, and negative, March 23, 1916; that of the spinal fluid was negative, March 28, 1916. The cell count of the spinal fluid was: seven cells per cubic millimeter, all mononuclears; globulin, faintly positive.

In view of these findings, a tentative diagnosis of a cord tumor was made, probably a glioma, and operation was decided on.

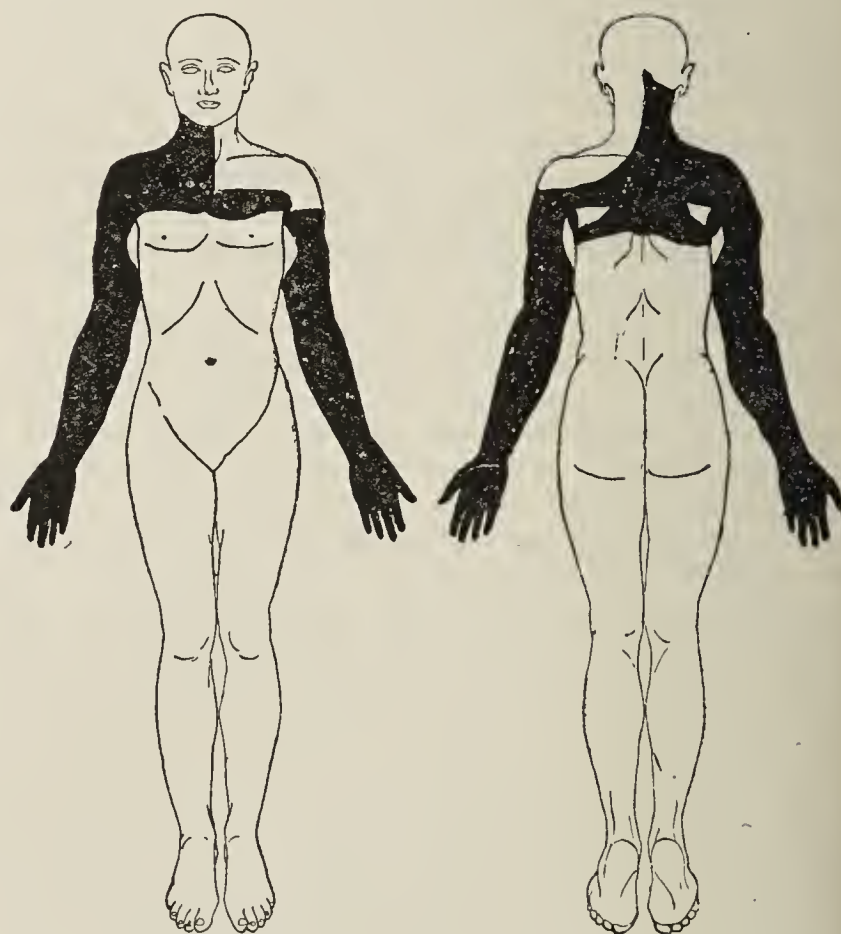


Fig. 3.—Anterior aspect after operation: dark shading, loss of pain and temperature sense.

Fig. 4.—Posterior aspect after operation: dark shading, loss of pain and temperature sense.

Operation and Result.—The patient was operated on by Dr. Stewart, May 4, 1916. The central canal was found enlarged and a probe could be passed upward and downward.

The flaccid paralysis of the upper extremities still persists, but the patient is able to flex the fingers somewhat. The wasting is quite marked in the entire extremities. Otherwise the patient is physically improved. The eyegrounds are normal.

* Read before the Section on Nervous and Mental Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

The reflexes of the upper extremities are completely abolished. The abdominal reflexes and those of the lower extremities are exaggerated. There is a double ankle clonus and Babinski's reflex. The pupils are small, equal and regular; the response to light is sluggish, especially in the right pupil; accommodation is good in both.

Sensation of the anterior and posterior aspects on the right side is as shown in Figures 3 and 4. There is complete loss of touch, pain sense in the arm and the chest corresponding to the lower six cervical and first, third and fourth dorsal segments of the cord. On the left side there are complete anesthesia and analgesia in the arm and part of the chest corresponding to the lower four cervical and first, third and fourth dorsal segments. There is also a hypesthesia on the face corresponding to part of the right second cervical segment. The thermanesthesia is complete on both aspects of the neck and chest as far down as the sixth ribs.

The left pronator radii responds to a strong faradic current. All other muscles of both upper extremities do not respond to faradic current, and show a complete reaction of degeneration.

46 East Fifty-Second Street.

ABSTRACT OF DISCUSSION

DR. I. ABRAHAMSON, New York: We had a similar case at the Montefiore Home. The provisional diagnosis was a central tumor of the cord. An unusual feature of our case was the existence at the level of the lesion of an action myotonia, that is, a spinal type of myotonia. At the operation a myelomalacia was found. The cord was incised and improvement followed. The occurrence at the level of the lesion in Dr. Fisher's case of involvement of tactile and pain and temperature sensibility indicated that the lesion was at or very close to the posterior roots. Below this level the pain and temperature sensibilities alone were involved.

DR. E. D. FISHER, New York: A possible origin of this disease was hemorrhage into the cord at the time of injury, and at the site of the hemorrhage we found the beginning of the glioma later. I think without question the nerves were affected.

INTERESTING REACTIONS INCIDENTAL TO THE TREATMENT OF TWO CASES OF BRONCHIAL ASTHMA*

FRANCIS M. RACKEMANN, M.D.

Assistant in Medicine, Massachusetts General Hospital; Alumni
Assistant in Medicine, Medical School of Harvard
University
BOSTON

It is now well known that naturally sensitive individuals give a skin test to the proteins to which they are sensitive and thus presumably have many antibodies fixed in the cells of their skin. In connection with other work done in New York in 1915-1916, Dr. Longcope and I attempted to demonstrate circulating antibodies either as precipitins or as so-called anaphylactins in the blood serum of these naturally sensitive individuals, but always with a negative result. Cooke¹ could find no circulating antibodies in the blood of hay-fever patients. Schloss² and also Koessler³ succeeded in finding circulating antibodies in a case of egg susceptibility and hay-fever, respectively, and recently Walker⁴ has reported the irregular appear-

ance of complement fixing antibodies and precipitins in patients naturally sensitive to horse hair and cat hair proteins.

In view of the fact that, in the case of artificial sensitization, circulating antibodies appear immediately after the subsidence of the anaphylactic symptoms, as Dr. Longcope and I were able to show,⁵ it has seemed worth while to study and report two interesting cases of natural sensitiveness in patients who, during treatment for their asthma, showed anaphylactic symptoms after injection of the offending protein, since circulating antibodies should be expected at this time if ever.

One patient was a woman of 33, who had had asthma for fifteen years. The other was a man of 39, with asthma for thirty years. In both patients the asthma came on in attacks which were often associated with contact with horses or other animals. Both patients gave markedly positive skin tests to an extract of horsehair as well as to extracts of other animal proteins. In both patients there seemed to be no other cause of asthma and they were, except for asthma, apparently normal persons. In view of the fact that their troubles were presumably due to a great excess of antibody in the cells, which fixed the offending protein to the cells and there split it to its poisonous elements,⁶ it seemed justifiable to attempt to reduce the number of fixed antibodies by small repeated doses of the antigen—in these cases horsehair.

This antigen was a Ringer solution extract of crude horsehair, which had been previously treated with an alcohol and ether mixture to dissolve the fat and dirt. The extract was sterilized by passage through a Berkefeld filter and was standardized by determining the total nitrogen content by the ordinary Kjeldahl method.

The woman received subcutaneously, on successive days (in terms of nitrogen content), 0.01, 0.01 and 0.02 mg. On the fourth day the dose (0.03 mg.) was introduced into the outside of the left thigh a little above the knee. Immediately following the injection a little blood appeared in the syringe so that presumably the dose had been injected into a vein, although no vein showed under the skin at that point.

Within two minutes she complained of being full and hot; within three minutes she had a definite coryza with red running eyes and flushed face, and complained of a burning, prickling sensation, especially over the head and upper trunk.

Within five minutes definite asthma began, associated with a choking sensation in the throat and an anxious, worried expression. Twelve minims of a 1:1,000 solution of epinephrin (adrenalin chlorid, Parke, Davis & Co.) was injected subcutaneously at this time, and in ten minutes afterward the asthma was much relieved.

In thirty minutes after the dose of extract the severe asthma was practically over, though there was still a little wheeze. The redness, heat and burning of the arms had become a general urticaria which spread over the arms, chest and back. In one hour the asthma had gone, the urticaria was clearing, and in an hour and a half the patient was practically normal again.

The man was given eight desensitizing doses of horsehair extract at intervals of three or four days, the doses gradually increasing from 0.006 to 0.65 mg. During this time his asthma was perhaps a little better,

* From the Medical Clinic of the Massachusetts General Hospital.

1. Cooke, R. A.: Jour. Immunol., 1917, **2**, 217.

2. Schloss, O. M.: A Case of Allergy to Common Foods, Am. Jour. Dis. Child., June, 1912, p. 341.

3. Koessler, G. L.: The Specific Treatment of Hay-Fever (Pollen Disease), in Forchheimer, Therapeutics of Internal Diseases, **5**, 671.

4. Walker, I. C.: Jour. Med. Research, 1917, **31**, 243.

5. Longcope and Rackemann: Proc. Soc. Exper. Biol. and Med., 1916, **13**, 101.

6. Weil, Richard: Jour. Med. Research, 1915, **32**, 107. Vaughan: Protein Split Products, Lea and Febiger, 1913, p. 324.

but he still had some wheezing. After the last dose he had a bad asthmatic attack which came on in five hours and lasted about twenty-four hours. His arm was swollen and red for two days.

At this point a stronger dilution of a different extract, although made up in the same way as the first extract, was used. He was given, however, in terms of nitrogen content, less than half the preceding dose—only 0.3 mg. being used.

One and a half hours after this last dose he had a large swelling on his arm and severe asthma. In three and a half hours he reported and his arm presented a large yellowish, raised, hard wheal surrounded by an areola, the whole area being approximately 12 cm. in diameter.

In ten hours the patient was found at home with the whole arm from shoulder to elbow red, swollen, brawny and itching intensely, and he was definitely wheezy.

In fourteen hours the swelling on the arm had increased and he had severe asthma, which was quite promptly relieved by epinephrin subcutaneously. He required another dose in three hours.

In twenty hours his asthma was somewhat better, but at this time he presented a marked generalized urticaria with typical lesions scattered over the arms, face, legs and back, with a few on the abdomen.

In thirty-three hours the patient had rather more urticaria with intense itching; the lymph nodes were not enlarged, and he had no joint pains. There was some asthma. Epinephrin again relieved the asthma and the itching.

On the third day he had transient, though severe attacks of urticaria and asthma lasting an hour or so.

On the fourth day the urticaria was gone and the patient felt much better, but he showed definite puffiness of his eyes and swelling of his lips, although no frank edema of the ankles or the sacrum could be made out and he had no albuminuria.

On the fifth day he had some asthma in the night, but no further urticaria. He was up on the sixth day for a short time and felt much better. Puffiness of the eyes was still present on the seventh.

By the eleventh day he was quite normal again and declared that he was almost free of asthma.

He had, therefore, passed through a fairly typical attack of serum disease.

From my previous study of serum disease⁵ the appearance of antibodies would have been expected in both these patients immediately after the subsidence of their symptoms.

Twenty-four hours after the definite acute anaphylactic shock the woman was bled and series of tubes were set up containing 0.5 c.c. of her fresh, undiluted serum and 0.5 c.c. of various dilutions of the same extract of horsehair which had caused the shock. Other tubes contained 0.5 c.c. of serum and 0.5 c.c. of various dilutions of cathair extract and cat serum. After two and a half hours' incubation at 37 C. no precipitates were visible in any of the tubes, nor were any seen the next morning.

With exactly this same technic, the blood serum of the man was tested against the same antigens. The test was done twenty-five days before the "serum disease" on the first day of freedom from asthma and urticaria after the "serum disease," and again on the third day after the "serum disease" when he had had no asthma or urticaria for at least forty-eight hours. The tests were all negative, those set up after the

attack showing no more precipitation than the tubes set up before any treatment had been instituted.

It is regrettable that no attempt to transfer these suspected antibodies to guinea-pigs to demonstrate passive anaphylaxis was made, and it is also regrettable that no other opportunity occurred to test for circulating antibodies on later dates.

Skin tests were repeated in both patients after the attack, and were found to be slightly diminished in intensity, but were still positive and have since remained so.

Following the acute shock the woman went home on the third day, but had an attack of asthma on the train. Since then, however, she has been distinctly better; she is still being cautiously treated with horsehair and cathair extracts. She has had no severe attacks, although she has been wheezy at times.

After his serum disease, the man remained comparatively free from asthma for the next seventeen days, when he had two bad nights, which he attributed to exposure to dogs. But during the following five months his asthma has distinctly improved; he was treated with horsehair extract during the first of these months.

CONCLUSIONS

That the asthma in these two individuals at least could be caused by horsehair protein was obviously shown. The striking and rather alarming reactions are not without significance. The acute shock illustrates well the danger which always exists in the treatment of these cases regardless of the size of dose or care of administration. The typical serum disease, with all its clinical manifestations, illustrates another danger and, furthermore, suggests a possible accumulation of the antigenic substance in the cells with explosive manifestations when this accumulation has reached a certain point.

That the woman had an attack of asthma on her way home, three days after the shock, is interesting and important. It shows either a multiplicity of causes of her asthma, or else it shows that the well known principles of antianaphylaxis do not obtain in these cases.

The immune reactions are interesting. Real conclusions cannot be drawn from such meager observations. They do, however, suggest again a difference between natural and artificial sensitization in the mechanism concerned in the production of symptoms in each.

263 Beacon Street.

State Makes New Low Mortality Record.—Returns to the New York state department of health show that despite an increase in the population in the last quarter of a century of over 67 per cent., there were fewer deaths in July, 1917, than in July, 1892. Had the rate of mortality of twenty-five years ago prevailed during the months of July, 1917, there would have been recorded in the state 12,000 more deaths than actually were recorded. The reduction in the number of infant deaths is particularly notable. From a total of 2,237 infant deaths from diarrheal diseases, in 1910, the number of such deaths declined to 1,133, in 1913, and in July, 1917, to 439 deaths, one fifth the number of deaths from this cause only seven years ago. The infant mortality rate for July was only 70 per thousand births in contrast to the July rate of 186 per thousand births in 1910. In contrast to this reduction in infant mortality is an alarming increase in the number of deaths from accidental causes, chiefly automobile accidents. Thus far this year there have been reported 5,103 such fatal injuries in the state, or 700 more than the average of the last five year period, 4,401.

SURGERY OF BONES AND JOINTS

WITH ESPECIAL REFERENCE TO THE OPEN OPERATIVE
TREATMENT OF FRACTURES, AND A METHOD
OF ARTHROPLASTY IN ANKYLOSIS OF
THE ELBOW JOINT*

HUGH McKENNA, M.D.

President of Staff of St. Joseph's Hospital

CHICAGO

ETIOLOGY AND PATHOLOGY

The bacteriologic laboratory has shown that pathogenic organisms require special culture mediums for their growth. This is especially true of the gonococcus, which requires blood-agar for its best development artificially. Just as this organism requires special mediums for its cultivation in the laboratory, so also it shows certain points of election for tissues in the human host, particularly the subsynovial structures of the joints. The endothelium covering the

Surgeons of experience in joint surgery have come to realize how difficult to manage and how distressing are pathologic conditions of long standing in joints. The contractures in the capsule, ligaments and



Fig. 1.—Anteroposterior view of phalanx destroyed by tuberculosis.



Fig. 2.—Anteroposterior view of the same phalanx immediately after the autogenous transplant has been put in place.

membrane of the joint surface is rapidly destroyed, probably by pressure necrosis, and with the destruction of this tissue, first a fibrous and later a bony ankylosis results. Concomitant with the destruction of the intra-articular tissue comes probably a stimulation and increase in antibodies to the periarticular structures which would seem to cause the death of the infective organism. I believe the gonococcus does not remain dormant in periarticular structures for any great length of time, and by this I mean any number of months. Consequently, surgical intervention in the form of arthroplasty may be resorted to much earlier than in those cases of ankylosis caused by such pathogenic bacteria as the staphylococcus and streptococcus, or chronic infections, as tuberculosis, which processes must not be disturbed until a much later period.

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.



Fig. 3.—A case of fracture badly treated, four months after injury.

tendons require long periods of time before they are restored to even an approximately normal condition. Therefore, surgeons should realize how imperative it is, first, to determine whether or not the ankylosis has been caused by the gonococcus, so that an arthroplasty may be done early before the distressing contractures take place, and, secondly, to introduce, in the management of the early cases of ankylosis caused by organisms other than the gonococcus, such treatment as will lead to a rapid and early encapsulation and death of the etiologic organism. I believe that careful observation along this line will enable us to perform arthroplasties much earlier than formerly, thereby saving much unnecessary suffering to the patient, shortening the period of invalidism very materially, and producing a more perfect anatomic and functional result.

The foregoing statements respecting the performance of early arthroplasties are not to be construed as



Fig. 4.—Same case with deformity corrected by means of an autogenous intramedullary splint shown at A.

excusing any physician for responsibility in not instituting proper treatment in acute infections of joints if observed at the onset of the disease, since careful

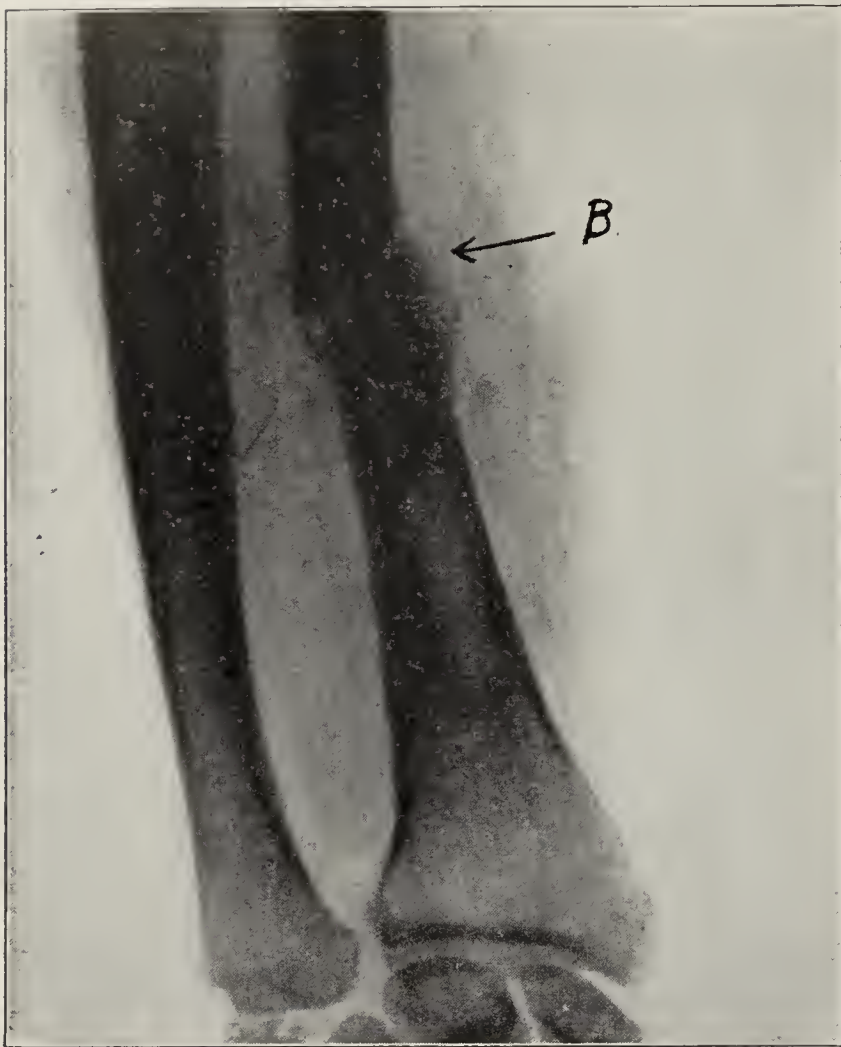


Fig. 5.—Anteroposterior view of the same deformity corrected: B, point of regeneration.

management at this stage of arthritis would probably have prevented the ankylosis.

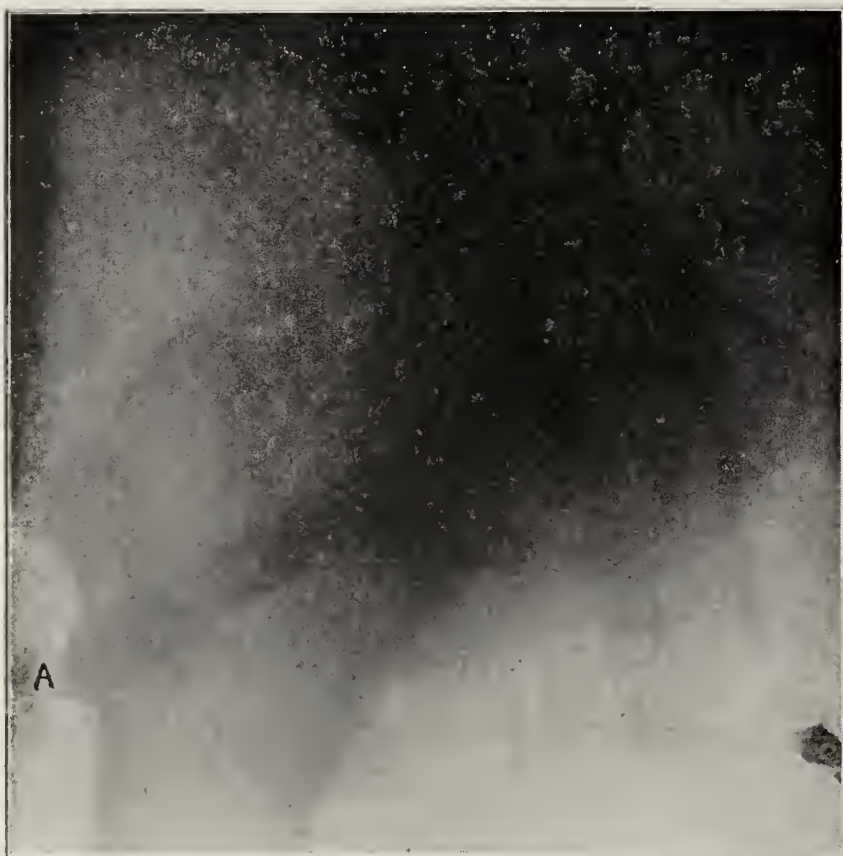


Fig. 6.—Intracapsular fracture of the neck of the femur reconstructed by means of a heavy autogenous bone splint.

DIAGNOSIS

The modern bacteriologic and Roentgen-ray laboratories are accessible to every physician. Certainly the

question of a carefully interpreted history is within the range of every medical man. In summing up the diagnosis, we find that the history holds a very prominent place in the records of every case of joint disease. In this connection, I wish that every physician might read the paragraphs on incubation and diagnosis in a paper by Kreuscher.¹

The subject of diagnosis of fractures may be dismissed with little comment, since practically every injury of any moment is subjected to Roentgen-ray examination. Two or more views at different angles should be taken; stereoscopic plates may be made in special fractures, or in certain pathologic conditions of bones or joints.

TREATMENT

Fractures.—1. Closed method. I have mentioned this method only to dispose of it by saying that the majority of simple fractures should be handled by this form of treatment. This is especially true when the surgeon has not had experience, or has not the equipment for carrying out surgical asepsis to the highest degree.



Fig. 7.—Complete bony ankylosis of the elbow joint.

2. Open method. I will not burden my readers with the details of the technic used in bone and joint surgery, as I have outlined the procedure thoroughly in previous papers. I wish only to state that the most careful asepsis is carried out, instruments and sponges being introduced directly from the sterilizer into the wound.

The indications for the open method are based on the treatment of ununited fractures (Figs. 3, 4 and 5), recent fractures with the intervention of muscle or fascia, certain spiral or oblique fractures whose fragments, owing to muscular strain, cannot be maintained in proper alinement, and intracapsular fractures of the neck of the femur (Fig. 6). I have operated in three of the latter. In all these fractures, I found the head turned and the torn capsule protruding down between the fragments. I am firmly convinced that this type of fracture should be treated by the use of an autogenous bone graft, which acts, first, as a splint in

1. Kreuscher, P. H.: A Clinical and Experimental Study of the Metastatic Arthritides, Med. Rec., New York, 1916, 40, 834.

fixing the head to the neck, and, secondly, as a bridge for the laying down of osteoblastic cells between the neck and the head. My experience has taught me that bony union rarely ever takes place in a true intracapsular fracture unless an impaction is produced either artificially, after the plan of Cotton, or by the method just outlined.

Joints.—In the treatment of ankylosis of the elbow joint by arthroplasty, I have followed a modified plan of the pedicle flap operation outlined by Murphy (Figs. 7 and 8). The modification I have worked out consists in making a much longer internal pedicle flap than that described by him. The long flap extends through the joint, coming well out over the external condyle of the humerus, thereby permitting the external flap to be used in taking care of the head of the radius alone (Figs. 9 and 10). This procedure I believe is an important point in the technic of the elbow arthroplasty.

Treatment of Certain Bone Defects Caused by Disease or Congenital Absence of Bones.—I have recently

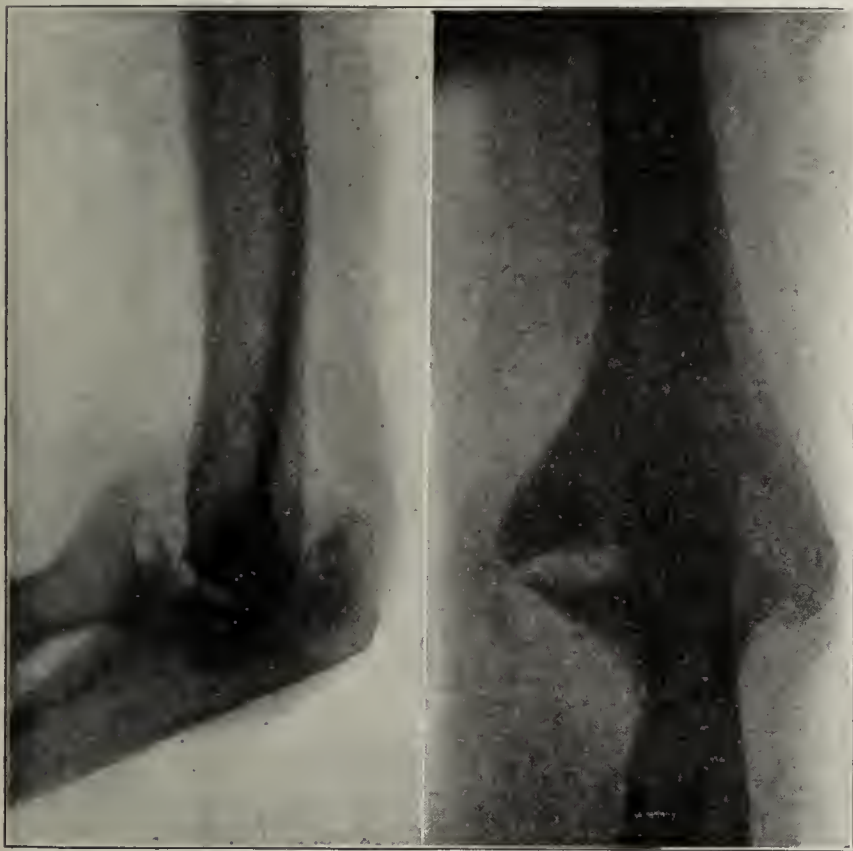


Fig. 8.—The condition shown in Figure 7 after operation by the flap method.

operated in a number of cases of tuberculosis of bones in which it was impossible to remove the diseased bone and splint the remaining soft tissues to prevent contracture (Figs. 1, 2, 9, 10 and 11). Consequently, I decided to transplant a graft immediately, knowing, of course, that this was against the generally accepted principles of bone grafting. I felt, however, that it would serve as a splint during the healing process of the soft tissues, and that there was some possibility that it might heal in. I am rather enthusiastic about the outcome of these cases, as I believe they go to show that autogenous bone grafts are more tolerant to chronic infection than we have generally supposed. I am especially enthusiastic about the transplantation of bone into those areas made absent by bone disease, instituting, immediately after operation, treatment with neutral solution of chlorinated soda, which I am certain hurries the healing process very materially. I do not wish to go on record, on the basis of the results obtained in these few cases alone, as an advocate of

transplanting bone into infected areas generally. I wish, however, to state that I have performed this operation a number of times on the small bones of the fingers, in which conditions, if the graft were lost, it would be of small consequence, and it might act as a splint to prevent contracture of the fingers. Murphy frequently said that one single case explains a principle. That being true, the accompanying illustrations show that the autogenous bone graft has

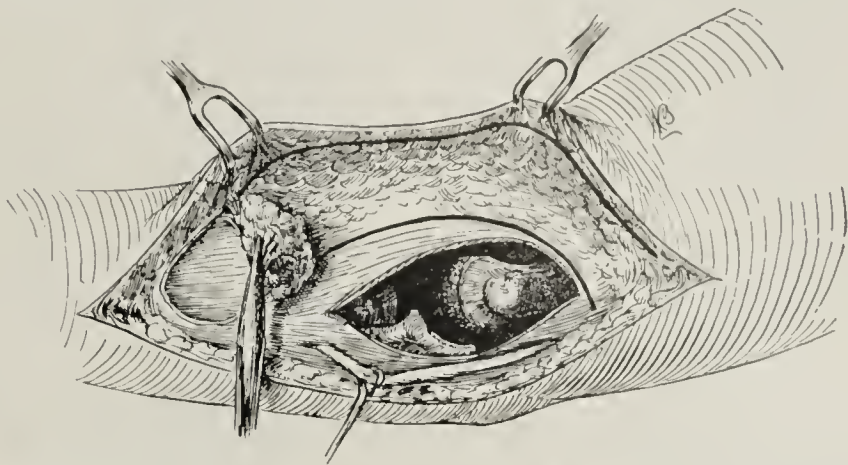


Fig. 9.—Long flap of fat and fascia loosened; ulnar nerve being retracted out of operative field.

healed in perfectly in a relatively short time. To me, these cases are very interesting, first, because the sinuses in the soft tissue have entirely closed, and secondly, because the graft not only has served as an osteoblastic bridge, but has united to what remained of the bony segments after the disease was removed, to form a permanent shaft of bone. One of these patients was operated on seven months ago, and the pictures show that the graft is still strong and healthy, and does not present any appearance of being absorbed, but has rather taken the place of the permanent shaft of the bone.

CONCLUSIONS

1. The surgeon should establish definite surgical indications before undertaking the treatment of fractures by the open method.
2. Better results are obtained from early arthroplasty in ankylosis caused by gonorrheal infection. The long pedicle flap is best suited for this procedure.

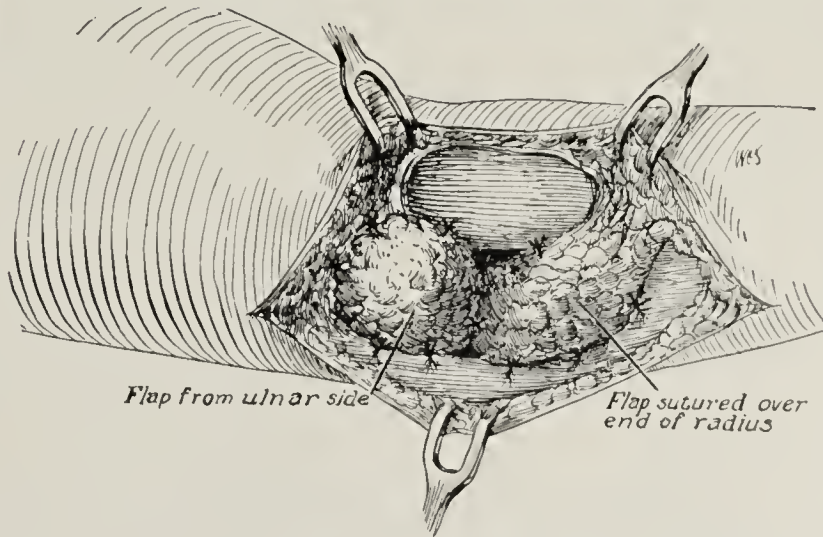


Fig. 10.—Flap from ulnar side brought through and sutured over end of humerus; short flap loosened and sutured over end of radius.

3. The autogenous bone graft, or in certain cases the heterogenous bone graft, is the choice of procedure when it can be used in fractures. The autogenous transplant is used to good advantage in bridging defects in the congenital absence of bone, or in bone destroyed by disease.

104 South Michigan Avenue.

ABSTRACT OF DISCUSSION

DR. PHILIP H. KREUSCHER, Chicago: Dr. McKenna has been able to implant in the infectious area of the hand a



Fig. 11.—Tuberculosis of the lower end of the tibia in which sinus formation was present for ten years.

transplant of a boy who had tuberculosis of the phalanx. If that can be done, then we will be able to transplant much



Fig. 12.—The same case shown in Figure 9, in which $6\frac{1}{2}$ inches of the tibia have been completely removed.

earlier than we thought in the tuberculous cases. In over 900 cases in Dr. Murphy's clinic and mine we found streptococcal metastasis occurred in twenty-four to seventy-two

hours; gonococcal metastasis in eighteen to twenty-two days; staphylococcal, in ten to fourteen days; staphylococcal and colon bacilli, in eight to ten days; colon bacilli and typhoid, in four to six weeks. I have seen infection in twenty-four hours following sinus operation. I have a young man under observation who was infected April 20, and May 10 showed acute gonococcal metastasis in the elbow and knee joints. There were streptococci present in 31 per cent. of the cases. I have under my care now a case of metastasis, occurring on the third day of smallpox, showing that we may have a metastasis from furuncles. The sinuses caused the arthritis in over 60 per cent. of cases in our arthritis series of over 900 cases.

DR. R. H. CONWAY GIBBONS, New York: Fifty years or more ago Professor Stille of the University of Pennsylvania taught that all of these troubles were due to blood poisoning. Joint troubles were pointed out as coming from various diseases—of the tonsils, teeth, etc. A young woman in New York, subject to tonsillitis, took employment with a laryngologist who had at the time six or eight severe cases of infection of the throat which she helped take care of. She became ill and was taken to the Presbyterian Hospital. She



Fig. 13.—The same case as described in Figure 9, in which a heavy autogenous transplant from opposite tibia 9 inches in length completely healed in place.

came out with a stiffened joint. The late Dr. John B. Murphy saw her and advised her to have an operation. He said he could give her right-angle motion, which he did. But the operation was not a success, as there was uncontrollable lateral motion. Finally, she was examined by Dr. Henry Ling Taylor of this city. He put a brace on her leg, but she is not well and never will be free from various forms of lateral motion. When the crucial ligaments are gone, all is gone for usefulness of the knee joint. It is different with the elbow.

DR. HUGH MCKENNA, Chicago: I have seen a number of knee arthrodeses performed by Dr. Murphy, and my conclusions are a little different from those of Dr. Gibbons. My patient would have been invalided for the remainder of her life. She had all her anatomic points remaining, and can do practically anything with this arm that she can do with the other.

A Foundation of Health.—Good health is the foundation of personal usefulness either in peace or war.—Connecticut *Health Bulletin*.

THE DIAGNOSIS AND TREATMENT OF SINUSITIS IN INFANTS*

ROSS HALL SKILLERN, M.D.

PHILADELPHIA

A DEFINITION OF SINUSITIS

The title of this paper is distinctly a misnomer. As a matter of fact, I do not believe that such a thing as sinusitis per se in infants exists. To bear out this

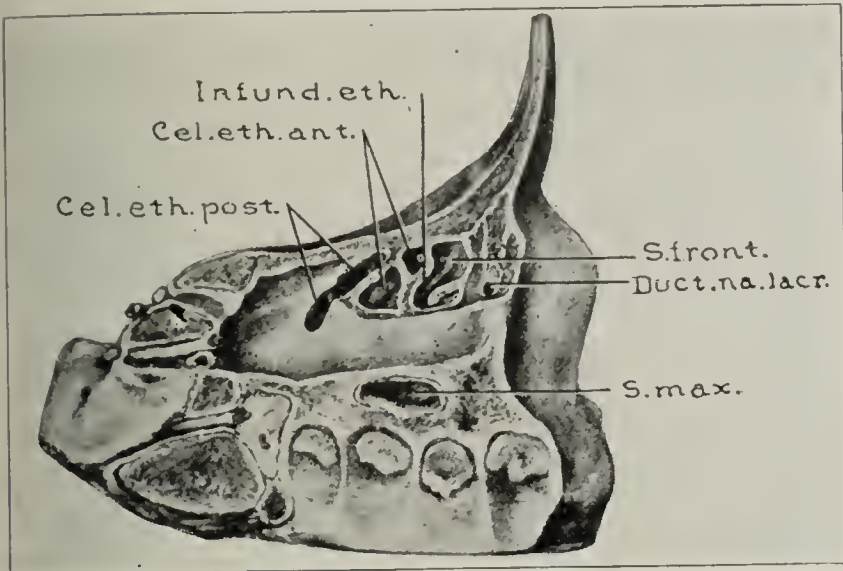


Fig. 1.—From a child 8 days old (after W. Davis).

assertion, we must revert to the actual anatomic conditions that are present in the first years of life. Let us arbitrarily classify infants and children according to the stage of development of the sinuses and not according to the actual age, although for the purpose of standardization we will take the age of 5 years as the dividing line between infancy and childhood, at least as far as the sinuses are concerned.¹

DEVELOPMENT OF THE ACCESSORY SINUSES IN INFANTS

Let us follow the development of the accessory sinuses from the infant.² The ethmoid is the only one which is well developed, the cells are perfect and contain the usual number (Fig. 1). The maxillary is small and rudimentary, not being as large as the bulla cell (Fig. 2). We must always keep in mind that the true sinuses develop from ethmoid cells. The antrum develops first and enlarges rapidly (Figs. 3 and 4). Under the age of 2 years the sphenoid is but an indentation and the frontal has not yet made its appearance (Fig. 5). The transitional stage of the frontal and sphenoid sinuses is from 2 to 6 years. After the sixth year the true sinuses have become well developed and occupy their permanent positions in relation to the surrounding structures. In view of these facts, to speak of a sinusitis per se in infants is manifestly absurd, at least from the standpoint of the anatomist and pathologist. Various forms of ethmoiditis are not being considered in this category.

Exception might be taken to this statement on the basis that the true sinuses have their inception originally from the ethmoid cells, and should be regarded as cavities lined with mucous membrane which is, in fact, the periosteum of the bone.

This contention is proper when we speak of a true cavity surrounded by unyielding bony walls and this cavity alone being diseased (similar to a localized abscess). However, this is a far different picture from that observed in infants in whom a purulently diseased mass of cells, resembling a sponge, hangs free in a portion of the upper respiratory tract.

SINUSITIS IN INFANTS

Localized sinusitis in infants, or, to be more explicit, a localized inflammation of the mucosa of the maxillary sinus, has not come under my observation, nor have I been able to find the report of a case in medical literature. When infants (under 2 years) acquire a disease that affects these sinuses, it always attacks the tissues as a whole rather than confines itself to the maxillary sinus or ethmoid cells. These cases then show a general purulent affection of most of the lateral nasal wall incidentally embracing the ethmoid and antrum rather than taking them as a point of inception and remaining therein confined.

COURSE OF INFECTION

I think you will bear me out in this description when you recall the unusual severity with which these cases are always characterized. The infection acutely attacks not only the mucosa but the soft, spongy underlying bone so that almost the entire side of the nose and often the face is affected, always showing a marked predilection to point and rupture externally either above or below the orbit, depending on which portion of the underlying bone is more virulently involved. This picture usually occurs in the sinusitis of adults only when the drainage passages have become occluded. As the antrum in infants is so small that it would be almost impossible to occlude the ostium without obliterating the entire cavity, this sinus can hardly be the focus of infection.

THE ETHMOID

The ethmoid cells present a totally different proposition. Here we have numerous cells separated by

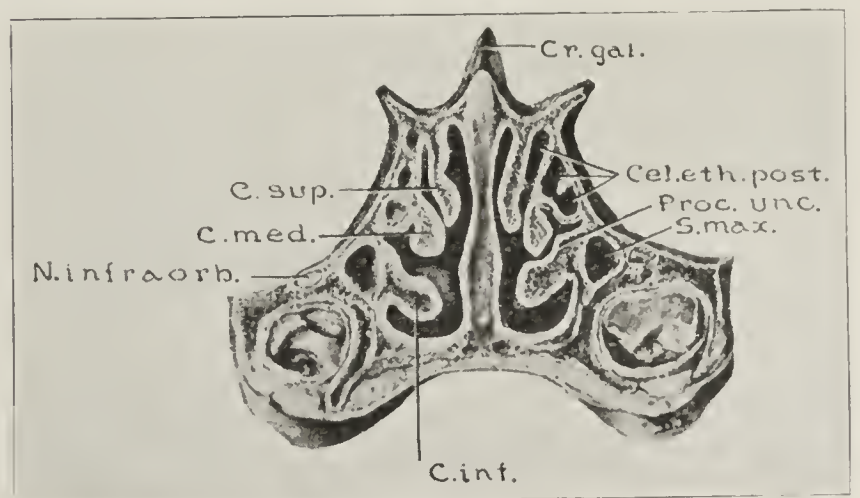


Fig. 2.—From a child 38 days old (after W. Davis).

their layers of soft, young bone which in itself is as susceptible to disease as its own lining membrane. Small wonder is it then, when the mucosa is once affected, that the bone becomes involved, and the disease spreads through the canaliculi and appears externally on the face. If we accept this view, sinusitis properly speaking in infants does not exist, but a general purulent infection embracing the ethmoid and maxillary sinuses together with the bone not infrequently occurs. This condition should be placed in the

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Thomas Hubbard (Accessory Sinus Suppuration in Scarlatina, *Am. Jour. Dis. Child.*, July, 1911, p. 11) recognizes this principle.

2. Davis: Nasal Accessory Sinuses, Philadelphia, 1914.

category of osseous infections and treated as such, rather than classed as a disease of the accessory nasal sinuses.

TREATMENT OF ETHMOID INFECTION

The treatment is as simple as it is radical. If seen sufficiently early, a thorough endonasal curetting of the ethmoid cells and antrum may prevent the formation of an external fistula and eventually bring about a cure. My experience in these cases has shown that, at least a discharge (if looked for) continues for many months after the acute symptoms have subsided.

SINUSITIS IN CHILDREN OVER 5 YEARS OF AGE

This condition appears to be a different form from the foregoing when not a sequel of scarlet fever or diphtheria.³ In the first place, its inception is usually a common cold in the head, the discharge continuing until a sinusitis is present, resembling that form seen in the adult. Of course, it may be ushered in by an acute attack, but it does not show the tendency to involve the great amount of tissue nor to reach such an abrupt climax as seen in younger children. The older the child, the more marked becomes the tendency toward chronicity and limitation. It is common in the infant to have the disease result in producing a large area of external suppuration. Frequently the first indication of the disease, as far as the surgeon is concerned, is a slight swelling and redness to the median side of one eye, slightly anterior to the lacrimal bone and tear duct. This is accompanied by a purulent discharge from that side of the nose. Examination shows a well marked purulent inflammation of the ethmoid cells (frontal sinus), and unless it is promptly checked, will rupture externally. There is no question that the tear sac is often involved in the inflammatory process; indeed, it has been advanced that this often concomitant dacryocystitis may be the causative factor of the sinusitis.⁴ After the rupture, the acute symptoms subside, and the discharge becomes chronic and the fistula permanent.

Sinusitis in children, however, does not always first manifest itself externally. It may simulate that of the adult by appearing as the continuation of a chronic cold and vague headaches, and intermittent though persistent occlusion of one side of the nose, with considerable purulent discharge from that side, together with the general symptoms of malaise, loss of appetite, anemia, etc. It is, however, the exception rather than the rule for the nasal specialist to see the child at this stage unless it has been referred by the general practitioner under whose care it probably has come. More often, the disease has advanced to that end stage before it reaches the specialist when complications, such as swollen eye lid with imminent rupture or even

the more serious orbital or cerebral manifestations, threaten or are actually present.

DIAGNOSIS

The ease or difficulty of the diagnosis will depend largely on the time and pains one takes with the examination. As most of those cases occur among the poorer classes and as infants are usually not amiable subjects to handle, one is apt to give them but a cursory examination or turn them over to an assistant. Under these circumstances, many cases in the earlier stages will be entirely overlooked and only those conditions which have already manifested themselves externally will be properly diagnosed. In a comparatively recent case the predominant symptom will be the profuse nasal discharge. Subjective symptoms, such as pain and fever, will rarely be complained of. In the diagnosis, one condition which is rather common must be differentiated, that is, adenoids associated with post-nasal suppuration or infected nasopharyngeal adenoid tissue. This differentiation, of course, can be accomplished by proper examination or, better still, one sweep of the curet.

Suppose, then, we had established a purulent secretion from one or both nostrils but were unable definitely to state its source, although one or more of the sinuses was suspected. What is our next course? Several ways and means are open to our use:

In the first place, by the nasopharyngoscope we can determine the approximate places of secretion. Before it is used, the necessity of thoroughly cleaning the nostril of secretion and shrinking the mucous membrane is of course obvious. It may also be

necessary to have the aid of a strong nurse or an assistant to control the young infant or recalcitrant child, but it is well worth the trouble for the gained information.

The puncture needle as a diagnostic means in children does not especially appeal to me, although Hajek⁵ reports good results in children as young as 5 years. When one considers the small size of the antrum even should pus appear on irrigation through the needle, it would be difficult to determine whether or not the pus really was secreted by the antral mucosa. Transillumination as a diagnostic factor is unreliable in adults; in children it is positively misleading and, in my experience, worthless, although one writer⁶ appears to have found it useful.

The Roentgen ray is of positive assistance, which has been proved in a most exhaustive article by Haike⁷ and recently by Coffin. The plates should give one a fair idea of the size, shape and condition of the various sinuses and, when compared with the normal side,

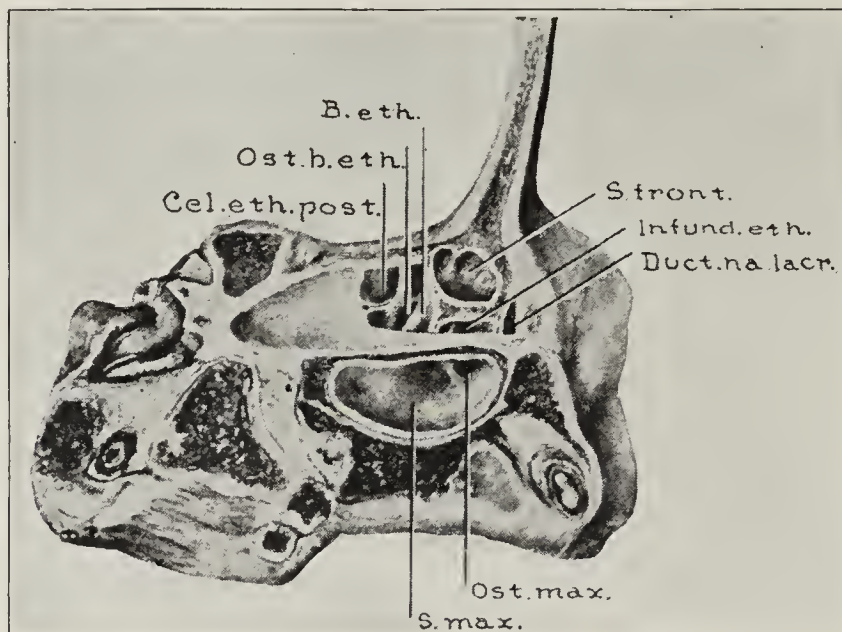


Fig. 3.—From a child 4 months and 27 days old (after W. Davis).

3. This form will not be included, as it has been exhaustively treated elsewhere (Killian: Die Erkrankungen der Nebenhöhlen der Nase bei Scharlach, Ztschr. f. Ohrenh., 1908, 56, 189).

4. Van den Wildenberg: Complications des sinusitis frontales chez les enfants, Verhandl. d. III. Internat. Laryngol. Cong., 1911, p. 322.

5. Hajek: Nebenhöhlen der Nase, 1914, p. 11.

6. Oppenheimer: The Surgical Anatomy, Diagnosis and Treatment of the Inflammatory Affections of the Nasal Accessory Sinuses in Children, Med. Rec., New York, Feb. 21, 1914.

7. Haike: Die Roentgenuntersuchung der Nasennebenhöhlen der Kinder, Arch. f. Laryngol. u. Rhinol., 1910, 23, 206.

show even more changes than are visible in the adult. In all suspicious cases unless the Roentgen ray has been used, not all reliable diagnostic means have been employed.

TREATMENT

Conservative.—In the beginning of an attack it can almost always be brought under control by general and conservative intranasal treatment, particularly when the symptoms point to frontal or anterior ethmoidal trouble (scarlet fever being excluded). This is also the experience of some of our foreign colleagues.⁸ Calomel, one tenth grain, with sodium bicarbonate, 1 grain, should be given every hour until free purgation is produced. Calomel has a peculiarly beneficial effect with children and as a general eliminant cannot be surpassed. Locally a cleansing douche of physiologic sodium chlorid solution several times daily will suffice to keep the nose free.

Vaccines.—I have found these more useful in this class of sinus disease than in any other. My experience has been confined mostly to those commonly carried in stock, although on one or two occasions these preparations have failed and the subsequent use of the autogenous vaccine brought about a cure.

Surgical.—There is one thing marked in these cases; it is that the indications for surgical interference are very definite. A case is either one for conservative treatment or for operative procedure. That boundary line so perplexing in the adult is, at least as far as I know, not seen in children, and when operation is indicated, it should be performed at once. In no other class of patients does the disease progress so fast as in the young child, and often it is so advanced, when coming under our observation, that a most extensive and radical operation is required to save the child's life, not to speak of a cure of the affection. When we observe a child with a deformed face from a sinus abscess about to rupture, with exophthalmos, swelling of the lids, edema and a redness which together constitute a hideous deformity, one cannot help but feel, as Coffin⁹ states, that there existed a previous stage during which proper treatment would have prevented the present serious condition.

When a case comes to operation, a simple conservative procedure is usually of no avail. Chiari and Marschick,¹⁰ by the removal of the anterior end of the middle turbinate and antiphlogistic measures, were able to bring only 25 per cent. of the cases to the healing stage. We should first try the intranasal exenteration of the diseased ethmoid cells and maxillary antrum with subsequent applications of an organic silver compound and administration of appropriate vaccines. Intranasal operations alone, however, are usually unavailing if much redness and swelling have appeared externally in the region of the eye. If it is necessary

to make an external opening, even though a fistula had already formed, the incision should only be large enough for drainage. The bulk of the work should be intranasal. I have never seen a patient who did not recover under this form of treatment. Regarding the maxillary sinus, the Caldwell-Luc or any similar procedure through the canine fossa should never be resorted to on account of the destruction of the teeth germs which must necessarily follow.

If the antrum alone is affected, any thorough intranasal operation will give as good results as one can hope for from any of the more radical or external methods.

2032 Chestnut Street.

ABSTRACT OF DISCUSSION

DR. ALBERT H. BEIFELD, Iowa City, Iowa: The question of the infection of the sinus in infants should always impress every physician as soon as he finds an acute rhinitis or coryza becoming chronic. I recently encountered five cases which looked like pellagra. In the fifth, when it seemed that the child was about to die, noting the purulent nasal discharge, I asked Dr. Dean's help and he found a definite enlargement of the cranial tissues, a bulging, and the treatment in this case was followed by improvement within a week. The same depression which had been the picture in the other cases, such things as the falling down, dizziness, the skin rash, general weakness, gradually but surely disappeared. Sneezing is a common symptom and I think often we do not realize the significance of it. I have seen ethmoiditis in a case of psychic vomiting, associated with thyroid disturbances in children, with enlargement of veins, and with diphtheria. When I see a child with a nasal discharge, I ask whether there has been sneezing or not. I frequently find that these cases are worth sending to the nose and throat

department, and the treatment there instituted gives relief.

One point in regard to the differential diagnosis is that those things that are associated with symptoms which might lead you to suspect ethmoidal infections, namely, the question of rhinorrhea with sneezing, always occur in nasal asthmatic attacks to which children are subject. I therefore made an appeal for careful and thorough topical diagnosis of chronic or acute nasal discharge in infants and children. The same thing applies in children in at least a certain degree that applies to adults. We see many children whose lives and health are affected by focal infection of the tonsils, causing digestive disturbance and chronic poisoning of the nervous system. The subject of sinus infection is important, and who knows that it may not be one of the things that lead, perhaps, to ozena in the adults.

DR. L. A. COFFIN, New York: I showed at Atlantic City by lantern slides a double series of Roentgen-ray findings in children from 6 months to 15 years of age, one series showing clear, the other diseased sinuses. The 6 months child showed distinct and clear antrums. Dr. Skillern has almost taken ethmoids out of the sinus classification. To me, the ethmoid is a group of sinuses with which we shall still have to deal, and we shall deal with them as we deal with the other accessory sinuses, and their disease is in every way comparable to diseases of the larger sinuses. What we are especially interested in is that this class of disease be more generally recognized by the pediatrician.

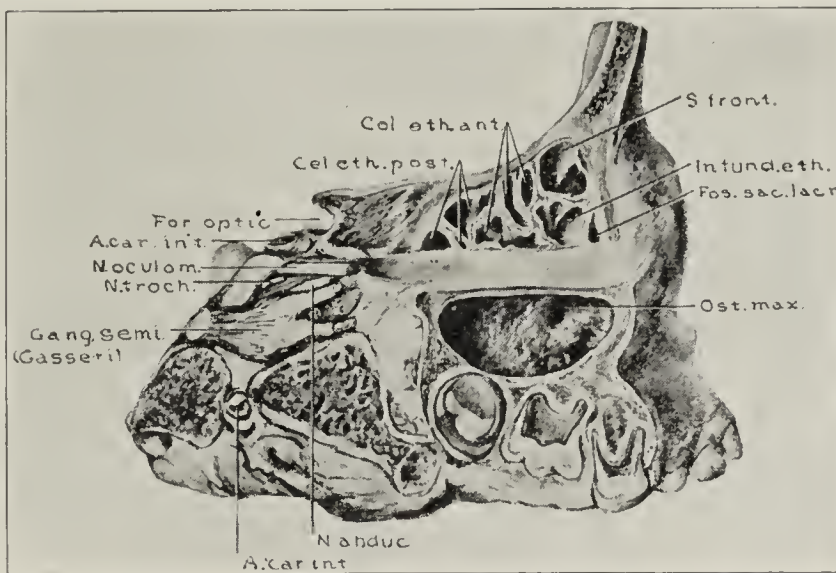


Fig. 4.—From a child 1 year and 4 months old (after W. Davis).

8. Glas: Verhandl. d. III. Internat. Cong., 1911, p. 332.

9. Coffin: Empyema of the Nasal Accessory Sinuses in Children under Fourteen Years of Age, Tr. Am. Laryngol. Assn., 1914, p. 111.

10. Chiari and Marschick: Zusammenhang der Erkrankungen der Orbita und der Nebenhöhlen der Nase, Med. Klin., 1908, No. 16.

There is a train of eye symptoms which we frequently see in children, comprising exophthalmos, chemosis, keratitis, etc., almost invariably due to a thrombophlebitis arising from empyema of one or more of the accessory sinuses. Such extreme conditions are frequently the result of the non-recognition of the seriousness of the so-called common cold in children. If the pediatrician or general practitioner does not know how to handle these cases, he should early seek the advice and help of the rhinologist.

Dr. Skillern did not mention suction as a form of treatment. Suction properly applied will give brilliant and satisfactory results. It can be used by the pediatrician as well as by the rhinologist, and not infrequently obviates all necessity for operative procedures that would otherwise be required.

Dr. Skillern says the Luc operation should not be performed. Personally, I feel that radical operations are safer than intranasal work. It is hard to do intranasal work in infants. It necessitates the use of ether, and the intranasal exenteration of ethmoids under general anesthesia is a dangerous operation even in adults.

DR. GREENFIELD SLUDER, St. Louis: It seems to me that Dr. Skillern is proving a difference with very little differentiation, but Dr. Coffin has emphasized that. That an inflammatory involvement of the lateral wall of the nose be differentiated from a sinusitis, it seems to me is pretty much of a nicety. I believe these cases are to be classed as a sinus inflammation quite as much as in the older patients with a pus cavity. They come under not so much a suppurative head, as Dr. Skillern emphasizes, but under a hyperplastic classification. Dr. Skillern spoke of all the sinuses but the sphenoid. The sphenoidal sinus—and in this statement I quote his authority, Warren Davis of Philadelphia—the sphenoid begins in the sixtieth day of fetal life. At the end of two years it has reached laterally to the foramen rotundum; at the end of six years it has reached the floor of the sinus and the Vidian canal. Sinus involvement in young persons seems to be difficult, and more so when in the posterior portion, according to age. I feel absolutely sure that sphenoid—and when I mention that I include postethmoid—involvement is of frequent occurrence in childhood. I have been in the habit of separating infancy at the second year from childhood beyond the second year. The diagnosis of postethmoidal sphenoiditis in children is exceedingly difficult. Postnasal examination is to be achieved rarely. In such cases suppuration is not profuse. There is pain and swelling and a more or less serous discharge, which continues. These cases I have seen repeatedly exploited, as Dr. Beifeld has said, as psychic vomiting. I have repeatedly seen them made the asthma of childhood, and have seen that asthma recover after postethmoidal interference.

DR. ROSS H. SKILLERN, Philadelphia: There is no question of the truth of Dr. Coffin's statement regarding the baby sinuses. I quoted directly from him in this respect. I do not know anything about the suction method of treatment in children. I have never tried it but should like to. I imagine it would be a rather difficult procedure, however. We all know that it is difficult enough to treat children anyway, and to give suction in these cases it seems to me would be a difficult thing.

Dr. Sluder says that in most cases the ethmoids are hyperplastic. That is true. He did not mention that these cases occur in infants under 2 years of age, but I suppose that is what he means. I do not recall seeing a case of hyperplastic ethmoids in a baby. Regarding the connection between the ethmoids and sinuses, that is true, but at the same time, I cannot help feeling that a mass such as the ethmoid, representing structurally a sponge covered with thin mucosa, is totally different from the smooth sinus with hard, bony walls, and it seems to me that it must be, and often is, affected in a totally dissimilar manner.

Signs of Death.—It is a sign of death when the forehead grows reddish and eyebrows sink, the left eye decreases, the tip of the nose becomes white, the chin falls, while the pulse runs, feet grow cold and the belly is relaxed.—Galen.

EXPERIMENTAL PYELITIS IN THE RABBIT *

H. F. HELMHOLZ, M.D.

AND

CAROL BEELER, B.S.

EVANSTON, ILL.

Numerous attempts have been made in the past to produce pyelitis by injecting bacteria into the bladder, with the idea of getting an ascending infection, and by injecting organisms into the circulation and expecting them to set up lesions in the kidney during the process of being filtered out. It has long been known, and it is becoming increasingly more evident, that bacteria during any infection, if they reach the blood stream, are likely to be excreted in the urine. This



Fig. 1.—Spontaneous pyelitis (distended ureters and pelvis).

applies to acute as well as chronic diseases. The kidney acts as a filter to remove bacteria from the circulation. If this is constantly taking place, we must naturally assume that the kidney has a great resistance to these organisms or that the bacteria are carried out so rapidly that they do not have an opportunity to multiply.

The two possibilities for infection are: (1) a loss of resistance of the kidney or an increase in the virulence of the organism; and (2) a stopping up of the natural washing-out of the urinary passages. The latter one of these factors has been studied by a great many observers, who have all showed that anything that obstructs the flow of urine makes possible an

* From the O. S. A. Sprague Memorial Institute Laboratory of the Children's Memorial Hospital.

* Read before the Section on Diseases of Children at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

infection of the kidney, whether the infecting organism is introduced from the bladder or by the blood stream. Furthermore, the work of Stewart¹ on ascending infection of the kidney by ureteral transplantation into the rectum has shown that the infection spreads upward by the lymph channels, and that the spread by the lumen of the ureter is less of a factor than formerly supposed. In this work, however, the lymph channels were cut and naturally offered excellent opportunity for the spread of infection. Hess² came to the conclusion that something more than the simple injection of colon bacilli into the bladder was necessary to produce ascending infection in the rabbit. The previous injection of turpentine or other irritant into the bladder was sufficient to bring about an involvement of the upper urinary tract. More recently Eisendrath and Schultz³ have attempted to show that infection of the bladder with *Bacillus coli*, streptococci and *B. proteus* travels up the periureteral lymphatics. They used rabbits and dogs in their work. They described very extensive changes in nineteen of thirty-eight animals but recovered organisms from the kidney in only six of their positive cases in their first series and in none of their second. It seems that in view of the negative bacteriologic results, the causal relationship of the lesions and the organisms injected must be left open.

It is not our object here to go into a discussion of the etiology of pyelitis, but merely to point out that with an unobstructed urinary tract there have been practically no constantly positive results in the production of pyelitis experimentally, either by intravenous or intracystic injection. In a previous series⁴ of intravenous experiments we were able to produce kidney lesions in only eight out of sixty-six animals injected with colon bacilli, and in four out of eleven animals when injected with a mixture of colon bacilli and pneumococci, the tendency of the organisms to produce lesions in other organs being just as great as in the kidney. During the course of the experiments just cited, in controlling the urine of all animals before injection, we found a female rabbit with a constantly purulent urine. Cultures taken from a catheterized specimen of urine showed a pure culture of a gram-negative bacillus, that had the following characteristics:

The organism grew well on all mediums. There was a profuse yellowish growth on agar. Gelatin was not liquefied. Litmus milk was rendered acid and

coagulated; but there was no digestion of the casein. Indol was produced. There was acid and gas formation in dextrose, lactose and saccharose. The organism thus belongs in the group of *Bacillus coli-communior*.



Fig. 2.—Hematogenous cortical abscesses.

1. Stewart: A Study of Ascending Infection, etc., Univ. Pennsylvania Med. Bull., 1910, 23, 233.
2. Hess: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1913, 26, 135.
3. Eisendrath and Schultz: Jour. Med. Research, 1917, 35, 295.

4. Helmholtz, H. F., and Beeler, Carol: Focal Lesions Produced in the Rabbit by Colon Bacilli Isolated from Pyelocystitis Cases, Am. Jour. Dis. Child., July, 1917.

SUMMARY OF INJECTIONS

Series	No.	Kidney Lesions				Other Organs Involved
		Total	Pyelitis	Abs.	Bact.	
A. Intravenous Injection						
I	10	6	4	4	..	Hemorrhage into lung.
II	2	2	2	1	..	Abscess of seminal vesicle.
III	4	2	2	1	..	Hemorrhage of cecum and rectum.
IV	2	2	1	2	..	0
V	5	4	2	3	..	0
VI	2	2	1	2	..	Chronic nephritis.
VII	2	1	1	0	..	Generalized peritonitis.
VIII	2	1	1	1	..	0
IX	3	2	2	2	..	0
	32	22	16	16		
B. Intracystic Injection						
II	2	0	0	0	..	Infected Right Testis.
IV	2	2	2	0	..	0
V	5	3	1	0	2	0
VI	2	2	2	1	..	0
VII	2	2	2	0	..	0
VIII	2	2	2	0	..	0
	15	11	9	1	2	
C. Rectal Injection						
VII	2	0	0	0	..	0
VIII	2	0	0	0	..	Gram-negative bacillus.*
D. Oral Administration						
V	5	0	0	0	..	1x Bladder Gram-positive coccus; Gram-negative bacillus.
VI	4	0	0	0	..	2x Bladder Gram-negative bacillus.

* From bladder urine.

HISTORY

Feb. 17, 1917. The first urine examined showed about 150 pus cells to a low power field.

February 9. There was a large excess of pus cells.

February 10 to February 20. Daily examination revealed a large number of pus cells, single and in groups.



Fig. 3.—Ascending pyelitis (distended ureter).

February 20. A catheterized specimen of urine was cultured in litmus lactose agar, plain agar and broth.

February 21. There are innumerable colonies on both plates.

February 23. Specimens were expressed every other day showing albumin and casts in addition to pus cells.

March 3. Another catheterized specimen was cultured; pure culture same as obtained on February 20.

The animal was chloroformed, as it was getting very much weaker.

Necropsy.—On opening the peritoneal cavity the abdominal organs all appear practically normal. The bladder is distended with urine. The stomach, gastro-intestinal canal, spleen, liver, gallbladder, heart and lungs show nothing abnormal. On dissecting free the overlying organs the ureters on both sides are seen to be considerably dilated, as far down as the brim of the pelvis. Beyond this point they appear to be of normal diameter. No apparent pathologic constriction in the ureter at the brim of the pelvis was visible. The pelves of both kidneys were smooth, and of a reddish brown color; the capsule stripped readily. On section the cortex was of normal thickness, the striations regular. The outer portion of the medulla was deeply congested. The pelves in both kidneys were markedly distended, as seen in Figure 1. The left kidney pelvis was filled with thin purulent material, the right practically empty. The bladder urine showed only relatively few leukocytes, numerous casts and much debris. Cultures taken from the bladder and right kidney pelvis yield a pure culture of gram-negative bacillus.

Histology.—The bladder mucous membrane in the entire section is practically intact. In areas there are small clusters of lymphocytes; there are practically no polymorphonuclear leukocytes to be seen in the section. Kidney: There is considerable degeneration of the epithelium and dilation of collecting tubules; in areas focally there is considerable increase in connective tissue. In the medulla, especially toward the tip of the papilla, there is marked leukocytic infiltration about the tubules.

Eosinophil cells are much in evidence. The mucosa of the pelvis is apparently thickened and shows considerable infiltration with leukocytes. The pelvis is filled with masses of polymorphonuclear leukocytes.

The colon bacillus isolated from the catheterized specimen of urine was used in nine series of experiments. The technic used in the experiments was as follows: The intravenous injections were made with a bacterial suspension that was made by centrifuging 15 c.c. of a twenty-four hour broth culture and suspending the bacilli in 5 c.c. of physiologic sodium chlorid solution. One c.c. of this suspension was injected into the ear vein. The intracystic injections were made after carefully catheterizing the animals and then allowing 5 c.c. of the bacterial suspension to run into the bladder.⁵ In the feeding experiments 8 c.c. were injected. In the first series of ten animals which were injected intravenously, six showed lesions of the kidney; in four instances a pyelitis, and in four instances cortical or medullary abscesses. In two instances, as is evident from the table, both were present. In Series 3 and 9 also, all the injections were intravenous. In the other series the same culture was used in the injections given intravenously, intracystic and either rectally or orally, in order that the results could be more accurately compared.

In the thirty-two animals of nine series injected intravenously, twenty-two showed lesions of the kidney, in sixteen instances pyelitis and in sixteen instances cortical (Fig. 11) or medullary abscesses. In ten instances there were both abscesses and pyelitis. No doubt if the animals with abscesses had lived they would all have developed a pyelitis also. Of the thirty-two animals only three showed lesions outside of the urinary tract that could be ascribed to the colon bacillus: one instance each of abscess of the seminal vesicle, hemorrhage of the

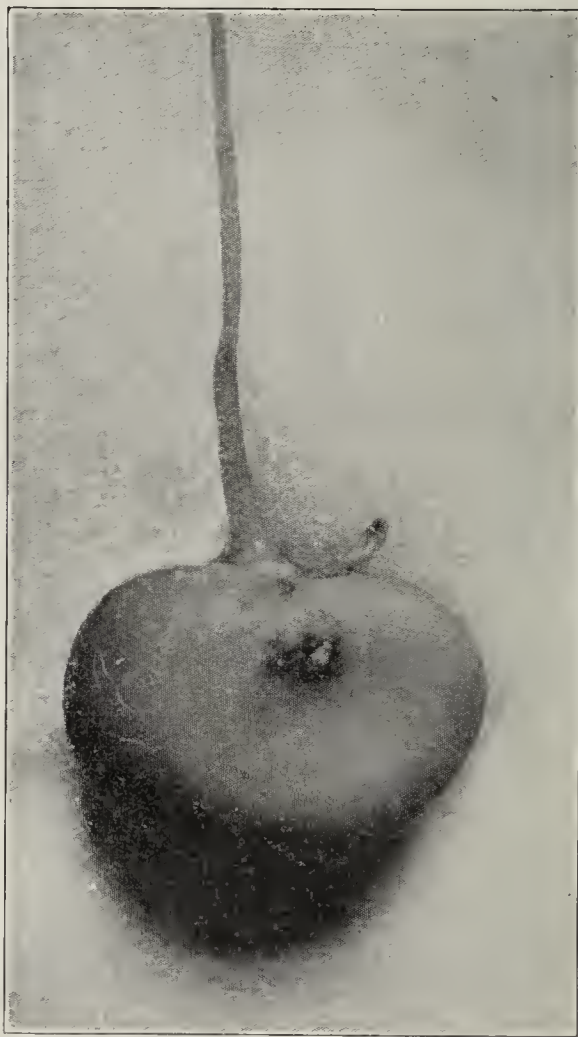


Fig. 4.—Ascending pyelitis (cortical abscesses).

cecum, and generalized peritonitis. The peritonitis was due in large measure no doubt to extensive coccidiosis. The absence of lesions in other organs is just as striking as the localization of the organism in the kidney in twenty-two of the thirty-two cases.

The intracystic injections consist of six series, totaling fifteen animals. In four series of two animals each, pye-

5. Three control animals injected with a dilute solution of gentian violet showed that no fluid passed beyond the bladder.

litis was produced in 100 per cent. In the fifth only one had a definite pyelitis, but in two others gram-negative bacilli were isolated from the pelvis of the kidney. In the sixth series neither one of the two animals injected acquired a kidney infection. Figure 3 shows the swelling of the ureter, Figure 4 the one kidney with cortical lesions in the intracystic series.

Four animals that received rectal injection and nine that were repeatedly fed the colon culture showed no lesions of the urinary tract, except that in one instance in the rectal series and in three instances in the oral series, colon bacilli were isolated from the bladder but not from the kidney.

The serum of a rabbit immunized to the specific organism isolated from the urine agglutinated the organism in a dilution of 1:2,000. It did not agglutinate several strains of *B. coli-communior* isolated from human cases of pyelitis nor several strains of *B. coli* isolated from rabbit feces. A *B. coli-communior* isolated from the feces of the original pyelitis rabbit was agglutinated in the same dilution as the colon bacillus isolated from the urine.

COMMENT

The remarkable specificity of this organism is of interest from two very different points of view: first, it enables us to study better than ever before the etiology and probably the treatment of kidney infections, and secondly, from the purely biologic point of view, it shows us the extreme specificity the colon bacillus can acquire in localizing in the kidney, on intravenous injection.

These experiments prove without a doubt that pyelitis can be produced experimentally by intravenous injection as well as by injection into the bladder. What the route of the infection is from the bladder to the kidney we must leave an open question at this time. One point that we do wish to make, however, is that this work shows that if the organism has a specific affinity for the kidney its introduction into the bladder can be of very serious consequence to the individual. It will take further study to determine whether the bacilli reach the kidney via the lumen, the lymphatics or the blood stream. Experiments in that connection are at present under way.

If we compare these experiments with the results obtained by the injection of organisms isolated from human pyelitis cases, the specificity of this organism is even more striking. In sixty-six animals injected with different strains of *B. coli* only eight showed kidney lesions, and twenty-one lesions of the other organs; with this organism, of thirty-two animals injected twenty-two showed kidney lesions and in only three instances were the other organs affected.

The so-called epidemics of pyelitis that have been described from various European clinics might well be ascribed to an organism that, as this organism, has a specific affinity for the kidney tissue.

The specific localization of organism in tissues has been of great interest, especially since the work of Rosenow on the pneumostreptococcus group. Rosenow⁶ in his work on the colon bacillus and streptococcus in gastro-intestinal infection, especially of the appendix, showed that the combination had specific tendencies to localize but that the colon bacillus alone had no such powers. Our work on the colon bacilli of human pyelitis cases led to practically the same result. With this organism the specificity manifests itself not only in that the kidney is involved in about 70 per cent. of the injections, but that in less than 10 per cent. of the injections is there involvement of any other organ. The intracystic infections are not of

much importance in this connection because the distribution of the bacteria is not so widespread throughout the system as with the intravenous injections.

SUMMARY

1. Infections of the kidney were produced in 70 per cent. of all animals injected by the intravenous or intracystic route with a colon bacillus obtained from a rabbit with spontaneous pyelitis.

2. The organism, a *Bacillus coli-communior*, had a specific tendency to localize in the kidney tissues.

A CASE OF POISONING BY MUSTEROLE

DAVID I. MACHT, M.D.

BALTIMORE

The following case should be of interest not only to the pharmacologist and toxicologist but also to the general practitioner:

Mrs. S., aged 32, consulted me, May 31, 1917, on account of a rash. There was a scarlatiniform eruption over the neck, face, chest, arms and back. The rash resembled very much that of scarlet fever. Further examination, however, contradicted such a diagnosis. There was no history of exposure to scarlet fever; the patient's temperature was normal; the pulse rate was 76; there was no sore throat, "strawberry tongue" or any other sign of scarlet fever, and the general condition of the patient was good except that she complained of itching and burning. A very marked irritation of the conjunctivae was also noted. Physical examination of the chest and the abdomen was negative. There were no abnormal urinary findings.

On investigating the case more carefully, it was learned that the patient on the day before was complaining of pain behind the right ear and that some friends advised her to apply musterole to the painful spot. Accordingly the patient rubbed in thoroughly some of the nostrum in the right mastoid region, and on the following day the general exanthem appeared.

Musterole has been described¹ as being essentially a mixture of lard or some similar material, with oil of mustard, menthol and camphor.

Oil of mustard is known to the chemist and pharmacologist to be an exceedingly irritating drug attacking especially the eyes. When applied to the skin for any length of time it quickly draws blisters. Erysipelatous eruptions, general dermatitis, and even necrosis of the skin have also been described following its use. If absorbed into the circulation, oil of mustard may produce albuminuria and even nephritis.² Its use in therapeutics is for that reason very limited, and when it is employed, care should be exercised in handling it. Mustard plasters are for all purposes safer than the oil of mustard, and can be employed whenever the oil is indicated. A mixture of such an irritant oil as oleum sinapis and lard is very liable to be absorbed through the skin, and therefore the indiscriminate use of such oils in salves under fanciful names, without a physician's supervision, should be discouraged, as it may lead to untoward effects, such as in the case described above.

3218 Auchentoroly Terrace.

1. Musterole, THE JOURNAL A. M. A., Jan. 20, 1917, p. 214.

2. Compare Lewin: Nebenwirkungen der Arzneimittel, Berlin, 1899, p. 679.

Special Article

AT FORT RILEY

Fort Riley, on the Union Pacific Railway about 60 miles west of Topeka, is one of the largest of the historic forts of the West, and by many is considered the most beautiful.

THE TERRAIN

Situated on the Republican River at its junction with the Smoky Hill River to form the Kaw or Kansas, the post lies in a large, wonderfully drained basin with many small cañons leading down from the plateau, and innumerable side cañons opening into these. A noticeable feature is the rim rock which juts out from the hillside just below the level of the plateau surrounding the basin.

For a number of miles this plateau, at a level of perhaps 150 feet above the camp, extends to the north and to the west, forming an indefinite number of drill and maneuver grounds. Up the hill to the drill grounds is about the first hike of a new comer.

CANTONMENTS

The cantonments here are of the type approved by the War Department, and are substantially identical with those described and pictured in *THE JOURNAL* as they are found at Fort Benjamin Harrison and at Fort Oglethorpe. From 100 to 140 men are in each company, and each company has its own barracks with its mess hall immediately adjacent.

Up to the present date—August 10—ten companies have been formed with a total enrolment of 912 men.

Special emphasis has been laid on these companies at Riley. Quite irrespective of his actual rank, one officer is appointed permanent captain of the company, others as lieutenants, others as sergeants and corporals, and the rest make up the roster of privates. This arrangement has been a wonderful help in giving the medical officer a thorough insight into the actual organization and working of a company, and in addition, it has stimulated a healthy rivalry between the companies in matters of drill, discipline and general efficiency. In nearly every company the "top" sergeant selected has been a man who has seen service, and has been able to drill men in such fashion that they take on the real military spirit in a surprisingly short time. To the casual observer, it is little short of wonderful to see how a group of medical men, who as a class are intensely individualistic and self-centered, sink all this below the threshold of their consciousness, and think, reason and act as units of a military organization.

THE WORK

There is perhaps no better way of getting an idea of what the men do than to schedule a typical day's work:

5:15	a. m.	First call for reveille.
5:30	a. m.	Reveille.
5:30 to 5:50	a. m.	Straightening up and getting things ship-shape; polishing shoes and puttees.
5:50	a. m.	Mess (breakfast).

6:10 to 7:00	a. m.	Study or perhaps repairing clothes.
7:00 to 7:20	a. m.	Physical exercise.
7:30 to 9:20	a. m.	Drill.
9:30 to 10:20	a. m.	Lecture: Army Regulations.
10:30 to 11:30	a. m.	Lecture: Manual of the Medical Department.
11:30	a. m.	First sergeant's call.
12:00	m.	Mess (dinner).
12:30 to 1:15	p. m.	Study or finishing up the various odd jobs.
1:15	p. m.	First call for afternoon instruction.
1:20	p. m.	Assembly.
1:20 to 2:20	p. m.	Lecture: Field Service Regulations.
2:30 to 3:30	p. m.	Lecture: Examination of recruits.
3:30 to 4:50	p. m.	Equitation or hike.

At 4:50 p. m., hot and tired, every one races for the cold shower and a change of clothes. This can just about be done in time for the day's closing ceremony—retreat.

Falling in at the assembly at 5:40 p. m., retreat is blown at 5:45, immediately followed by "To the Colors," the company standing at attention and the company commander at the salute. It is a hungry lot of men who go to mess immediately after retreat. Finishing supper at about 6:15, every one sits around and smokes or discusses the day's work till 7, and then studies from 7 until 9 and generally until 10. The call to quarters is blown at 9:45, which means hustle to bed; and taps at 10 finds every one in bed and the lights out. Every newly arrived man will solemnly declare that he has not been in his blankets over an hour when that bugler blows reveille, and he has to dash into his clothes just in time to hear the "top" call out in typical stentorian tones, "Fall in," and a new day's work begins.

Later on some of the lectures and quiz work are replaced by practical work such as tent pitching, map making, or a practice hike, staying on the field over night, sleeping in a pup tent and doing one's own cooking, etc. Toward the last of the course, the study lessens considerably, and men are assigned to field hospitals or ambulance companies for practical work with these units. Others may be given a platoon of enlisted medical corps men to drill, or are given sanitary inspection to make. If one misses lectures while doing these, he makes them up—somehow, somewhere.

RECREATION

There is a tradition at Fort Riley that the man who has time for recreation uses it by doing some extra work. Saturday afternoon there is no instruction, and one can do as one likes; but on one's first Saturday afternoon, one is likely to be detailed to fit shoes to a couple of hundred men; the next, one may be "on" at the camp infirmary, and so it goes. One hears rumors of pink teas, tennis, concerts and dances elsewhere, but not at Riley. The nearest town, Junction City—or "Junktown," as it is familiarly known—is 5 miles away, and about all an officer can want there is to get a hair cut or invest in some trifle.

MESS

The mess is the usual officers' mess—plain, generally well cooked, the food eaten on a long deal table, and seasoned by appetites bordering on the ravenous.

ESPRIT DE CORPS

The one thing which is the goal of the camp, which is striven for at all times and in all ways, is that indefinable thing known as *esprit de corps*—in sporting parlance, “playing the game.” Each new company acquires it a little quicker than the last one, and prides itself on the fact. Every officer realizes that no instructor asks him to do that which he doesn’t do himself.

If one is jerked up sharply for a bit of slow work at drill or in quiz, one remembers one’s college football or baseball experience when the coach “bawled him out” or, if he is a teacher of medicine, he remembers his own way of doing, and so he plays the game, for he sees that the system works wonders. When one sees in how short a time a group of civilian physicians can be transformed into a body of trained medical officers, eager and able to maintain the high traditions of the Army, one realizes that this is the best possible commentary on the efficiency of the system, and on the enthusiasm of the instructors who have made the system a living reality.

While there is but little talk of the war and its possibilities, the undercurrent of deep feeling is evident on every hand, and this typical American spirit, “play the game and play it to the finish,” is the reason of it all.

The following is a list of those in the photographs:

ARKANSAS

344 Huffman, K. B., Bentonville
106 Powell, B. V., Camden
93 Proctor, F. R., Fordyce
218 Posey, Ernest L., Van Buren

CALIFORNIA

274 Cline, Harry X., Burbank
73 Downs, J. M., Los Angeles
245 Luckie, Lorenzo F., Los Angeles
247 Sprague, Fred F., Los Banos
330 Newman, Richard J., Oakland
4 Reynolds, H. I., Palo Alto
18 Stolz, H. R., Palo Alto
200 Roherts, Wm. H., Pasadena
57 Smith, A. W., Pasadena
224 Irones, R. B., San Diego
46 Smith, F. J., San Diego
53 Alden, B. F., San Francisco
45 Dowdall, R. J., San Francisco
56 Ffoulkes, B., San Francisco
26 Flynn, T. J., San Francisco
75 Gibson, A. C., San Francisco
205 Glover, Cosmos A., San Francisco
289 Howe, Theodore G., San Francisco
14 Howell, E. H., San Francisco
35 Reddy, John J., San Francisco
80 Sampson, W. A., San Francisco
24 Stuckey, H. W., San Francisco
28 Weed, F. W., San Francisco
103 Berlew, J. M., Santa Ana
71 Winter, F. E., Santa Ana
279 Smythe, Hudson, Stockton
89 Lewis, W. J., Ventura

COLORADO

238 Allen, Floyd R., Colorado Springs
132 Bancroft, George, Colorado Springs
297 Filmer, Burnett A., Colorado Springs
48 Stough, C. F., Colorado Springs
321 Gjellum, A. B., Del Norte
237 Bane, Wm. M., Denver

124 Dorset, B. C., Denver
283 Finnoff, Wm. C., Denver
61 Garwood, A. G., Denver
62 Jones, W. W., Denver
6 Kent, W. C., Denver
236 Lunt, Lawrence K., Denver
104 Atkinson, C. F., Fort Collins
174 Rew, Albert W., Fort Collins
285 Leydam, James H., Frederick
165 Frank, W. W., Glenwood Springs
280 Edwards, Ernest G., La Junta
314 Turner, Floyd O., Stoneham

CONNECTICUT

273 Landry, A. B., Hartford

DISTRICT OF COLUMBIA

118 La Garde, Louis A., Washington
29 Snyder, Craig R., Washington

IDAHO

178 Howard, Wm. F., Pocatello
13 Sprague, F. M., Pocatello
74 Bland, C., Preston
316 Ingram, Jesse W., Priest River
214 Montgomery, Chas. F., Wallace

ILLINOIS

275 Wilson, Clyde S., Abilene
20 Kellar, D. H., Anvas
498 Monroe, C. W., Arthur
554 Stevens, H. I., Ashley
516 Harrod, R. W., Avon
161 Hendricks, W. W., Bardolph
507 Kunz, F. O., Beardstown
240 Field, Albert, Bement
458 Lewis, C. F., Brussels
574 Hughes, L. D., Carbondale
478 Edwards, F. M., Centralia
493 Adkins, R. E., Chicago
571 Allport, W. H., Chicago
326 Barnes, Carl, Chicago
466 Bernhardt, H. B., Chicago
496 Bettman, R. B., Chicago
202 Bower, Albert G., Chicago
430 Brodsky, L. L., Chicago
163 Brown, A. K., Chicago
418 Brucker, E. A., Chicago
495 Colebaugh, C. W., Chicago

438 Cornell, J. W., Chicago
36 Davis, George G., Chicago
44 Davies, H. R., Chicago
162 Edison, L. M., Chicago
9 Freeman, H. P., Chicago
78 Gatewood, L. F., Chicago
338 Green, Thomas S., Chicago
21 Harvey, B. C. H., Chicago
481 Howard, W. H., Chicago
474 Jared, V. M., Chicago
419 Jones, R. T., Chicago
47 Kerr, E. K., Chicago
259 Krasa, J. M., Chicago
492 Kuhn, L. C., Chicago
194 Leahy, Thomas M., Chicago
325 Lower, Frank S., Chicago
1 Lueders, A. H., Chicago
22 Lyons, J. B., Chicago
286 McGuire, John W., Chicago
526 Meacham, W. C., Chicago
429 Mellinger, H. V., Chicago
420 Merritt, F. W., Chicago
505 Miller, E. B., Chicago
77 Mock, H. E., Chicago
235 Rice, Wm. P., Chicago
442 Robinson, E. T., Chicago
41 Roblee, L. H., Chicago
573 Rosenbaum, L. W., Chicago
221 Sweeney, John S., Chicago
213 Thorpe, John N., Chicago
282 Thurlow, Ralph M., Chicago
544 Van Alyea, O. E., Chicago
11 Von Zelinski, W. F., Chicago
58 Webster, R. W., Chicago
81 Werlich, R. C., Chicago
59 Williamson, C. S., Chicago
102 Wyatt, B. I., Chicago
484 Armbrustet, A. C., Collinsville
3 Wilhelmy, A. H., Decatur
567 Hartnack, K., Downers Grove
72 Puffer, M. L., Downers Grove
152 Applewhite, Lee D., E. St. Louis
563 Boyne, W. W., E. St. Louis
189 Harney, Louis G., E. St. Louis

339 Williams, S. W., Eldorado
459 Bowman, N. W., Flora
145 Walton, James C., Forest City
556 Moffett, R. A., Gladd
111 Hall, W. L., Greenville
545 Bond, R. G., Harrisburg
559 Cummins, E. W., Harrisburg
550 Fuson, C. M., Harrisburg
230 Van Kirk, John A., Hatseka
268 Baker, L. W., Herrin
182 Murrell, Frank C., Herrin
266 Jacks, R. R., Highwood
532 Brink, H. W., Hopedale
271 Pearce, F. B., Jacksonville
199 Woltman, H. C., Jacksonville
258 Lumley, Zoda D., Kampsville
453 Chapman, W. E., Leland
107 Gaffney, C. C., Lincoln
250 Fowler, Loren L., Marion
64 Barker, F., McWaukegon
566 Floreth, G. A., Mount Olive
169 Ellis, E. K., Murphysboro
417 Barclay, C. K., New Lenox
261 Morgan, D. A., Nilwood
543 Alderson, A. L., Pana
181 Knox, Thos. B., Quincy
535 Jackson, A. D., River Forest
477 Earngey, Willard, Rockford
415 Clarke, G. W., Roseville
551 Egan, D. E., St. Charles
456 Hazel, J. B., Staunton
246 Van Meter, E. P., Staunton
482 Horn, A. S., Tampico
557 Allyn, P. R., Waverly
541 Allyn, W. H., Waverly
284 Jacobson, Guy H., Wayne City
549 Blatchford, F. W., Winnetka
450 Adams, J. W., Witt

INDIANA

87 Sechrest, W. C., Bicknell
39 Brown, K. T., Indianapolis
540 Newell, G. W., Peru
70 Betsy, F. A., Union City
569 Jones, J. G., Vincennes
447 Quillin, L. J., Warsaw

IOWA

375 Mattison, G. O., Acron
304 Irwin, Harry, Adel
343 Lang, Corvis C., Altoona
514 Guernsey, P. F., Bloomfield
576 Alt, R. C., Cedar Rapids
542 Skinner, George, Cedar Rapids
108 Howard, W. A., Cherokee
501 Greenwood, T. M., Circleville
267 Bartlett, C. L., Clinton
529 Bridgman, H. L., Columbia
225 Golden, Thos. V., Creston
346 Macrae, J. G., Creston
546 Lamh, F. H., Davenport
378 Schroeder, P. H., Davenport
345 Earwood, E. R., Des Moines
264 Elder, J. W., Des Moines
384 Hunt, J. C., Des Moines
439 Osborn, J. W., Des Moines
521 Price, A. S., Des Moines
361 Stewart, A. B., Des Moines
475 Binford, W. S., Dixon
114 Parker, H. C., Dubuque
445 Ruycwitz, J. L., Duncombe
223 Hoffman, Wm. L., Gilhert
142 McAllister, F. J., Hawarden
60 Parker, E. S., Ida Grove
500 Van Epps, C., Iowa City
454 Brown, W. F., Keokuk
116 Gilfillen, Bruce L., Keokuk
34 Hill, F. R., Logan
357 Swift, F. J., Maquoketa
315 King, Oran W., Montezuma
137 Fulliam, Ed. B., Muscatine
148 McClean, Earl D., Oskaloosa
443 Anthony, W. E., Ottumwa
421 Clary, W. H., Prescott
457 George, A. B., Red Oak
388 Christensen, J., Sioux City
367 Freer, C. E., Sioux City
515 Caldwell, J. W., Steamboat Rock
399 Kas, T. D., Sutherland
525 Morganthaler, O. P., Templeton
485 Pace, A. A., Toledo
402 Parsons, C. D., Vincent

KANSAS

229 Mielke, Charles H., Alma
110 Young, R. C., Arkansas City
196 Hickey, Frederick R., Chanute
233 Norman, Wm. G., Cherryvale
295 Lewis, Arthur J., Council Grove
32 Reno, W. W., Fort Riley
2 Ellis, F. G., Frederick
548 Hood, T. A., Garnett
364 Alford, J. S., Independence
272 Boyce, S. F., Inka
318 Palmer, Wm. R., Kansas City
506 Burkett, W. C., Kingman
570 Donnell, J. B., Kinsby
369 Barnes, R. E., Lawrence
363 Siever, C. M., Manhattan
463 Engberg, A., McPherson
140 McCool, Stanton A., Neosho
313 Cole, Charles W., Norton
504 Hawthorn, H. B., Palmer
509 Appleby, C. E., Peabody
197 Lasche, P. G., Richland Center
239 Brown, L. T., Spearville
470 Adams, C. S., St. John
366 Lindsay, M. J., Topeka
333 Phares, Willard A., Wichita
365 Hawk, C. C., Winfield
362 Jones, H. H., Winfield

KENTUCKY

139 Price, Carroll P., Harrodsburg
398 Coolidge, W. L., Louisville

LOUISIANA

207 Tucker, James A., Baton Rouge
242 Furman, Frances S., Shreveport

MAINE

568 Fox, J. S., Fort Preble

MARYLAND

27 Pillshury, H. C., Takoma Park





MICHIGAN

292 Salisbury, Walter N., Ann Arbor
5 Walsh, J. L., Iron River

MINNESOTA

76 Snyder, G. W., Belle Plaine
441 Laney, R. L., Brown Valley
146 Guittard, Virgil, Cloquet
360 Raiter, F. W. S., Cloquet
499 McHugh, R. F., Coleraine
510 Robertson, J. B., Cottonwood
303 Lares, Bert V., Delano
359 Andreas, J. H., Duluth
340 Clark, Chester H., Duluth
128 King, Emil, Fulda
270 Elsey, J. R., Glenwood
254 Ransom, Matthews L., Hancock
241 Bursheim, Peter J., Lake Benton
385 Liedloff, A., Mankato
249 Pratt, Chelsea C., Mankato
243 Heagerty, Wm. B., Mazeppa
255 Bacon, Harry P., Milaca
290 Brown, Paul, Minneapolis
120 Butler, John, Minneapolis
381 Cruzen, R. E., Minneapolis
281 Forsythe, Samuel T., Minneapolis
306 Graves, Floyd E., Minneapolis
63 Hengstler, H., Minneapolis
192 La Vake, R. T., Minneapolis
180 McCusker, Chas. F., Minneapolis
383 Noice, R. R., Minneapolis
358 Rosenwald, J. P., Minneapolis
94 Sessions, J. C., Minneapolis
184 Shewbrooks, D. M., Minneapolis
135 Thomas, Gilbert J., Minneapolis
10 Bickford, H. G., Minn. Lake
68 McKeon, J. O., Montgomery
222 Schmidt, Geo. F., Pipestone
83 Wilkinson, J. C., Red Lake Falls
251 Bjerkén, Fred N., Red Wing
52 Bell, L. F., Rochester
149 Berkman, David, Rochester
82 Brodie, W. D., St. Paul
115 Cook, P. B., St. Paul
522 Meyerding, E. A., St. Paul
335 Middleton, Wm. L., St. Paul
90 Staley, J. C., St. Paul
248 White, Jonas S., St. Paul
121 Daniels, J. W., St. Peter
50 Workman, W. G., Tracy
301 Kenyon, Paul E., Wadena
320 Bates, Bert V., Wheaton
520 Canfield, H. E., Willmar
396 Schaefer, S., Winona
127 Manson, Frank, Worthington

MISSISSIPPI

109 Stephenson, R. M., Lexington
437 Butler, H. C., Moselle

MISSOURI

473 Albright, F. C., Bronough
193 Jenkins, Chas. E., Brookfield
332 Crank, Alexander C., Canton
208 Berry, John W., Cape Girardeau
531 Williams, P. R., Cape Girardeau
324 Noyes, Guy L., Columbia
323 Ravenel, Mayzek P., Columbia
227 Griffith, Edgar M., Creighton
98 Johnson, J. W., Hayti
123 Blankenship, E. P., Houston
131 Abramopoulos, C., Kansas City
300 Beebe, Joseph A., Kansas City
386 Broyles, G. H., Kansas City
511 Culbertson, W. F., Kansas City
400 Gist, Wm. L., Kansas City
211 Harrington, Walter W., Kansas City
12 Hecker, F. H., Kansas City
190 Hill, Wm. H., Kansas City
296 Hiller, Frank B., Kansas City
228 Hopkins, Chas. B., Kansas City

410 Howell, J. F., Kansas City
405 Hurwith, F. R., Kansas City
126 La Rue, H. M., Kansas City
350 Leonard, W. H., Kansas City
407 Lyle, H., Kansas City
327 Lynch, John C., Kansas City
448 McCarthy, H. E., Kansas City
167 Meade, R. H., Kansas City
305 Miller, George C., Kansas City
49 Milne, L. S., Kansas City
220 Powers, James W., Kansas City
331 Rogers, Fordyce B., Kansas City
307 Small, Walter L., Kansas City
37 Smith, D. O., Kansas City
472 Smith, J. H., Kansas City
287 Trachinos, Frank R., Kansas City
337 Valentine, H. S., Kansas City
406 Wilhelm, D., Kansas City
257 Bogard, Edward, Libbourn
395 Lewellen, C. P., Louisiana
141 Toney, Les E., Piedmont
293 Coffey, Grundy C., Platte City
201 Yeagle, Roland P., Pleasant Hill
203 Insley, Herbert W., Rich Hill
198 Powers, Chas. E., Rockville
210 McCall, Otis S., Rocky Comfort
212 Heibner, Eugene A., Sedalia
560 McGinnis, C. S., Sedalia
166 Beckemeyer, W. A., Sedalia
256 Box, Ernest M., Springfield
138 Kizer, Philip, Springfield
329 Wills, Wm. J., Springfield
299 Gossow, August A., St. Charles
113 Brewer, W. H., St. James
19 Cook, E. F., St. Joseph
519 Corbin, S. W., St. Joseph
408 Schmidt, O. A., St. Joseph
153 Smith, A. S. J., St. Joseph
143 Alexander, Robt. B., St. Louis
523 Axline, J. T., St. Louis
157 Bremser, H. L., St. Louis
464 Fry, W. F., St. Louis
480 Gibbs, F. L., St. Louis
319 Gordon, Frank N., St. Louis
92 Hawley, N. J., St. Louis
483 Heiple, E. E., St. Louis
176 Herrick, Harold C., St. Louis
244 Heuman, Geo. W., St. Louis
276 Hobson, Dana A., St. Louis
130 Hynes, J. C., St. Louis
468 Kouri, M. F., St. Louis
349 Ude, Waldemar, St. Louis
382 Unger, O. L., St. Louis
204 Woodruff, Fred E., St. Louis
455 Shudde, O. N., Sullivan
411 Belshe, G. W., Trenton
351 Awry, S. D., Troy
277 Lutman, Harry N., Versailles
291 Harrison, Alfred M., Warrensburg

MONTANA

136 Loring, Fred W., Butte
23 Wilking, S. V., Butte
97 Hathaway, R. E., Glendive
173 Irwin, J. H., Great Falls
51 Bartlett, J. D., Lewiston
491 Androps, S., Richey

NEBRASKA

85 Howard, W. S., Alliance
553 Cline, E., Auburn
513 Metheny, E., Cairo
426 Legg, C. E., Champion
168 Koefoot, T. H., Columbus
112 Newparker, U. R. C., Columbus
164 Johnson, C. C., Creighton
380 Reed, C. O., Ewing
69 Redfield, W. J., Grand Island
476 McCabe, F. H., Holbrook
8 Garlinghouse, O. L., Iola
374 Hibbard, P. L., Kearney
117 Andrews, Henry S., Minden
175 Clements, Stanley C., Neligh
186 Hooper, Clifford, North Platte
342 Nade, John C., Oconto

322 Wallingsford, C. C., Ogallala
503 Akers, W. O., Omaha
172 Akin, H. L., Omaha
534 Egen, L., Omaha
158 Eggers, H. E., Omaha
160 Fricke, A. A., Omaha
7 Gilbert, G. R., Omaha
129 Johnson, A. A., Omaha
84 Van Buren, F. A., Omaha
353 Buis, John, Pender
416 Crawford, W. H., Rushville
394 Ershine, E. B., Wayne
427 Brenn, C. P., Western
195 Wells, Harry L., West Point

NEVADA

188 Turner, Delos A., Goldfield

NEW JERSEY

265 Brady, C. S., Union Hill

NEW MEXICO

423 Tinder, J. W., Roswell

NEW YORK

428 Dwyer, J. G., New York City
33 Richardson, W. H., New York City

NORTH CAROLINA

555 Allen, B. C., Henderson

NORTH DAKOTA

95 Hillis, S. J., Berthold
209 Brimi, Carl L., Cooperstown
302 Pryse, Roscoe C., Dawson
217 Nachtweg, A. P., Dickinson
479 Meland, O. N., Grand Forks
444 Nickerson, B. S., Mandan
147 Livingston, Jos. W., Valley City
185 Strong, Thos. J., Williston
67 Reedy, P. G., Wilton

OHIO

154 Williams, Curtis C., Niles
144 Syman, L. L., Springfield

OKLAHOMA

391 Bradfield, S. J., Bartlesville
462 McDonald, C. R., Broken Bow
561 Clark, E. W., Granite
171 Janney, J. G., Lawton
312 Davenport, A. E., Oklahoma City
187 Long, Robt. D., Oklahoma City
389 Mraz, J. J., Oklahoma City
390 Reed, H. L., Oklahoma City
25 Bolend, F. J., Okla. National Guard
371 Capps, J. F., Tulsa

OREGON

156 Guillion, W. F., Eugene
16 Abraham, V. R., Hood River
119 Everett, E. A., Lake View
125 Buck, George, Portland
42 Dammasch, F. H., Portland
317 Grant, Daniel, Portland
234 Kane, Edward J., Portland
252 Palmer, Dowin L., Portland
311 Pargon, Joseph A., Portland
170 Rockey, Paul, Portland
348 Weatherbee, J. R., Portland
347 Houck, G. E., Roseburg
356 Vincil, F. H., Roseburg
86 Smith, W. C., Salem

SOUTH DAKOTA

278 Field, Louis M., Aberdeen
461 Kaps, F. O., Britton
179 Edward, Geo., Bruce
226 Ashcroft, F. E., Deadwood
216 Duerr, John E., Groton
232 Fiksdal, Mads J., Webster

TENNESSEE

54 Steele, J. B., Chattanooga
122 Bundrandt, Wm. C., Lawrenceburg

TEXAS

91 Doole, T. P., Eagle Lake

43 Sauer, P. K., El Paso
31 Bispham, W. N., Galveston
440 Morgan, E. H., Granbury
524 Clark, F. E., Jayton
336 Whisenant, J. R., San Antonio

UTAH

253 Whalen, Walter E., Ogden
412 Jansen, F. J., Salt Lake City
373 Jellison, R. T., Salt Lake City
372 Van Scoyoc, J. C., Salt Lake City

WASHINGTON

308 Brooks, Samuel G., Anacorta
219 Powell, I. W., Bellingham
294 Knox, John F., Elmira
334 Campbell, Daniel R., Pullman
377 Beeler, G. W., Seattle
341 Pontius, Nevin, Seattle
288 Simpson, Austin V., Seattle
65 Smith, E. H., Seattle
376 Durrant, J. A., Snohomish
354 Byrne, J. G., Spokane
191 Lambert, G. E., Spokane
328 Nather, Fred B., Spokane
38 Newell, R. J., Spokane
888 Pennock, W. J., Spokane
66 Robinson, H. H., Spokane
17 Sprowl, F. S., Spokane
55 Whittaker, F. J., Spokane
206 Allen, Robert A., Tacoma
397 Gammon, C. P., Tacoma
215 Laws, Clement E., Tacoma
151 Stryker, Ralph F., Wedgefield

WISCONSIN

471 Palmer, J. A., Arcadia
309 Coleman, Harry N., Barrow
489 Driessel, S. J., Barton
310 Lewis, Paul J., Bloomington
494 Farrage, J., Breckinridge
552 Axley, A. A., Butternut
572 Beeson, H. B., Cornell
502 Hager, F. J., Denmark
486 Bennett, L. J., Fort Atkinson
40 Clark, W. T., Fort Atkinson
231 Fritchen, Arthur F., Franksville
562 Rodecker, R. C., Holcombe
469 Brunkhorst, F. O., Hortonville
508 Burns, H. J., Hudson
488 Clarke, C. C., Janesville
150 Van Kirk, Jas. W., Janesville
414 Hanley, W., Kenosha
436 Nelson, N. O., Madison
467 Grannis, I. V., Menominee
449 Bading, G. A., Milwaukee
387 Blumenthal, R., Milwaukee
446 Bornstein, M., Milwaukee
433 Jenner, A. G., Milwaukee
413 Mackedon, T. E., Milwaukee
370 Sargent, H. L., Milwaukee
392 Shubert, F. J., Milwaukee
15 Parmenter, E., Mondovi
497 Menefee, B. F., Montgomery City
460 Johnson, J. C., Ogdensburg
177 Provost, A. G., Oshkosh
512 Crane, M. C., Osseo
533 Barnes, H. T., Pewaukee
487 Fowler, P. H., Plain
159 Borden, F. R., Plainfield
96 Pretts, W. I., Plattville
79 Richards, C. W., Reedeberg
355 Schiek, J., Rhinelander
379 Boyden, W. L., Seymour
518 Bedford, E. W., Sheboygan
432 Dehmel, R. W. A., South Germantown
517 Christensen, J. W., Sparta
368 Erickson, H., Stanley
431 Keenan, H. A., Stoughton
527 Huff, F. C., Sturgeon Bay
452 McEacheon, W. A., Superior
528 Boland, J. E., Two Rivers
465 Converse, G. L., Webster
490 Tyvand, J. C., Whitehall

WYOMING

30 Coffin, J. M., Fort Yellowstone

The Venereal Diseases

THE DIAGNOSIS AND TREATMENT OF SYPHILIS

NOTE.—This is the first of a series of four articles on the management of venereal diseases with special reference to military practice. The articles have been prepared under the direction of the Surgeon-General by the Advisory Committee on Venereal Diseases, Dr. William Allen Pusey, Chicago, chairman; Dr. Francis R. Hagner, Washington, D. C.; Dr. Grover W. Wende, Buffalo; Dr. Sigmund Pollitzer, New York, and Dr. Henry H. Morton, Brooklyn, with Lieut.-Col. F. F. Russell in charge of Infectious Diseases. The series is published with the permission of the Surgeon-General, and will include the following: Treatment of Syphilis; Chancroid; Balanitis Gangrenosa; Acute and Chronic Gonorrhea, with its complications. The complete series will be issued in the form of a manual.—ED.

The care of syphilis in the new army will have to do chiefly with early syphilis, and in this article early syphilis is the condition under consideration, unless otherwise stated.

CASE RECORDS

Great importance is attached to the keeping of systematic and full histories of venereal cases. Such records will in time accumulate a very large and valuable fund of information on these diseases.

In respect to syphilis, the army now requires the keeping of a syphilitic register. This register will insure a much desired uniformity in the keeping of the records of syphilitic cases, and attention is called to it in order to emphasize its importance.

IMPORTANCE OF EARLY DIAGNOSIS

The matter of prime importance in handling syphilis is to get it at the beginning of the infection. The earlier it is treated the better are the prospects of cure, and the quicker the soldier can be made non-contagious and gotten back to duty. It should be the constant effort to discover syphilis at the earliest possible time, if possible before the development of a positive Wassermann reaction.

To this end, every sore, whether on the genitals or elsewhere, that is open to any suspicion of being a chancre, should be repeatedly examined for spirochetes. No determining weight should be given to the so-called specific clinical characteristics of any lesion that might by any possibility be a chancre. Experience has shown that the typical clinical characteristics of the chancre, aside from indolence—and this may be masked by another infection—are often lacking. Any excoriations, papule, nodule, crack, herpetic or other erosion, no matter how small, may be an initial lesion of syphilis; and such lesions, as well as ulcers about the genitals—and elsewhere, if there is any reason to suspect them or if they are indolent and not readily to be accounted for—should be searched for spirochetes.

Chancroids in particular should never be accepted as uncomplicated by syphilitic infection. They are likely to have a double infection, and should always be zealously examined for *Spirochaeta pallida*. Sometimes, in spite of the most careful search, the spirochetes escape detection in chancroids. For that reason, one can never be sure that a chancroid does not hide a chancre; patients with chancroid, therefore, require watching for the possibility of syphilis, and, when the spirochetes cannot be found, should always

have weekly Wassermann tests for three or four weeks until the question of syphilis can be decided.

Antiseptics, especially mercurials, render the finding of *Spirochaeta pallida* difficult or impossible; and, because of this, it should be routine practice to apply no mercurial dressings, or better, no antiseptic dressings, to suspicious lesions until the necessary examinations to exclude *Spirochaeta pallida* have been made. If any such application has been made to a suspected lesion, the lesion should be thoroughly irrigated with physiologic sodium chlorid solution, and a wet dressing of this solution applied for twelve hours or more before examining for spirochetes.

In order to aid in discovering the initial lesion at the earliest moment, soldiers who have been exposed should be inspected at intervals of a few days for at least three weeks, and also instructed to be themselves on the watch for suspicious lesions.

EXAMINATION FOR SPIROCHAETA PALLIDA, AND DIAGNOSIS

To obtain the *Spirochaeta pallida* for examination, two procedures are of value. In obtaining them directly from the lesion, the surface should be wiped with gauze wet with physiologic sodium chlorid solution, to remove saprophytic organisms, especially the *Spirochaeta refringens*. The rubbing should leave a clean oozing surface, not bleeding. Light curettement may be necessary in some cases. Moderate squeezing of the lesion will then cause an exudation of lymph from the deeper portions of the tissues. A drop of this lymph is then touched to a cover-glass and placed on a slide, or the fluid may be collected in a capillary pipet. It may be preserved for a few hours by sealing the pipet, or the specimen on the slide may be ringed with paraffin or petrolatum and kept on ice for variable periods up to twelve hours or longer. Delay impairs the validity of the findings, however, and multiplies uncertainties, so that examination should be made at once.

A valuable method, which relieves the observer of much of the responsibility for differential diagnosis of the organism, is glandular aspiration. This can be done on prominent nodes in the satellite adenopathy accompanying the primary lesion. It can also be performed on the indurated base of a suspected chancre. A sterile glass syringe, of 1 c.c. capacity, fitted with an ordinary stout hypodermic syringe needle, an inch or so in length, is sufficient. The skin over the gland is painted with iodine, and the gland palpated and fixed between the thumb and forefinger of the left hand. The needle is plunged through the skin into the gland, the penetration of the capsule being indicated by the moving of the gland under the finger when the position of the syringe is changed. The gland is then held firmly while the needle is manipulated enough to macerate the tissue immediately around the point. Aspiration will draw a drop or two of tissue juice into the needle and barrel. The fluid thus obtained is often rich in *Spirochaeta pallida*. The method is not especially painful, and is easily borne by the average patient.

The *Spirochaeta pallida*, as obtained for study by these methods, has a morphology usually easily recognized by the experienced observer. It is a regular spiral organism, of from 6 to 15 microns in length, with from 3 to 26 turns. The average length is about twice that of a red blood cell, and the usual number of turns is from 10 to 20. It is rather slow moving,

which is a distinctive characteristic. A movement in the direction of the long axis and a rotating movement are most commonly observed. The organism retains its clear-cut, regular spiral turns exceptionally well, even at rest—another distinctive characteristic. Long forms bent in the middle are occasionally seen.

From *Spirochaeta refringens*, if this is not eliminated by proper cleansing, the *Spirochaeta pallida* is distinguished by the fact that *Spirochaeta refringens* is obviously coarser, and the turns are fewer and less regular. *Spirochaeta refringens* does not keep its corkscrew shape so well as *Spirochaeta pallida* when at rest, and when in motion moves much more rapidly than the *Spirochaeta pallida*. *Spirochaeta dentium*, seen in mouth preparations, is much more minute than the *Spirochaeta pallida*. Fibrin spirals have been mistaken for syphilitic spirochetes by inexperienced observers. In general it may be said that while the recognition of the organism of syphilis is not an affair for the tyro, a moderate amount of experience on the part of the examiner, coupled with the presence of numerous organisms of the above described type in a given preparation made under favorable conditions, is sufficient for a diagnosis of syphilis and the institution of appropriate treatment. Failure to find them, however, is no evidence that the lesion is not syphilis.

In all suspected cases, Wassermann tests should be made. It should be made a general rule that the first finding of a positive Wassermann reaction should immediately be confirmed by a second; but it is not necessary to delay beginning treatment until the second report is received. For the first ten days after the appearance of the chancre, the Wassermann reaction is usually negative. It is at this critical period that the establishment of the diagnosis of syphilis by demonstration of the specific spirochetes is of such importance, because it enables us to begin treatment while the infection is still relatively localized and can usually be aborted by thorough treatment. In suspected chancres in which spirochetes cannot be found, Wassermann tests should be made at intervals of a week, for a month, before it is decided finally that the case is not syphilis. In cases in which the spirochetes are found, a Wassermann test should be made at the outset, and if it is not positive, should be repeated at weekly intervals for the first few weeks to see if, in spite of treatment, it becomes positive. Further Wassermann tests should be made at about monthly intervals.

In no case should specific treatment be started until a positive diagnosis of syphilis has been made.

TREATMENT OF THE CHANCRE

Excision of the chancre is a procedure which theoretically should be useful, on the ground that it removes the important focus of infection. And when the location of the chancre is such that its excision will not cause deformity, surgical excision may be done; but excision of the chancre does not abort syphilis. The excised chancre should be preserved and sent for laboratory examination. Until the search for spirochetes is ended, the chancre should be treated only by cleansing with saline solution and covering with a compress wet with the same solution. As soon as spirochetes are demonstrated, if the chancre is not excised, it should receive an inunction of 33 per cent. calomel ointment twice daily for a week; it should be kept clean and protected by a calomel ointment or some bland protecting dressing.

SYSTEMIC TREATMENT

In the presence of early syphilis, treatment should be immediately started and vigorously pushed. It should be with both salvarsan and mercury. Before beginning there should be a preliminary survey of the patient's physical condition. Patients with acute febrile diseases, or with diseases of the liver, kidney or vascular system—when they are nonsyphilitic in origin—should be given salvarsan with caution.

SALVARSAN

There is agreement among syphilographers that the most effective time for producing radical results with salvarsan is in the first few weeks of syphilis—best before the Wassermann test becomes positive—and that salvarsan should be pushed at this time. But there is considerable difference of opinion as to how vigorously it should be pushed.

A safe vigorous course of salvarsan between extremes is advised. Such a course is a dose of from 0.4 to 0.6 gm. of salvarsan given at five day intervals until three doses are taken; after that at intervals of a week for five more doses, making a total of eight doses of salvarsan in a little more than six weeks.

It is possible that in cases seen before the Wassermann test has become positive, one such course of salvarsan combined with mercury may cure. But this is not safe to assume, and, in the light of our past knowledge of syphilis, it is advised even in these cases to repeat the course of salvarsan and mercury treatment at least once after a rest period of from six to eight weeks. Such patients should be subsequently watched for a year with monthly Wassermann tests and treated should any evidence of syphilis be discovered.

In all cases seen after the Wassermann test has become positive the first course of treatment should be followed by a second after six to eight weeks' rest. And it is safest to give at least a third similar course after an interval of two months even in the most promising of cases.

In all those cases in which a positive Wassermann test or any other evidence of syphilis remains, further courses of salvarsan and mercury should be given at intervals similar to the foregoing, the persistence in treatment to be determined by the findings in the individual case.

In place of salvarsan, neosalvarsan can be used in 50 per cent. larger doses. It may be somewhat less effective, but the difference is not sufficient to allow of dogmatic statements on this point.

The word "salvarsan" is used here for convenience, and is intended to cover the same product made in the United States and elsewhere under different trade names. Experience has shown that those furnished by responsible manufacturers are as effective as the original.

It may be repeated that the use of salvarsan is to be combined with that of mercury in the attempt at cure of syphilis; and that reliance is not to be placed on salvarsan alone.

PREPARATION AND CARE OF PATIENT

The urine should be examined before each injection of salvarsan. Salvarsan should be given with the patient's stomach empty, or nearly so. The treatments are best given at noon or in the early afternoon, the patient omitting lunch. He should remain quiet for the rest of the day—best in bed—and should take no food until the next morning.

SALVARSAN REACTIONS

Reactions after salvarsan are rarely of consequence. Many patients experience a degree of nausea six or seven hours after the injection, and occasionally they vomit, sometimes the vomiting being severe and prolonged. These reactions do not necessitate the abandonment of salvarsan, but they indicate that the further use of the drug should be guarded.

Occasionally immediate acute anaphylactoid reaction, such as edema and syncope, occur. These demand the intramuscular injection of from 5 to 10 minims of the standard 1:1,000 solution of epinephrin. This solution and a sterile hypodermic syringe should always be at hand for this emergency. In patients subject to such reactions, these occurrences may be prevented by the administration of epinephrin from ten to fifteen minutes before the injection of salvarsan.

In rare cases, patients respond after from twelve to thirty-six hours with a more or less pruritic erythema. This may go on, if salvarsan is pushed further, to a general exfoliative dermatitis with nephritis and dangerous intoxication, and is an indication for conservatism in the further use of the drug.

It is not uncommon to find a trace of albumin and a few casts in the next morning's urine after an injection of salvarsan. This is not a contraindication to the further use of salvarsan unless the albumin is present in considerable quantity and there are more than half a dozen casts to the slide.

The occasional ocular and auditory and other nerve symptoms in syphilitic patients are not manifestations of salvarsan poisoning, but of syphilitic lesions, and call for further use of salvarsan.

In general, the careful man is likely to attach undue importance to minor symptoms arising in the course of salvarsan administrations, and to be influenced too readily by them to give up its use in the particular case. On the other hand, a reasonable caution in the face of symptomatic warnings of salvarsan intoxication demands care in its further use in such cases.

TECHNIC OF SALVARSAN ADMINISTRATION

The fundamental principle of administering any form of salvarsan is a rigid asepsis, and only extreme conditions justify its administration when this is not obtainable. The apparatus should be boiled twenty minutes in distilled water. It is important that freshly distilled water be used for salvarsan solution. Twenty-five c.c. of water per decigram of salvarsan is a safe dilution. If the ampule has been immersed in mercuric chlorid, it must be carefully wiped before it is opened.

The drug is first dissolved in about 50 c.c. of *hot* water. If the water is hot, it dissolves easily. This yields a strongly acid solution, which must be neutralized and diluted before injection. Neutralization is accomplished after all the salvarsan is dissolved by a 15 per cent. freshly prepared solution of sodium hydroxid, which should be added drop by drop. Salvarsan is precipitated from the solution by the alkali, but redissolves as soon as the suspension becomes slightly alkaline. The point at which this occurs can be gaged with sufficient accuracy if the sodium hydroxid is added carefully and mixed after each drop or two. Since salvarsan oxidizes easily, it is undesirable to shake the material too vigorously while in preparation. As soon as the salvarsan has redissolved, yielding a clear yellow solution, it may be fil-

tered through wet sterile cotton in a funnel directly into a graduated container; when hot or cold water is added to the proper dilution and to approximately body temperature. Care must be taken to fill the tube attached to the container with water and to expel all air bubbles before the salvarsan solution is filtered into the container.

In the event that the salvarsan precipitates somewhat on dilution, it may be redissolved by another drop or two of the sodium hydroxid. If the preparation has been made too strongly alkaline, a drop of dilute hydrochloric acid may be added and the neutralization repeated. The drug should be administered promptly after preparation, and no more than enough for use on the patients to be treated at the time should be prepared.

The technic of injection of the solution is comparatively simple, and the older custom of making an incision to find the vein, with its resultant scarring, has been abandoned by skilful operators. A variety of needles has been proposed, but the Schreiber 18-gage with thumb guard and a proper adapter, or even a plain needle, will answer all purposes. In difficult cases a finer needle may make it much easier to get in the vein. The skin over the field of operation, preferably in the region of the large cubital veins, is sterilized as for a surgical procedure, but if tincture of iodine is employed it is desirable to remove it with alcohol in order that the vein may be more easily seen. The injection should be given with the patient lying down and the veins distended by encircling the arm with a tourniquet.

In nervous patients, local anesthesia may be used to advantage. The needle is pushed directly through the skin over or to one side of the vein and then introduced into the vein. As soon as the blood returns freely through the needle, the adapter attached to the tube of the container is fitted to the shoulder of the needle, the tourniquet is released, and the injection begun by elevating the container about two feet. As a rule assistance is desirable, since the operator is occupied by keeping the needle in position in the vein. Failure to enter the vein is apparent by this method, before injection is begun, through the imperfect flow of blood through the needle. The sterile water contained in the tube allows sufficient warning of the infiltration of the tissues before the salvarsan solution reaches the needle point. Various forms of apparatus which inject saline solution as a test before beginning the injection of the salvarsan are not essential and are often complicated. A glass telltale in the rubber tube permits the operator to watch the progress of the injection. When the injection is completed, the lowering of the container below the level of the arm before the needle is withdrawn will aspirate a small amount of blood from the vein and prevent the escape of solution into the tissues. Only experienced operators, in this procedure, as in any other of a surgical nature, should attempt difficult cases.

Infiltrates, if they occur, are usually trivial, provided the operator has been on his guard. The escape of salvarsan into the subcutaneous tissues is indicated by a burning sensation, which the patient should be warned to report. The reaction which ensues when salvarsan is injected around the vein is inflammatory, with induration and infiltration, and may, if severe, progress to a slough. Salvarsan infiltrates should be treated by wet dressings, icebag, and, after inflammatory symptoms subside, by massage and passive move-

ment. An alarming degree of involvement may subside with practically no damage after several weeks or months. Thrombosis of the vein is an infrequent complication if the drug has been properly diluted, and should be treated on general indications.

THE TECHNIC OF NEOSALVARSAN ADMINISTRATION

The original administration of neosalvarsan, in dilutions similar to those used with salvarsan, has been greatly simplified by the injection of the dose in concentrated solution. In this procedure, the dose of neosalvarsan is dissolved in 10 c.c. of freshly distilled sterile water at room temperature—not hot water. The solution is drawn up into an all-glass syringe and administered as an intravenous injection after the usual preparations. The method is rapid and extremely convenient, and its applicability to difficult cases is apparent.

The solution of neosalvarsan being already neutral, it requires no addition of sodium hydroxid. Care must be taken to avoid infiltrates with the concentrated solution, but in general infiltrates with neosalvarsan are apt to be less serious than those with salvarsan.

MERCURY

For the cure of syphilis, salvarsan and mercury should be combined, and at the same time with each course of salvarsan a vigorous course of mercury should be given. This should begin at the same time or within a few days after the first dose of salvarsan.

A course of mercury should consist of six or eight weekly injections of an insoluble salt, or of thirty-five to forty-five daily inunctions of mercurial ointment. The administration of mercury either by inunction or by intramuscular injection is effective; and in the selection of either method one may be properly influenced by considerations of convenience and practicability.

INUNCTIONS

If inunctions are used, it is necessary to see that they are properly performed. Patients cannot be trusted to give themselves inunctions; but they can very readily do it for each other by sitting one behind another and having each man rub the back of the man in front of him. From 4 to 8 gm. of mercurial ointment may be used for a daily inunction. It is desirable before the inunction to wipe off the area to be rubbed with alcohol or to wash it lightly with soap and water and dry. The ointment should be rubbed in slowly and gently with the palmar surface for twenty or thirty minutes, or until the ointment is practically absorbed. Any excess should be allowed to remain on the skin. After six inunctions, a day should be skipped and the patient allowed a bath.

In giving inunctions, hairy surfaces and the thin skin of joints should be avoided, and the same area should not be used often enough to produce dermatitis. The two sides of the back furnish the most tolerant areas. The sides of the abdomen and of the chest, and the inner surfaces of the thighs, the arms and the forearms may all be used.

INJECTIONS

For injections, the preferable insoluble preparations are mercuric salicylate or calomel in oil, or metallic mercury in the form of gray oil. Perhaps the best proportion for the salicylate or calomel suspension is 20 gm. (weight) in sterile olive oil or thin liquid petrolatum, enough to make 100 c.c. (volume). A

good formula for mercurial oil (gray oil) is redistilled mercury, 20 gm.; chlorbutanol, 2 gm.; anhydrous lanolin, 30 c.c., and liquid petrolatum, enough to make 100 c.c.

The intramuscular dose of calomel, salicylate and metallic mercury are the same. These three preparations, being of the same strength, have the advantage of having the same dose. The average dose of either, for an adult man, is 5 minims (0.06 gm., 1 grain) weekly; by graduations the dose may be increased to 0.12 gm. (2 grains) weekly, or with caution even higher.

The curative action of the injection of soluble salts of mercury is perhaps less than that of the insoluble. However, they are free from the dangers of cumulative effect which are inherent in the insoluble salts; and in emergencies, when there is need to get prompt, certain and vigorous effect of mercury, they are of great value. Mercuric chlorid or mercuric succinimid are the most useful soluble salts for injections. A good preparation is 1 per cent. mercuric chlorid or 1 per cent. mercuric succinimid with 1 per cent. sodium chlorid by weight in distilled water. The average dose is 25 minims (0.015 gm., $\frac{1}{4}$ grain) into the muscle of the buttock every second day.

TECHNIC OF INJECTIONS

For intramuscular injection, a syringe such as the all-glass Luer hypodermic syringe with a $1\frac{1}{2}$ inch, 20 or 22 gage needle is used. The needle should have a slip shoulder to permit of its easy detachment from the syringe. Sterilization of the skin with tincture of iodine is sufficient; emulsions once sterilized will remain so with reasonable care in their handling. In military service the syringe and needle should be sterilized by boiling, or by liquid phenol and the water or phenol removed by filling the syringe first with alcohol and then with ether.

The site of the injections is usually in the upper outer quadrant of the buttock, care being taken to avoid the region of the sciatic nerve or the structures about the hip joint. They can also be well given in the upper inner quadrant of the buttocks. Injections are made alternately into each buttock.

The needle with the syringe empty should be introduced to its full length, and the syringe then detached and filled with the necessary dose. This introduction of any empty needle is a safeguard against making an injection into a vein. If the dry needle should be in a vein, on detaching the syringe, blood would well up through it; if the needle remains free from blood, as is nearly always the case, there is reasonable security against introduction into a vein.

In general, in order to prevent leakage of the emulsion, it is desirable to introduce the needle on a slight slant in the tissue. This may be accomplished by drawing downward on the skin of the buttock, which permits a valve action as soon as the needle is withdrawn and the hand released. The injection if made slowly is practically painless. The development of infiltrates and nodules of any considerable size, or in any number, during a course of injections, is either a reflection on the operator's technic or shows the case to be unadapted to this form of treatment. Each of these nodules represents encapsulated mercury, and materially increases the danger of cumulative action. Daily massage by the patient will usually reduce them in a short time. If their formation cannot be prevented, the patient should be put on a rest period until they disappear.

CARE OF PATIENT WHILE TAKING MERCURY

Mercury as well as salvarsan throws a burden on the kidneys; and patients under intensive treatment with mercury and salvarsan should have the renal functions carefully watched. An examination of the urine for albumin and casts should be made weekly, and the development of definite nephritis during a course of treatment is an indication to stop. Treatment may be undertaken again after the nephritis has disappeared, but must be less vigorous than before and must be carefully watched.

Care of the mouth is a part of the general care which a syphilitic should have. Dental troubles should be looked after and the patient instructed in the care of the teeth. A dentifrice should be used, and it is a good plan to have the patients as a routine use an oxidizing mouth wash such as a one-half saturated potassium chlorate solution, or a diluted solution of hydrogen peroxid. When the gums are soft or unhealthy, a good astringent application is tincture of kino, one part, and tincture of myrrh, two parts, to be painted on two or three times daily, after brushing the teeth.

SALIVATION

If salivation should occur, the mouth should be cleaned at short intervals by washing with hydrogen peroxid solution or half saturated potassium chlorate solution. Compound solution of sodium borate (Dobell's solution) may also be used, and, while less effective, it has the advantage of being soothing. Pledgets of cotton or gauze moistened with boric acid solutions placed between cheeks and teeth give comfort and get rid of exudate. Atropin is useful, given to the point of reducing salivary secretion. If the patient has been using inunctions, he should, in order to get rid of mercury in the skin, be greased with an oil and then well washed with soap and water and put in fresh clothes. He should have a soft, nutritious diet, be protected from exertions, and given the care for exhausting illness. In particular, he should be given an abundance of water.

ESTIMATING THE COURSE OF CASES

During the early course of syphilis, a Wassermann test should be made at monthly intervals, and after it has apparently become permanently negative, it should still be repeated at intervals of two or three months for at least a year. It should be remembered that the Wassermann test is not likely to be positive for the first ten days of the chancre. After it becomes positive, the obtaining of a single subsequent negative reaction means little; it must remain negative over a period of months to justify the conclusion that it is permanently negative.

In estimating the effect of treatment on syphilis, not only the disappearance of specific clinical symptoms and of the positive Wassermann reaction should be considered, but the patient's general well-being as well. In zeal to sterilize a patient of spirochetes the effect of the treatment itself on the patient should not be overlooked, and treatment should not be pushed beyond the point at which the patient is able to tolerate it without distinct lowering of his general physical tone.

A patient may be regarded as free from the necessity for further observations or treatment who, under observation and with Wassermann tests at intervals of two months, has remained free from all evidence of syphilis for a year.

There is room for difference of opinion as to the advisability of spinal puncture or a provocative injection of salvarsan with a subsequent Wassermann test in every case before discharge. Conservative practice reserves the use of these diagnostic measures to cases in which there are special indications.

LATE SYPHILIS

The late manifestations of syphilis in the Army will be less common than the early. Gummatous lesions in the skin or bones or elsewhere, which may be cured without leaving any serious damage to the body, do not constitute a difficult clinical problem. In old cases of this sort, there is not the need for the intensive treatment administered in early cases. These patients should have mercury and potassium or sodium iodid until their lesions are cured. How much farther treatment should be carried is a matter for judgment in the individual case. The deep lesions of late syphilis—syphilis of the viscera, of the vascular system, especially of the heart or aorta, and of the central nervous system—indicate such serious impairment of the body that these patients will not be able to endure the strain of military life in the field. If the lesions in such cases can be controlled, it may be practicable to find duties for which the patients are still fit; otherwise, they should be considered for discharge.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, SECRETARY.

THIOLCOL-ROCHE.—Potassium Guaiacol-Sulphonate.— $C_6H_3(OH)(OCH_3)(SO_3K)$, 1:2:6.—The potassium salt of orthoguaiacol sulphonic acid, $C_6H_3(OH)(OCH_3)(SO_3H)$ 1:2:6.

Actions and Uses.—Thiocol-Roche acts as a sedative expectorant. It has the advantage over guaiacol in that it is comparatively tasteless, does not disturb digestion and is non-toxic. In thiocol-Roche the guaiacol is so firmly bound that almost none is split off when the salt is administered, and it is a question if its action is due to small quantities of guaiacol set free or to the guaiacol-sulphonic group as a whole.

It is claimed that thiocol-Roche is useful in the treatment of diseases of the respiratory tract, incipient tuberculosis and certain diarrheas.

Dosage.—From 0.3 to 1.3 Gm. (5 to 20 grains), dissolved in water or in syrup, or in the form of tablets.

Manufactured by F. Hoffmann-La Roche and Co., Basel, Switzerland (The Hoffman-La Roche Chemical Works, New York). U. S. patent No. 650,218 expired.

Syrup Thiocol-Roche.—A syrup containing thiocol-Roche, 10.5 Gm., in 100 Cc. (6 grains in a fluidrachm).

Thiocol-Roche Tablets, 5 grains.—Each tablet contains thiocol-Roche 0.3 Gm. (5 grains).

Thiocol-Roche is prepared by sulphonating guaiacol at a temperature not exceeding 70 to 80 C. with concentrated sulphuric acid, converting the guaiacol sulphonic acid produced into the barium salt, and this by decomposition with potassium sulphate into the potassium guaiacol-sulphonate.

Thiocol-Roche is a colorless, crystalline powder, neutral or faintly alkaline, odorless, and having a faint bitter taste. Thiocol-Roche is soluble in water, slightly soluble in ordinary alcohol, but insoluble in absolute alcohol and in ether or oils.

If to an aqueous solution of thiocol-Roche, barium chloride solution is added, no precipitate is produced; ferric chloride produces an intense violet-blue color, which disappears on the addition of ammonia, or of concentrated solution of alkali chlorides or sulphates.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address "Medic, Chicago"

Subscription price Five dollars per annum in advance

*Contributors, subscribers and readers will find important information
on the second advertising page following the reading matter*

SATURDAY, SEPTEMBER 15, 1917

CIVILIZATION AND DETERIORATION

Nowadays, when one hears so much about the crimes of civilization as an almost unspeakable and inconceivable concomitant of the warfare of the assumedly intellectual nations, it may be informing, though not inspiring, to turn to the silent crimes of peaceful civilization. Maccaughey,¹ of the College of Hawaii at Honolulu, has given a depressing picture of the deterioration of the early Hawaiians, one of the finest physical types native in the Pacific and comparing favorably with the best from any part of the world.

In order to understand what the debasing influence of intercourse with the assumedly higher Caucasian peoples has wrought in undermining, with astonishing speed, the constitution of a once physically splendid race, it is essential to recall the Hawaiian of only a few generations ago. The details of bodily superiority need not be rehearsed here; but certain items of the Hawaiian customs and hygiene are worth inquiring about. The popular belief in the bad effects of inbreeding seems to be negated by the physical superiority of the chiefs, who were often closely intermarried within their class. As is well known in the science of animal breeding, when dominant characters are desirable ones, it is an advantage to have them accentuated by inbreeding. The danger in this practice lies in the possible existence of inferior dominant features that are transmissible rather than in any inherent defect or danger in the intermarriage itself.

In speaking of the evidently healthy integument of the Hawaiians, Maccaughey says that in the ancient régime the better class of natives kept their skins in excellent condition through daily baths in the sea and in fresh water and by oiling the body with coconut oil. The effectiveness of such hydrotherapy is well appreciated today; but we fail to realize the unquestionable merit in the inunctions with oil that undoubtedly confer a suppleness and pliancy to the skin quite contrary to the extreme detergent action of the water bath. It is not without hygienic significance that the

skin is normally lubricated by a sebaceous secretion which the bath tends to remove, often to a degree no longer compatible with a perfect epidermis. The value of massage was duly appreciated by the chiefs and women of rank among the Hawaiians; for they employed an exceedingly thorough and elaborate system which aided to keep skin and bodies in perfect condition.

The nervous temperament that is a by-product of our higher civilization and is characteristically American, leaves its mark in the muscular activities of our people. In emphasizing the beautiful muscular development and the absence of nervousness among the ancient Hawaiians, Maccaughey points out that this brings about an ease and grace with which the limbs are habitually moved. The gait of the men and women alike was almost invariably graceful, smooth and dignified, we are told. When we bear in mind the "nervous, jerky motions" that characterize so many moderns, it may well be asked whether a return to the older simplicity of life with its admirable poise is not worth debating in some respects. Perhaps the charm of some of the native dances with their graceful rhythms lies in the suggestion of a serene life devoid of civilization's stirring excitements.

To a people remarkably free from disease and disfigurement, the inroad of members of a different civilization has brought disease, drunkenness and debasing influences that have undermined the constitution of the race with astonishing speed. The primitive Hawaiian, with fine physical and mental traits of the greatest promise, is disappearing, Maccaughey writes, and in a few years will have vanished forever. Is this the civilization of peace?

SPECIAL PREPARATIONS FOR THE MANAGEMENT OF HEAD INJURIES IN THE WAR

It is reported that approximately 20 per cent. of the bed capacity of the base hospitals in the war zone is occupied with cases classified as surgery of the head. This can readily be believed since warfare has become almost wholly of the trench variety, in which the head is particularly exposed and for which reason all the armies have adopted the steel helmet instead of the ordinary head-gear. Even in time of peace 12 to 15 per cent. of the conditions treated in an army general hospital are classified as eye, ear, nose and throat cases. This does not include the cases requiring brain and oral surgery. In view of the number of these and their importance, as shown by the experience of our allies, the Surgeon-General of our Army is making special preparations to take care of these cases according to the best and most recent methods. These include the provision of a specially trained personnel and adequate equipment near the front. In order to work out this program the Surgeon-General has created a spe-

1. Maccaughey, V.: The Physique of the Ancient Hawaiians, *Scient. Month.*, 1917, 5, 166.

cial section on Surgery of the Head, including divisions for the special organs—eye, ear, nose and throat, brain, mouth and teeth. This section, with headquarters in the Surgeon-General's Office, is under the general direction of Lieut.-Col. T. C. Lyster, and is divided into four divisions—ophthalmology, otolaryngology, brain, and oral and plastic surgery. Associated with Colonel Lyster as advisory committee are members of the Medical Reserve Corps representing the various specialties, each of whom is a member of a subcommittee of the General Medical Board of the Council of National Defense.¹ Through this advisory committee and its subcommittees, qualified men throughout the country who have been commissioned in the Medical Reserve Corps have been secured for service in their specialties.

In order that this work shall be done in the most effective manner it is planned to have one hospital established in France which shall be devoted entirely to head injuries. To this hospital all such cases are to be evacuated when deemed to be to the best interest of the service and of the wounded soldier. This hospital is to have a capacity of perhaps one thousand beds, and is to be accessible—in reality an adjunct—to the various base hospitals. The institution is to be complete with laboratory Roentgen-ray apparatus, shops and a mechanical division for reconstructive apparatus. It is hoped to follow the steps of the English Army and to furnish the men with spectacles from a standard lens grinding department.

For years, the type of specialized and expert service here described has been available in civil life; it is now to become a practical part of the practice of military medicine and surgery. It means not only the saving of lives, but also better care of these most dangerous and disfiguring of all wounds of war.

SOME UNDERAPPRECIATED MENACES OF THE ORGANIZATION OF ARMY RECRUITS

The concentration of large numbers of men in the new army cantonments has suddenly furnished novel and hitherto little appreciated problems of medical import. The proximity of so many persons from many parts of the country and widely different communities means opportunities for the transmission of contagion on a large scale, and compels the institution of rigorous means of combating it. Diseases that ordinarily occasion comparatively little worry to the sanitary officer, because they occur in isolated instances in which effective control can be instituted as soon as the danger is recognized, assume a more threatening aspect when they make their appearance in the midst of people who are crowded together.

Surgeon McMullen¹ of the Public Health Service has recently pointed out a danger of this sort incident to the enlistment of recruits affected with trachoma. Although the prevalence of this disease has been so great in the armies of past European wars that trachoma was at one time termed "military ophthalmia" and believed to be confined to soldiers, it is today recognized as having a far more universal significance. Nevertheless few physicians realize the widespread distribution of trachoma in the United States. Only a few years ago the Indians of this country were found to be almost universally affected. Indeed, so prevalent and extensive is the infection in some sections of the United States that the Public Health Service has established and maintains in those sections six ophthalmic hospitals for the treatment of trachoma, which is classed by the government as a dangerous contagious disease. According to McMullen,¹ these hospitals have now been in operation for several years and, during the past year, a total of 18,530 patients were treated; 1,880 patients were admitted to the hospitals, and 1,687 operations were performed. Trachoma thus appears as a public health menace to which the new conditions established by our National Army must become adjusted before the disease establishes many foci. The schools may be invaded, now that the summer vacation is past. Fortunately the malady is a curable one. Physicians who seldom if ever have had occasion in the routine of their past experience to come in contact with trachoma should familiarize themselves with the clinical symptoms as an act of preparedness for an undesired possibility.

Casual observations made by Dr. Stiles² of the Public Health Service have emphasized even more strongly than before the importance of providing against the spread of infection with intestinal parasites. These are more insidious because the damage or deterioration which they may cause is not so easily recognized by a physical sign or symptom in the patient afflicted. Stiles reports that in a total of seventy-five military recruits recently examined by him at a government reservation, forty-seven men (63 per cent.) showed hookworm infection, three *Ascaris lumbricoides*, one *Hymenolepis nana*, and one a heavy infection with *Strongyloides*; two recruits had double infections; twenty-five examinations were negative. He points out that a failure to treat the hookworm cases and to eliminate at least the severe infections of *Strongyloides* will undoubtedly result in unjust and preventable punishment for offenses due to remediable conditions, considerable physical and mental inefficiency, an unnecessarily high daily "sick call," and premature and preventable pensions. Furthermore, the military aspects of the situation offer sobering

1. The following compose this advisory committee: Major N. M. Black, Milwaukee, Wis., Ophthalmology; Major H. P. Mosher, Boston, Otolaryngology; Major V. P. Blair, St. Louis, Oral and Plastic Surgery, and Captain Charles Bagley, Jr., Baltimore, Brain.

1. McMullen, J.: Trachoma and the Army, Pub. Health Rep., 1917, 32, 1101.

2. Stiles, C. W.: Certain Military Aspects of Hookworm Disease, Pub. Health Rep., 1917, 32, 1299.

reflections. The danger is present, says Stiles, that our military forces may cause a widespread infection in France and Belgium that it will take years of work and large expenditures of money to control and eradicate after the war.

The menace from hookworm and allied disorders is, of course, greater in the case of recruits from the warmer portions of the country than from men living in colder localities. Vigorous treatment in all hookworm cases following their detection by systematic examination for intestinal parasites is an obvious solution of many of the difficulties involved. Skilled microscopists are demanded for the work; and the numbers of those competent is still small. In critical times it is not always easy to determine what prophylactic or hygienic procedures should take precedence. Stiles believes that even leaving out of consideration the money value of increased efficiency, the entire expenditure involved in the examination would be saved in the reduced pension roll. It is certain, however, that the stay-at-home colleagues must prepare themselves quite as well as the medical officers with our forces to recognize the new menaces and needs of great bodies of men shifted about this country through the creation of an inevitable situation.

SURGERY OF THE HEAD IN WAR

Early in the war, there was a wide divergence of opinion as to when and where operations for head wounds should be performed. Sir Anthony Bowlby and Cuthbert Wallace,¹ consulting surgeons to the British Armies in France, have now reviewed the developments in the treatment of head wounds since the beginning of the war. In the first year, the rule was for surgeons, called on to treat head injuries, to operate at once. Apart from the physical defects, many of the patients seemed to be suffering from compression. The operations were performed both at casualty clearing stations and in field ambulances. Many septic complications were being seen in the base hospitals, and it was noted that the patients who, from force of circumstances, arrived at the base without previous operation did better than those operated on at the front. This at first was attributed wholly to faulty technic. Later it was found that if patients were kept quiet in the hospital in which they were operated on, they did well, while those who were evacuated to the base, even though apparently doing well at the time, arrived at the base in bad condition. These faults were corrected by the utilization of the obvious corrective measures, namely, improvements in technic and later evacuation.

The next important step was the establishment of special hospitals for head cases at the front. By this means patients were given the advantages both of early

operation and of prolonged rest. A standard method of treatment of head injuries has thus been developed. In brief, it consists of a primary cleansing of the wound, the transmission of the patient as soon as possible to the hospital in which he will remain until convalescent, the making of roentgenograms, the excision of the scalp and bone wound, a careful removal of foreign bodies, the covering of the exposed brain, the closure of the wound, and prolonged rest in bed.

Dr. Harvey Cushing is of the opinion that cranio-cerebral wounds are not usually to be considered as cases requiring immediate surgery, unless there is extensive hemorrhage, and these are practically hopeless. Patients treated at a field ambulance are apt to suffer from complications after their evacuation, not because of having been transported, but as the result of incomplete procedures before transportation. The external appearance of the wound is rarely to be considered as an indication of what surgical procedure should be performed. Trivial wounds may require extensive operations, and vice versa. Bowlby recommends special hospitals for these cases of head injury, and as the result of experience, such hospitals have been developed by the British Army Medical Department.

G. H. Makins² examined a considerable number of patients after their return to England, and he found that the mortality among this class was small; that later complications, such as cerebral abscess, are comparatively rare, and that serious sequelae, such as insanity and epilepsy, are not common. Many patients with foreign bodies deeply lodged in the brain recovered. These and other observations emphasize strongly that first aid is not indicated in cases of head injury, except as concerns the external wound, and that treatment, in a special hospital, equipped and manned by specialists, will yield the largest number of recoveries and the fewest complications and sequelae, even though this hospital may be far removed from the front.

2. Makins, G. H.: Development of British Surgery in Hospitals on Lines of Communication in France, *Brit. Med. Jour.*, June 16, 1917, p. 789.

Mixed Infection in Epidemic Meningitis.—A. Netter found the diplococcus along with the meningococcus in the cerebrospinal fluid in five cases of epidemic meningitis, and has learned of seventeen similar cases in neighboring hospitals. They were all encountered since last January. The list includes one infant, nine children and twelve adults from 17 to 60 years old. All died except one child of 5, the infant, and one young adult. In five of the fatal cases there was also bronchitis or pneumonia. Since then he has made a practice of injecting 2 or 3 c.c. of antipneumococcus serum when injecting antimeningococcus serum in cases of meningitis, and reports that only two of the nineteen patients thus treated showed the pneumococcus in the cerebrospinal fluid, and in these the disease seemed to be mitigated, both patients recovering. This mixed serotherapy was given also to six children with meningococcus meningitis in a neighboring hospital and none showed pneumococcus invasion, while the pneumococci were found in one of three other meningitis children not given the antipneumococcus serum.—*Bulletins*, 1917, **41**, 789.

1. Bowlby, Sir Anthony, and Wallace, Cuthbert: The Development of British Surgery at the Front, *Brit. Med. Jour.*, June 2, 1917, p. 705.

Current Comment

PROGRAM OF PREPAREDNESS IN THE ARMY MEDICAL DEPARTMENT

We comment elsewhere on one of the important divisions of the general program of preparedness that is being developed by the Surgeon-General and his associates — that on surgery of the head. In addition to this and the section on venereal diseases, the program of which we have already outlined, there are divisions on internal medicine, hospitals and ambulances, laboratories, general surgery, orthopedic surgery, etc. The programs of all these divisions are practically worked out, and will be taken up in THE JOURNAL from time to time. There is also being outlined a general program for reconstruction and rehabilitation, to include training for special vocations. Our people may rest assured that every provision is being made for the protection of the health of our soldiers, both in this country and abroad, and that the wounded — the disabled and the disfigured — soldiers will be returned to civilian life in as perfect condition as modern medicine and surgery make possible. Further, plans are being worked out for the restoration of those who may be so disabled as to be unfit for their regular calling. This program proposes the training of such men for some special life-work, adapted to their changed physical condition. In the working out of these programs the Surgeon-General has called to his assistance the best trained men in every branch of medicine. It is becoming a fact, as one has expressed it, that if one wants the best advice in any branch of medicine or surgery, one will have to go to the Army for it.

BACK TO THE SIMPLE LIFE

In our grandfather's day it was usual to have the bread on the table and bread was cut as needed; also it was considered wasteful to leave food on one's plate. The vital need today for conserving food has caused the United States Food Administration to urge, among other measures looking toward the elimination of waste, the preaching of the gospel of the clean plate and a resurrection of the old plan of cutting bread on the table. The by-products of war are not all evil.

KIDNEY CURES

A few years ago a quack, in a Rufus Wallingford attempt to convince druggists that they would find in his nostrum a veritable gold-mine, said, with a burst of advertising candor: "Fully 75 per cent. of all . . . kidney remedies are bought by people who THINK they have . . . some serious kidney ailment . . . and not by people who actually have them." There stood truth, naked and unashamed. The "patent medicine" man was telling tales out of school. His frankness in giving away one of the most cherished secrets of the "patent medicine" business constituted a violation of "patent medicine" ethics of the gravest kind if not, indeed, *lèse majesté* against the Proprietary Association. The selling of alleged cures for the self-treatment

of so serious a condition as kidney disease is one of the many rotten branches of an industry that is more than 99 per cent. discreditable. The trade in "kidney remedies" stands condemned, not only because the self-treatment of kidney disease is fraught with danger, but also because, in order to make such nostrums commercially profitable, it is necessary to convince the public, through playing on its fears or on its ignorance, that any one of a score or more of common and unimportant symptoms is a positive and deadly indication of kidney disease. A "patent medicine" of this type is dealt with in the Propaganda Department of this issue. "Dr. Pierce's Anuric Tablets" emanate from the "World's Dispensary Medical Association" of Buffalo, an emporium of quackery better, but no more creditably known through the sale of such nostrums as "Dr. Pierce's Favorite Prescription," "Dr. Pierce's Golden Medical Discovery," "Dr. Pierce's Compound Extract of Smartweed," etc. "Anuric" is proclaimed as the "Newest Discovery in Chemistry"; it is not a chemical discovery at all. It is said that "Eminent Medical Authorities Endorse It"; no medical authority of eminence would touch the thing with a ten-foot pole. It is claimed to be the "Wonderful Discovery" of a "Famous Physician"; the only apparent discovery connected with the stuff seems to be that made by the exploiters that there is money to be made in selling alleged cures for kidney disease. The "famous physician" enjoys a professional fame of the same quality and type as that which characterized Hartman of "Peruna" or Munyon of sugar pills. "Anuric" is an unscientific mixture sold under false and misleading claims. It is invested with the mystery that is so necessary an element of the "patent medicine" trade by the usual device of keeping its composition secret. "Scare" advertisements are supplemented by booklets that may be counted on to convince any but the most well-balanced that trivial and commonplace symptoms of passing indispositions are portentous of kidney disease. In short, "Anuric" and its method of exploitation conform to all the orthodox principles of quackery.

WAR ECONOMY

It is interesting in these times of high prices to recall the way in which real Americans like Asa Gray, Lowell and Emerson met the financial pressure of the Civil War. It is pleasant, too, to think that cheerful sacrifice and unbending resolution in a righteous cause are part of the inheritance of our race. "My wife and I," wrote Asa Gray in 1862, "have scraped up \$550, all we can scrape, and lent it to the United States." Lowell wrote, in a private letter, "I had a little Italian bluster of brushwood fire yesterday morning, but the times are too hard with me to allow of such an extravagance except on the brink of gelation." "The first of January," wrote Emerson in 1862, "has found me in quite as poor a plight as the rest of the Americans. Not a penny from my books since last June, which usually yield five or six hundred a year; no dividends from the banks or from Lidian's Plymouth property. Then almost all income from lectures has quite ceased, so that your letter found me in a study how to pay

three or four hundred dollars with fifty. . . . I have been trying to sell a wood lot at or near its appraisal, which would give me something more than three hundred, but the purchaser does not appear. Meantime, we are trying to be as unconsuming as candles under an extinguisher, and 'tis frightful to think how many rivals we have in distress and in economy. But far better that this grinding should go on bad and worse than we be driven by any impatience into a hasty peace or any peace restoring the old rottenness."¹ The last sentence in Emerson's letter is finding many echoes today.

THAT DEADLY PSORIASIS

Many and various are the excuses offered to support the claims for exemption from military service. One of the latest to be given publicity is that made by a man who offered affidavits from two physicians setting forth—to quote from newspapers—that his wife “was suffering from psoriasis, a skin disease which they [the physicians] averred was incurable and which, if not given proper care and treatment, might prove fatal.” That psoriasis may be incurable can be readily granted; so also may be baldness and pigeon-toes—and about as fatal.

EMETIN DIARRHEA—A DANGER

Most drugs harbor dangers that express themselves when proper dosage is exceeded. Pharmacodynamic effects produced by potent substances do not remain restricted to those manifestations that are therapeutically advantageous. A weak concentration of hydrochloric acid, for example, such as is found in the gastric juice, is a physiologically advantageous solution at times; but concentrated hydrochloric acid is an irritant of the most dangerous sort. These facts are sometimes forgotten when undue enthusiasm is awakened for some new or hitherto little used drug. As a result, the borderline of physiologic safety may easily be overstepped through disregard of the knowledge that a large dose of a chemically active substance is not proportionately better because a small one is useful. Lately emetin has acquired considerable prominence in the field of medicine; and at length the reports of its dangers are following the stories of its virtues. Hemorrhagic gastro-enteritis has been produced experimentally with emetin by a number of investigators.² From the Harvard Medical School in China³ additional reports have lately come to verify the fact that emetin not rarely produces a bloody diarrhea in the course of its clinical use. In discussing the danger which this involves, Kilgore and Liu remark that the difficulty in the recognition of diarrhea from emetin, as well as its danger, is due to the fact that it occurs in the course of treatment for amebic dysentery, and that the symptoms and the gross appearance

of the stools in emetin diarrhea are almost indistinguishable from those in amebic dysentery. All of the cases reported from China were in children that had received doses of emetin hydrochlorid considerably larger than would be proportionate on a basis of 1 grain (65 mg.) for an adult. Contrary to a somewhat prevalent opinion, children are not especially resistant to the drug, so that the dosage for them should be graduated with great care.

FOOD CONSERVATION

Some one has said that the present world war will be won as much in the kitchen as on the battlefield. There is an element of truth in the statement. When this fact is realized the importance of the United States Food Administration will be understood. This body has a huge task before it and is meeting it. Two important publications just issued by the United States Food Administration are the “Home Card” to be hung on the kitchen wall, and the general directions for hotels, restaurants, dining cars, etc. The last is in the form of a leaflet and will be of especial interest to stewards of hospitals, asylums and sanatoriums. The superintendents of such institutions should write to the United States Food Administration at Washington for copies of these leaflets and should impress on their subordinates the benefits, both to the institutions and to the country, that will accrue from following the directions given. Every physician who has a home of his own should send for a copy of the “Home Card” for personal use and should lose no opportunity of urging his patients to do the same thing. This is one way in which we can all do a little “bit.”

CIVILIAN COOPERATION IN COMBATING THE VENEREAL DISEASE PERIL

Two weeks ago, in discussing the venereal peril of our army, we called attention to the importance of cooperation between the civilian physicians in the community surrounding the camps and the medical officers in the cantonments. It is encouraging to know that many communities are already in action. A circular received from the health officer of Jackson, Mich., calls for a conference at Jackson of the administrative, health and police officials of the principal cities of southern Michigan, and representatives of the civil and military authorities responsible for the government of training camps, together with delegates from the medical profession, labor organizations, commercial associations and others interested in helping to do their part in this new program. A committee headed by Governor Stewart of Virginia is distributing a special folder on the subject in training camps and surrounding zones in that state. The California State Board of Health has outlined a definite program and has made a large appropriation to carry it out in a practical manner. New York City and the state have been exceptionally active in attacking the problem from every point of view. Everywhere are signs of a tremendous awakening to the new responsibility devolving on the public and especially on the medical profession in regard to these matters.

1. Rhodes: History of the United States, 3.

2. Levy, R. L., and Rowntree, L. G.: On the Toxicity of Various Commercial Preparations of Emetin Hydrochlorid, Arch. Int. Med., March, 1916, p. 420. Dale: A Preliminary Note on Chronic Poisoning with Emetin, Brit. Med. Jour., Dec. 18, 1915, p. 895. Pellini and Wallace: Pharmacology of Emetin, Am. Jour. Med. Sc., 1916, 152, 325.

3. Kilgore, A. R., and Liu, J. H.: Emetin Diarrhea—Clinical and Experimental, Arch. Int. Med., August, 1917, p. 78.

Medical Mobilization and the War

EXEMPTION OF MEDICAL STUDENTS AND INTERNS

Method of Procedure

An intern or medical student called by his local board and accepted for service under the Selective Service Law but not ordered to military duty may apply to the Surgeon-General of the Army to be ordered to report at once to the local board for military service; to be inducted at once into the military service of the United States; immediately thereon to be discharged from the National Army for the purpose of enlisting in the Enlisted Reserve Corps of the Medical Department.

NECESSARY PAPERS

Each such request must be accompanied with (1) copy of the order of the local board calling the intern or medical student to report for physical examination; (2) sworn evidence of the status of the applicant as a medical student or intern; and (3) an engagement to enlist in the Enlisted Reserve Corps of the Medical Department.

FORM OF NECESSARY PAPERS

No blank forms have yet been provided for the application and the affidavits called for. A clear and succinct statement embodying the necessary facts and duly sworn to before a notary public will be sufficient. The intern or student should appear before an officer authorized to administer oaths and sign an acknowledgment of his application to enter the Enlisted Reserve Corps on release from his obligation to enter the National Army under the draft. Incorporated in the acknowledgment should be an affidavit showing his status as an intern or medical student.

AFFIDAVIT FROM HOSPITAL SUPERINTENDENT OR DEAN OF COLLEGE REQUIRED

An additional affidavit showing the status of the intern should be obtained from the medical superintendent of the hospital in which he serves. In the case of a student, an affidavit should be obtained from the dean of the medical college as to the status of the student.

The superintendent or dean must obligate himself to make such future reports as the Surgeon-General may require.

AFFIDAVIT OF INTERN MUST INDICATE DATE SERVICE BEGAN

An intern's affidavit should show the date he began service.

AFFIDAVIT OF MEDICAL STUDENT MUST SHOW GRADE AND STANDING

A student's affidavit should show whether he is in the second, third or fourth year of his medical course, and what conditions, if any, are outstanding against him.

PROCEDURE

If the Surgeon-General acts favorably on an application he will forward it to the Adjutant-General of the Army with his recommendation. The Adjutant-General may issue an order directing the intern or student to report to his local board for military duty on a specified date. This report may be in person, by mail, or by telegraph. From the date of such report the intern or student named will be considered as in the military service of the United States. The Adjutant-General may forthwith issue an order discharging the intern or medical student from the military service for the convenience of the government.

STUDENT SUBJECT TO DRAFT UNTIL DISCHARGED

No intern or student will be excused from reporting to his medical board or from assuming his duties under the Selective Service Law, including that of reporting at the assigned mobilization camp, until after the receipt of an order from the Adjutant-General, as has been described. After making application for discharge from duty under the Selective Service Law and on the receipt of such discharge, the intern or medical student must perform every duty required of him under the law.

DURATION OF INTERNSHIPS

No internship will be recognized for a period longer than one year from the date of its commencement.

INTERNSHIPS NOT INCLUDED

(1) Internships in hospitals conducted for gain; (2) internships in private hospitals of fifty beds or less, and (3) internships that have been created since May 18, 1917, except to meet the needs of hospitals actually established since that date, or bona fide enlargement of hospitals since that date, will not be recognized.

RELATION OF ENLISTED RESERVE CORPS TO MEDICAL RESERVE CORPS

Application for enlistment in the Enlisted Reserve Corps of the Medical Department and enlistments in that corps will not interfere with the application by an intern or by a student after graduation for a commission in the Medical Reserve Corps.

DEFINITION OF A WELL RECOGNIZED MEDICAL SCHOOL

For the present a medical school recognized generally by state examining boards will be considered as a well recognized medical school.

TERMINATION OF EXEMPTION

An intern or student who loses his status as such, and a student who fails to pass from one class to another or to graduate, will be called into active service as needed.

PENALTY FOR FAILURE TO COMPLY WITH OBLIGATION

An intern or medical student who fails to comply with his obligation to enlist in the Enlisted Reserve Corps after discharge from duty under the Selective Service Laws will render himself liable to punishment under that law.

SURGEON-GENERAL'S PROGRAM FOR MANAGE- MENT OF INJURIES OF THE BRAIN, EYE, EAR, ETC.

The Surgeon-General has authorized the formation in one section of units devoted to the surgery of the head, to wit: (1) brain; (2) eye; (3) ear, nose and throat; (4) mouth. Major T. C. Lyster, M. C., U. S. Army, chief of the section, has just reported its activities to the Surgeon-General. "The physical disasters which the present war occasions are more severe and more specialized than those of any other war," he says. In order that these disasters be mitigated and checked, there must be a new alignment of medical and surgical service. "The men who fight have a right to expect that the physical distress which such combat entails shall be alleviated by means as scientifically accurate as those which can be commanded by the civil population." To this problem the Surgeon-General, with the support of the Medical Section of the Council of National Defense, has authorized the formation of units devoted to the surgery of the head.

The justification of the organization of such units resides in the fact that their component parts represent special departments of surgery which have made notable advances. Their practice requires training along special lines, and especially of military surgery. They are gathered into one unit because they represent a natural selection, each supplementing and aiding the other in an effort to restore the individual to physical well being. "The vital necessity of ophthalmoscopic examination by the ophthalmologist in the work of the brain surgeon"; says Major Lyster, "the need of prompt release by the brain surgeon of increased intracranial pressure to save eyesight; the value of expert examination of the ears by the trained otologist in the elucidation of the problems of neurology and cerebral surgery; the need of search by the expert rhinologist and oral surgeon for foci of infection in the accessory sinuses, the tonsillar tissues and the dental areas, are well known. For years this type of specialized and expert work has been at the disposal of the practice of medicine and surgery in civil life; for the first time in history it has become an integral part of the practice of military medicine and surgery."

"The service of such specialized surgery as has been described," he says, "may proceed along three lines:

"1. Immediate service, or what is ordinarily known as first aid, to be given at the first dressing station. Time is of vital importance in dealing with many head injuries, involving lesions of its special organs, notably of the eye, and many eyes have been saved which otherwise would have been lost where it has been possible to act at once. As to the accuracy of this statement all eye surgeons who have been at the front will testify.

"2. Later service in the base hospital where all operative procedures of these types of special surgery can be brought into deliberate action. The triumphs of oral surgery in particular, are matters of common knowledge and of scientific record and the same is true of the procedures of cerebral surgery and of those of the eye and ear.

"3. Final service in special hospitals devoted to reconstruction and reeducation. In such hospitals the work of the department of the surgery of the head will find and has found one of its widest and most important fields of action, not only in individual work, but in the work devoted to those who must be trained for special duties in these regards. For the purpose of making a personnel available for the tasks outlined a committee has been formed which has mobilized the material according to definite plans."

A questionnaire so worded as to give the special training and experience of the men addressed has been sent out, and those who can qualify are urged to join the Medical Reserve Corps so that they can be assigned to the division representing their specialty. Letters were sent to 9,000 ophthalmologists, 5,000 otolaryngologists and 350 surgeons specializing in brain surgery. Probably several hundred men specializing in oral surgery will be asked to give their services. Men of known integrity were selected in each state to furnish confidential information. Members of the Medical Reserve Corps wishing immediate service have been recommended to make application to the Surgeon-General for assignment to one of the Medical Officers' Training Camps for instruction in the administrative duties so necessary for the proper carrying on of the Medical Department of the Army. All the specialists who have already applied for and received commissions in the Medical Reserve Corps have been indexed separately and put on a retained list so that so far as possible they may be used in the line of their specialty. Methods of procedure, tests, lists of instruments and working space have been outlined by each division. The Brain Surgery Section has established district boards throughout the states and outlined plans for the establishment of special schools for the instruction of surgeons classified in this section. The course will be arranged along an anatomic, clinical and operative line and will extend over a period of from four to six weeks. These schools probably will be established in Chicago, Baltimore, Philadelphia and New York and will be directed in each instance by an eminent brain surgeon.

The Division on Oral Surgery has outlined a tentative plan for a short, intensive course of special instruction in oral surgery for general surgeons, and plans have been suggested in individual cases for helping men on base hospital units, who expect to be called out in the near future, for especially preparing themselves for doing oral surgery. It is suggested that the surgeon in charge of oral surgery shall, unless otherwise specified in individual instances, have charge of injuries and surgical diseases of the mouth and its essential structures, including the bony framework and soft structures of the face, and also of the neck when the major part of the surgery is situated above the clavicle. This does not include injuries and surgical diseases of the orbit, its contents and appendages, the external nose, ear and accessory sinuses, pharynx, thyroid diseases, and special cases of injuries of the peripheral nerves and spinal column. Sufficient provision is made for the activities of specialists and consultations in all cases, when necessary. The surgical field of three of the divisions of the Head Surgical Section (eye, ear, nose, throat and brain) are clearly defined. The field of oral surgery has not been quite so defined as to prevent possible confusion in the cantonments, base or other hospital units here and abroad.

DR. BILLINGS IN RUSSIA

A letter just received at Red Cross headquarters gives an interesting account of the arrival of the Red Cross mission to Russia at Vladivostok, and its journey in the imperial train across Siberia to Petrograd.]

THE LETTER

"The party arrived at Vladivostok on the morning of July 26," says the letter. "As soon as the ship docked it was boarded by a large group of officials and military personages who made their way to Dr. Billings, head of our commission, to offer a welcome to Russian soil. There were present the head of the provisional government, the mayor of the city, the military commander, the military medical officer, the officer of the port, and representatives of the national and local Red Cross.

DR. BILLINGS' GREETING

"Dr. Billings' words fell with gratifying effect on his hearers when he responded to the enthusiastic welcome. He said:

We have come a long distance, my friends, to see if we can do anything commensurate with the deep sympathy which is felt in our Republic for this new Republic whose representatives you are. The hearts of the American people go out to you in your hour of trial—for it is an hour of trial. They have given largely and spontaneously, and are willing to give more largely yet. We have come to you in all modesty thinking we might be able to help your wounded and sick soldiers and extend relief to your sick and needy civilians who have suffered from the war. With the political problems which you are working out in your own way we have nothing to do, except to give you our heartiest good wishes. We are here to help in the ways in which we can help, and I thank you for your generous welcome and for the cooperation which you offer. We are going to Petrograd as quickly as our supplies can be transferred from the Russian ship which brought us to the Russian train which we see waiting for us.

"The landing at Vladivostok was made about noon. Then ensued ten hours of hard work incident to the landing of a large party and a considerable cargo from ship to shore and thence to train. This work was greatly facilitated by the American consul, Mr. Caldwell, and his assistants. The Russian Red Cross sent Col. George Landou to have charge of the train. It was the train which had brought Mr. Root and the members of his commission back from Petrograd only a few days before. The minister of communications sent as his representative Gen. Vibold Ertel, who had been with the Root mission throughout its travels, and we were also provided with the interpreters who had served the Root mission. The British officials, Colonel Dunlop of the consular service, and Major Binus of the British patrol, were of the greatest assistance to the party and the baggage and supplies were all passed without examination.

"It was a hot afternoon and evening in Vladivostok. There were cables to be answered and hundreds of details to attend to before we could proceed westward. Some necessary printing had to be done in a hurry, loads of supplies and equipment had to be transferred, medical supplies had to be examined and repacked. Finally at 9:45 o'clock that night the imperial train departed for Petrograd bearing our party.

"Throughout the journey through the noble landscapes of Manchuria and Siberia at every stop the greatest interest was shown by the people. The train was decorated with a large placard bearing the Red Cross emblem and the following inscription in Russian: 'American Red Cross Mission to Russia. Hospital Supplies.' It was interesting to watch the crowds at station stops gather and read this notice, and then nod in pleased satisfaction as comment was murmured from man to man. As the train left each station it was roundly cheered, and at Harbin there was a great demonstration.

ADDITIONAL SUPPLIES FROM JAPAN

"The train consists of nine cars, four of which are laden with supplies and baggage. The stock of serums and medicine brought from Chicago and New York was amplified by a large purchase of vaccines and other materials at Yokohama. One box contains enough cholera serum to immunize 100,000 persons.

"Everywhere the mission has gone it has been received with open arms. Much light has already been obtained as to the medical needs of the Russian people, and these facts are being promptly communicated to the Red Cross War Council in Washington."

Though written on July 27, says the *Official Bulletin*, from which we quote, the letter did not reach Washington until the first week in September. It traveled by courier from Siberia to Peking, and from there by diplomatic pouch, finally reaching its destination by the Pacific route.

NEWS OF THE TRAINING CAMPS

At Fort Riley

A number of the instructors of the Medical Officers' Training Camp have been ordered away on special assignments. Lieut.-Col. C. R. Reynolds, M. C., has been ordered to Yaphank, Long Island, as division surgeon. Lieut.-Col. Jacob M. Coffin, who has been director of ambulances and whose enthusiasm for "hiking" has caused the course in equitation to be known throughout the camp as "the Coffin Course," has been appointed division surgeon at Deming, N. M. Lieut.-Col. C. R. Snyder has gone to Anniston, Ala., as division surgeon, and Lieut.-Col. F. W. Weed has been made division surgeon, with headquarters at Camp Funston, Kan.

INSTRUCTORS FOR THE SECOND CAMP

A number of reserve officers in the first school of instructions have been detailed as instructors for the second course, among them being Majors P. B. Cook, G. G. Davis, Ralph W. Webster and Charles S. Williamson, Capts. H. L. Akins, J. M. Downs, Ellis K. Kerr, S. E. Lambert, W. L. McBride, L. S. Milne, H. C. Parker, J. C. Sessions and J. G. Shewbrooks.

ATHLETICS AND SPORTS

Lieut. F. H. Dammasch, M. R. C., who has been appointed athletic manager for the camp, has arranged for boxing and wrestling matches every Wednesday evening. Representatives of different companies and troops meet in athletic contests which have proved extremely popular. A large audience is assured for each evening's exhibition.

ACTIVE DUTY FOR MEN IN FIRST COURSE

Companies I, II and III, which began work June 16, have been assigned to active duty. One of the distinct achievements of the camp was the sending out of between 200 and 300 medical officers to posts all over this country, and some to foreign assignments, without any confusion or delay. In fact, the assigned men left the camp ahead of their schedule. The smoothness and celerity with which this work was done reflect great credit on Colonel Bispham and his staff.

FIELD MANEUVERS

One feature in which the Fort Riley Training Camp is probably unique is the field maneuvers which have been carried on during the past two weeks. One company at a time is mounted and taken into the field. A problem for medical officers is then propounded involving a definite military situation with a regiment, brigade or division in a certain position and in contact with the enemy. The number of wounded, the location of aid and dressing stations, field and evacuation hospitals, the disposal of the wounded, the establishment of lines of transportation and communication and the relation of the Medical Corps to the rest of the Army being some of the details worked out. Student officers are assigned to duty for the day as regimental, brigade and division surgeons, directors of ambulances, field and evacuation hospitals, etc. The dressing stations and hospitals are actually established and the ambulances used for bringing in the wounded. For the purpose, enlisted men of the Hospital Corps are distributed over the field, each man being tagged as to his supposed condition, as "Dead," "Gunshot Wound of the Leg," "Stab Wound of Abdomen," etc. The supposedly dead and wounded men are then brought in by litter squads and field ambulances and must be disposed of by the student officers in charge, whose orders and disposition of the wounded is later criticized by the instructors. The country around the training camp is admirably adapted for such maneuvers, which are ideal for training the medical officers in handling real conditions.

PRESS BUREAU APPOINTED

Colonel Bispham has appointed a special board of officers to act as a press bureau for the Medical Officers' Training Camp, consisting of Major C. S. Williamson, Capt. Frederick R. Green and Lieut. Robert A. Allen.

At Fort Benjamin Harrison

The impending departure of most of the National Guardsmen has created a peculiar restlessness in the camp atmosphere. As the majority of the company instructors are drawn from the ranks of these men, their departure will necessitate extensive changes in the teaching personnel. A general exodus began on September 8, and is still in progress. Those of us that are left are for the most part heartily envious, as this journey seems to be one more step in the direction of the battle front.

VISITORS

The camp was honored on Monday, September 3, by a flying visit from the Belgian Mission. As a great number of the medical cadets were absent on furlough over the week-end and holiday (Labor Day), no review was staged in their honor, but some of those left in camp caught a fleeting glimpse of the uniforms as the automobiles sped by.

LECTURES

Two lectures of special interest have been delivered during the week. Of these one was given by Major L. R. Williams, and dealt with the methods of sanitation in use behind the western front. Major Williams was for a time associated with Dr. Hermann Biggs, who was sent over by the Rockefeller Institute, and had an unusual opportunity to study his subject at first hand.

The other lecture was given by Capt. F. H. Harms, on the subject of the more recent condition of German war prisons. Captain Harms was himself detailed to inspect these prisons by the American Red Cross, and was given all sorts of privileges by the German government. The chief point brought out in this most interesting talk was the improvement in prison conditions made effective through the agency of American inspectors. At the time of his inspection, which was subsequent to the prison reforms instituted by the German government, the prisoners were getting 2,600 calories daily, chiefly in the form of soup, and showed no sign of emaciation.

OTHER EVENTS OF INTEREST

During the past week, by special request of Colonel Ashburn, all the companies have been rehearsing the "Battle Hymn of the Republic," so as to be able to sing it in unison at the next parade. The open-air rehearsals have been very impressive, and have developed considerable cantatorial rivalry between the various companies.

Colonel Ashburn is receiving hearty and well-deserved congratulations on his recent promotion.

Capt. Russell M. Wilder, assistant adjutant, is on short leave of absence. His place is being taken temporarily by First Lieut. R. H. Chaney, M. R. C., of Company 7.

The companies which began their training in August are beginning to lose their men to the field hospitals and other units.

One hundred and forty new recruits to the training camp arrived on Monday, September 3; 250 more are now in process of arriving.

Base Hospital No. 32 (Indianapolis) has arrived in camp and is busily training for the hoped for period of foreign service.

An admirable evening's entertainment was provided on September 3 by Lieut. C. J. Lewis, N. G. Pa. (Medical Corps), and a few collaborators, in the shape of a badger fight. The exact details are not allowed to be printed, by order of the committee in charge, but any military man will supply them on request. Suffice it to say that the affair was a striking success, from the social as well as from the sporting standpoint. Further details will be sent on request, on receipt of a stamped addressed envelope.

COMPANY NEWS

There are now ten companies in camp aggregating 1,023 men.

Company 5 gave a theater party in honor of Major McMillan's promotion. They also gave a farewell banquet for their departing officers.

Company 7 gave a banquet and theater party as a send-off for their officers, all of whom are National Guardsmen. Major Gurney has come to live in the company office and will act as instructor after their departure, in addition to his duties as battalion commander.

Physicians Recommended for Commission in the Medical Reserve Corps

During the week ended Sept. 1, 1917, 116 physicians were recommended to the Adjutant-General for commission in the Medical Reserve Corps, the proportion being three majors, twenty-six captains and eighty-seven lieutenants.

During the week ended Sept. 8, 1917, 279 physicians were recommended to the Adjutant-General of the Army for commission in the Medical Reserve Corps, the proportion being eleven majors, twenty captains and 248 lieutenants.

Gift for Medical Research

The War Council of the American Red Cross on August 22 appropriated \$100,000 for the medical research work in France.

Homes for Soldiers

The country home of Harry Gordon Selfridge, High Cliff Castle, has been converted into a hospital for convalescent soldiers. Mrs. Percy Proctor has offered to place her villa near Mentone, France, at the disposition of the American Army authorities to be used as a convalescent home. The villa will accommodate forty men.

Goldthwaite Returns

Major Joel E. Goldthwaite, M. R. C., U. S. Army, Boston, who recently returned after a visit to the hospitals in France and England to study the new methods of treating the wounded, reports that 1,000 out of 1,350 wounded soldiers who had been crushed and maimed by shells were so skilfully treated at the London Orthopedic Hospital that they were able to return to duty.

United States Takes Over Ambulance Service

Medical officers left New York for France, August 30, to make physical examinations of the 1,100 Americans in the forty-five sections of the American Ambulance Field Service before the transfer to the regular establishment. It is expected that the army will take over the entire ambulance corps, which will be under the command of Col. Jefferson R. Kean.—The formal transfer of the American Ambulance, Neuilly, to the United States Army took place, July 22, under command of Major George P. Peed, M. C., U. S. Army.

Air Raids on Hospitals

The Germans made an aerial attack on the American Hospital occupied by the St. Louis and Harvard base hospitals, killing one medical officer and two of the enlisted personnel, and wounding nineteen.—Incendiary bombs dropped by German aviators in the regions of Verdun, August 19, killed one female nurse and nineteen male nurses, in Vadelaincourt, Mount Hiron, Dugny and Belrupt hospitals and wounded forty-nine. The hospitals were marked prominently with Red Cross signs.—Austrian aeroplanes bombarded Venice, August 14, and dropped bombs on the civil hospital, wounding several patients.

Advisory Committee on Public Health

A committee having this name has been appointed by the United States Food Administration to act as experts for the Food Administration in problems concerning the relation of nutrition and food supply to the public health. The committee consists of Dr. William H. Welch, chairman, Drs. Leonard P. Ayer, Hermann Biggs, David T. Edsall, A. Walter Hewlett, Theodore T. Janeway, F. G. Novy, Richard M. Pearce, H. Gideon Wells and Admiral Cary T. Grayson, together with Drs. Alonzo E. Taylor and Ray Lyman Wilbur, of the Food Administration as ex-officio members. The men named are all well known to the medical profession.

Advisory Committee on Alimentation.

The United States Food Administration announces the creation of an Advisory Committee on Alimentation consisting of C. L. Alsberg, chief of the Bureau of Chemistry; Prof. Russell H. Chittenden, director of the Sheffield Scientific School; Dr. C. F. Langworthy, head of the office of Home Economics, Department of Agriculture; Graham Lusk, professor of physiology, Cornell University Medical College; Lafayette B. Mendel, professor of physiological chemistry, Yale University, and Dr. E. V. McCollum, formerly of Wisconsin University, now of Johns Hopkins. In addition, Dr. Alonzo E. Taylor, Dr. Ray Lyman Wilbur and Dr. Vernon Kellogg, members of the Food Administration, are ex-officio members. The purpose of the committee on alimentation is to cooperate with experts in the policy of food control from the standpoint of scientific nutrition.

Orders to Officers of the Medical Corps

The following promotions in the Medical Corps are announced: To be colonels, with rank from May 5, 1917—Lieut. Cols. David Baker, Albert E. Truby, James B. Church, Joseph H. Ford, Percy M. Ashburn, Elmer A. Dean, Francis M. C. Usher, Willard F. Truby, Frederick F. Russell and Edwin P. Wolfe.

To be lieutenant colonels, with rank from May 15, 1917—Majors Henry F. Pipes, Charles L. Foster, John R. Bosley, Robert C. Loving, Orville G. Brown, George F. Juenemann, Joseph F. Siler, Arthur M. Whaley, Theodore Lamson.

To be lieutenant colonel, with rank from June 25, 1917—Major C. R. Snyder.

To be majors, with rank from June 16, 1917—Capts. C. L. Gandy, A. W. Williams, L. H. Bauer, W. W. Vaughan, J. B. Anderson, E. P. Thode, W. P. Davenport, H. N. Kerns, R. S. Wilds, A. J. Canning, L. W. Webb, Jr., J. H. H. Scudder, W. C. Von Kessler, J. M. Pratt, C. L. Beaven and W. G. Guthrie.

To be major, with rank from July 19, 1917—Capt. H. B. McIntyre.

Col. Edward R. Schreiner, M. C., to permanent command of U. S. Army General Hospital No. 1, New York, N. Y. (Aug. 24, War D.)

So much of Par. 119, S. O. 188, Aug. 14, 1917, War D., as relates to Lieut. Col. M. A. W. Shockley, M. C., is revoked. (Aug. 23, War D.)

Captains of M. C. to duty as follows: George W. Cook to Fort Riley, Kan.; Leonard S. Hughes to Fort Riley, Kan., training camp; Henry C. Maddux to Fort Des Moines, Iowa. (Aug. 23, War D.)

Capt. T. D. Woodson, M. C., from Canal Zone, to Washington for temporary duty. (Aug. 27, War D.)

Orders to Officers of the Sanitary Corps

First Lieut. Charles W. Williams, San. Corps, to duty at Louisville, Ky. (Aug. 23, War D.)

First Lieut. George C. Van Sickle, San. Corps, to Mineola N. Y., as medical supply officer. (Aug. 23, War D.)

Orders to Contract Surgeons

Contract Surg. Benjamin F. Williams to Fort Des Moines for examining in his specialty men at officers' training camp.

Contract Surg. Eugene J. Leopold from duty at Fort McPherson to Camp Hancock, Augusta, Ga., for examining for tuberculosis.

Orders to Officers of the Medical Reserve Corps**ALABAMA**

To Camp Shelby, Hattiesburg, Miss., for duty, Lieut. J. Shahan, Gadsden.

CALIFORNIA

To American Lake, Wash., for duty in the cantonment laboratory, Lieut. K. J. Staniford, Fresno.

To Fort Sill, Okla., for instruction in gas defense, Capts. F. F. Sprague, Los Banos; R. B. Irons, San Diego.

To Linda Vista, Calif., for duty in the cantonment laboratory, Lieut. J. M. Rehfish, San Francisco.

To Letterman General Hospital, San Francisco, to report to commanding officer for duty, Capt. Frank P. Topping, San Francisco.

To San Francisco for duty, Lieut. D. E. Arnold, Kerman.

To Walter Reed General Hospital, Washington, D. C., for duty, Lieut. C. L. Baker, San Francisco.

To report by telegraph to commanding general Western Dept., for duty, Lieuts. J. L. Miller, Jr., Los Angeles; J. T. Gardner, Santa Margarita.

COLORADO

To Fort Riley, Kan., for duty in the cantonment laboratory, Lieut. O. F. Broman, Greeley.

To Fort Sill, Okla., for instruction in gas defense, Lieut. W. M. Bane, Denver.

CONNECTICUT

To Ayer, Mass., for duty, Lieut. L. U. Gardner, New Haven.

To Greenville, S. C., for duty at base hospital as chief of the surgical service, Capt. J. S. Dye, Waterbury.

GEORGIA

To Atlanta, Ga., for duty in the cantonment laboratory, Capt. H. L. Van Winkle, Atlanta.

To Fort McPherson for equipping and training his command after completion of mobilization of Red Cross Ambulance Co. 20, Lieut. L. P. Daly, Atlanta.

To Petersburg, Va., for duty, Lieut. J. J. Beaton, Waycross.

ILLINOIS

To Berkeley, Calif., for duty, Lieut. G. C. Otrich, Belleville.

To Fort Sill, Okla., for instruction in gas defense, Capt., H. C. Woltman, Jacksonville; Lieuts. C. Barnes, F. H. Harms, Chicago.

To Rockford, Ill., for duty, Capt. W. L. Baum; as roentgenologist Lieut. L. J. Palmer, Chicago.

To Thirty-Fourth Division for duty, Capt. B. C. H. Harvey, Chicago.

INDIANA

To Fort Sill, Okla., for instruction in gas defense, Capt. L. A. Ensminger, Indianapolis; Lieut. O. O. Alexander, Terre Haute.

To Garden City, Long Island, N. Y., for duty, Lieut. E. J. Dubois, Indianapolis.

IOWA

To Ayer, Mass., in connection with venereal diseases, Lieut. H. L. Walker, Cedar Rapids.
To Camp Fremont, Palo Alto, Calif., Capt. Marcus C. Terry, Brighton.
To Des Moines, Ia., for duty with 3d Iowa Infantry, Lieut. C. N. O. Leir, Des Moines.
To Garden City, Long Island, N. Y., for duty, Capt. T. A. Burcham, Des Moines.

KANSAS

So much of Par. 146 S. O. 186, Aug. 11, 1917, War D., as relates to Lieut. Franklin W. Koons, Nickerson, is revoked.

KENTUCKY

To Camp Taylor, Louisville, Ky., for laboratory work, Lieut. M. Flexner, Louisville.
To Fort Ethan Allen, Vt., as drillmaster and instructor for Hospital Corps, Lieut. R. M. Means, Midway.
To Little Rock, Ark., for duty in the cantonment laboratory, Lieut. M. Warren, Science Hill.
To Louisville, Ky., for duty, Lieut. M. S. Veal, Daniel Boone.

LOUISIANA

To Fort Sill, Okla., for instruction in gas defense, Lieut. F. S. Furman, Shreveport.
To Fort St. Philip, La., for duty, Lieut. E. J. Huhner, New Orleans.
To Little Rock, Ark., for duty in the cantonment laboratory, Capt. J. J. Robert, Baton Rouge.

MARYLAND

To Admiral, Md., for duty in the cantonment laboratory, Lieut. J. R. Oliver, Baltimore.
To Camp Meade, Annapolis Jet., Md., for duty, Lieut. P. F. Sappington, Bel Air.
To Montgomery, Ala., for duty at base hospital as chief of the surgical service, Lieut. D. P. Peters, Baltimore.

MASSACHUSETTS

To Admiral, Md., for duty in the cantonment laboratory, Lieut. D. J. MacPherson, Boston.
To Ayer, Mass., for duty, Lieuts. L. H. Spooner, Boston; as roentgenologist, E. L. Davis, Springfield.
To Camp McClellan, Anniston, Ala., Capt. Edgar M. Medlar, Boston.
To Deming, N. M., for duty as chief of medical service, Capt. E. B. Bigelow, Worcester.
To Fort Banks, Mass., for duty, Lieut. W. M. Crandall, Lawrence.
To Fort Sill, Okla., for instruction in gas defense, Capt. F. R. Hsley, Medford; D. F. Mahoney, Boston; J. M. Birnie, Springfield.

MICHIGAN

To Columbia, S. C., for duty in the cantonment laboratory, Capt. F. W. Baeslack, Detroit.
To Columbus Barracks, O., for duty, Lieut. DeW. C. Adams, Highland Park.
To Fort Sill, Okla., for instruction in gas defense, Capt. H. M. Beebe, Ann Arbor.
To Hampton, Va., for duty, Lieut. D. V. Hargrave, Carson City.

MINNESOTA

To American Lake, Wash., for duty in the cantonment laboratory, Lieut. A. E. Anderson, Minneapolis.
To Fort Sill, Okla., for instruction in gas defense, Capt. C. C. Pratt, Mankato; Lieut. B. V. Bates, Wheaton.
To Fort Snelling, Minn., for duty, Lieut. J. E. Soper, Norwood.
To Minneapolis, University of Minnesota for duty, Capt. F. C. Todd, Minneapolis.

MISSOURI

To Fort Sill, Okla., for instruction in gas defense, Capt. A. A. Gossow, St. Charles.
To Waco, Tex., for duty at base hospital as chief of the surgical service, Capt. J. C. Morfit.

NEBRASKA

To Fort Omaha, Neb., for duty, Lieut. F. W. Scott, Lodgepole.

NEVADA

To report by telegraph to commanding general, Western Dept., for duty, Lieut. J. L. Garner, Manhattan.

NEW HAMPSHIRE

To Fort Ethan Allen, Vt., for duty, Capt. L. C. Stillings, Surry.
To Fort Sill, Okla., for instruction in gas defense, Lieut. J. A. Drew, Rumney.

NEW JERSEY

To Fort Ethan Allen, Vt., as drillmaster and instructor for Hospital Corps, Capt. A. G. Bising, Weehawken.

NEW YORK

To Anniston, Ala., for duty at base hospital as chief of the surgical service, Capt. J. C. A. Gerster, New York City.
To Atlanta, Ga., for duty in the cantonment laboratory, Capt. G. Baehr, New York City.
To Camp McClellan, Anniston, Ala., Lieut. Ralph A. Kinsella, New York City.
To Chillicothe, O., for duty as roentgenologist, Lieut. S. Brown, New York City.
To Fort Benjamin Harrison for duty, Capt. R. Morris, Lincoln.
To Fort Ethan Allen, Vt., for duty, Lieut. H. L. St. John, Rochester.
To Fort Jay, N. Y., for duty, Lieuts. J. I. Meagher, New York City; R. N. Severance, Staten Island.
To Fort Sam Houston, Tex., for duty as roentgenologist, Lieut. D. S. Childs, New York City.
To Fort Sill, Okla., for duty, Capt. F. G. Young, New York City; for instruction in gas defense, J. N. Boyce, Stanfordville.
To Fort Worth, Tex., for duty in the cantonment laboratory, Lieut. C. Boettiger, Long Island City.

To Governors Island, N. Y., for duty, Lieut. D. W. Cairns, New York City.

To Greenville, S. C., for duty as chief of medical service, Lieut. P. Van Ingen, New York City.

To Louisville, Ky., for duty, Lieut. H. Fox, New York City.

To Mincola, Long Island, N. Y., Aviation School for duty, Lieut. G. F. Gracey, New York City.

To Presidio of San Francisco, for duty with Thirteenth Infantry, Lieut. Jesse Ettelson, New York City.

To Spartanburg, S. C., for duty as chief of medical service, Major H. S. Satterlee, New York City.

To Toronto, Canada, School of Military Aeronautics as post surgeon, Lieut. W. W. Laing, Brooklyn.

To Walter Reed Hospital, Washington, for duty, Capt. G. Draper, New York City.

To West Point, N. Y., for duty, Lieut. J. F. Grattan, New York City.

To Wrightstown, N. J., for duty, Major T. W. Hastings; for duty in the cantonment laboratory, Lieut. H. W. Jackson, New York City.

To Yaphank, Long Island, N. Y., for duty, Lieuts. A. Zingher; for duty in the cantonment laboratory, M. McBurney, New York City.

NORTH CAROLINA

To Camp Greene, Charlotte, N. C., for duty, Lieut. W. J. McAnally, High Point.

To Fort Ethan Allen, Vt., as drillmaster and instructor for Hospital Corps, Lieut. J. Thames, Wilmington.

To Fort Worth, Tex., for duty as roentgenologist, Lieut. H. H. Ogburn, Greensboro.

OHIO

To Battle Creek, Mich., for duty in the cantonment laboratory, Capt. D. Marine, Cleveland.

To Columbus, Ohio, for duty, Lieut. C. H. Weintz, Cincinnati.

To Fort Sam Houston, Tex., for duty at base hospital as chief of the surgical service, Major F. E. Bunts, Cleveland.

To Princeton, N. J., for duty, Lieut. M. H. Urner, Cincinnati.

To Youngstown, O., mobilization of Base Hospital No. 31, Major Colin R. Clark, Youngstown.

OKLAHOMA

To Camp Travis, Fort Sam Houston, Tex., for duty, Lieut. C. E. Lee, Oklahoma.

OREGON

To Fort Ethan Allen, Vt., as drillmaster and instructor for Hospital Corps, Lieut. F. Van Doren, Seaside.

To Fort Sill, Okla., for instruction in gas defense, Lieut. D. Grant, Portland.

To report by telegraph to commanding general, Western Dept., Lieut. H. E. Carruth, Yarnhill.

PENNSYLVANIA

To Allentown, Pa., for duty with Base Hospital No. 27, Major T. S. Arbuthnot, Pittsburgh; for duty, Lieut. W. J. Sener, Douglassville.

To Annapolis Junction, Md., for duty, Lieut. J. R. Conover, Philadelphia.

To Augusta, Ga., for duty at base hospital as chief of the surgical service, Capt. W. A. Dearth, Pittsburgh.

To Austin, Tex., for duty, Lieut. G. W. H. Conrad, Philadelphia.

To Camp Gordon, Atlanta, Ga., for duty as roentgenologist, Lieut. W. S. Newcomet, Philadelphia.

To Camp Taylor, Louisville, Ky., for duty, Lieut. H. S. Wilson, Huntingdon.

To Chillicothe, O., for duty in the cantonment laboratory, Capt. F. Proescher, Pittsburgh; for duty, Lieut. H. L. Brush, Conneaut Lake.

To Fort Sill, Okla., for instruction in gas defense, Lieut. A. L. Hicok, Meshoppen.

To Ithaca, N. Y., for duty, Lieut. E. R. Sibley, Elkins Park.

To Macon, Ga., for duty in the cantonment laboratory, Lieut. M. H. Baker, Pittsburgh.

To Montgomery, Ala., for duty as chief of medical service, Major W. Pepper, Philadelphia.

To Petersburg, Va., for duty in the cantonment laboratory, Lieuts. G. R. Moffitt, Harrisburg; for duty, E. J. Asnis, West Conshohocken.

To Pittsburgh, Pa., for duty, Lieut. J. L. Burkholder, Mt. Pleasant.

To Rockford, Ill., for duty, Lieut. H. I. Newcomet, Reading.

To Urbana, Ill., for duty, Lieut. W. S. Shimer, Philadelphia.

To Yaphank, Long Island, N. Y., for duty as roentgenologist, Lieut. R. V. Wolfe, Morristown.

SOUTH CAROLINA

To Columbia, S. C., for duty in the cantonment laboratory, Lieut. G. F. Klugh, Cross Hill.

To Hattiesburg, Miss., for duty in the cantonment laboratory, Lieut. T. R. W. Wilson, Greenville.

To Spartanburg, S. C., for duty at base hospital as chief of the surgical service, Capt. C. B. Earle, Greenville.

SOUTH DAKOTA

To Fort Sill, Okla., for instruction in gas defense, Capt. F. E. Ashcroft, Deadwood.

TENNESSEE

To Columbia, S. C., for duty in the cantonment laboratory, Lieut. J. S. Fleming, Memphis.

To Fort Oglethorpe for duty with Hospital Unit P., Lieuts. K. M. Buck and S. E. Frierson, Memphis.

To Fort Thomas, Ky., for duty, Lieut. C. M. Banks, Springfield.

TEXAS

To Camp Custer, Battle Creek, Mich., for duty, Lieut. C. C. Odom, Childress.

To Fort Worth, Tex., for duty in the cantonment laboratory, Capt. J. C. Flynn, Galveston.

To Laredo, Tex., for duty with 37th Infantry, Lieut. Eugene A. Frechet, Frisco.

To report by telegraph to commanding general, Southern Dept., Lieuts. J. F. Stein, Denison; E. H. B. Steele, Deport; H. D. Filmore, Maryneal; M. O. Rea, Pottsville; C. O. Terrell, Ranger.

VERMONT

To report by telegraph to commanding general, Western Dept., for duty, Lieut. F. S. Pratt, Bennington.

VIRGINIA

To Battle Creek, Mich., for duty in the cantonment laboratory, Capt. W. B. Blanton, Richmond.

To Camp Lee, Petersburg, Va., for duty, Lieut. J. C. Dunford, Portsmouth.

To Petersburg, Va., for duty in the cantonment laboratory, Lieut. B. L. Crawford, Richmond.

To Richmond, Va., for duty, Lieut. C. H. Lewis, Richmond.

WASHINGTON

To Fort Riley, Kan., for duty in the cantonment laboratory, Lieut. W. L. McClure, North Yakima.

To Fort Sill, Okla., for instruction in gas defense, Capt. N. D. Pontius, Seattle.

To report by telegraph to commanding general Western Dept., for duty, Lieut. G. W. Phillips, Bridgeport.

WISCONSIN

To Fort Sill, Okla., for duty, Lieut. G. C. Ruhland, Milwaukee.

To Fort Snelling, Minn., for duty, Lieut. G. F. Spencer, Evansville.

To Washington, for duty, Major Nelson Black, Milwaukee.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Soldier's Welfare Work.—The California State Board of Health, August 21, established a Military Welfare Bureau for the care and prevention of venereal diseases in and near military camps in California. The central station has already been appointed by Dr. Wilbur A. Sawyer, Sacramento. The governor has appropriated \$60,000 for carrying on this work.

ILLINOIS

Addition to Post-Graduate School.—The Post-Graduate School of Chicago has acquired from the Northwestern University a lot 50 by 105 feet, east front, 50 feet south of its present building, for \$15,500, to erect an addition to the hospital.

New Commissions.—Dr. B. McPherson Linnell, Chicago, has been commissioned major, M. C., Ill. N. G., and assigned to duty with the Eleventh Infantry.—Dr. Daniel W. Rogers, Chicago, has been commissioned major, M. C., Ill. N. G., and assigned to the Third Artillery.

Correction.—By an error in the points of the compass, THE JOURNAL announced, Aug. 25, 1917, p. 657, that Dr. Charles E. West had been appointed Medical Officer of the Camp Grant District, including the city of Rockford. The name should have been Dr. Clarence W. East.

Addresses Before Graduates.—Dr. Eliot R. Clark, professor of anatomy in the University of Missouri, Columbia, recently delivered an address on "Some Aspects of the Problem of Endothelium," and Dr. Frederick G. Novy, professor of bacteriology in the University of Michigan, Ann Arbor, an address on "Anaphylaxis," before the faculty of students of the graduate summer quarter in medicine of the University of Illinois.

IOWA

State Hospital for Epileptics.—The new State Hospital for Epileptics at Woodward has been completed, and was opened to receive patients, September 3.

Personal.—Capt. Rodney P. Fagen, Des Moines, has been commissioned major, M. C., Iowa N. G., and assigned to the Second Infantry.—Dr. John H. Stalford has resigned as mayor of Sac City.—Dr. William C. Witte has been assigned to take charge of rural sanitation in the extra cantonment zone, Camp Dodge.—Lieut. Charles T. Kemmerer, M. C., U. S. Army, Davenport, has been ordered to Deming, N. M., his special duty being the prophylaxis of communicable diseases.

MARYLAND

Personal.—Dr. Henry H. Hampton, formerly chief resident physician at the Church Home and Infirmary, has taken up his new duties as chief resident physician of the Hebrew Hospital, succeeding Dr. M. B. Levin, who has entered private practice.—Dr. Edgar Fay has been appointed an assistant resident physician at Sydenham Hospital by Health Commissioner Blake.—Dr. Hans Hohn, lately associated with the medical staff of Mercy Hospital, Baltimore, has accepted a post at St. Joseph's Hospital, Lancaster, Pa., and has assumed his duties at that institution.

Appointment to Medical Staff.—Dr. Cary B. Gamble has been appointed on the medical staff at Camp Meade, with the rank of major. Dr. Gamble will be stationed at the camp permanently, and his special duty will be to specialize in the treatment of diseases of the heart and blood vessels. Major Gamble will be assisted by a staff of physicians and some enlisted men. Major Gamble follows to Camp Meade Major Arthur M. Shipley of the University Hospital, who was selected to direct the hospital at the Maryland cantonment; Dr. John M. T. Finney in charge of the Johns Hopkins Base Hospital Unit in France, and Dr. Winford H. Smith, superintendent of the Johns Hopkins, who is on the staff of Surgeon-General Gorgas in Washington.

Health Report for August.—The health department's report shows that 237 babies died from illnesses due to the hot weather in August. Of this number, 207 were under 2 years of age. The summer has been extremely hard on infants, and the mortality among them was largely responsible for the highest August death rate in Baltimore since 1913. A total of 945 persons died during the month, compared with 901 a year ago, 822 in 1915, and 845 in 1914. Forty-two fatal accidents were reported; heart disease took a toll of 126. Other diseases were fatal in the following number of cases: tuberculosis, 107; apoplexy, 58; Bright's disease, 85; pneumonia, 53; cancer, 57; typhoid fever, 10, and epidemic meningitis, 2. There have been just two cases of infantile paralysis in Baltimore this year. Typhoid fever showed a remarkable falling-off. The new cases numbered seventy, as against 175 a year ago. Whooping cough is on the increase, there having been 208 cases last month as compared with 154 in August, 1916. The department reported 1,422 births last month.

Result of Examination of National Guard.—The examination of the Maryland National Guard was completed about September 1. Practically all of this work was done during the month of August. Dr. A. P. Herring was appointed by the War Department as contract surgeon in charge of this work, and was assisted by Dr. J. Percy Wade, superintendent of the Spring Grove State Hospital; Dr. R. P. Winterode, superintendent of the Crownsville State Hospital, and Dr. Lewis H. Gundry, Relay. The total number of men inspected was 5,700. Out of that number, 210 were examined and twenty-eight were recommended for rejection. The Fourth and Fifth Regiments were examined at their respective camps: the Field Hospital and the Coast Artillery were examined at the Richmond Street Armory; Troop A and Batteries A, B and C at the Pikesville Armory; Companies D and H of the First Regiment at Lake Montebello; Company B at Hagerstown; Company A at Frederick, and Company C at Cambridge. The remaining companies of the First Regiment have not been examined. Certificates of disability were made out on regular forms and forwarded through the proper channels, in order that the men might be promptly discharged. Dr. Herring and Dr. Wade have been serving as members of the Medical Board under Form No. 484 A. G. O., and with them the major of each regiment. Maryland is the only state in which such an examination has been possible before the troops left for their cantonments.

MASSACHUSETTS

Personal.—Dr. Elliott Washburn, for four years superintendent of the Rutland Sanatorium, has resigned to accept a position as superintendent of the Municipal Hospital of Kansas City, Mo.—Dr. Charles W. McClure, Boston, has been made physician in charge of the medical service of St. Luke's Hospital, South Bethlehem, Pa.—Dr. Milton H. Foster has been appointed to take charge of the physical examination of aliens at the immigration station, Long Wharf, Boston.

Infantile Paralysis.—More than 800 cases of infantile paralysis reported to the Massachusetts Board of Health during 1916 have been given after-treatment by the Harvard Infantile Paralysis Commission. Clinics were held in Boston, Newburyport, Springfield, Quincy, Lynn, Beverly, Greenfield,

Worcester, Malden, Melrose, Lawrence, North Adams and Lowell. There were 1,917 cases reported to the state department of health during the year, and of this number, 454 patients died; no paralysis resulted in 246 cases, and 303 patients were treated privately. The commission supplied treatment directly to 698 patients, and the field agents visited 142 others.

Guard Appointments and Changes.—Lieut.-Col. William A. Brooks, chief surgeon of the state, announces that the following medical officers have been transferred from the State Guard Unit Hospital, with the rank of major: Drs. Donald V. Baker, Brookline, to the Twelfth Infantry; Edward A. Supple, Boston, to the Fifteenth Infantry; Harold Giddings, Allston, to the Fourteenth Infantry; Garry de N. Hough, New Bedford, to the Seventeenth Infantry; Charles E. Durant, Haverhill, to the Sixteenth Infantry, and Benjamin E. Sibley, Brookline, to the Eleventh Infantry.—Dr. Russell F. Sheldon, Boston, has been transferred from the Unit Hospital to the Fifteenth Infantry.—Dr. John J. Egan, Gloucester, has been commissioned first lieutenant, and assigned to the Fifteenth Infantry.—Drs. Francis H. Slack and Charles L. Overlander, Brookline, have been appointed bacteriologists to the Unit Hospital, with the rank of first lieutenant.—Dr. De Witt G. Wilcox, Boston, has been appointed surgeon to the unit, with the rank of captain.—Dr. Orrin Curtis Blair, Lynn, has been assigned to the Fifteenth Infantry, with the rank of captain.—Dr. Hugh Williams, Boston, has been commissioned major, and assigned to the Thirteenth Infantry.—Dr. Hardy Phippen, Salem, has been transferred from the Unit Hospital to the Fifteenth Infantry, with the rank of captain.

MICHIGAN

Base Hospital Mobilized.—The Detroit College of Medicine and Surgery Base Hospital No. 36 was mobilized at the state fair grounds, August 24, under the command of Major Burt R. Shurly. Capt. Theodore A. McGraw, Jr., has been officially detailed as adjutant of the unit.

State Trudeau Society Organized.—The Michigan Trudeau Society was recently organized at Ann Arbor for the purpose of fighting tuberculosis: president, Victor C. Vaughan, Jr., Detroit; vice president, Dr. James S. Pritchard, Battle Creek, and secretary, Dr. William De Kleine, Flint.

Inches Held with Unit.—The War Department has refused to accept the resignation of Dr. James W. Inches, health officer of Detroit, from the Detroit College of Medicine and Surgery Base Hospital No. 36, in order to allow him to accept an appointment by the American Red Cross as one of the fifteen commissioned specialists to study conditions abroad.

Society Meetings.—The meeting of the Kalamazoo Academy of Medicine was held in South Haven, August 18, the program being furnished by the Chicago physicians who have their summer homes near there.—The August meeting of the Muskegon-Oceana Counties Medical Society was held in Muskegon, August 17. Asst. Surg. Harold S. Hulbert, U. S. Navy, Great Lakes, Ill., presented a paper on "Military Surgery."

Personal.—Capt. Randall M. Cooley, M. C., Mich. N. G., has been detailed as assistant chief surgeon at Camp McArthur, Waco, Texas.—Dr. Allison H. Edwards has been appointed superintendent of the Grand Rapids Sanatorium.—Dr. Johnston B. Kennedy, Detroit, fell in Washington Arcade, August 21, fracturing two ribs.—Dr. Nellis B. Foster, Ann Arbor, has started for Serbia with the Red Cross Commission.

Hospital Items.—The new Public Hospital, Hancock, was thrown open, August 27, for the inspection by the copper country physicians. On the following day there was a public reception, and the formal opening of the institution occurred, August 29.—A commission from Menominee, Delta, Dickinson and Iron counties recently visited the tuberculosis sanatoriums in Marquette and Houghton counties in order to familiarize themselves with this practical phase of county service. An effort is being made to secure a county sanatorium for Menominee, Delta and Dickinson counties.

MINNESOTA

New Hospital for Rochester.—The Sisters of St. Francis have completed the arrangements for a medical building to be erected in the rear of St. Mary's Hospital, Rochester.

Insane Patients Transferred.—The transfer of sixty chronic insane patients from various state hospitals to a hospital established in connection with the State Farm for Inebriates,

Wilmar, was made August 1. They will occupy two cottages recently erected for their accommodation.

Personal.—Dr. Edward W. Buckley, St. Paul, was elected supreme physician of the Knights of Columbus at its thirty-fifth annual meeting, held in Chicago, August 8.—Major James E. Merrill, M. C., Minn. N. G., has been assigned to duty as sanitary inspector at Camp Cody, Deming, N. M.

Women Physicians Organized.—Seventy-five women physicians of Minnesota have formed an organization known as the Minnesota Medical Women's Association, and have elected the following officers: president, Dr. A. Auten Pine, St. Paul; vice president, Dr. Emma L. S. Aldrich, Belview, and secretary, Dr. Florence M. Ridgway, Minneapolis.

Infantile Paralysis Clinics.—The state board of health is holding clinics in various parts of the state for the examination and treatment of infantile paralysis. Dr. Arthur J. Gillette, St. Paul, is acting in an advisory capacity to the state board, and Dr. Willard P. Greene is supervising the medical part of the clinic.

Sanatorium Notes.—The Southwestern Minnesota Tuberculosis Sanatorium, located on the south shore of Lake Okabena, near Worthington, was formally opened, July 23. The institution has been established and is maintained by the Southwestern Minnesota Tuberculosis Association, which comprises the counties of Nobles, Whitestone, Murray, Jackson, Cottonwood, Lyn and Lincoln. The buildings are of monolithic concrete structure, fireproof, and have cost \$100,000.—The commissioners of Ramsey County have passed an appropriation of \$16,630 for the maintenance of a county sanatorium at Lake Owasso.

MISSISSIPPI

Hospital Nearly Completed.—Work on the new King's Daughters Hospital, Greenwood, is rapidly nearing completion. An institution of this kind is much needed in Leflore and the adjoining counties.

Personal.—Dr. Henry Boswell, Booneville, has been placed temporarily in charge of the State Tuberculosis Sanatorium, McGee.—Dr. Joseph W. Hough, Jackson, has purchased for \$20,000 two houses on adjoining lots, which he has given to the Young Women's Business Club to be used as homes for working girls.

NEW YORK

Diphtheria on Indian Reservation.—On account of the existence of diphtheria in the Tonawanda Indian Reservation, the state department of health has forbidden the holding of picnics or festivals on the reservation until further notice.

Society Will Take in Training Recruits.—The Queens-Nassau Medical Society has initiated and maintained in the organization a collective department to take care of applicants for enlistment in the armed forces of the United States who have been rejected for minor physical defects.

Director of Children's Home.—The New York Civil Service Commission announces that applications will be received from Sept. 7 to Sept. 21, 1917, for the position of director of the Children's Home Bureau.—Applicants must be citizens of the United States and residents of the state of New York. The compensation will be \$4,000 per annum. There is one vacancy. Information may be had from Robert W. Belcher, secretary, Municipal Building, New York.

Few Cases of Infantile Paralysis in State.—During July, 1916, nearly 4,000 cases of poliomyelitis were reported in this state, and almost 6,000 during the month of August. In striking contrast to this, there were this year but forty-one cases reported in the entire state, including New York City. The returns for August show but fourteen additional cases in New York City for the month of August, and thirty cases in the rest of the state. Scrutiny of the cases shows them scattered over the state, with no apparent center of infection.

Personal.—Dr. Edward Durney, Buffalo, has been designated as deputy health commissioner during the absence in war service of Capt. Arthur C. Schaefer.—Dr. James P. Marsh, Troy, has been appointed surgeon in chief of the new Henry W. Putnam Memorial Hospital, which is now approaching completion at Bennington, Vt.—Dr. Hermann M. Biggs, state commissioner of health, has been appointed a member of the public health staff of the conservation division of food administration.—Dr. William E. Youland of the state department of health, Poughkeepsie, has been transferred to take up other health matters, and the dysentery situation has been left in charge of Sanitary Supervisor Marsh.—Dr. Barnett P. Stivelman has been appointed medical superin-

tendent of the Montefiore Home Country Sanatorium at Bedford Hills.—Dr. Irving I. Gellman has been appointed first assistant physician of the house staff in the sanatorium, to succeed Dr. Joseph Rosenblatt.

Civil Service Examination.—The civil service examination will be held throughout the state, October 6, for the following positions:

Muscle Tester, Infantile Paralysis Aftercare, State Department of Health; salary \$75 a month and traveling expenses; open to women only between 21 and 45 years of age. Candidates must have had not less than three weeks' instruction of practical work in muscle testing and in the use of the spring balance.

Inspector, State Department of Health; salary \$1,260, for men only.

(a) Those qualified in general sanitary and milk inspection.

(b) Those qualified in complete construction of county tuberculosis hospitals.

Assistant superintendent (male), State Custodial Asylum for Feeble-Minded Women, Newark; salary \$2,000 a year and maintenance. Candidates must be graduates of local chartered medical colleges, licensed to practice medicine in the state, with training in psychology and other related subjects, and with at least three years' experience in the care of the feeble-minded, epileptic or insane.

Medical Assistant, Office of District Attorney, County of Kings; salary, \$3,000, open only to male residents of Kings County who have been duly licensed to practice medicine in the state for at least ten years.

Applications for these positions should be obtained from the State Civil Service Commission, Albany. No applications will be received at the offices of the commission after September 26.

New York City

House Given to Red Cross.—Mrs. Nicholas F. Brady, the buyer of the Colony Club, Thirtieth Street and Madison Avenue, which was purchased for \$400,000, has turned over the structure to the American Red Cross to be used as administration headquarters for the New York District during the period of the war.

Sale of Absinthe Prohibited.—The department of health has amended the Sanitary Code so that from September 1 it will be a violation of the code to "have, sell, or offer for sale the alcoholic beverage known as absinthe, a manufactured product containing wormwood, or absinthe, an ingredient which may render the beverage injurious to health."

Personal.—Dr. Michael V. Ball has resigned as professor of pathology of the New York Medical College and Hospital for Women, and will resume practice at Warren, Pa.—Dr. Benjamin F. Knause, as a result of a competitive examination, has been given first place on the list from which the health commissioner will appoint an assistant sanitary superintendent for Brooklyn.—Dr. Lewis P. Harris has been appointed director of the Bureau of Preventable Diseases of the health department, to succeed Dr. Bertram Waters who has resigned to resume private practice.

War Hospital Opens Ward.—The War Demonstration Hospital of the Rockefeller Institute for Medical Research has opened a second ward to which patients are admitted who have chronic or obstinate infections, compound fractures, chronic osteomyelitis, and various leg ulcers. This class of patients will be used to demonstrate the efficacy of the Carrel-Dakin method of treating infected wounds.

Contagious Disease Hospital.—Plans have been completed for a hospital for contagious diseases to be erected in the Bronx which will have accommodation for 1,000 patients. It will be a four-story structure, and will occupy the entire block bounded by Schieffelin Place, Seton Avenue, and East Two Hundred and Thirty-Third Street. The building will have glass partitions to separate the wards, and also for the observation rooms where patients will be under surveillance.

Society for Reeducation of War Cripples.—September 3, the National Society for the Promotion of Occupational Therapy met at the land ship *Recruit* and discussed ways and means of fitting cripples for the work they did before the war, or in case this cannot be done, reeducating them for some other vocation. The society has been put on a permanent footing, and offers to investigate every case brought to its notice. W. P. Jackson has been elected president, and Mrs. Winifred Brainerd, chairman of the executive committee.

Typhoid in Borough of Richmond.—An outbreak of typhoid fever is reported from the West Brighton district of Staten Island. Up to September 6, about thirty-five cases had been reported, and forty more were under observation. The course of infection is at present supposed to be the milk of a certain dealer who has been getting his supply from Delaware, N. J.

The usual precautions are being taken to prevent the spread of the disease, including a warning sent to about 4,000 of the residents of that section not to eat raw food, and to be careful in the selection of a milk supply.

Draft Evasion.—Dr. Albert R. Fritz, Brooklyn, is reported to have been arrested, August 25, by the Department of Justice, charged with conspiracy to obstruct the selective draft law, and to have been held in \$10,000 bail. It is alleged that Dr. Fritz approached a registrant and promised him exemption on the payment of \$300.—Dr. Seligman, Brooklyn, assistant examining physician on Local Exemption Board No. 52, Williamsburg, is said to have been arrested, August 21, charged with conspiracy and offering to accept a bribe of \$200 to disqualify a drafted man who appeared before him.

Report on Drug Cases.—A report of the chief statistician of the city, made at the request of Chief City Magistrate William McAdoo, shows that during the first six months of 1917 there have been 1,242 drug cases disposed of by the city magistrate. Of this number, 1,104 of the defendants were men, and the remainder women. The cases were separated into four classes: the voluntary commitments, through the magistrate's office, to Warwick Farms, of which there were 108; the drug addicts, over whom the city magistrates have summary jurisdiction, of whom there were 175, 138 male and thirty-seven female; the distributors of drugs charged with misdemeanor under the public health law, of which there were 471, 424 men and forty-seven women, and the dealers charged with misdemeanor. Of the 392 felony charges against dealers in narcotics, 339 defendants were men and fifty-three were women.

OHIO

Northwestern Ohio Physicians to Meet.—The annual meeting of the Northwestern Ohio District Medical Association will be held at Lima, October, 17-18, under the presidency of Dr. James R. Tillotson, Delphos.

Joint Tuberculosis Hospital.—The county commissioners of Lorain, Erie, Sandusky and Huron counties have arranged a meeting to consider the feasibility of constructing a tuberculosis hospital for the four counties, to be located at a central and accessible point.

Health Insurance Board Appointed.—August 23, the governor appointed the following commission to conduct a study of health insurance, sickness prevention and old age insurance: M. D. Hammond, Columbus; D. F. Garland, Dayton; Andrew Warner, Cleveland; T. J. Donnelly, Columbus; M. W. A. Julian, Cincinnati; D. R. Kennery, Youngstown, and O. B. Chapman, Dayton.

Personal.—Dr. Paul A. Murr, Galion, was seriously injured, August 25, by being crushed between an automobile and the wall of a building.—Dr. Ora O. Fordyce, superintendent of the Athens State Hospital, has been granted further leave of absence on account of ill health.—Dr. Herbert M. Platter, Columbus, medical inspector of schools, has been appointed temporary secretary of the State Medical Board, succeeding Dr. George H. Matson, deceased.—Dr. Ralph W. Van Horn, Findlay, saved a man from drowning in Lake Erie at Rye Beach, August 19.—Dr. Martin F. Vereker has been elected a member of the Common Council of Hamilton.

PENNSYLVANIA

Personal.—Dr. William M. Lynch, Clarks Summit, who has been appointed superintendent of the State Hospital for Criminal Insane at Farview, Wayne County, has resigned as senator from Lackawanna County, and has entered on the duties of his new position.—Dr. Ross H. Skillern, Philadelphia, has been appointed major in the U. S. Medical Reserve Corps to take charge of the Nose and Throat Unit at Camp Sheridan, Montgomery, Ala.—Dr. Alfred Gordon, Philadelphia, addressed the York County Medical Society at its annual meeting, September 6, on "Differential Diagnosis and Modern Treatment of the More Common Neurological Conditions Met with in General Practice."

Philadelphia

Hold Red Cross Carnival.—A carnival and bazaar was held by the southeastern section of the American Red Cross, in West Philadelphia, September 7, to raise \$1,000 for the Red Cross Fund.

Medical Institutions.—The Union County Society met in annual session, July 19, at Lewisburg, with eight members present. Officers were elected for the ensuing year as follows: president, Dr. Ralph Steans; vice president, Dr. Harry R. Thornton; secretary-treasurer, Dr. Ainos V.

Persing, Allenwood; reporter, Dr. William E. Metzger, Alvira; censors, Drs. Thomas C. Thornton and William Leisler, and committee on public policy and legislation, Drs. Charles A. Gundy and William Leiser, Lewisburg, and Paul H. Bigle, Mifflinburg.

Negro Association Pledge Aid.—At the opening session of the National Medical Association, an organization of colored physicians, pharmacists and dentists, which met in the southwest branch of the Young Men's Christian Association, August 28, delegates pledged themselves to use their influence with negroes all over the country to induce them to enlist and to loyally support the government in war. A committee consisting of Drs. G. J. Bowen, J. A. Kenny and W. J. Daniels was appointed to visit the Surgeon-General to question him as to the manner in which the members of the association can best aid the government. They will also offer to the government a fully equipped base hospital for service abroad.

Personal.—Dr. Edward E. Montgomery has been elected president of the Philadelphia Branch of the National War-time Prohibition Committee.—Dr. Frank C. Abbott, who has been in France since the beginning of the war, was specially mentioned for service on the occasion of the distribution of medals at Vendome.—Dr. William H. Morrison was elected president of the Baltimore and Ohio Association of Railway Surgeons, at its meeting in Cleveland, June 22.—September 7, Dr. Wilmer Krusen, director of public health and charities, delivered an address on "Activities of the Municipal Health Department" at the College Settlement. The meeting was attended by nearly 200 persons, including many neighborhood physicians.

UTAH

Personal.—Dr. Andrew J. Bowman, Salt Lake City, has been commissioned first lieutenant, Utah National Guard, and assigned to duty with the Field Hospital Company.—Dr. John S. Gordon, Ogden, who was knocked down by a car in Los Angeles several weeks ago, sustaining a fracture of the hip, is reported to be improving.

Typhoid Fever.—The report of the Salt Lake Board of Health for the week ending August 25 shows that on that date there were thirty-five houses under quarantine in the city on account of typhoid fever. Dr. Theodore B. Beatty, secretary of the state board of health, who has just returned from an inspection trip, states that outside of Salt Lake City there is less typhoid fever in Utah this year than there has been in any corresponding season in twenty-five years.

VIRGINIA

National Quarantine Station.—Craney Island, across the Elizabeth River from Norfolk, Va., has been turned over by the Navy Department to the United States Public Health Service to be used as a National Quarantine Station, and Congress has been asked to appropriate \$400,000 for the purpose of erecting the necessary buildings on the island.

GENERAL

Book on Health in War.—The American Museum of Natural History has published a booklet entitled "Health in War," which is intended for distribution at a nominal price as a means of acquainting the soldier, recruit, and also the general public with all the proper precautions against disease and other causes of poor health. The book is being issued in connection with the "Food and Health Show."

Examinations for Appointments in the Children's Bureau.—The previously announced examinations for special agents and research assistants to fill vacancies in the Children's Bureau, Department of Labor, at salaries ranging from \$1,200 to \$1,680 a year; and examinations for assistant inspectors, Child Labor Division, at the same salaries, which was scheduled to be held September 19 and 20, have been postponed to Sept. 20 and 21, 1917. This is the most recent announcement of the Children's Bureau in regard to these examinations.

Association of Military Dental Surgeons.—The Association of Military Dental Surgeons of the United States, John D. Millikin, president, with headquarters in San Francisco, is making a bid for additional members on account of the increased interest in military dental matters induced by the war. The association now publishes a quarterly bulletin containing dental military news of interest to both the Army and Navy Dental Corps. At present it is contemplated by the military authorities to have at least 1,000 members in the Dental Reserve Corps.

Safety Congress.—The American Museum of Safety held its fourth annual National Safety Congress and Exposition in the Grand Central Palace, New York, during the week of September 9. The entire ground floor of the Grand Central Palace was occupied by appliances for accident prevention, fire prevention, and sanitation. Reports of the organized safety activities last year claim a saving of 5,000 lives through their efforts. Statistics show that 22,000 workmen were killed in American industrial accidents during the year 1916, and that more than 1,500,000 were injured so that they had to lose time from their work during the year. Of this number, 600,000 were incapacitated for more than four weeks. It is estimated by Arthur H. Young, the director of the American Museum of Safety, that 70 per cent. of all industrial accidents are preventable.

Civil Service Examination.—The United States Civil Service Commission announces that examinations will be held at the time stated for the following positions:

October 2: Scientific Assistant in the Public Health Work (male); salaries, Grade 1, \$1,500 to \$2,000; Grade 2, \$900 to \$1,500. Applicants for Grade 1 must have had college or university instruction in medicine, biology or sanitary engineering subsequent to graduation from a four year's high school course, and at least six months' experience in Public Health work under federal or state authorities. Applicants for Grade 2, at least graduation from a four year's high school course and six months' experience of public health work under federal or state authorities; must be between 21 and 35 years of age, of good character and physique.

October 3: Pathologist (male), to fill vacancy in Freedmen's Hospital, Washington, D. C.; salary \$2,000 a year. Applicants must have had at least one year's experience in a pathologic laboratory after having graduated from a medical college of recognized standing, and must be able to make all kinds of pathologic examinations and reports thereof; applicants must be citizens of the United States, and must have reached their twentieth birthday.

Physician (male) to fill present and future vacancies in positions of physicians of the Indian and Panama Canal service; acting assistant surgeon of United States Public Health Service; surgeon in the Coast and Geodetic Survey, and other similar positions; salaries in the Indian Service, \$1,000 to \$1,200 a year; in the Panama Canal service, \$1,800 a year; in the Public Health Service, from \$480 to \$1,800 a year; and in the Coast Geodetic, \$1,020 a year and an allowance for subsistence of \$1 per diem while serving aboard ship, except in the Philippines, where the allowance is \$2.50 per diem. Applicants must be graduates from medical schools of recognized standing or senior students in such institutions, and must furnish proof of actual graduation within six months from date of examination; for Public Health Service at least two years' experience and practice since graduation is required. Applicants must be at least 21 years of age, but eligibles more than 40 years of age will not be certified, except to fill vacancies as acting assistant surgeon in Public Health Service. In the Panama Canal Service applicants must be between 22 and 30 years of age. For the positions in Public Health Service and Coast and Geodetic Survey, the medical certificates in the application form may be executed by officers of the Public Health Service.

Applicants should apply at once for form 1312, stating the title of the examination required, to the Civil Service Commission, Washington, D. C., or the secretary of the local civil service board.

CANADA

Infant Mortality in Ontario.—The number of deaths in children under 5 years of age in Ontario in 1915 was 8,632. The towns show up well in this regard, the same as in tuberculosis. Of the total number, 3,943 occurred in the cities; 4,144 in the rural municipalities, and 545 in towns. The deaths are 133 greater than in 1914.

Cancer in Ontario.—The rate per hundred thousand of the population in deaths from cancer in Ontario is 71.3, the total number of deaths being 1,982 in 1915. This is an increase of sixty-eight, and an increase in the rate in 1914, which was 69.6. The Ontario Board of Health is now conducting a campaign of education with respect to cancer and other diseases.

Births, Marriages and Deaths in Ontario.—The forty-sixth annual report of the vital statistics of the province of Ontario for the year 1915 has recently been issued. The population of the province is estimated to have been in that year 2,767,350. The births registered for the entire province were 67,032, the males being 34,701 and the females 32,331. The illegitimate births were 1,472. The marriages numbered 23,506, as against 24,245 in 1914. The deaths were 33,294, as against 32,440 in 1914. The following diseases give the highest mortality in the province: organic heart disease, 2,835; tuberculosis, 2,466; pneumonia, 2,352; cancer, 1,982; apoplexy, 1,418; diseases of the arteries, 1,242; infantile diarrhea, 1,189; Bright's disease, 1,117; bronchopneumonia, 662; paralysis, without specified cause, 527. As to tuberculosis, the rate per hundred thousand of population for deaths from this disease is eighty-nine,

which is an increase of four over that of the two preceding years. The increase in the number of deaths is 122. In 1914, tuberculosis caused 7.2 per cent., and in 1915, 7.4 per cent. of all deaths. It is interesting to note that the percentage of deaths in rural municipalities is put down at 57.5, while that in cities is 36.2, and in towns 6.3. The ratio per hundred thousand population in cities is eighty-seven; in towns, twelve, and in rural municipalities, eighty-seven.

FOREIGN

Organization of National Radium Institute in Argentina.—Both houses of the Argentine legislature have voted affirmatively on the creation of a radium institute to be in charge of the medical department of the University of Buenos Aires. The state is ordered to obtain for the university up to half a gram of radium, the sum of 120,000 pesos, national money, having been appropriated for the purchase of the radium. The agitation which has resulted in the decree was inaugurated by the Sociedad de Obstetricia y Ginecologia. The institute is to be modeled on a similar institution at Montevideo, which has been issuing promising reports since its foundation a year or so ago.

The Argentine Medical Library.—The Argentine Medical Association has resolved to enter the publishing field to a certain extent so that the best medical works by Argentine writers will get their chance of publication. The series of books thus to be published by the association are to be known as the Biblioteca Medica Argentina. The first book of the series is already in press. It is Dr. E. R. Coni's "Memoirs." As Coni has always taken a leading part in matters connected with hygiene and the public health, his autobiography forms a complete history of hygiene in Argentina. Some of the chapters have been appearing recently in the *Semana Medica* and the *Prensa Medica* of Buenos Aires, but the whole is now to be issued in book form. It seems to be the plan to publish the works in serial form first, in the *Revista de la Asociacion medica Argentina*, the official organ of the association. The first chapter, with illustrations, appears in the *Revista* for July.

PARIS LETTER

PARIS, Aug. 16, 1917.

Homage Shown by the American Committee on Study in France

Mr. Sharp, ambassador of the United States, recently called on M. Steeg, minister of public instruction, to pay his respects in the name of the American Committee on Study in France, and to present to him a copy of the volume entitled "Science and Instruction in France." This book, in the preparation of which numerous professors and scholars of the United States have collaborated, presents a complete and remarkable survey of the scientific development in France during the past hundred years, and enumerates the resources of every nature that our country offers at the present time to the active investigator and to students.

M. Steeg thanked Mr. Sharp warmly for the step that had been taken, and requested him to convey his cordial congratulations to the authors of the work.

The War

TREATMENT OF PURULENT PLEURISY BY PROLONGED ASPIRATION

At a recent meeting of the Académie de médecine, Dr. J. S. Dauriac explained the method of prolonged aspiration that he uses in the treatment of purulent pleurisy, which is a frequent sequela of chest wounds. All his patients made a rapid recovery, in two weeks, on an average, and the history of their illness was remarkably simple. The technic employed is as follows: A rubber tube 1.5 meters long is introduced into the pleura and pushed down to the bottom of the pleural cavity. The edges of the wound are drawn close around the tube, or the orifice around the tube is padded with small compresses. The empyema is relieved and the necessary costal resections made. The pleura is irrigated with neutral solution of chlorinated soda and the false membranes are removed. The distal end of the tube passes through the dressings, is attached to the lateral branch of a glass tube bent in the shape of a hunter's horn, and functions as a water tube. A reservoir of water is installed 1.5 meters above the level of the bed, and a tube from this reservoir connects with the horn-shaped tube, through which the contents of the reservoir flow in drops into a receptacle placed at the foot of the bed. The falling of the water through the trumpet-

shaped tube produces a constant vacuum in the lateral branch that is buried in the pleural cavity. The water dropping constantly produces also a constant vacuum in the pleura. When for any cause the tube ceases to perform its function, the patient is immediately aware of it. The feeling of comfort and easy respiration that he had before is succeeded by a feeling of discomfort and oppression. This uncomfortable feeling is due to the fact that the lung ceases to reach the limits of the pleura by the aid of the prolonged aspiration. This procedure shortens markedly the duration of the pleural suppurations, which often threaten to continue indefinitely, owing to the fistulas which develop. Two weeks suffice to put an end to the discharge. The dressings are never soiled and there is no odor whatever. Moreover, the patients, who are always cachectic in purulent pleurisy and remain so for a long time, rapidly assume the appearance of good health.

THE MEDICAL SERVICE AT THE BATTLE OF FLANDERS

In order that, during the offensive of July 31, the soldiers of the Anthoine army might be cared for, restored to health and evacuated as rapidly as possible, three sorting stations had been provided near the firing line. At these stations the first-aid dressings were opened by qualified surgeons, who gave to each patient, according to the nature and gravity of his wounds, a card designating a definite surgical center to which he should be removed. Thanks to the explicitness of the instructions given to the hospital ambulances that were to take the men to these centers, few errors were made, and none that were made entailed serious consequences. An innovation that was introduced in the case of the transportable wounded was an intermediate unit between the sorting stations and the evacuation hospitals. In the intermediate hospital center the available surgical resources were such that it was possible to operate on all the wounded without exception before directing them to the evacuation hospitals charged with their further transportation. Thus were avoided the dangers of infection and of gas gangrene, the untoward results of which were so deplorable at the beginning of the war. These precautions were all the more necessary because on the banks of the Yser our soldiers had to fight in a veritable mire.

THE SANITARY CONDITION OF THE AMERICAN TROOPS IN FRANCE

The report of the Medical Corps of the American Army indicates that all the American troops in the French camps are in excellent health. The only diseases confirmed are measles and mumps. All the troops are vaccinated against typhoid fever and smallpox. The Medical Corps is hastening the installation of a hospital at the port of landing. Red Cross stations have been established all along the line between the port and the entraining camps.

A PHYSICIAN THE VICTIM OF HIS DEVOTION

The *Journal Officiel* has just published a decree appointing to the rank of knight of the Legion of Honor Dr. Henri Blanc, formerly a hospital intern, to which the following comment is attached: "Exceptional claims: A distinguished surgeon. Although relieved of all military obligations, he has given, since the beginning of the war, unsparingly of his time and energy in the treatment of the wounded. During the course of a surgical operation he suffered a slight puncture of the skin which brought on a grave septicemia endangering his life."

TREATMENT OF PALUDISM OF THE SALONIKI TYPE

At the last meeting of the Académie de médecine, Dr. Marchoux of the Pasteur Institute presented an interesting communication on this subject. According to the reports of certain authors, it seems that the Saloniki type of paludism differs from the type commonly known, and that it resists treatment by quinin administered in classic doses. In order to get a clear conception of the nature of the parasites of which so many soldiers returning from the Orient are carriers, Dr. Marchoux followed the course of the disease as displayed by the patients in the Pasteur Hospital. The blood of the patients whom he inspected was subjected to daily microscopic examinations. The thick-film method by which a drop of blood is dehemoglobinized, as recommended by Ross and perfected by Tribondeau, has been found particularly useful. After staining by the Romanowsky method, the examination of thirty fields is sufficient to give a high degree of diagnostic precision. All the patients except one (who was suffering from quartan fever) had been hospitalized for benign tertian fever. After they had been rid of the parasites of the type *Plasmodium vivax*, five of them remained

carriers of gametes of *Plasmodium falciparum*. The Saloniki type of paludism is therefore produced by Laveran's three types of hematozoon. Quinin treatment remains as usual sovereign. When administered by the digestive tract in 1 gm. doses, quinin alkaloid insures the rapid disappearance of the schizonts. It seems that an exaggerated importance has been attached to subcutaneous and intravenous injections. Too rapid elimination of the drug is an objection. This objection applies strongly to the use of easily soluble salts, and even more so to the introduction of solutions under the skin, or especially into the blood stream. The superiority of cinchona to quinin was formerly proclaimed by Trouseau. The reason for his choice may doubtless be sought in the slow absorption of the alkaloids. From the researches of Marchoux it develops that quinin sulphate acts better than the more soluble salts, and that basic quinin is preferable to the sulphate. The sulphate contains 72 per cent. of quinin, the hydrate contains 85 per cent. The hypodermic and intravenous injections are not always without danger and should be reserved exclusively for the treatment of pernicious attacks which require energetic interference. In the treatment of chronic malarial fever the remedy should be administered by mouth and in a form as slightly soluble as possible. Basic quinin just fits the requirement. Quinin does not stop an attack once it has set in. When the schizonts bordering on maturity undergo division, a dose of 1 gm. of quinin absorbed *en masse* may ward off the fever. When the schizonts are younger, it is better, in order not to incite auricular trouble, to administer four 25 gm. wafers in twelve hours. The parasites break up and disappear in twenty-four hours without causing an attack.

Quinin has some effect on the gametes of *Plasmodium vivax* and *Plasmodium malariae*, but it does not reach them all, some being always left; those that are still growing seem to be able to resist successfully the action of the quinin. Even though the hematozoon resists quinin treatment, it should not be regarded as a cyst or a spore. It is not in a state of repose, but in a condition of activity. At the end of an average period of two weeks, it undergoes division (like an asexual plasmodium) by a sort of parthenogenesis. The radial striation thus formed serves as the point of origin for new generations of schizonts and gametes. The result of this evolution is that a cured attack is followed by a recurrence two weeks later. If the asexual generation is only slightly abundant, the attack is not forthcoming and the period of apyrexia lasts a month. When the patient is the host of several distinct generations of parasites, weekly, or even more frequent, attacks are induced. The rational treatment consists in destroying the schizonts as fast as they are produced, until the gametes are exterminated. It is impossible to accomplish clinically the sterilization of patients, because the infection does not manifest itself until an attack appears, and then it is too late to intervene. The microscope, however, reveals the parasites two or three days before the onset of the fever, and makes it possible to destroy them as soon as their presence is discovered. By this procedure it would seem possible to sterilize a patient by the mere use of a few grams of quinin. In order to attain this end, it would be well to assemble all malaria patients in a rural hospital in which they could be protected against mosquitoes of the genus *Anopheles* and their blood could be examined daily. All those for whom the test proved negative would work in the fields; the others would be given quinin and would be kept quiet. Until such an arrangement can be made, one can preserve in a state of convalescence such malaria patients as feel able to work by obliging them to present themselves twice a week at a dispensary provided with laboratory facilities.

The empiric procedure, which consists in giving quinin every day, offers a high degree of safety, but it is open to the objection that it entails a heavy waste of a valuable drug and also produces at times untoward symptoms, of a mild nature, to be sure, but such as to have their effect on the patient. Since from two to three days, at least, are required for the parasites to multiply sufficiently to incite any fever, it is practical therapy to give 3 gm. of quinin each week, in order to reach all the different generations that are successively produced. If the suppression of four generations can be successfully accomplished, this would appear to be sufficient to sterilize the system, in any event to such an extent as to permit the patient to triumph over any remaining elements. Quinin does not prevent parthenogenesis from taking place. If administered in too small quantities it does not hinder the development of parasites. One gm. in twenty-four hours is the required dose, which will, however, be sufficient only on condition that it is actually absorbed. Judg-

ing from the relative frequency of infections with *Plasmodium falciparum* in the Orient and infections with *Plasmodium vivax* in France, it is not possible to conclude that these two types of malaria parasites are identical. Many patients are infected with both parasites. The infections with *Plasmodium falciparum* are more rare in France than in the Orient because, for reasons as yet unexplained, patients suffering from malignant tertian seem to recover spontaneously in the climate peculiar to France.

LONDON LETTER

LONDON, Aug. 26, 1917.

Bonesetters and Parliament

For half a century at least there has flourished in London some "bonesetter" with a reputation of succeeding where the best surgeons of the day have failed. The man who now holds that position is a Mr. Barker, who enjoys the patronage of some of the most eminent persons. Such is his reputation that the members of Parliament have made it a grievance that the government does not seek his aid for the treatment of disabled soldiers whom, by the way, he has offered to treat gratuitously. One member alleged that nearly all the great discoveries of medicine had come from outside the medical profession and had nearly all been regarded in exactly the same way as "manipulative surgery" (the term by which the bonesetter dignifies his occupation) is now regarded by the orthodox members of the medical profession. "For example, ether was first used by unqualified men. Pasteur was refused a hearing because he had no degree, and Lister was scoffed at when he suggested the employment of antiseptics." This member also pointed out that Mr. Hodge, the present minister of labor, sprained his knee and was told by his physician that by usual methods of treatment the process of cure would be slow, and advised him to go to Mr. Barker, to whom he was carried in a motor car. After his treatment he was able to walk home.

Sir Watson Cheyne, who was recently elected as member for Edinburgh and St. Andrew's Universities, in a maiden speech said the difficulty was that if something were given to one particular bonesetter many other bonesetters would want it given to them also. He did not dispute the excellence of Mr. Barker's work, but if he were accepted, the Army Medical Service would be flooded with irregular practitioners who were absolutely incompetent. If bonesetters were admitted, where was the thing to stop? Were they to refuse faith healers, who gave wonderful accounts of their work? Then there were cancer cures and herbalists and all sorts of unqualified persons who had asked to come in. His own experience of bonesetters, as a rule, was that they were not educated for their job. They were usually brought up in places where a considerable number of accidents occurred, and had acquired a reputation for facility in dealing with them. He did not say that there were not some men who, having become bonesetters, had set to work to try to learn something about bones and joints; but the average bonesetter did not. The bonesetter had only one diagnosis—dislocation—and only one method of treatment, and that was to wrench and twist the limb. The human frame was a very delicate organization. It should not be meddled with by people who did not know it as intimately as it was possible to know it after years of study. In spite of want of knowledge on the part of the great majority of bonesetters, they did often produce marvelous cures, and it was a great puzzle for a long time how these were brought about. They themselves spoke of a dislocation which they reduced, but it was quite clear that in many cases this was not so. They tore through adhesions which had formed. Developments of that kind occurred often in former days, but now the surgeon was on the alert in the case of all injuries against such developments. There were certain dangers, in connection with these cases: it might happen as the result of a sprain or slight injury of the joint that disease was set up in the adhesions—for instance, a patient with a tendency to tuberculosis might get a tuberculous cyst in connection with the injured joint; probably such a joint would get well with careful attention; but if a bonesetter broke it down with violence, it might set the disease to spreading with rapidity and utterly spoil the joint. He had seen many such cases, and more than once had had to amputate. A still more tragic thing was that a tumor sometimes developed in the bone, and he had known cases in which the bonesetter, still thinking it was a case of dislocation, had violently broken up the part, and the disease, which was local, had then spread throughout the whole body. Turning then to cases of dislocation of the cartilage, he said that

it might be due not only to injury but also to three or four other causes. When it was really a case of dislocation of a cartilage, manipulation might give great success; it was necessary, however, to exercise great care in diagnosis. In soldiers it was not usually a case of loose cartilage, but terrible fractures and terrible breaking up of the joint. He had not heard that bonesetters claimed any skill in treating wounds; the treatment of wounds was the whole science of the business of the surgeon among soldiers. Sepsis getting into wounds was the trouble, and to avoid sepsis was a difficult problem not yet fully solved. Was the bonesetter to be allowed to put his dirty fingers into a wound?

Mr. Macpherson, undersecretary for war, replying for the government, pointed out that, unlike civilians, soldiers could not choose their own physician. The state required that every physician must have passed a recognized test and could not, therefore, ask a soldier to undergo treatment by an unqualified man. The soldier could do so on his own responsibility and if he died, or was maimed for life, the state could not be responsible. If the Army Council said that a duly qualified physician could send a soldier to an unqualified man and he refused to obey that order, the Army Council would dismiss him from the service. If, on the other hand, he did send the soldier to an unqualified man, he would be disobeying the General Medical Council. Vote of credit, by way of amendment to which the subject was raised, was then passed; that is, the subject was dropped.

The Welfare of the Blind

A committee appointed by the government to consider the condition of the blind and the means available for their industrial or professional training has just made a report. It has come to the conclusion that the condition of the blind calls for the more active intervention of the state to secure (a) central control, organization and assistance for the existing agencies of voluntary help, which could be utilized with far greater effect if centrally directed; and (b) additional assistance for the blind. It is recommended that a special department, whose function shall be the general care and supervision of the blind, shall be set up in the ministry of health, whenever such a ministry is created, and that in the meantime it shall be set up in the Local Government Board. This central authority should make grants, capital and annual, for the purposes indicated in the recommendations. The initial capital expenditure considered most essential is that for increasing the workshop accommodation. Three thousand additional places are urgently required, and the estimated cost per place varies from \$500 to \$875. An outside estimate of the capital sum required would be \$2,500,000. The annual expenditure is estimated at approximately \$1,250,000.

CAUSES OF BLINDNESS

The following uniform definition of blindness is recommended: "Blindness means too blind to perform work for which eyesight is essential." The absence of a generally accepted definition militates against persons being marked out for special treatment by the state and being eligible for the benefits of various organizations for the blind. Further, the want of such a definition seriously hampers the collection of exhaustive and uniform statistics. In regard to the causes of blindness, ophthalmia neonatorum is declared to be responsible for over 10 per cent. of the cases. The committee recommends that steps should be taken to assure uniform and more effectual notification of the disease, and that the immediate treatment of all patients should be secured. It is also recommended that the provision and wearing of goggles in dangerous occupations should be made more widely obligatory, as the proportion of blindness caused by accident could be thereby reduced. The provision for the elementary education is regarded as generally satisfactory. The following recommendations are made: 1. The attention of elementary education authorities should be drawn to the necessity of seeing that all possible steps are taken to discover the aptitudes of blind pupils. 2. Residential institutions are preferable to day centers for the majority of young children. 3. The employment of blind teachers whenever practicable should be encouraged, and the salaries of blind teachers should be on an equality with those of teachers with normal eyesight. 4. The committee has no doubt that the education departments will give their closest attention to the need for Braille books, which the National Institute for the Blind is endeavoring to meet. 5. The education authorities should take steps to increase the number of schools or classes for the separate treatment of myopic and partially sighted children. 6. A uniform scheme of after-care should be initiated

in the elementary educational system, and a detailed register should be made of all the children in the elementary schools, and by means of paid visitors, the elementary education authorities should keep in touch with the children leaving elementary schools till they are transferred to a secondary education authority or some recognized organization for the blind. The government should consider the desirability of increasing the facilities for the higher education and professional training of blind persons, and of extending the grants payable in respect of pupils undergoing professional training; and the central authority should endeavor to secure financial assistance for persons embarking on professional careers. Pianoforte playing, tuning and repairing, typewriting, massage, teaching, the ministry, the law and commerce are mentioned among occupations for the blind. The financial position of the Royal Normal College, which is mainly dependent on charitable funds, has a serious deficit. The accommodation for industrial training does not appear to be materially deficient, but the problem is the inadequacy of workshop accommodation.

BLIND SAILORS AND SOLDIERS

In the matter of pensions, the committee recommends that further grants should be placed at the disposal of the central authority. Soldiers and sailors blinded in the war are very adequately provided for at St. Dunstan's Hostel (a hostel for soldiers blinded in the war described in previous letter). The largest number of men learn cobbling. They learn in six or seven months to sole and heel a pair of boots, and those who have acquired this industry are making good earnings. The cobblers are also taught mat making. Constant employment is thus secured. Basket making, joinery, poultry keeping, shorthand writing and massage are also taught. The men have been uniformly successful in passing the examinations of the Incorporated Society of Trained Masseurs, the most severe in England. In every possible case a man is returned to his original occupation. In conclusion, the committee refers to the extremely hopeful nature of this problem, and is convinced that if its recommendations are adopted the proportion of the blind to the population will gradually and permanently be reduced. It hopes that each decade will see a diminution in the number of those who are blind from birth and those who are blind from accident.

Marriages

LIEUT. ROY CLARK GUTCH, M. R. C., U. S. Army, Chariton, Iowa, to Miss Ruth Chase of Indianapolis, at Des Moines, August 15.

ASST. SURG. JOEL JESSE WHITE, U. S. Navy, to Miss Ina Virginia Armistead, both of Nashville, Tenn., August 22.

ALPHEUS MCKIBBEN, M.D., Pittsburgh, to Miss Constance Margaret Hartgering of Rapid City, S. D., August 22.

JOSEPH ELLIS SKAGGS, M.D., Leavenworth, Kan., to Miss Margaret Marshall Cole of St. Louis, August 25.

WARREN ERNEST TUPPER, M.D., Cameron, Idaho, to Miss Ada Taylor of Forest Grove, Ore., August 22.

JACOB HENRY TERLINDEN, M.D., Bonduel, Wis., to Miss Alydia Hoge of Jackson, Wis., August 22.

ROSCOE EDMUNDS STEPFIELD, M.D., Cleveland, to Miss Elizabeth Sufall of Somerset, Pa., August 21.

GUSTAV BAAR, M.D., Portland, Ore., to Miss Vera Rosenblatt of San Francisco, August 24.

HUBERT FRANKLIN MEACHAN, M.D., Oak Park, Ill., to Miss Genevieve Mason of Chicago, recently.

HARRISON M. WELLMAN, M.D., to Miss Freda G. Keller, both of St. Petersburg, Pa., recently.

ALBERT J. BOWER, M.D., Greenville, Mich., to Miss Carlotta Selleck of Flint, Mich., August 16.

LIEUT. PHILIP M. BEDESSEM, M. C., Ill. N. G., to Miss Marie Foley, both of Chicago, August 4.

EDWARD J. PURTELL, M.D., to Miss Antonette Krubsack, both of Milwaukee, Wis., July 8.

LYMAN ALDEN COPPS, M.D., to Miss Stella Bernice Murat, both of Madison, Wis., July 16.

HANS NACHTIGALL, M.D., to Miss Annamarie von Frantzius, both of Chicago, August 20.

Deaths

Elizabeth A. Follansbee, M.D., Los Angeles, Calif.; Women's Medical College of Pennsylvania, Philadelphia, 1877; aged 77; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of California; for twenty-five years professor, and thereafter emeritus professor, of diseases of children in the University of Southern California, Los Angeles; said to have been the first woman to practice medicine in southern California; one of the founders of the Hospital for Children, and Training School for Nurses, in San Francisco; died in the psychopathic ward of the Los Angeles County Hospital, August 22.

William Thomas Fitzsimmons, 1st Lieut. M. R. C., U. S. Army, Kansas City, Mo.; University of Kansas, Lawrence and Kansas City, 1912; aged 28; adjutant of the Harvard University Base Hospital Unit, on duty in France; was killed by the explosion of a bomb dropped from a German aeroplane, September 8. It is reported that when the German aeroplanes were sighted Dr. Fitzsimmons came to the door of his tent just as two bombs fell, exploding within 6 feet of him. This is the first death of an American medical officer from wounds since the declaration of war with Germany.

Wylls Seaman Walkley, Act. Asst. Surg., U. S. P. H. S., Grand Haven, Mich.; University of Michigan, Ann Arbor, 1879; aged 71; formerly a member of the Michigan State Medical Society, and president of the Ottawa County Medical Society; a member of the Association of Military Surgeons of the United States; a veteran of the Civil War; for many years surgeon in charge of the U. S. Marine Hospital at Grand Haven; died at his home, August 29, from heart disease.

Almon Darwin Blakely, M.D., Syracuse, N. Y.; New York University, New York, 1880; aged 69; formerly a member of the Medical Society of the State of New York, and once president of the Otsego County Medical Society; health physician of Milford, visiting physician to the Cooperstown Hospital, and president of the board of education of Milford; died at his home, August 24, from the effects of a fall several weeks before in which he sustained a fracture of the hip.

Herschel D. Hinckley, M.D., Oxford, Ohio; Medical College of Ohio, Cincinnati, 1867; aged 70; formerly a member of the Ohio State Medical Association; for many years a practitioner of Cincinnati; surgeon in St. Mary's Hospital; professor of surgery and dean of the faculty of the Cincinnati Polyclinic and Post-Graduate School, and professor of surgery in the Cincinnati College of Medicine and Surgery; died at his home August 29 from cerebral hemorrhage.

Philip Kittredge Taylor, M.D., New York; University of Pennsylvania, Philadelphia, 1882; aged 57; a Fellow of the American Medical Association; for eight years surgeon of the Ward Steamship Line, and surgeon of the steamship *Monterey*; was taken ill with nephritis on the steamer, and on her arrival in Brooklyn, August 21, was removed to the Brooklyn Hospital, where he died the same night.

John Adams Colliver, M.D., Los Angeles, Calif.; University of California, San Francisco, 1899; aged 45; a fellow of the American Medical Association; instructor in pediatrics in his alma mater; a well known specialist in diseases of children; died in the Angelus Hospital, Los Angeles, August 22, from pneumonia following a surgical operation.

Green Robbins Hulsizer, M.D., Philadelphia; Jefferson Medical College, 1887; aged 55; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of Pennsylvania; Commander of the Philadelphia Medical Emergency Corps; died at his summer home, in Delanco, N. J., August 31.

John Herbert Ewing, M.D., Delmont, Pa.; College of Physicians and Surgeons, Baltimore, 1897; aged 44; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of Pennsylvania; president of the Delmont Board of Health, died at his home, August 27, from cerebral hemorrhage.

Andrew Stewart, M.D., Chicago; McGill University, Montreal, 1883; L.R.C.P. (Lond.), 1884; aged 57; a Fellow of the American Medical Association, and for several years a member of the faculty of the College of Physicians and Surgeons, Chicago; died at his old home in Howick, Que., about September 8.

Skidmore Hendrickson, M.D., Brooklyn, N. Y.; New York University, New York, 1866; aged 76; a Fellow of the Ameri-

can Medical Association; for one term president of the Queens County Medical Society; acting assistant surgeon U. S. Army during the Civil War; died at Monsey, N. Y., August 30.

Charles Hooks Harris, M.D., Cedartown, Ga., New York University, New York, 1857; aged 83; for half a century a practitioner of Cedartown; surgeon in the Confederate service during the Civil War; died at the home of his son, in Cave Spring, Ga., August 18, from senile debility.

Oliver Morton Davis, M.D., Marion, Ind.; Medical College of Indiana, Indianapolis, 1894; aged 47; a member of the Indiana State Medical Association, and a member of the Marion Health Committee of Public Instruction; died in his apartment, August 26.

William S. Gillam, M.D., South Manchester, Conn.; University of Pennsylvania, Philadelphia, 1888; aged 58; a Fellow of the American Medical Association; surgeon of the First Infantry, Conn. N. G.; died in Hartford, Conn., July 21, from cerebral hemorrhage.

Charles James Paton, M.D., San Francisco; University of California, San Francisco, 1883; surgeon for many years in the service of the Pacific Mail Steamship Company, and surgeon of the steamer *Peru*; is reported to have died at sea, about August 22.

Frederick F. Laws, M.D., Minneapolis; Northwestern University Medical School, Chicago, 1874; aged 68; one of the founders of the Norwegian Lutheran Deaconess Hospital, Minneapolis; died in that institution, August 26, from cerebral hemorrhage.

Levi Springer Gaddis, M.D., Uniontown, Pa.; Jefferson Medical College, 1873; aged 67; a Fellow of the American Medical Association; secretary of the board of trustees of the Uniontown Hospital; died in his apartment, August 31.

John Edgar Brock, M.D., Arkansas City, Kan.; Rush Medical College, 1890; aged 56; a Fellow of the American Medical Association; died at his home, August 19, from nephritis.

Joseph King Turner Van Pelt, M.D., Chelsea, N. J.; Jefferson Medical College, 1864; aged 85; for more than fifty years a practitioner of Philadelphia; died at his home, August 20.

E. A. Chance, M.D., Garfield, Ga.; University of Georgia, Augusta, 1892; a member of the Medical Association of Georgia; also a pharmacist; died at his home, August 13.

Oliver Graham Burgess, M.D., North Yakima, Wash.; Harvard Medical School, 1885; for several years deputy health officer of Yakima County; died at his home, August 19.

L. V. Conwell, M.D., Van Buren, Ind.; Indiana Medical College, Indianapolis, 1878; aged 63; died in the Marion (Ind.) Hospital, July 8, after an operation for hernia.

Robert C. Andrews, Floydada, Texas (license, Texas, Act of 1907); aged 84; formerly a member of the State Medical Association of Texas; died at his home, August 13.

Fay Austin Allen, M.D., Roswell, N. M.; University of Louisville, Ky., 1909; aged 38; died in a sanatorium at Albuquerque, N. M., August 17, from tuberculosis.

Jacob B. Heller, M.D., Easton, Pa.; University of Pennsylvania, Philadelphia, 1878; aged 64; died in the Easton Hospital, August 19, from septicemia.

Edward Watson Updegraff, M.D., Keyport, N. J.; Tulane University, New Orleans, 1897; aged 40; died at his home, August 2, from heart disease.

Jacob Salamon, M.D., Brooklyn; Long Island College Hospital, Brooklyn, 1917; aged 25; was drowned while bathing at Coney Island, August 19.

Leopold Johan Schaub, M.D., Columbus, Ohio; University of Marburg, Germany, 1860; aged 83; died in Grant Hospital, Columbus, August 22.

Raymond Leonard Feser, M.D., Chicago; Loyola University, Chicago, 1915; aged 25; died at his home, August 25, from pneumonia.

James Edward Smith, M.D., Shenandoah, Pa.; Maryland Medical College, Baltimore, 1907; aged 35; died at his home, August 22.

Robert McGurk, M.D., Standish, Mich.; University of Michigan, Ann Arbor, 1878; died in St. Petersburg, Fla., recently.

Thomas A. Allen, M.D., Berlin, Tenn.; University of Nashville, Tenn., 1860; aged 79; died at his home, August 14.

J. T. Wharton, Ceredo, W. Va. (license, West Virginia, 1883); died at his home, August 15.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

A FAKE NEOSALVARSAN FACTORY

A Medical Diploma Mill as a Side Line

"Dr." Nicholas Clements is under indictment in New York City for manufacturing and marketing imitation Neosalvarsan, and operating a fake medical-diploma factory; he is charged with grand larceny, forgery and conspiracy. The Department of Health of the City of New York is responsible for unearthing this swindle. An inspector of the department's Bureau of Food and Drugs came across a suspicious lot of Neosalvarsan some time ago and, on June 20, succeeded in obtaining 10 tubes of what purported to be Neosalvarsan but which proved to be nothing but a little common salt colored yellow. A second lot of the fake product was obtained some time later from a Third Avenue druggist.



Fake Neosalvarsan seized by the inspectors of the New York City Department of Health showing three different makes of spurious products. The large box at the top (A), representing the cleverest of the three imitations, and was purchased by a wholesale export house for \$1,800; it is not worth a cent. At the left are seen (B) empty ampoules, (C) labels, inserts, etc.; also a tin of aluminum paint (D) for painting the tin containers used in the lot shown in the middle of the picture (E). In the two other imitations aluminum containers were used. Notice the steel die (F) used by the counterfeiters to emboss the emblem on the cover of the middle containers.

Visiting physicians at the recent session of the American Medical Association held in New York will remember the specimens of imitation Neosalvarsan that the Department of Health of the City of New York displayed in the exhibit hall. This brand was made, it seems by one Arthur Tomassell who was arrested last week by the New York police charged with grand larceny and held in \$5,000 bail. How extensive a business this has been may be gauged from the fact that Tomassell had ordered 50,000 aluminum containers made in imitation of those in which the genuine Neosalvarsan is supplied.

The arrest of Clements for the more recent sale of fake Neosalvarsan was due to the persistent detective work of Inspector Cohen under the direction of Mr. Lucius P. Brown of the Bureau of Food and Drugs. Mr. Cohn traced the supply to 2323 Belmont Ave., where he found an individual styling himself Dr. Nicholas Clements. The police cooperated with the Health Department and in arresting Clements the interesting discovery was made that not only was he manufacturing fake Neosalvarsan but that he also was engaged in selling fake medical and dental diplomas. One Lazinsky who purported to be a physician declared when apprehended that

he had purchased a diploma from Clements and said that Clements assured him that he would have no trouble in practicing without a license because he, Clements, was an inspector of the New York State Medical Association. Among Clements' papers, seized by the police, was a framed letter dated Oct. 31, 1902, addressed to Nicholas Clements, 403 W. Broadway and signed James Taylor Lewis as "Counsel" for the New York State Medical Association. This letter declared that Clements was appointed by Lewis as an inspector to assist "in the apprehension and conviction of illegal practices of medicine." In addition to Lazinsky, a "Dr." Lacavora, 198 First Ave., Manhattan, has been arrested for practicing medicine without a license and under a "diploma" purchased from Clements. Two other alleged doctors—Brooks Forester Norwood and Stanley Tomassell have been apprehended as a result of the investigation of Clements' diploma mill.

The traffic in fake Neosalvarsan has evidently been lucrative. Tubes of the imitation product cannot have cost more than five or ten cents each to prepare and they were sold to physicians for from \$5.50 to \$9.00 each depending on the urgency shown by the physician. The printing on the labels and circulars of the genuine preparation had been reproduced photographically for use with the imitation, and the embossed cap on the aluminum container had also been cleverly imitated. Health Department officials in New York believe that the publicity the Department has given to the fraud in the sale of fake Neosalvarsan has resulted in fewer physicians purchasing the preparation from speculators. Most of the recent sales have, it seems, been made to wholesale drug houses who wanted the drug for exportation. One lot alone now in the possession of the Department of Health was purchased by a wholesale export house for \$1,800; it is, of course, not worth a cent.

PIERCE'S ANURIC TABLETS

A Fake Cure for Kidney Disease

"Anuric" is "The Newest Discovery in Chemistry," if one is to believe the World's Dispensary Medical Association of Buffalo, N. Y. "Eminent Medical Authorities Endorse It." "A New Remedy for Kidneys, Bladder and all Uric Acid Troubles." Thus does quackery play on the fears of those who are led to believe that every pain in the back means "Bright's disease." "Anuric," the public is told, "is the recent discovery of Dr. Pierce who is head of the Invalids' Hospital and Surgical Institute of Buffalo, N. Y." The concern also puts out such nostrums as "Pierce's Favorite Prescription," "Pierce's Golden Medical Discovery" and other profitable specialties in the merchandise of quackery.

In common with most "kidney disease cures," Anuric is advertised by the "scare" method. Here are some advertisement headlines:

"SUDDEN DEATH Caused by Disease of the Kidneys."
"Why 'Anuric' is an Insurance Against Sudden Death."
"Are You Being Slowly Poisoned?"
"If It Catches You There, Anuric Will Quickly Stop It."

The typical pictures of the stooping man, with his hands over the lumbar region, graphically conveying the idea—as erroneous as it is popular with fakers—that pain in the lower part of the back means disease of the kidney—are strongly in evidence.

"Most cases of kidney trouble may easily be overcome by merely taking a little Anuric with the meals."

"When the kidneys no longer pour forth waste, uremic poisoning occurs, and the person dies . . . it is a good insurance against such a risk to send 10 cents for a sample package of 'Anuric'—the latest discovery of Dr. Pierce."

Needless to say, the changes are rung on the old uric acid superstition:

" . . . hundreds . . . daily give their thankful endorsement to this powerful enemy of uric acid."

" . . . will throw out and completely eradicate this uric acid from the system."

"Anuric is 37 times more active than lithia in eliminating uric acid . . ."

"Anuric will overcome such conditions as rheumatism, dropsical swelling, cold extremities, scalding and burning urine and sleeplessness due to constant need of getting out of bed at night, by carrying off the uric acid poison."

FRIGHTENING THE VICTIM

Those who purchase a box of "Dr. Pierce's Anuric Tablets For Kidney And Backache" get, in addition to 50 kidney-shaped, red pills, a booklet that may be counted on to convince the average person that he or she has kidney disease. The booklet starts out by giving what purport to be "symptoms of disease of the kidneys" which have been "taken from the 'Diagnostics of Internal Medicine,' by Dr. Butler, whose great work on diagnosis is one of the standards in use by physicians." Apparently, the World's Dispensary Medical Association has turned over the compiling of the "symptoms" to the office boy or some equally massive intellect. By comparing the quotations with the original it is found that first of all the "patent medicine" concern has copied a number of symptoms of movable kidney. The symptoms are tabulated, removed from the context and separately paragraphed. Of course, the public is not advised that these symptoms are of movable kidney. They are led to believe by the "Anuric" booklet that they are "symptoms of disease of the kidneys." The idea of attempting to cure movable kidney with pills would be humorous, if the matter were not so brutally serious. Then

"Menstruation, Scanty, Painful and Profuse" is the subject of another chapter, although just what relationship this bears to kidney disease is not explained. However, "Dr. Pierce's Anuric Tablets and Dr. Pierce's Favorite Prescription" are recommended. Under "Stone in the Bladder" the booklet tells what wonderfully successful results have been achieved by the "Physicians at the Invalid's Hotel and Surgical Institute" by means of an instrument of "their own invention" used for crushing the stone. For "palliative treatment" of the condition "there can be no better agent than Dr. Pierce's Anuric Tablets." In the latter part of the book this statement appears:

"In all these conditions the use of 'Anuric Tablets' is of great benefit. Reference may be made to the writings of eminent medical authorities, quotations from whose works included in this book [Italics ours.—Ed.] will give some idea of the extent to which they are used by the medical profession, and as to how satisfactorily they act in removing the diseased conditions that produce these painful maladies."

This can only mean, and evidently is intended to mean, that "Anuric Tablets" are used by the medical profession and that "eminent medical authorities" have referred to "Anuric Tablets" in their writings which references are alleged to be quoted in the booklet. Of course no physician needs to be told that the medical profession does not use Anuric Tablets and that no eminent medical authority has ever praised this piece of quackery.

GARBLED QUOTATIONS

Under the title "What Others Say of Them" the booklet purports to quote the opinions of certain medical writers on, not "Anuric Tablets" as the average reader might infer, but of one or more of the unnamed drugs which are claimed to be ingredients of "Anuric Tablets." Not all of the alleged quotations have been checked, but enough of them have been to show that the matter is misquoted, garbled and that unwarranted liberties have been taken with the author's statements. Yet, the matter is given in the booklet within quotation marks and so arranged as to convey the idea that it has been taken literally and verbally from the books quoted.

For the purpose, doubtless, of adding to the element of mystery, the names of none of the alleged ingredients are mentioned and in quoting the names of some of the alleged ingredients have been suppressed and the non-informative pronoun "it" substituted. To better understand the liberties that have been taken in compiling the advertising "literature" on "Anuric Tablets" part of the matter that has been printed in the "Anuric" booklet alleged to be a quotation from "Lloyd and Felter, in King's American Dispensatory" will be compared in parallel with the original:

ALLEGED QUOTATION AS IT AP-
PEARS IN THE ANURIC
BOOKLET

"Rheumatism yields to it, when a swelling of a part or whole of the body is present, or even where there is slight puffiness or glistening of the parts. It is a decided heart stimulant and has relieved the heart oppression due to smoking. It is also a decided antineuralgic, relieving sciatic, pleural and lumbar neuralgia. The most valuable remedy to relieve renal congestion or inflammation. It is one of the best remedies for acute inflammation of the upper passages of the nose and throat."

AS IT APPEARS IN THE ORIGINAL

"Rheumatism yields to it when edema of a part of or whole of the body is present, or even where there is slight puffiness or glistening of the parts. Frequently it must be given with other antirheumatics."

"Apocynum is a decided heart tonic. The conditions above named, and a dilated condition of the cardiac ventricles, point to its use. It is not the remedy where the circulation is excited, with hard, quick pulse. Dr. E. R. Freeman reports an inveterate case of angina pectoris benefited by it. Edema was a feature of the case. Dr. Waterhouse relieved the precordial oppression of a smoker with it. Dr. J. C. Kilgour declares it a decided antineuralgic, relieving sciatic, crural, and lumbar neuralgias. Prof. G. C. Gere asserts that it is the most valuable of deobstruents to relieve renal congestion in the second stage of tubular nephritis. Too much, however, must not be expected of it where there are structural changes of the vital organs. Acute inflammation of the upper laryngeal and post-nasal is specifically met by this drug, according to Prof. Webster being nearly as positive as phytolacca, and preferable when the irritation does not extend beyond those parts, and is readily brought on by slight exposure."



Greatly reduced reproduction of some of the "Anuric" advertisements. Notice the attempt to capitalize the public's misapprehension that a pain in the lower part of the back means kidney disease.

follows another page of symptoms, still, of course, under the "blanket" description of "disease of the kidneys" taken from Dr. Butler's chapter on "Uremia." The public, of course, is not advised that these are symptoms of so deadly a condition as uremia, nor if it were, would it realize the preposterous futility of treating uremia with "Dr. Pierce's Anuric Tablets." Then, still under the "blanket" head, come more symptoms picked at random from Butler's description of acute Bright's disease, chronic Bright's disease (both diffuse and interstitial), pyelitis, nephrolithiasis and perinephritic abscesses. "In no case," says the pamphlet, "are all these symptoms felt at one time."

The booklet then takes up various conditions that are supposed to be more or less related to diseases of the kidney. In the chapter on "Colds, Bronchitis," the reader is advised first to take "Dr. Pierce's Pleasant Pellets" following them up with "Dr. Pierce's Anuric Tablets." In "Stomach Trouble" due to "weak kidneys" the sufferer is told that "Anuric Tablets will be found to help and assist the kidneys to do their work thus relieving all the other organs." In the chapter on "Bright's Disease" we read:

"In the early stages the use of these tablets will speedily restore the kidneys to normal and healthy action and do away with the congestion and changes that appear in the kidneys and their function. It is important that they be used early."

By comparing the alleged quotation with the original, it will be seen that the Anuric concern, by separating phrases from their context, omitting qualifying clauses, featuring the alleged virtues and ignoring the limitations of the drugs discussed, attempts to make out a case for what is said to be one of the ingredients of its "kidney cure." The trick is as old as the "patent medicine" business itself and it is entirely fitting that the World's Dispensary Medical Association should run so true to form.

IN THE PRE-ANURIC DAYS

Anuric is one of the newer "patent medicines" put out by the World's Dispensary Medical Association. This concern has for many years published a pretentious book of about 1,000 pages entitled "The Peoples Common Sense Medical Adviser" devoted mainly to advertising the "Invalids' Hotel and Surgical Institute" and incidentally to the exploitation of its nostrums. Before the days of the Anuric Tablets the following statements appeared regarding Bright's disease:

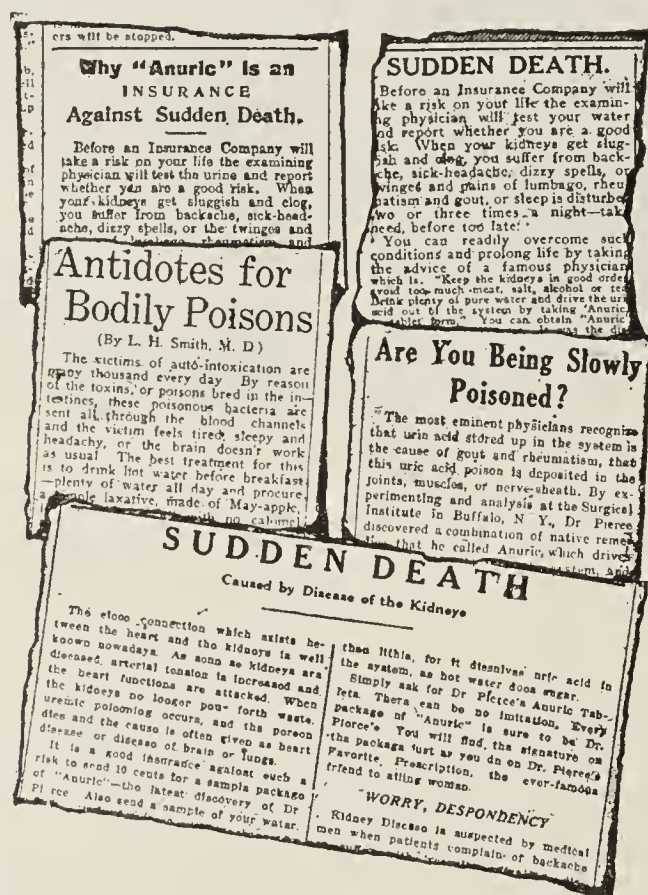
"We venture to assert that less than 1 per cent. of those who imagine they have 'Bright's' have this disease at all."

"... true Bright's disease is not a common affection, and nine out of ten individuals who think that they suffer from it, or the early stages of the trouble, in fact have something more curable."

"... in true Bright's, deposits [in the urine] of any kind are rarely met with."

Under the same subject (Bright's disease) the "Common Sense Medical Adviser" published—before the days of "Anuric"—this good advice:

"Not less harmful are the many advertised 'kidney cures,' 'kidney remedies,' 'buchus' and kindred preparations. . . . The cases of Bright's disease reported cured by these preparations are cases of far less dangerous maladies, made to appear, by exaggerated accounts of them, as true Bright's disease. The use of these general, ready-made or proprietary remedies in any case of true Bright's disease is hazardous in the extreme."



Greatly reduced reproduction of some "Anuric" advertisements of the "scare" type.

Attention is especially directed to the closing sentence of the matter just quoted. So long as the World's Dispensary Medical Association had no "kidney cure" to sell but instead wished to have people who had or thought they had, kidney disease either come to the "Invalids' Hotel" or be treated by correspondence, the concern was willing to tell the truth about "patent medicines" of the "kidney cure" type. ALL OF THIS MATERIAL HAS BEEN DELETED FROM THE BOOK NOW SENT OUT!

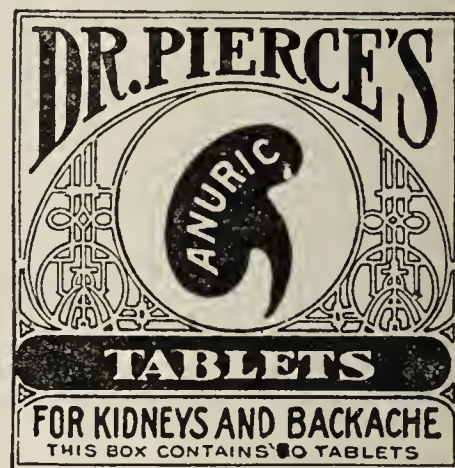
For the purpose of determining in a general way the composition of "Dr. Pierce's Anuric Tablets for Kidneys and Backache" the assistance of the American Medical Association's

Chemical Laboratory was invoked. The laboratory report follows:

LABORATORY REPORT

"Six original bottles of 'Dr. Pierce's Anuric Tablets' were submitted to the Chemical Laboratory for examination. Each bottle contained 50 red, kidney-shaped, coated tablets, weighing on an average 0.5 gm. (7½ grains). Qualitative tests indicated the presence of acetate, carbonate, chlorid, iodid, phosphate (trace), salicylate, ammonia, calcium, iron (trace) potassium, sodium, emodin, aloin, quinin, hexamethylenamin and sugar. The amount of reducing sugar, calculated as dextrose, was about 35 per cent. Besides the substances mentioned above, there are evidences of other drugs being present. What some of these drugs are may be judged by tracing the so-called quotations appearing in the circular around the bottle. Although in many instances garbled, the statements evidently refer to such plant drugs as *Apo-cynum cannabinum* (Canadian hemp), *Eupatorium purpurcum* (Queen of the meadow), etc. Such a mixture as the above is so unwarranted and foolish, that a more exhaustive examination appeared a waste of time.

But from the qualitative data alone, it can be seen that Anuric Tablets contain essentially sugar, an acetate, iodid and salicylate of either sodium or potassium, quinin, aloin and hexamethylenamin, calcium carbonate is present as part of the coating."



Summed up, it may be said that the selling scheme of Anuric Tablets is first to frighten those who have any vague aches and pains into the belief that something is wrong with their kidneys for which Anuric purports to be the one great remedy. The popular idea that urinary sediments and pain in the lower part of the back mean kidney disease, while false, is assiduously cultivated. It is unnecessary to tell physicians of the dangers of self-diagnosis and self-treatment in such a serious condition as true disease of the kidney. The public is wedded to the idea that every disease can be cured by taking something out of a bottle three or four times a day. The average man does not realize that in the treatment of kidney disease the hygienic and dietetic measures may be of vastly greater importance than drug therapy. Such measures mean a certain amount of discomfort to the patient, the breaking up of old habits, a readjustment of one's method of living. If a cure can be brought about by taking medicine why should one subject himself to the minor discomforts of a modified diet and a more or less exacting hygiene? Therein lies the danger and wickedness of all alleged cures of kidney disease.

Not only are "Anuric Tablets" foisted on the public under false and misleading claims but, as alleged cures for diseases that should never be self-treated, they are fundamentally and essentially vicious.

Facilitating the Making of Books for the Blind.—The *Ugeskrift for Læger* describes a method for manifolding books with raised letters for the blind. The paper to be used for the page is placed between two frames with openings corresponding to the letters to be punched. Instead of punching them on a zinc plate, as is the usual method, an oiled and water-tight paper is stretched below, and the letters are punched with an instrument built on the principle of the ticket punch. A pulplike mass, a mixture of dextrin, starch and rubber, is then spread over the frame. It dries rapidly and when taken off, this hard sheet has the printing in letters in relief. It is then a simple matter to print as many sheets as desired from this matrix. The printing can be done in the home by this means and the books manifolded. The technic is said to be the invention of Max Herz, privat-docent at the University of Vienna.

Correspondence

"PATRIOTISM RAMPANT"

To the Editor:—Continuing the subject of "Patriotism Rampant": Patriotism sometimes goes to excess; but, like the old adage of "better to have loved and lost than never to have loved at all," it is better that patriotism ramp, and wildly ramp, than that it crouch or cower. That the language and literature of a people reflect the spirit of the people is a truism: why then should we wish to perpetuate or encourage by any authoritative act of our own the spirit that decorates authors of "Hymns of Hate"; that finds solemn treaties but "scraps of paper"; that stamps its very money with "God damns" of its enemies; that mints commemorative medals of the sinking of a *Lusitania*; that, while professing good will with its lips, sinks the ships of its friends "without a trace being left"?

I take off my hat to "Patriotism Rampant."

But *science*—so much *science*—will be lost to us if patriotism continues to ramp. To this, like Job to his comforters, I am willing to reply, slightly paraphrasing, "No doubt but the German is the language and all wisdom shall die without it."

W. F. R. PHILLIPS, M.D., Washington, D. C.

To the Editor:—Dr. Robert Peter's letter in THE JOURNAL, Sept. 8, 1917, reminds me of Mark Twain's comment, in Appendix D to his "Tramp Abroad":

"... for I once heard a gentle and lovely old German lady say to a sweet young American girl: 'The two languages are so alike—how pleasant it is; we say "Ach! Gott!" you say "Goddam!"'"

F. A. McDERMOTT, Washington, D. C.

FIRST YEAR MEDICAL STUDENTS AND THE DRAFT

To the Editor:—It is a genuine relief to all interested in the medical aspects of national preparedness to know that a way has at last been announced whereby second, third and fourth year medical students may continue their training for future service. First year medical students are not included, doubtless because of the fear that, if they were, medical schools would become a refuge for slackers.

It would indeed seem that there can be no other reason for this failure to provide for the first year student; for the only valid and conclusive argument for keeping any medical student at his work is that there should be at no time, either during the war or after it is over, a diminution in the output of medical schools. The demand for hospital interns and for the recruiting of every branch of the profession with an adequate supply of men trained in modern medicine will continue year by year after the war. Before war was declared, the output was not quite equal to the demand. The demand will be greater—not less—after the war is over.

Far-seeing leaders in medicine recognize today that the medical resources of America will be heavily called on to assist in the rehabilitation of war-devastated Europe. For this reason, if for no other, it is most desirable that there shall be no diminution in the number of students entering on the study of medicine this year. If possible this number should be increased. There can be no question of the demand for the service of these men when they are graduated four years hence.

In my opinion, the delay of the War Department in providing for the continuance of medical students at their work will tell chiefly in deterring men from entering on the study of medicine this year. Many causes will contribute to this result, one of the most important being the natural hesitation to incur the expense of a period of five years of study with no assurance that it will be uninterrupted. Ordinary foresight dictates that it is sound policy to keep this loss of first year students to a minimum.

Granting that it is better to keep the medical schools free from slackers so that only those men will go in for medicine who have the aptitude and taste therefor as a profession,

there is a class of first year students many of whom are drafted but against whom no just charge of being slackers can be preferred; namely, those men who, prior to the declaration of war—or even prior to the introduction of the draft bill into Congress—had declared their intention of entering on the study of medicine in the fall of 1917. In many colleges there are premedical courses in which students are formally registered; other college students can show that they had given their names to the deans of medical schools as candidates for entrance; still others can show that their entrance credits had been approved for admission. These men are as truly in the medical ranks as the man who has finished the first year of his medical course. Why should they not be included in the order by which drafted medical students have the privilege of enlisting in the Enlisted Reserve Corps of the Medical Department and so of being discharged from the National Army to continue the study of medicine? They will be needed four years hence; it may be that they will be needed as England needs medical graduates today.

When, last May, college authorities at the urgent request of the Medical Board of the Advisory Council of National Defense discouraged not only medical but premedical students as well from leaving their studies to volunteer for officers' training camps, ambulance corps, hospital units, etc., because continuance at their work was their best form of national service—and this on the one ground given above, that "their country needs their trained and not their untrained service"—these drafted premedical men followed this sound advice and made their contribution to the service of their country. Will the government now do less to make as strong as possible our future medical preparedness?

To accomplish the desired result it is only necessary to extend the privilege of enlisting in the Enlisted Reserve Corps of the Medical Department to all men who can present evidence satisfactory to the Surgeon-General that prior to the declaration of war—or to the introduction of the draft bill into Congress—they were recognized as candidates for admission to any well recognized medical school.

THEODORE HOUGH, PH.D., Charlottesville, Va.
Dean, University of Virginia Department of Medicine.

OPPORTUNITIES FOR WOMEN IN LABORATORY WORK

To the Editor:—I note the editorial mention of this subject in THE JOURNAL, Aug. 18, 1917, p. 569. During the 1917 summer school at the University of Wisconsin, there was offered in the Department of Agricultural Bacteriology a special course in laboratory methods. The object in presenting this course was to give to young women who had had preliminary work in bacteriology an intensive training in those laboratory procedures that are of greatest importance from the standpoint of the diagnostic and control laboratory. To this end special attention was devoted to the methods used in the examination of water and of milk and the diagnosis of tuberculosis, diphtheria and typhoid fever. The course was taken by nineteen young women, all of whom had had at least a year and a half of chemistry and a semester's work in bacteriology. A number of these women had had a more extensive preliminary training. Some of these young women have already accepted positions in laboratories, and a number of others are available for such work.

E. G. HASTINGS, M.S., Madison, Wis.
Professor of Agricultural Bacteriology.

PRIORITY IN APPLICATION OF HEAT IN CORNEAL ULCERS

To the Editor:—In the abstract of the discussion on the papers of Drs. Verhoeff and Shahan (THE JOURNAL, June 30, 1917, pp. 1973 ff.) Dr. L. Webster Fox credits Dr. Barkan with being the originator of the application of heat in the treatment of corneal ulcer. Without in the least wishing to impugn Dr. Barkan's claim as "one of California's pioneers in ophthalmology," I will say that it is a grave error to assign to him the authorship of corneal cauterization. As

Dr. Fox rightly refers to cauterization in corneal ulceration as an epochal step in ophthalmic surgery, which assures its author a permanent place in medical history, it seems to me very desirable that THE JOURNAL should correct the error as to the originator of this procedure.

It was Dr. Martinache, a practicing oculist of San Francisco, who was the first to treat corneal ulcer successfully with the active cautery (as well as iris prolapse and keratitis interstitialis). He published his method, "Ulcers of the Cornea, Treated by the Actual Cautery," in the *Pacific Medical and Surgical Journal*, Nov. 18, 1873, p. 294; also "De l'emploi du cautère actuel dans les maladies des yeux, et principalement dans les ulcères de la cornée," *Annales d'oculistique*, 1878, 80, 21. It is true, however, that the procedure was taken notice of and came into general use only after the publication of Gayet in 1877.

On the other hand, it sounds rather naive for a writer in the American Encyclopedia for Ophthalmology to remark rather disparagingly that since the active cautery had been in general use for a long time before it must be presumed that it may have been used in this field as well. The answer to that is of course that there is no record to that effect—and there are other eggs of Columbus—and may the wholesome fear for those precious, unique, odd millimeters of pellucid tissue never die!

C. S. G. NAGEL, M.D., San Francisco.

DRAFTING PHYSICIANS

To the Editor:—Referring to your editorial of Aug. 11, 1917, on the selective draft for physicians, it is quite possible that the prevalence of "hysteria" with reference to the providing of adequate medical service for the new Army would be reduced if the acquiring of sufficient physicians was done by such a selective draft as would take into consideration both the individual's wishes, his obligation to community or family, and the government's need for his services.

The editorial of August 11 disregards the points which alone make a selective draft desirable. It is not the absolute number of men that has been, or can be, obtained for the medical service which is causing, or has caused, anxiety on the part of the government, or "hysteria" on the part of the Committee of National Defense or of the individual physician.

The figures quoted in the editorial are correct, but they speak of physicians without qualification as to the age or fitness of these men for active military service.

There are three things that make this selective draft of physicians particularly desirable: (1) the best protection of the government's needs; (2) the protection of the community, which should be assured adequate medical attendance, and (3) the protection of the physician himself from decisions which perhaps may have been made at times unwisely through the very "hysteria" referred to above.

The first, the needs of the government, of course includes the second and third. The economical use of the medical material is of first importance, if this is to be a long war. The continuance of the output of doctors through the conservation of medical students and teachers, and the maintenance of the health of the community at large are as important as the immediate providing of a given number of physicians for military service.

Regarding the number of men available: While the figures given in THE JOURNAL are satisfactory, if looked at on the basis of the present law providing seven medical men for 1,000 troops, they immediately become quite unsatisfactory if looked at in the light of the probable ultimate decision to provide twenty medical officers per thousand troops. It will be difficult to obtain the latter number by the volunteer system without falling into the same error that has brought about so much local distress in Great Britain through lack of medical attention at home.

Second, protection of the community: Under the volunteer system there can be no control exercised over the reduction of medical men in certain districts to a number fewer than necessary for proper care in that community. If the number of men taken from a given locality depends solely on the decision of the individual physician, as to whether he would

like to, or should, enter military service, some localities may be devastated, others may be very little affected.

An even distribution of the remaining talent is impossible. Under the selective draft of physicians this matter would be properly covered.

Third, the protection of the physician himself: It must be admitted that the decision of many men as to the relative importance of military or home service has been wrongly made, through the feeling that their example makes it necessary for them to enlist, in spite of the knowledge that their professional capacity makes their services particularly desirable in nonmilitary affairs.

A selective draft puts the individual on record as to his qualifications and obligations, but leaves his disposition to the proper authorities. It offers the great asset to the individual of the sense of direct service, whether his orders involve civilian or military duties. The "tremendous sacrifices" referred to in the summary of the editorial would probably be reduced to a minimum under the action of a selective draft, making the most economical use of medical material at hand, without "coercion," without "threats," but with a view of sending the man best fitted for the service into the Army, and conserving all nonmilitary interests to the country by holding in their proper places men who should not go, but who certainly do go through their anxiety to avoid any possible appearance of selfish avoidance of military duty.

HERBERT B. WILCOX, M.D., New York.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

ACUTE DIARRHEA IN INFANTS

To the Editor:—In THE JOURNAL, Aug. 25, 1917, p. 645, it is stated that lactose in from 3 to 5 per cent. solution in water should be given. Will you please explain to me why, how much, and how it should be given? Also please explain the advantage of starch water. Also please explain the methods of administration, indications for, and advantages of giving glucose. If this is published please withhold my name.

A. W. P.

ANSWER.—Many infants suffering from acute diarrhea die of acidemia, especially if the diarrhea is accompanied by vomiting. Hence to prevent acidemia a little sugar or starch is advisable during the starvation, or insufficient diet, period. If acidemic symptoms are present, starch and sugar are essential, and if they cannot be retained by the stomach, small colon injections of these substances are advisable. Furthermore, sugar in any form is a food and a stimulant, and it will even strengthen a weak heart in prostration.

Lactose (milk sugar) is better than sucrose (cane sugar) because it is less sweet and is less apt to cause fermentation in the stomach and intestine; it is a diuretic also, and in these diarrheal conditions the kidneys act very sluggishly. A 3 to 5 per cent. solution of lactose in water (or in a thin cereal gruel if such a food is advisable) in 1 or 2 ounce doses may be given at two or three hour intervals. The little patient should receive plain water between these feedings, unless more food is advisable.

Starch water acts like any other bland starchy food; in other words, it is a food. Warm starch solutions are very soothing to every inflamed mucous membrane, whether it is the mouth, the throat, the gullet, the stomach, the intestine or the rectum.

Glucose (grape sugar) is not so sweet as sucrose, but it is not so well tolerated as lactose, as it is rather irritant. The glucose of the Pharmacopeia is a syrupy liquid, very soluble in water.

In acidosis conditions, glucose is valuable as a nutrient enema, given either in water or in milk. A 3 to 10 per cent. solution, or even stronger, in milk or in physiologic sodium chlorid solution may be given by the rectum. For a child, 2 or 3 ounces, repeated every six hours for a few times, would be a fair dose. In older patients the rectal drip method is valuable.

When glucose is absorbed into the blood it is theoretically more quickly ready for muscle use than are other sugars;

hence it is frequently used in serious conditions, such as diabetic acidosis, persistent vomiting, or when for any reason food cannot be taken by the stomach.

STOCK AND BOND TRANSACTIONS IN RELATION TO THE INCOME TAX

To the Editor:—Please give me some information on the following questions:

1. If a physician, druggist or lawyer purchases a railroad or other bond at 90 and sells it at 95, how shall the result be treated in his personal income return? If the same person purchases the same kind of security at 90 and sells at 85, how shall the result be treated?
2. If the same person purchases a railroad or other stock at 80 and sells at 100, how shall the result be treated in his personal income return? If the same person purchases a similar security at 80 and sells at 70, how shall the result be treated in his income return?

The ruling now stands that if any one, except a stockbroker, purchases stock and sells at a profit, he must return the result as income, but if he sells at a loss he will not be allowed to deduct such loss from his income.

Kindly omit my name.

_____, Chicago.

ANSWER.—1. If a physician buys a \$1,000 bond at 90 and sells at 95, he makes a profit of \$50, which must be reported as income; if the same man later in the year buys a \$1,000 bond at 90 and sells at 85, he loses \$50, which can be deducted from his total income because he gained \$50 during the year in buying and selling a bond. In other words, his loss is offset by his profit.

2. If a person buys a share of stock at 80 and sells at 100, he must report the profit of \$20 as income; if the same person later buys a share of stock at 80 and sells at 70, he has the right to deduct his loss of \$10 when making his income return. However, if his losses on these transactions exceed his profits, he cannot deduct more than the aggregate profits during the year.

Profits made during the year on transactions in stocks and bonds must be returned as income. The only deduction which can be made for losses experienced during these transactions is an amount smaller or equal to the amount of profits derived therefrom; in case only losses have been incurred during the year, such losses cannot be deducted from the income.

It must be understood that this does not apply to regularly established firms dealing in stocks and bonds as a business.

LITERATURE ON POISON GASES

To the Editor:—Will you kindly send me any literature on the subject of poison gases and the treatment used in warfare that you may have at your disposal?

S. T. F., Camp Dodge, Iowa.

ANSWER.—The following is a list of recent articles on poison gases and their treatment in warfare:

- Miller, J.: Blood Changes in Gas Poisoning, *Lancet*, London, May 26, 1917.
Pisano, G.: Toxic Action of Asphyxiating Gases, *Gazz. d. osp.*, Dec. 3, 1916.
Ujlaki: Injuries from Asphyxiating Gases, *München. med. Wchnschr.*, Jan. 2, 1917.
Irvine: Gas Poisoning from Fumes of Explosives, *Brit. Med. Jour.*, Jan. 29, 1916.
Boudreau: Iodin Internally in Gas Asphyxia, *Jour. de méd. de Bordeaux*, September, 1916.
Treatment of Gas Asphyxia, *THE JOURNAL*, April 21, 1917, p. 1190.
Immediate Treatment of Patients Suffering from Chlorin Gas Poisoning, Paris Letter, *THE JOURNAL*, Jan. 1, 1916, p. 45.
Lung, G. A.: Asphyxiating Gases in Warfare, *Mil. Surg.*, November, 1915.
Hill, L.: Gas Poisoning, *Brit. Med. Jour.*, Dec. 4, 1915.

EYE MANIFESTATIONS IN ARSENIC POISONING—ARSENIC IN THE URINE

To the Editor:—1. What are the eye manifestations of chronic arsenical poisoning?

2. Is arsenic, in the most minute quantity, ever found in normal urine?

Please do not use my name if you publish this.

W. F. R.

ANSWER.—1. In the second phase of chronic arsenic poisoning the conjunctiva is often red and inflamed, and symptoms of coryza appear. In the prolonged therapeutic action of arsenic, the first indications are suffusion and swelling of the conjunctiva and eyelids. "Impaired nutrition or toxic actions give rise to polyneuritis, with atrophy of the muscles, disturbance and paralysis of the special senses (blindness)" (Sollmann, Torald: *Manual of Pharmacology*, 1917, p. 740).

2. Arsenic is not found in normal urine; but when ingested, in any manner, slightly less than one fifth is excreted by the kidneys within twenty-four hours. The remainder is slowly eliminated by means of the hair and the epidermis.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

- ARIZONA: Phoenix, Oct. 2-3. Sec., Dr. John Wix Thomas, 306 Goodrich Bldg., Phoenix.
CALIFORNIA: Los Angeles, Oct. 9-13. Secretary, Dr. Charles B. Pinkham, State Capitol, Sacramento.
COLORADO: Denver, Oct. 2. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.
DISTRICT OF COLUMBIA: Washington, Oct. 9-11. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington, D. C.
GEORGIA: Atlanta, Oct. 9-11. Sec., Dr. C. T. Nolan, Marietta, Ga.
IDAHO: Pocatello, Oct. 2. Sec., Dr. Charles A. Dettman, Burke.
ILLINOIS: Chicago, Oct. 9-11. Superintendent of Registration, Mr. F. C. Dodds, Springfield.
IOWA: Des Moines, Oct. 9-11. Sec., Dr. G. H. Sumner, State House, Des Moines.
MICHIGAN: Lansing, Oct. 9-11. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.
MINNESOTA: Minneapolis, Oct. 2-5. Sec., Dr. Thomas S. McDavitt, Lowry Bldg., St. Paul.
MONTANA: Helena, Oct. 2. Sec., Dr. William C. Riddell, Power Bldg., Helena.
NATIONAL BOARD OF MEDICAL EXAMINERS: Chicago, Oct. 10-18. Sec., Dr. J. S. Rodman, 2106 Walnut St., Philadelphia.
NEW JERSEY: Trenton, Oct. 16-17. Sec., Dr. Alexander MacAlister, 438 E. State St., Trenton.
NEW MEXICO: Santa Fe, Oct. 8. Sec., Dr. R. K. McClanahan, East Las Vegas.
NEW YORK: Albany, Buffalo, New York City and Syracuse, Oct. 2-5. Chief, Examinations Division, Harlan S. Horner, State Education Bldg., Albany.
OKLAHOMA: Oklahoma City, Oct. 9-10. Sec., Dr. Ralph V. Smith, 502 Daniel Bldg., Tulsa.
PORTO RICO: San Juan, Oct. 2. Sec., Dr. M. Quevedo Baez, San Juan.
RHODE ISLAND: Providence, Oct. 4-5. Sec., Dr. Byron O. Richards, State House, Providence.
UTAH: Salt Lake City, Oct. 1-2. Sec., Dr. G. F. Harding, Templeton Bldg., Salt Lake City.
WYOMING: Laramie, Oct. 10-12. Sec., Dr. H. E. McCollum, Laramie.

South Dakota July Examination

Dr. P. B. Jenkins, secretary of the South Dakota State Board of Health and Medical Examiners, reports the practical and written examination held at Waubay, July 10-14, 1917. The examination covered 15 subjects and included 125 questions. The percentage required to pass was 75. Of the 11 candidates examined, 10 passed and one failed. Four candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Chicago College of Medicine and Surgery	(1911)	83.1
Rush Med. Coll. (1893)	89.7; (1913) 82.5; (1916) 84.4;	(1917)	89.5
University of Illinois	(1913)	88.4
State University of Iowa, Coll. of Homeo. Med.	(1905)	86.1
University of Louisville	(1912)	81.2
University of Nebraska	(1915)	86.1
University of Vermont	(1908)	88.1

College	Year Grad.	Reciprocity with
St. Louis College of Physicians and Surgeons	.....(1915)	68.1

College	Year Grad.	Reciprocity with
Rush Medical College	.....(1913)	N. Dakota
University of Illinois	.....(1915)	Minnesota
University of Minnesota	.....(1915)	Minnesota
St. Louis University	.....(1906)	N. Dakota

Vermont July Examination

Dr. W. Scott Nay, secretary of the Vermont State Board of Medical Registration, reports the oral, practical and written examination held at Burlington, July 10-12, 1917. The examination covered 12 subjects and included 90 questions. The percentage required to pass was 75. Eleven candidates were examined, all of whom passed. Two candidates were granted reregistration certificates. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
University of Maryland	.....	(1916)	75.7
University of Vermont	(1916)	91.1; (1917)	85.5; 86.9; 87.3; 87.3; 87.4; 88.4; 89; 90.1.
University of Naples	.....	(1912)	84.5

Book Notices

FOOD FOR THE WORKER. The Food Values and Cost of a Series of Menus and Recipes for Seven Weeks. By Frances Stern and Gertrude T. Spitz, with a Foreword by Lafayette B. Mendel, Professor of Physiological Chemistry in the Sheffield Scientific School of Yale University. Cloth. Price, \$1 net. Pp. 131. Boston: Whitcomb & Barrows, 1917.

This volume was especially prepared with a view to the needs of the wage earner, and was planned to furnish a series of balanced menus for the use of the visiting housekeeper or social worker. Dr. Lafayette B. Mendel has prepared a foreword to this volume, which he considers a timely attempt at a practical solution of satisfying the needs of the average family, furnishing them with the indispensable nutrients in a ration that is especially palatable, digestible and liberal in quantity, and well within the purchasing power of the family. The authors provide tables which Dr. Mendel states indicate at once "that there is no superfluity of food, no unwarranted excess of calories suggested." The authors consider first the requirements of the family; a general consideration of the subject is followed by suggestions as to purchasing economically. Menus are planned for various days of the week over a period of seven weeks. Most of the book is devoted to these tables and diets for forty-nine days. Following the tables are recipes for the foods contained in the tables, giving the measure, weight in grams, protein, fat and carbohydrate calories, and cost in cents of each constituent. Following these recipes are tables of the cost of supplies as based on calculations during January, July and November of 1916. A special section is devoted to an article on how to build and use a fireless cooker. An ingenious table at the end of the book is a practical compilation of the menus for seven weeks so that at a glance the reader can see how to compile the diets for any day.

PRACTICAL DIETETICS, WITH REFERENCE TO DIET IN HEALTH AND DISEASE. By Alida Frances Pattee. Eleventh Edition. Cloth. Price, \$1.75. Pp. 502. Mount Vernon, N. Y.: A. F. Pattee, 1917.

This book, now in its eleventh edition, has been thoroughly revised in accordance with the modern tendencies in the treatment of numerous diseases by modification of the diet. It is, of course, especially prepared with a view to the demands of the trained nurse. A copy of state board requirements in dietetics and examinations is furnished with each copy. The book is divided into three parts: (1) principles of nutrition and food preparation; (2) practical application of principles of nutrition; (3) hospital dietaries, diet in disease, and diet in special diseases. In the first part there are general instructions as to estimating food values, feeding the sick, preparation of trays, and numerous tables, weights, measures and food values. The second part is devoted wholly to recipes classified as beverages, animal foods, vegetable foods, and nutritious desserts. The third part gives in outline form all of the special diets commonly used in hospitals, and then lists diets for various diseases as prepared by different physicians. It is an excellent compilation, and will be found a most practical aid for both physicians and nurses.

ANIMAL MICROLOGY. Practical Exercises in Zoological Micro-Technique. By Michael F. Guyer, Ph.D., Professor of Zoology in the University of Wisconsin. With a Chapter on Drawing by Elizabeth Smith, Ph.D., Instructor in Zoology in the University of Wisconsin. Revised Edition. Cloth. Price, \$2 net. Pp. 289, with 74 illustrations. Chicago: The University of Chicago Press, 1917.

The first edition of this book, primarily a textbook for college students, appeared in 1911. The numerous advances in this subject since that time prompted the authors to undertake a thorough revision. A chapter on intestinal microbiology has been added. Dr. Marshall believes that the word "microbiology" is the best expression for the study of bacteria. But he says, "Whether it should be called Protistology, Microbiology, Bacteriology, Mycology, or something else must be left for the future to determine." The various chapters were prepared by twenty-five Canadian and American bacteriologists, including such authorities as M. Dorset,

W. D. Frost, Edward Fidler, H. W. Hill, Earle B. Phelps, L. F. Rettger and E. E. Tyzzer. The book is almost encyclopedic, covering every phase of the relation of bacterial organisms to human life. Chapters of especial interest are those on the microbiology of milk and milk products, and on the control of infectious diseases.

GOOD HEALTH: HOW TO GET IT AND HOW TO KEEP IT. By Alvah H. Doty, M.D. Cloth. Price, \$1.50 net. Pp. 304, with 32 illustrations. New York: D. Appleton & Co., 1917.

This popular treatise is intended to inspire in its readers that cooperation which is essential to combat physical inefficiency, ill health and disease, and, as is said, to inculcate an intelligent appreciation of the fundamental principles of hygienic and sanitary laws and ordinances and a definite sense of responsibility in maintaining bodily health for both individual and social ends. It distinguishes between and treats of hygiene, which relates to the person, and sanitation, which concerns the surroundings. Its teachings are in the main in accordance with present scientific knowledge and sanitary and hygienic practice.

FOOD FOR THE SICK. A Manual for Physician and Patient. By Solomon Strouse, M.D., Associate Attending Physician, Michael Reese Hospital, and Maude A. Perry, A.B., Dietitian at the Michael Reese Hospital, Chicago. Cloth. Price, \$1.50 net. Pp. 270. Philadelphia: W. B. Saunders Company, 1917.

The authors discuss each disease in order to make plain the reasons for the dietary rules that follow. Complete diets are given, with instructions in the preparation of the food and the recipes. The first chapter considers the general subject of food and its uses; the second is devoted wholly to the subject of diabetes, the Allen treatment being given in detail. There are numerous special diabetic menus and recipes. Other chapters are devoted to gout, diseases of the kidney, the heart, prepared by Dr. Sidney Strauss, the stomach and intestine, the liver and respiratory system, the skin, prepared by Dr. Philip Schaffner, fevers, obesity, anemia, scurvy and goiter.

COMPENDIUM FOR MEDICAL OFFICERS. By Gilbert E. Seaman, M.D., F.A.C.S., Major and Chief Surgeon, Wisconsin National Guard. Paper. Pp. 165, with illustrations. Madison: State of Wisconsin, 1917.

The information contained in his compendium represents lectures and lessons in the course for medical officers of the National Guard conducted during April and May, 1917. It is composed principally of quotations of laws and orders directly related to the work of the Medical Department, and other information compiled from various standard textbooks on the subject. This booklet contains, in brief, much that the medical officer needs to know and can find elsewhere only by referring to a number of different authors. It will form an excellent review on modern army organization and methods.

SEX-HYGIENE. A TALK TO COLLEGE BOYS. By Frederic Henry Gerrish, M.D., LL.D., Professor Emeritus of Surgery in Bowdoin College. Cloth. Price, 60 cents net. Pp. 51. Boston: Richard G. Badger, 1917.

This book, which represents a lecture delivered for a number of years to the freshman class at Bowdoin by Professor Gerrish, has been described as a "scientifically direct" and "ethically elevated" discussion of the subject of sex hygiene. It accords accurately with that description. It is a convincing presentation of the subject.

MODERN DIETETICS. Feeding the Sick in Hospital and Home, with Some Studies on Feeding Well People. By Lulu Graves, Dietitian, Lakeside Hospital, Cleveland. Cloth. Price, \$2. Pp. 214. St. Louis: The Modern Hospital Publishing Company, 1917.

This is a compilation of the articles by Miss Graves of the Lakeside Hospital, Cleveland, which have appeared in the *Modern Hospital* under the general title "Feeding the Hospital." The book contains a good general discussion of dietetics, with chapters containing special diets in disease, instructions for training schools, school work in dietetics, numerous recipes and tables.

Social Medicine, Medical Economics and Miscellany

Carbon Monoxid Poisoning in the Steel Industry

J. A. Watkins of the Public Health Service has made a study of carbon monoxid poisoning in the steel industry, and in Technical Paper 156 gives his findings. Carbon monoxid gas occurs in the course of many industrial processes, and aside from fatal and other accidents from acute "gassing" it is a source of ill health in those who are compelled to work in situations in which they are exposed to it in greater or less quantity. In connection with the steel industry the sources of this gas are blast furnaces, gas engines, gas producers, gas-fired boilers, cupola furnaces, dolomite furnaces, dinky engines, and it may even be found in shanties or rest rooms. While the factors of individual resistance and the matter of adjustment of the bodily mechanism to carbon monoxid poisoning enter into the effect on different persons, its constant influence is perhaps always deleterious, and the result is final incapacity. One of the earliest symptoms of carbon monoxid poisoning as described by Watkins is persistent and distressing headache, accompanied at times by nausea and vomiting. Sometimes the headache does not begin until the person has quit work, but in most instances it begins while at work and increases during the day. Giddiness is common, and there may be staggering, muscular weakness, lack of coordination and rapid fatigue. Derangements of digestion are common, with nausea and vomiting, and diarrhea may occur. Among the most serious effects of the poisoning are palpitation and cardiac distress, with occasional dilatation; but the chief effect is on the nervous mechanism controlling the heart. The pulse is irregular, sometimes being slow, at others fast, the irregularity being increased on slight exertion. The oxygen content of the red blood cells is displaced, reduced hemoglobin resulting, with consequent anemia which may be resistant. Nervous symptoms are less frequent, but there may be neuritis, with ensuing paralysis or mental derangements such as melancholia or hallucinations. Albumin and sugar may be found in the urine. Persons not entirely incapacitated are physically below par, and their industrial efficiency consequently suffers. Careful tests of the air in various situations in the steel industry in which men are compelled to work showed variations in the carbon monoxid content ranging from 0.01 to 3.40 per cent., the high figures being found only exceptionally. In this study no physical examinations were made of employees working in the places from which air samples were taken, but from experimental work on carbon monoxid poisoning and from observations made in serious and fatal cases it has been determined that 0.2 per cent. of carbon monoxid for thirty minutes will be sufficient temporarily to incapacitate the person exposed. Increase in amount of gas or length of exposure would be dangerous. Serious symptoms may result from exposure to as small amounts as 0.01 per cent., especially if the exposed person does much physical work. It is said from the industrial hygienist's standpoint that air where men work containing the last mentioned amount of carbon monoxid is dangerous, and that such a condition should be remedied.

Causes of Death by Occupation

The occupational mortality experience of the Metropolitan Life Insurance Company's industrial department as compiled by Louis I. Dublin, Ph.D., for 1912-1913 is set forth in a reprint by the Bureau of Labor Statistics, U. S. Department of Labor, in Industrial Accidents and Hygiene Series No. 11. The bulletin comprises a study of 94,269 deaths which occurred in 1911, 1912 and 1913 among occupied white males, and 102,467 deaths in the same period in white women, aged 15 and over, insured in the industrial department of the company. Each occupation is discussed with reference to the death rate, and tables show the exact figures and percentages by age periods. The table of causes of death in all occupations combined shows some interesting figures. The high points for deaths at ages

over 15 were for typhoid fever, 1,390; pulmonary tuberculosis, 19,349; cancer, 4,578; cerebral hemorrhage, apoplexy and paralysis, 5,825; organic diseases of the heart, 11,323; pneumonia (lobar and undefined), 6,766; accidental violence, 8,752; all other causes than those named in the table, 18,719; for women, among the 102,467 deaths for the same diseases the figures were: typhoid fever, 1,187; pulmonary tuberculosis, 14,782; cancer (all forms), 10,098; cerebral hemorrhage, apoplexy and paralysis, 8,552; organic diseases of the heart, 15,183; pneumonia (lobar and undefined), 6,034; accidental violence, 2,887; all other causes than those named in the table, 22,362. A comparison of deaths from all causes between males and females for the various age periods shows the following percentages: between ages 15 and 24, female 10.1, male 11.8; 25 and 34, female 12.1, male 13.7; 35 and 44, female 13.1, male 16.2; 45 and 54, female 15.4, male 17.7; 55 and 64, female 21.0, male 20.3; 65 and over, female 28.4, male 20.3. The average age at death among males in various occupations was found to be as follows: bookkeepers and office assistants, 36.5; enginemen and trainmen (railway), 37.4; plumbers, gas fitters and steam fitters, 39.8; compositors and printers, 40.2; teamsters, drivers and chauffeurs, 42.2; saloonkeepers and bartenders, 42.6; machinists, 43.9; longshoremen and stevedores, 47.0; textile-mill workers, 47.6; iron molders, 48; painters, paperhangers and varnishers, 48.6; cigarmakers and tobacco workers, 49.5; bakers, 50.6; railway track and yard workers, 50.7; coal miners, 51.3; laborers, 52.8; masons and bricklayers, 55.0; blacksmiths, 55.4; farmers and farm laborers, 58.5. It is said that occupations having a low age at death are, in general, either composed of large proportions of young men or characterized by special occupational hazards inducing an early death. On the other hand, occupations having a high average age at death must not necessarily be supposed to exhibit freedom from injurious influences. The condition may result from the high average age of the living.

Medicolegal

Sufficient Complaint and Evidence in Action for Malpractice

(*Schillinger et al. vs. Savage (Ind.)*, 115 N. E. R. 321)

The Supreme Court of Indiana affirms a judgment for \$2,000 damages in favor of plaintiff Savage for alleged malpractice by the defendants in reducing and treating a fracture of his left femur. The court says that it was contended by the defendants that the complaint did not show that the negligence charged against them was the proximate cause of the plaintiff's alleged injury, that no allegation was made showing that the alleged negligence was the result of the violation of any duty owing by the defendants to the plaintiff, and that the defendants were employed by the plaintiff to treat this fracture. On the points suggested by the defendants, the complaint, in substance, alleged that the defendants were practicing physicians and surgeons, actively engaged in the practice of such profession; that they held themselves out to the public as practicing physicians and surgeons; that they as physicians and surgeons, both working together, endeavored to reduce the fracture, and entered on the work of setting and adjusting the broken bone, and of treating and caring for it, in all things as skilled and competent physicians should do; that they did unskilfully what they undertook to do, and omitted to do things that they should have done as skilful physicians and surgeons; and that solely on account of the negligence, carelessness, unskilfulness, unprofessional and improper manner and method used, the bone was caused to grow and become crooked, deformed and weak. Thus the complaint charged that the alleged carelessness was the proximate cause of the injury complained of. The complaint did not expressly allege the employment of the defendants by the plaintiff, but it did contain the allegations referred to, which, taken as a whole, stated that the defendants, under the circumstances stated, undertook to treat the plaintiff's injury as skilful and

competent physicians and surgeons should do; that the plaintiff reposed full faith and confidence in them as physicians and surgeons, and fully relied on the knowledge and skill that they possessed, or should have possessed, as such physicians and surgeons, and fully, carefully and explicitly carried out and performed those acts and things that they counseled, instructed and advised him to do. Thus a relationship came into existence between the defendants and the plaintiff, which imposed on the former the duty to exercise the average degree of skill possessed and exercised in like cases by members of their profession practicing in similar localities; and out of such relationship grows an obligation in favor of the patient, if injured by a failure to exercise said degree of skill and care. The complaint was not defective in the particulars contended for.

The record showed evidence tending to support the cause of action alleged. It was also true that a considerable amount of the evidence tended to support the contention of the defendants; there was, however, a strong conflict in the evidence, and these matters were submitted to and passed on by the jury. This court cannot weigh such conflicting evidence. Nor was there error in a refusal to instruct the jury that under the law the defendants were presumed to have exercised reasonable care and skill in setting and treating the plaintiff's fracture. It is the province of the jury to draw presumptions of fact from the evidence or from a given state of facts, and it is error for the court to instruct it as to what inferences it shall draw. The question of whether the defendants exercised reasonable care and skill in treating the plaintiff's fracture was properly left to the jury.

An Invalid Law as to Removal of County Health Officers

(Mississippi State Board of Health vs. Matthews (Miss.), 74 So. R. 417)

The Supreme Court of Mississippi, Division A, in a very short opinion, affirms a decree in favor of complainant Matthews, who filed a bill in chancery to enjoin the state board of health from putting into effect an order removing him from the office of county health officer of a county. The court holds that Section 175 of the state constitution, which provides that all public officers, for wilful neglect of duty or misdemeanor in office, shall be liable to presentment or indictment by a grand jury, and, on conviction, shall be removed from office, or otherwise punished as may be prescribed by law, provides the exclusive method by which a public officer may be removed from office. Consequently, Section 2490 of the Mississippi Code of 1906, so far as it authorizes the state board of health to remove a county health officer, is void.

Physicians and Fees Under Workmen's Compensation Act

(In re Huxen (Mass.), 115 N. E. R. 426)

The Supreme Judicial Court of Massachusetts says that the only questions raised by this appeal related to the obligation of an insurer under the workmen's compensation act to pay the fees of a physician to an injured employee. The first point to be decided was whether the physician can be a party to a proceeding under the act. It has been held that the questions relating to services of physicians are proper for consideration under the act, and since the fees are to be fixed by a committee of arbitration in case of disagreement, it seems to follow necessarily from the terms of the act that, when the physician is the party interested in that matter, he may be a party to the proceedings.

The employee in this case was injured by being burned with live steam. At his request he was treated at his home for a period of two weeks, after which he was able to go from his home to the physician's office and was treated there. The entire evidence about the kind of treatment after the expiration of the two weeks was from the physician, that when the employee came to his office he had to bandage around the chest and shoulder and clean the area of granulation; that there was a back area in which there was proud-flesh that had to be cleaned off. The question was whether this constituted an unusual case within the meaning of the statutory provision that during the first two weeks after the injury, and, if the employee is not immediately incapacitated

thereby from earning full wages, then from the time of such incapacity, and in unusual cases, in the discretion of the board, for a longer period, the association shall furnish reasonable medical and hospital services, and medicines, when they are needed. It is manifest that the legislature did not intend to impose all expenses of medical attendance on the insurer. The obligation to provide such attendance as an absolute duty is confined to two weeks after the injury. It is manifest that in the aggregate there must be many cases in which medical attendance may be required for a longer period. It is not in an ordinary case requiring longer medical attendance that the discretion of the board may be exercised to charge this attendance to the expense of the insurer. It is only in "unusual cases" that it may do so. There would be grave doubt whether a case in which the employee is able to go from his home in Cambridge to an office in Boston could be so unusual as to be within the purview of the act. But there was another circumstance which must be considered in this case.

After there had been several treatments at the physician's office in Boston, the insurer wrote to the employee offering to pay one dollar per visit to the physician, or to provide its own physician free of charge. That letter was shown by the employee to the physician, who continued to treat him. It is manifest that, after the letter was shown to him, he knew the attitude of the insurer which it was sought to hold liable for his services. There was no intimation that the physician proffered by the insurer free of charge to the employee was not competent and a proper person to treat the employee. The fact that the employee was able to go to the office for treatment made it plain that the case was no longer critical. It was not then a case of emergency. Under the conditions disclosed, there was no "other justifiable cause" for the continued attendance of the first physician after the date of the letter from the insurer to the employee. If he chose to continue to treat the employee at the expense of the insurer under these circumstances, he must do so on the terms offered. Wherefore the court orders that the amount decreed to be due to the physician be reduced to \$73.

Presumption from the Commission of Numerous Abortions

(People vs. Schultz-Knighten (Ill.), 115 N. E. R. 140)

The Supreme Court of Illinois holds that, in a prosecution for the murder of a woman by the performance of an abortion on her, evidence that the defendant committed an abortion on another woman which resulted in her death is competent for the purpose of showing the knowledge of the defendant and her guilty intent. Though a single abortion may have been committed for a sufficient reason and with no criminal intention, repeated acts of that character may create a reasonable presumption that they were not done to preserve life or ignorantly, but with criminal intent and knowledge; and the more numerous the acts the stronger, ordinarily, will be the presumption.

Society Proceedings

COMING MEETINGS

Amer. Acad. of Ophthal. and Oto-Laryng., Pittsburgh, Oct. 29-30.
Am. Assn. for Study and Prev. of Inf. Mort., Richmond, Va., Oct. 15-17.
American Association of Railway Surgeons, Chicago, Oct. 17-19.
Am. Assn. Obstetricians and Gynecologists, Newark, N. J., Sept. 17-19.
American Roentgen Ray Society, New York, Sept. 20-22.
Colorado State Medical Society, Colorado Springs, Sept. 25-27.
Delaware State Medical Society, Middletown, Oct. 8-9.
Indiana State Medical Association, Evansville, Sept. 26-28.
Kentucky State Medical Association, Louisville, Oct. 16-18.
Medical Association of the Southwest, Kansas City, Oct. 15-17.
Minnesota State Medical Association, St. Paul, Oct. 10-12.
Mississippi Valley Medical Association, Toledo, O., Oct. 9-11.
Missouri Valley Medical Society, Lincoln, Neb., Sept. 20-21.
Nevada State Medical Association, Reno, Oct. 18-19.
New Mexico Medical Society, Las Cruces, Oct. 4-6.
Pennsylvania State Medical Society, Pittsburgh, Sept. 24-27.
Southern Medical Association, Memphis, November 12-15.
Vermont State Medical Society, Barre, Oct. 11-12.
Virginia State Medical Society, Roanoke, Oct. 23-26.
West Virginia State Medical Association, Fairmont, Oct. 2-4.
Wisconsin State Medical Society, Milwaukee, Oct. 3-5.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Public Health, Boston

August, VII, No. 8

- 1 Sanitation in Some Canadian Barracks and Camps. J. G. Fitzgerald, Toronto, and J. W. S. McCullough, Ontario.—p. 655.
- 2 Fallacy of Reading Accurately Gas Percentages in Fermentation of Lactose Peptone Bile and Lactose Broth. W. W. Browne, New York.—p. 663.
- 3 Gasoline Engine Exhaust-Gas Poisoning. R. P. Albaugh, Columbus, Ohio.—p. 664.
- 4 De-Lousing Measures of Sante Fe Railway System. M. F. Boyd, Iowa City, Ia.—p. 667.
- 5 Saving Sight; Saving Citizens. E. M. Van Cleve, New York.—p. 675.
- 6 Activated Sludge Experiments at University of Illinois. E. Bartow, F. W. Mohlman and J. F. Schnellbach, Urbana, Ill.—p. 679.
- 7 Ammonia from Action of Caustic Soda on Organic Matter Source of Error in Determination of Nitrates in Sewage and Sewage Effluents by Reduction Method. S. DeM. Gage and H. H. Anderson, Providence, R. I.—p. 689.
- 8 Bacterial Examination of Milk. F. H. Slack, Brookline.—p. 690.
- 9 Synoptic Report on Comparative Sanitary Survey of Two Massachusetts Cities. M. P. Horowitz, Cambridge.—p. 698.

American Review of Tuberculosis, Baltimore

August, I, No. 6

- 10 *Diagnosis of Tuberculosis in Military Service. G. E. Bushnell, U. S. Army.—p. 325.
- 11 *Pleural Reaction to Inoculation with Tubercle Bacilli in Vaccinated and Normal Guinea-Pigs. R. C. Paterson, Saranac Lake, N. Y.—p. 353.
- 12 Public Health Work of Great Life Insurance Company. H. J. Howk, Mount McGregor, N. Y.—p. 372.

10. **Tuberculosis in Military Service.**—As a first principle Bushnell lays down the axiom that the examination must be confined to objective fact, to physical diagnosis. The examiner may listen to the applicant's story, but should not give weight to statements not supported by physical signs. It is frequently observed that the size of tuberculous foci is found at necropsy to be greater than that determined during life by clinical methods, there being recent extensions of the tuberculous process which have escaped detection. Now, if the numerous foci of miliary tuberculosis and the recent small foci surrounding an old lesion can not be discovered in their early stages, what, asks Bushnell, authorizes us to believe that it is possible to detect the incipient lesion of the apex by auscultation and percussion before râles have made their appearance? The physical examination for the presence of pulmonary tuberculosis as practiced by the specialist with a view to determine the precise extent, age and probable prognosis of the lesions, including as it should a careful record of past history and of all abnormal signs present, is a time consuming affair. For military purposes, however, in which the object is to reject from further consideration cases with well marked positive findings, much can be omitted from the examination and its duration can be correspondingly abbreviated. All that is absolutely necessary is to determine the presence of a tuberculous lesion of sufficient size and activity to constitute a cause for rejection. This can be done in well marked cases of active tuberculosis in a few minutes, in some cases in half a minute. To demonstrate the absence of disease naturally requires a longer time.

In order to determine the time requisite for a preliminary examination twenty-five test cases were examined by Bushnell by the auscultatory method aided by percussion, auscultation of voice, etc., whenever thought necessary, the object being to determine the least time which was necessary to get an approximation to the correct diagnosis. The time consumed for the whole examination was one and one-half hours. No special effort was made to shorten this time, which was spent to a considerable degree in consulting the case cards after the examination had been completed in the individual cases, in waiting for patients to remove their clothing, etc. The actual time of physical examination was fifty-eight minutes, the time for each patient varying from

one and one-half to two and one-half minutes. The diagnosis, not only as to the presence or absence of tuberculosis but also as to the extent of the lesions present, was made correctly as determined by comparison with the cards in twenty-two cases; in two cases the presence of an old pleurisy in which there had been effusion at an earlier time was not recognized, and in one case a cavity was erroneously diagnosed by carelessness in failing to notice that the patient was breathing noisily. The patients were as a rule afebrile. In most of them there were no signs of present activity; in one there was no evidence of clinical tuberculosis. They were, in short, such cases as might very well have been presented to the examiner of recruits. Bushnell believes that if all recruits were examined with no more care than was given to the examination above reported the number of patients treated at Fort Bayard would be reduced by at least one fourth and very probably by a much larger percentage.

The author describes in detail his method of making a rapid diagnosis by auscultation and concludes his paper by setting forth the following topical variations of normal signs: 1. Harsh breathing, slightly prolonged expiration over right apex posteriorly, without other signs, is not cause for rejection (proximity of bronchus). The same signs anteriorly over the right apex if slight are not necessarily pathologic. 2. The same signs second interspace right anteriorly close to sternum are not a cause for rejection (proximity of right main bronchus). If these signs are found outward and downward from this point they indicate a lesion. 3. Increased vocal resonance and slightly harsh breathing immediately below center of left clavicle are occasionally found. They do not indicate a lesion in the absence of other signs. 4. Fine crepitations over sternum or heard when stethoscope touches edge of that bone are not pathologic. 5. Clicks heard during strong breathing or after cough in the vicinity of the costosternal articulations (below the first) in the absence of other signs are not indicative of a lesion. 6. Sounds resembling râles at base of lung, especially in right axilla, are not pathologic if strictly limited to the base and to inspiration and not accompanied by other signs. 7. The same is true of sounds resembling râles over the lingula (heart apex) heard on cough. 8. Prolonged expiration at left base posteriorly, limited to this region, is not abnormal. 9. Slightly prolonged expiration at about the angle of the scapula, disappearing a short distance above this point, is not a sign of a lesion, if alike on both sides (transmission from normal bronchi) and not accompanied by other signs.

11. **Inoculation with Tubercle Bacilli.**—In attempting to do some experimental work with pleural effusions, Paterson found that the pleural cavity of rabbits, inoculated with virulent tubercle bacilli after a pneumothorax had been established, did not respond to the inoculation with the development of fluid. It was further discovered that a second inoculation of bacilli into the same pleural cavity some weeks later resulted in a rapid accumulation of bloody serous exudate, rich in leukocytes. The problem was therefore suggested as to whether a sensitization of the pleura prior to inoculation was necessary for the development of an effusion and whether this sensitization might not be a part of a general change in reaction produced by an already existing tuberculosis. Hence Paterson endeavored to determine the differences in reaction, following the inoculation of virulent tubercle bacilli into the pleura of normal guinea-pigs and of those which have been previously vaccinated with bacilli of low virulence and as a result have developed a localized glandular tuberculosis and show a tuberculin sensitiveness.

These experiments showed that intrapleural inoculations of tubercle bacilli in tuberculous guinea-pigs result in an exudation of serum, leukocytes, red blood cells and fibrin. Similar inoculations in normal guinea-pigs elicited no noticeable pleural reaction. The acute pleural reaction in tuberculous animals tend to localize the infection which is rapidly disseminated in normal controls. The length of life after intrapleural inoculation is much greater in tuberculous than in normal guinea-pigs. The effusions are capable of causing tuberculosis in normal guinea-pigs although no bacilli can be found. Tubercle bacilli are probably absorbed through both

the parietal and visceral pleura. Fibrous adhesions are formed by the organization of the fibrin. Clinical pleural effusions are caused by the infection of an allergic pleura.

Arkansas Medical Society Journal, Little Rock

August, XIV, No. 3

- 13 Deductions from Three Hundred Surgical Cases. M. D. Ogden, Little Rock.—p. 51.
- 14 Urticaria. C. T. Drennen, Hot Springs.—p. 57.
- 15 Electrotherapeutics. J. K. Smith, Texarkana.—p. 59.

Boston Medical and Surgical Journal

August 23, CLXXVII, No. 8

- 16 Medical Profession and Social Progress. A. F. Downing, Cambridge.—p. 237.
- 17 Studies of Infant Feeding. Mineral Constituents (Ash) of Milk. A. W. Bosworth and H. I. Bowditch, Boston.—p. 248.
- 18 Basic Principles in Symptomatology of Bright's Disease. H. Elwyn, New York.—p. 251.
- 19 *Epidemic of Dysentery at Boston State Hospital, Due to Member of Paratyphoid Enteritidis Group. M. E. Morse and G. Tryon, Boston.—p. 255.

August 30, No. 9

- 20 The Hospital Follow-Up System. C. C. Simmons, Boston.—p. 275.
- 21 Uniformity in Hospital Morbidity Reports. E. A. Codman, Boston.—p. 279.
- 22 Standardization of Hospitals. J. G. Bowman, Chicago.—p. 283.
- 23 Efficiency Tests Applied to Attending and House Physicians of Cook County Hospital, Chicago. J. A. Capps, Chicago.—p. 286.
- 24 Significance of Persistent Pain or Other Symptoms Referred to Peripheral Nerves. H. W. Wright, San Francisco.—p. 287.
- 25 Treatment of Viscerotropic. R. F. Chase, Portland, Me.—p. 290.
- 26 Relations of Prenatal and Postnatal Work. M. M. Davis, Jr., Boston.—p. 294.

19. **Epidemic of Dysentery.**—Morse and Tryon describe an acute very contagious disease, of short incubation period, appearing in three forms: the dysentery-septicemic-pneumonic; the pure dysenteric, and diarrheal. The conditions found in the virulent fatal cases were a membrane ileocolitis, septicemia and a pneumonia with miliary abscesses and large areas of necrosis. The severer forms of the disease occur in debilitated persons. Immunity is of short duration, and recurrences (usually mild) are frequent. The causative organism is a member of the paratyphoid enteritidis group, more closely allied, as shown by agglutination tests, with paratyphoid B, *B. suipestifer* and *B. enteritidis* than paratyphoid A, but not identical with any of them. The disease was limited to certain buildings of the Boston State Hospital. The epidemic was preceded by mild diarrheas among patients and attendants, then broke out in violence in one ward, and was passed from person to person by contact. The source of the infection was not definitely determined. The close affinity of the organism with certain members of the group (*suipestifer* and *enteritidis*) which are associated with animals, suggests the possibility of such an origin. No evidence was obtained connecting the human epidemic with an outbreak of hog cholera which had prevailed in the piggery during the previous summer, but the pathologic anatomy of the two diseases presents certain features of similarity. The hypothesis is suggested that the infection was introduced by the contamination of food in the refrigerator by rats, the infection appearing first as mild cases of diarrhea, then as an outbreak in a single ward, due probably to gross contamination of the food by a human carrier, the difference in the severity of the disease depending on the physical condition of the persons attacked, and possibly also on the rapid transfer of the virus.

Prophylactic inoculation will not suppress the disease among feeble patients, although it may have some influence in mitigating its severity. Among strong persons, however, it appears to be of more value, in reducing both the number of cases and the type of the disease. Vaccine treatment during the disease has given good results. A polymorphonuclear hyperleukocytosis occurs after both the prophylactic and therapeutic administration of vaccine. The leukocytic reaction is more marked in the stronger normal individuals than in the feeble ones who have had the disease and recurrent attacks. Agglutinin formation in the disease is very moderate. Agglutinins for the organism persist in some cases as long as fourteen and seventeen months after the original attack, when there has been no recurrence. After prophylactic vac-

cination, low titers have been obtained up to eleven months. Intradermal tests with concentrated glycerin broth cultures of members of the paratyphoid enteritidis group have given unreliable and conflicting results. Tests with powdered cultures are to be undertaken.

Canadian Medical Association Journal, Toronto

August, VII, No. 8

- 27 Past and Present. F. J. Shepherd, Montreal, Que.—p. 673.
- 28 Modern Conception of Public Health Administration and Its National Importance. C. J. Hastings, Toronto.—p. 684.
- 29 Study of Certain Psychogenetic Conditions Among Soldiers. C. K. Russel.—p. 704.
- 30 Cholecystectomy vs. Cholecystostomy (Technic and Complications); Treatment of Gastric and Duodenal Ulcer; Relationship of Thyroid to Exophthalmic Goiter. G. W. Crile, Cleveland.—p. 721.

Florida Medical Association Journal, Jacksonville

August, IV, No. 2

- 31 Volkmann's Contracture. J. K. Simpson, Jacksonville.—p. 33.
- 32 Advantages of Proper Handling of Acute Appendicitis. E. Jelks, Jacksonville.—p. 37.
- 33 Indications and Abuse of Cesarean Section. F. J. Waas, Jacksonville.—p. 39.
- 34 Sigmoid. M. H. Smith, Jacksonville.—p. 43.
- 35 Factors in Union and Use of Traction Suture Plates in Abdominal Incisions. R. R. Kime, Lakeland.—p. 45.
- 36 Food Value and Wholesomeness of Self-Rising Flour. H. O. Snow, Tampa.—p. 48.

Georgia Medical Association Journal, Augusta

August, VII, No. 4

- 37 Intensive Fattening; Some Results in Abdomen. W. W. Blackman, Atlanta.—p. 61.
- 38 Importance of Careful Examinations Before Advising Surgical Operations. E. C. Davis.—p. 65.
- 39 Review of Two Hundred Operations for Acute Abdomen, with Fifteen Deaths. R. M. Harbin and W. P. Harbin, Rome.—p. 67.
- 40 Traumatic Rupture of Viscera without External Wound. F. K. Boland, Emory University.—p. 74.

Indiana State Medical Association Journal, Fort Wayne

August, X, No. 8

- 41 Conservative Treatment of Penetrating Wounds of Eyeball. A. E. Bulson, Jr., Fort Wayne.—p. 307.
- 42 Leprosy in Indiana; Report of Case. S. L. Egart, Indianapolis.—p. 312.
- 43 First Aid Work of United States Bureau of Mines. A. F. Knoefel, Terre Haute.—p. 314.
- 44 Review of Prescription Work. C. N. Howard, Warsaw.—p. 317.

Journal-Lancet, Minneapolis

August 1, XXXVII, No. 15

- 45 *Uremia, Etiology, Types and Diagnosis. L. G. Rowntree, Minneapolis.—p. 491.
- 46 Certain Methods Used in Laboratory Investigation of Acidosis and Renal Function. J. M. Northington, Minneapolis.—p. 496.
- 47 Present Status of Acute Infections of Kidney. J. S. Gilfillan and W. A. Dennis, St. Paul.—p. 498.
- 48 Pituitary Extract. A. A. Conley, Cannon Falls.—p. 505.
- 49 Gastric Ulcer. J. C. Baker, Ramona, S. D.—p. 507.

August 15, No. 16

- 50 Fractures at Elbow. E. P. Quain, Bismarck, N. D.—p. 521.
- 51 Wire Filigree in Closure of Large Hernias. H. B. Sweetser, Minneapolis.—p. 530.
- 52 Neglected Surgery. R. S. Westaby, Madison, S. D.—p. 534.
- 53 *Acute Postoperative Obstruction and Paresis. E. H. Beckman, Rochester.—p. 535.
- 54 Medical and Surgical Nomenclature. F. W. MacManus, Williston, N. D.—p. 538.
- 55 If Your Son Is to Become Specialist in Practice of Medicine, How Shall He Secure His Training? F. C. Todd, Minneapolis.—p. 541.

45. **Uremia, Etiology, Types and Diagnosis.**—Rowntree says he has repeatedly seen acute exacerbations of uremia manifestations follow the administration of high protein diet in chronic nephritis, while, on the other hand, he has seen chronic uremia disappear on low protein diet. As a result of personal studies he is thoroughly convinced that acidosis is not responsible for uremia. The acidosis can be corrected without the disappearance of uremia, and death from uremia may still occur. Except in acute uremia he has yet to see anything but temporary relief from the correction of the acidosis. In the vast majority of cases the treatment adopted is based on

the theory of retention of products of metabolism. Indeed, he feels that it is wise to pursue this line of treatment in every case of uremia. When edema of the brain is present the question of mechanical relief of cerebral pressure may need to be considered. Lumbar puncture may be of the greatest value in cases with marked headache dependent on cerebrovascular changes. If acidosis coexists, alkali should be administered, but only to the point of correcting the acidosis, not indiscriminately in all cases of uremia nor in the large amounts recently advocated. In every case of uremia it is the physician's duty to determine if possible the underlying cause and to treat the case accordingly.

53. Acute Postoperative Obstruction and Paresis.—Occasionally, Beckman says, splendid results may be obtained with eserine or pituitary extract. On the other hand, it is often disappointing not to obtain the results expected. When all other results fail, an enterostomy at the lowest point of the distended intestine is often a life-saving measure, as in the case of a boy who had an acute attack of appendicitis. An unsuccessful search was made for the cecum through a small McBurney incision. This was closed, and a midline incision made. After considerable manipulation and packing off of the intestine it was found that the entire cecum had a very long mesentery and lay on the left side of the abdomen. The appendix, which was reddened but not ruptured, was removed, and the abdomen was closed without drainage. The patient had an apparently normal convalescence the first forty-eight hours. At the end of that time he appeared exhausted; the pulse rate began to increase; he vomited, and no result was obtained with enemas. The abdomen was flat, except possibly for a little distention in the epigastrium. Routine washing of the stomach every four hours was carried out. After the third day oil was given through the stomach tube, and at the next washing almost the entire amount was obtained. Condition unchanged.

There was no abdominal distention, no complaint of pain, and no temperature, but the pulse rate increased, and exhaustion increased in spite of salines given by bowel. On the fourth day at 5 p. m. the midline incision was reopened. The abdominal fluid had not increased, nor was there any evidence of inflammation in the abdomen. The jejunum was enormously distended from its beginning for a distance of about 4 feet. At this point, and without any evidence of adhesions, the distention ended abruptly, the remainder of the small intestine being entirely collapsed and contracted. An enterostomy was done at the lower point of the distended intestine, and a good sized rubber catheter introduced into the bowel. Almost no gas escaped through the catheter. During the first night 2 or 3 ounces of secretion came through the catheter. The next day this amount increased, and twenty-four hours after the second operation a small amount of gas was passed by the bowel. Vomiting ceased, and convalescence progressed from this time on. Beckman is convinced that this patient would have died if an enterostomy had not been performed.

Journal of Cancer Research, Baltimore

July, II, No. 3

- 56 *Alleged Increase of Cancer. W. F. Willcox, New York.—p. 267.
57 Tumors of Kidney in Rabbits. E. Scott, Cleveland.—p. 367.
58 *Distribution of Immune State in Mice. Second Communication on Homologous Immunity to Malignant Mouse Tumors. M. Tsurumi.—p. 373.
59 *Sulphur Metabolism in Carcinoma. M. Kahn, Pittsburgh.—p. 379.
60 *Traumatic Rhabdomyosarcoma Following Successive Fractures of Femur. H. R. Muller, New York.—p. 393.
61 *Comparative Pathology of Cancer of Stomach with Particular Reference to Primary Spontaneous Malignant Tumors of Alimentary Canal in Mice. M. Slye, H. F. Holmes and H. G. Wells, Chicago.—p. 401.
62 *Trauma and Primary Mouse Tumors. M. C. Marsh, Buffalo.—p. 427.
63 Tumor Immunity in Chick Embryo. H. N. Stevenson, New York.—p. 449.

56. Alleged Increase of Cancer.—The reported mortality from cancer is increasing in almost every part of the world from which reports exist, but Willcox's study shows that the real mortality, if it is increasing at all, is certainly not increasing with equal rapidity. In England and the United States the increase in cancer mortality is parallel with the

increase in mortality from appendicitis and both may be due entirely, as they certainly are in large degree, to the improvement of diagnosis. The cumulative evidence that improvements in diagnosis and changes in age composition explain away more than half and perhaps all of the apparent increase in cancer mortality rebuts the presumption raised by the figures and makes it probable, although far from certain, that cancer mortality is not increasing.

58. Distribution of Immune State in Mice.—The immune state produced by Tsurumi in mice by a single subcutaneous inoculation of mouse embryonic skin (0.05 c.c.) has been shown to extend to an internal organ—the lungs, and to the peritoneal cavity. In other words, resistance is not localized, but is distributed all over the body of immunized animals. This fact allows the assumption of the presence in immunized animals of some substance which is able to cause resistance and which is distributed throughout the body of such animals.

59. Sulphur Metabolism in Carcinoma.—In carcinoma there is generally observed an increase in the percentage of neutral sulphur in the urine. This may be ascribed to a lessened power of oxidation or to an increased destruction of tissue with the failure of the organism to oxidize the broken down products to the sulphate (oxidized) state. Kahn found that the colloidal nitrogenous substances are increased in the urine of cancer patients, as well as in the urine of anemic, diabetic and syphilitic individuals, etc. It has been the experience of the author that the determination of this fraction in conjunction with the Salomon-Saxl test for the so-called "neutral sulphur" is of great aid in the diagnosis of carcinoma if both of these tests are positive. A negative result with either the Salkowski-Kojo test or the Salomon-Saxl test detracts very much from the significance of the results so far as carcinoma is concerned.

60. Traumatic Rhabdomyosarcoma.—Clinically, Muller's case is of interest in that the tumor developed apparently in a femur which had twice been the seat of a fracture, and which later had been treated for periostitis. Pathologically it is noteworthy in that its morphology differs strikingly from that of a bone sarcoma, and that it must be regarded as a tumor arising in muscle tissue.

61. Cancer of Stomach.—A review of the literature made by the authors shows that in all animals except man, carcinoma of the stomach is extremely uncommon and the recorded cases found in the lower animals are here collected and discussed briefly. In animals with a rumen, or in which the cardia is lined by squamous epithelium, carcinoma of this tissue is observed much more frequently than in the glandular gastric mucosa. Only four cases of carcinoma of the stomach of mice could be found recorded in the literature, all in the squamous cardiac portion. In 16,500 necropsies on mice dying natural deaths at all ages in this laboratory, the authors have found three squamous cell carcinomas of the cardia, and one tubular pyloric carcinoma; the latter apparently resulted from the presence of a hair ball in the stomach. One gastric neoplasm, resembling closely a sarcoma, was also observed. Carcinoma of the intestine is also very rare in mice, the only case observed in the Slye stock being a squamous cell carcinoma arising in the external surface of a chronically prolapsed rectum. The significance of man's susceptibility to carcinoma of the stomach is not yet known, but probably it depends on the heat of his food or the condiments employed in seasoning it or on the chemical changes produced by cooking.

62. Trauma and Primary Mouse Tumors.—Investigations were begun by Marsh in the hope of finding a stimulus, injury, or irritation, which, when applied to the mammary gland of the mouse, would incite neoplastic proliferation and lead to the development of true tumors. The first trials aimed to open the skin, in imitation of the bites and other injuries to which mice are naturally liable, and through which the mites of the skin would, though probably involuntarily, find their way beneath the skin and thus be in a position to influence the mammary epithelium. Needle scratches and punctures were entirely negative. The skin in the mammary regions of thirty-three mice was slit in many places with a sharp scalpel

point. One tumor resulted after three months. The skin of eighty-two old females past the breeding age was punctured in many places with a jeweler's file, the rough surface of the file serving to scrape the edges of the wound and carry in scurf, parasites, and sometimes hairs. In three experiments, a total of six tumors in six mice resulted between the first and fifth months. Implants of skin with hair stubble proved negative, likewise injected skin scrapings and subcutaneous implants of living mites.

Injection of mites ground in salt solution into seven spontaneous tumor mice were made. Three of the seven mice developed each an additional tumor; two of these became recognizable fifteen days after injection, and one of them was in the field of the injection. The other mouse developed an additional tumor after four months, at a distance from the injection. Water injections through the nipples, subcutaneous injections of tap water, mammary injury and tap water injections were negative. Nine normal mice were fed with skin scrapings containing living and dead mites. All the mice died within forty-four days, and only one showed definite mammary reaction in the form of a few small adenomas. One had a small lung adenoma. Pressure injury to the mammary gland was negative. Injury after feeding with mouse skin was negative. Attempted air injections into the mammary alveoli in five normal breeding female mice were positive. One died after eighty-one days; it had had no tumor at the last examination, about one month before death. The other four all developed mammary growths between the third and sixth months after injection. Air injected subcutaneously, and mammary injury in presence of air were negative. Injury to the nipples showed that in eighteen virgin mice no tumors resulted, but ten females 13 months old, soon after their first and only parturition, were treated in the same way, save that nearly all the nipples in each mouse were pricked; half these mice had lost their young, while the others were nursing their litters. Six mice survived after five months, during which three have developed tumors between the sixth week and the third month, in the region of the pierced nipples.

More than 1,100 mice have been used in over sixty experiments in irritation and trauma, and in the main with negative results. These experiments as a whole might be summed up as tending strongly to exclude acarine parasites of the mouse from any concern with the origin of mouse tumors; as showing how extensive a series of acute injuries fails to inaugurate tumors; and in indicating a simple and definite form of trauma which seems to have a material effect in raising tumor incidence in old breeders. Incidentally one may further infer that the effective factor hidden in any mechanical procedure which appears to start tumors is a very subtle one, and that its isolation or identification is a very difficult task.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

August, X, No. 2

- 64 Toxic Action of Opium Alkaloids Individually and in Combination with Each Other on Paramecia. D. I. Macht and H. G. Fisher, Baltimore.—p. 95.
- 65 *Toxicity of Phosphates in Relation to Blood Calcium and Tetany. C. Binger, Baltimore.—p. 105.
- 66 *Perfusion of Mammalian Medulla; Action of Ethyl Alcohol. D. R. Hooker, Baltimore.—p. 121.
- 67 *Experiments with Succinate and Its Hydroxy Derivatives on Isolated Frog Heart. W. Salant, A. E. Livingston and H. Connet, Washington, D. C.—p. 129.
- 68 *Endermic Reactions. Experiments on Local Urticaria. T. Sollmann, Cleveland.—p. 147.

65. **Toxicity of Phosphates.**—The results of Binger's studies show that solutions of orthophosphoric acid and its sodium salts, when injected intravenously in dogs, cause a diminution in the amount of calcium in the serum. The degree of diminution in calcium content or serum depends on the amount of phosphate introduced. When the phosphate solution is injected in amounts equivalent to 150 gm. phosphorus per kilogram, the serum calcium drops from its normal level of 10 mg. per 100 c.c. to approximately 6 mg. At this level a condition of tetany supervenes, provided the neutral or alkaline salts have been injected. With acid phosphate solu-

tions, the calcium drop occurs unaccompanied by tetany. The region at which the phosphate solutions become toxic when injected in the doses here employed lies in the neighborhood of P 6.0.

66. **Perfusion of Mammalian Medulla.**—Perfusion of the medulla in the dog with defibrinated blood to which ethyl alcohol has been added to 0.025 per cent., stimulates respiration. If the amount of alcohol be increased to 0.1 per cent., the respiratory response is greater than with 0.025 per cent. alcohol. If the amount of alcohol be further increased to 0.2 per cent., a transitory stimulation occurs which is followed by a prolonged inhibition of respiration. Concomitant observations on the heart rate and arterial blood pressure indicate that the former is not affected while the latter is raised.

67. **Experiments with Succinate on Isolated Frog Heart.**—The chief conclusions drawn by the authors are as follows: sodium succinate and its hydroxy derivatives are cardiac depressants, but weak solutions of some of the isomers of the salts of tartaric acid may produce stimulation. The toxicity of the derivatives of succinate increases with the entrance of hydroxyl groups. Stimulating after effects were observed in experiments with tartrates. In experiments with repeated perfusions the depressing effects observed at first gradually diminished and stimulation was finally observed. The evidence obtained in this investigation contradicts the calcium precipitation theory advanced in explanation of the mode of action of tartrates and other organic salts whose calcium compounds are soluble with difficulty. The point of action of the salts is probably nervous in origin and not muscular. Simultaneous stimulation of inhibitory and motor mechanisms is suggested to explain the different and opposite effects produced by some of the compounds. The sodium salt of levotartaric acid was the most active of all the isomers of tartaric acid.

68. **Endermic Reactions.**—Sollmann's conclusions are as follows: Local urticarigenic agents do not sensitize the skin at a distance toward water. The local application of morphin to the scarified skin produces a distinct though limited analgesia. The severity of urticarial reaction does not decrease in strict proportion to the dilution. However, the difference of the urticarial reaction is sufficient to show the rapid deterioration of dilute histamin solutions. The combination of several weak urticarigenic agents does not produce marked potentiation. The morphin urticaria is not materially influenced by the local application of calcium or barium chlorid. Epinephrin and morphin are somewhat antagonistic in their vascular actions. Morphin may therefore remove the epinephrin blanching; but epinephrin cannot remove the morphin edema effectively. The fading of a drug urticaria is not due to rapidly acquired tolerance. Repeated applications do not increase the severity of the urticaria beyond a certain point; but this seems to be due to inherent limitations in the drug irritation. Excised human skin is not altered by the usual urticarigenic agents.

Medical Record, New York

August 25, XCII, No. 8

- 69 Treatment of Chronic Bright's Disease. J. M. Anders, Philadelphia.—p. 311.
- 70 Are There Subjective Pains? M. Solomon, Chicago.—p. 314.
- 71 Hospital Social Service in New York. N. G. Seymour, New York.—p. 320.
- 72 Should We Be More Conservative in Use of Artificial Pneumothorax? J. R. Williams, Asheville, N. C.—p. 323.
- 73 Care of Feet in Pregnancy. G. Gellhorn, St. Louis.—p. 326.
- 74 Case of Bothrioccephalus Infection. C. G. McGaffin, Kings Park.—p. 327.
- 75 Massage and Exercises in After-Care of Poliomyelitis. F. Berg, New York.—p. 329.

Missouri State Medical Association Journal, St. Louis

August, XIV, No. 8

- 76 *Cystoscopic Examination of Bladder in Psychoses. F. M. Barnes, Jr., and J. R. Caulk, St. Louis.—p. 329.
- 77 Transplantation of Fat, Fascia and Living Tissue in Surgery; Report of Experiences in Various Conditions. A. B. Kanavel, Chicago.—p. 333.
- 78 Report on Medical Education. A. W. McAlester, Columbia.—p. 340.

- 79 Plea for Establishment of Standardized County General Hospitals. F. G. Nifong, Columbia.—p. 343.
80 Methods and Results of Educational Work in Control of Cancer. F. J. Taussig, St. Louis.—p. 347.
81 Nephritis and Endocarditis; Report of Case. O. H. Brown, Phoenix, Ariz.—p. 349.
82 Some of Secretary's Duties and His Part in Maintaining an Interesting County Society. J. F. Roberts, Bolivar.—p. 351.

76. **Examination of Bladder in Psychoses.**—In a second series of cases of psychoses examined by Barnes and Caulk the neurologic findings were such as to lead to the expectation of a positive bladder picture in 23 per cent., whereas this positive picture was found in 54 per cent. The authors emphasized the fact that the appreciation of this bladder picture bears an important surgical significance, as its recognition will often spare an unnecessary operation and lessened postoperative incontinence. They believe that the results of their work quite definitely indicate that the cystoscope has an important field in the differentiation of functional from organic diseases of the central nervous system.

New York Medical Journal

August 25, CVI, No. 8

- 83 Value of Roentgen Rays in Diagnosis of Carcinoma of Stomach. R. H. Boggs, Pittsburgh.—p. 341.
84 Case of Heredocerebellar Ataxia (?) Presenting Unique Features. F. X. Dercum, Philadelphia.—p. 346.
85 New Combination Observation, Catheterizing and Operating Cystoscope. L. Buerger, New York.—p. 347.
86 Cellular and Humoral Factors in Anaphylaxis and Immunity. W. H. Manwaring, A. R. Meinhard and Y. Kusama, Stanford University, Calif.—p. 348.
87 Diagnosis of Gastric Ulcer, Duodenal Ulcer and Gastric Cancer. A. Woldert, Tyler, Texas.—p. 349.
88 Clinical Neurologic Examinations. J. C. Keeler, Philadelphia.—p. 354.
89 Elements of Success in Treatment of Diabetes. J. Safian, New York.—p. 357.
90 Local Anesthesia in Sixty Operations for Acute and Chronic Appendicitis. J. Wiener, New York.—p. 360.
91 Case of Acute Inflammatory Glaucoma Produced by Instillation of One Drop of One Per Cent. of Homatropin. M. J. Levitt, Brooklyn.—p. 362.
92 Medical Department of United States Army. W. W. Reno.—p. 363.
93 Some Medical Aspects of War. T. H. Goodwin.—p. 367.

Philippine Journal of Science, Manila

September, 1916, XI, Sec. B, No. 5

- 94 Congenital Bilateral Absence of Kidneys in A One Hundred and Forty-Millimeter Pig Embryo. A. Garcia, Manila.—p. 191.
95 *Poisoning by Illicium Religiosum Siebold. L. E. Guerrero, D. Je la Paz and A. L. Guerrero, Manila.—p. 203.
96 Rinderpest in Swine with Experiments on Its Transmission from Cattle and Carabaos to Swine and Vice Versa. W. H. Boynton, Manila.—p. 215.

95. **Poisoning by Illicium Religiosum Siebold.**—Four cases of poisoning by illicium religiosum are reported by Guerrero and his associates. According to these cases the following symptoms may occur: foaming at the mouth, repeated vomiting, diarrhea, thirst, unconsciousness, clonic and tonic convulsions, cramps in the legs, cephalalgia, mental disturbances, insomnia, profuse sweating, oliguria or anuria, large, strong pulse, giving place to small rapid pulse, cold extremities, contracted or dilated pupils, paresis of the lower limbs and exhaustion. The vomitus may be streaked with blood. During the convulsions the pupils as a rule dilate, the eyeballs bulge, the head is retracted toward the back, the respiration stops, and the face is cyanotic. In severe or fatal cases of poisoning in man, repeated vomiting, diarrhea, clonic and tonic convulsions which appear in paroxysm, cramps in the legs, and retraction of the head appear to be the most conspicuous symptoms.

The rational treatment of poisoning by illicium religiosum will not be possible till the chemical and pharmacologic reactions of its poisonous principle are definitely established. If the poison was introduced per orem, as is usually the case, the stomach should be rapidly evacuated, either by the use of apomorphin or of the stomach tube. Apomorphin offers decided advantage over the other medicinal emetics, on account of its ready action and the facility with which it can be administered, and lastly because it will produce emesis without causing further irritation of the stomach. After the

stomach is evacuated, demulcent drinks or emollients may be administered. In the authors' opinion liquid paraffin is the most preferable. It is not absorbable and is not changed by the digestive juices; hence its soothing effect will extend to the entire length of the alimentary tract. The efficacy of safe quantities of chloral hydrate against violent spinal convulsions is doubtful, since the action of such quantities on the spinal cord is little. The authors used this drug in one of their cases, but from experiments and the studies of Langaard, they believe that the best method of controlling the convulsions is by the careful inhalation of ether followed by the administration of chloral hydrate and sodium or potassium bromid; the bromids enhance the sedative effects of chloral hydrate. In the later stage of the poisoning, when paralytic symptoms predominate, these drugs are emphatically contraindicated. The treatment in this case is chiefly a struggle to keep up the working of the paralyzed respiratory center, the circulatory apparatus, and the organs of elimination.

Public Health Journal, Toronto

August, VIII, No. 8

- 97 Control of Venereal Diseases. G. Bates, Toronto.—p. 187.
98 Venereal Disease Campaign in New York City. L. Chargin, New York.—p. 190.
99 Church and Sanitation. G. G. Melvin, St. John, N. B.—p. 196.
100 Vital Statistics. J. Martin, Regina, Sask.—p. 203.

Southwest Journal of Medicine and Surgery, El Reno, Okla.

August, XXV, No. 8

- 101 Summer Diarrhea of Babies. A. T. Coley, Oklahoma City.—p. 185.
102 Acute Anterior Poliomyelitis. C. W. Garrison, Little Rock, Ark.—p. 191.
103 Plea for Uniform Technic in Wassermann Test. W. H. Bailey, Oklahoma City.—p. 197.
104 Fractures of Neck of Femur. M. E. Stout, Oklahoma City.—p. 201.
105 Calcereous Ovary. W. E. Dicken, Oklahoma City.—p. 205.

Texas State Journal of Medicine, Fort Worth

August, XIII, No. 4

- 106 *Blood Transfusion in Anemias. M. L. Graves, Galveston.—p. 137.
107 Roentgenotherapy of Skin Cancer. J. M. Martin, Dallas.—p. 141.
108 *Vomiting of Pregnancy; Cause and Treatment. C. R. Hannah, Dallas.—p. 145.
109 Why Quarantines Fail in Protection of Public Health. S. A. Woolsey, Austin.—p. 147.
110 Practical Application of Blood Grouping in Transfusion. W. F. Starley, Jr., Galveston.—p. 150.
111 Pasteurization of Corneal Ulcers. C. B. Williams, Mineral Wells.—p. 156.

106. **Blood Transfusion in Anemias.**—Graves' experience does not lead him to believe that blood transfusion in the present state of our knowledge may be regarded as a curative agent in pernicious anemia, notwithstanding the marked amelioration of symptoms, general improvement and even apparent remissions of the disease obtained by their employment.

108. **Treatment of Vomiting During Pregnancy.**—The following treatment is employed by Hannah: Insist on the patient taking her breakfast in bed and remaining there for one or two hours. Eat whatever she wants at any time during the day and even immediately after vomiting. Make a thorough vaginal examination. If she is normal, let her alone. Give large doses of sodium bicarbonate (1 dram to 8 ounces of water) six times daily.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Medical Journal of Australia, Sydney

July 7, II, No. 1

- 1 Extracts from a General Practitioner's Notebook. C. Joyce.—p. 1.
2 *New Method of Operating for Retrodisplacements of the Uterus. H. W. Sweetnam.—p. 3.
3 Granuloma Pudendi. C. G. Thorp.—p. 4.
4 Strangulation of Cecum in Inguinal Hernia Sac, complicated by Acute Appendicitis in Infant Sixteen Months Old. H. Bullock.—p. 5.
5 Embryoma Testis. H. M. Moran.—p. 5.
6 Colitis Polyposa. P. E. W. Smith.—p. 6.
7 Wide Propagation of Heart Murmur. F. G. Griffiths.—p. 8.

2. Operation for Retrodisplacement of Uterus.—Sweetnam's operation is a modification of the original Alexander-Adams operation. The essential features of his operation are: (1) a transverse superficial suprapubic incision, and (2) a vertical midline entry of the abdomen, permitting the palpation and inspection of the pelvic organs, appendix, etc. The author claims that his method is superior to the Alexander-Adams operation because it permits of a thorough inspection of the pelvis so that any pathologic condition may be detected; the exact position in which the uterus is placed can be determined both by sight and touch; it greatly lessens the contraindications to the Alexander principle of dealing with a retrodisplaced uterus, and the uterine condition and a diseased appendix can be dealt with through the one incision, while still preserving the Alexander principle of treating the displacement.

Practitioner, London

August, XCIX, No. 2

- 8 *Transverse Colostomy. P. L. Mummery.—p. 101.
- 9 Some Hints on the Tonsil Adenoid Operation Based on an Experience of 5,000 Cases. D. McKenzie.—p. 109.
- 10 *Contributory Causes of Cancer of the Throat. W. S. Low.—p. 122.
- 11 *Reduction of Blood Pressure by Nasal Cauterization. A. Francis.—p. 129.
- 12 Acute Glaucoma or Iritis? G. F. C. Wallis.—p. 137.
- 13 Some Cases of Acute Surgical Abdominal Disease Presenting Special Features. C. Bennett.—p. 145.
- 14 Plea for Caution in Surgery of Suspected Renal and Ureteric Calculus. G. Taylor.—p. 151.
- 15 Balneologic Treatment of Angina Pectoris. L. T. Thorne.—p. 155.
- 16 *Obesity and Its Vicious Circles. J. B. Hurry.—p. 164.
- 17 *Case of Bilateral Suprarenal Hemorrhage. J. Eadie.—p. 183.
- 18 Case of Bilateral Ossification in Brachialis Tendons. N. A. Sprott.—p. 188.

8. Transverse Colostomy.—Mummery calls attention to the fact that transverse colostomy, while offering certain advantages over sigmoid colostomy, should not be made a routine operation, but each case should be decided on its merits. This operation appears to afford better control over the stools than does sigmoid colostomy, and prolapse is much less common. In performing transverse colostomy, the colon should not be opened at the most dependent part, but as near the splenic flexure as is possible without causing tension. When the transverse colon is short, sigmoid colostomy should be preferred. The colon should subsequently be cut in half to arrest the peristaltic wave at the opening.

10. Cancer of the Throat.—One of the results of syphilis, in Low's opinion, is a predisposition, in association with other conditions, to cancer. In twelve cases of cancer of the throat, now under observation, syphilis had been contracted in earlier years. One of the most constant conditions present in all cases is sepsis of the throat from the presence of carious teeth, pyorrhea alveolaris or septic gingivitis. The normal reaction of the mouth fluids is alkaline, but in the presence of these septic conditions it is acid. The increased irritating effects of such acid fluids on the mucous covering of the throat is considerable, and may well prove a contributory factor to cancer of the throat. Nearly 96 per cent. of the cases investigated by Low have occurred in men, and in nearly every instance the patient has used tobacco to excess. Another pernicious influence noted was the baneful but common one of consuming very hot food, and all the cases investigated were found to be people who believed in the free use of common table salt. Salt increases the acidity of the alimentary tract and so causes irritation. Any form of nasal obstruction that leads to oral respiration, and one of the commonest is displacement of or irregularities in the nasal septum, is followed by chronic dryness of the mucous membrane of the throat. In the majority of cases of throat cancer well marked nasal obstruction has been found present.

11. Reduction of Blood Pressure by Nasal Cauterization.—Francis raises the blood pressure by touching different spots in the nose. In cases of abnormally high pressure he has gotten a lowering initially of 20 mm. of mercury; although the pressure tends to rise again it never reaches its original height, and by persevering with the treatment an ultimate reduction of from 20 to 40 mm. usually can be obtained. Raising the blood pressure is a less certain result than its

reduction. The effect is produced by acting on the sympathetic fibers in the mucous membrane, probably by inhibiting vasoconstrictor action. In a fair percentage of cases the results are lasting. Good results have been obtained in cases of asthma. Cauterizing the inferior turbinates has little or no effect on the blood pressure. There is a spot on the lower edge of the middle turbinate which will sometimes raise the pressure. Within certain limits, the higher on the septum one touches, the greater is the effect in reducing the pressure. Below the mid-horizontal line there is very little reduction.

16. Obesity and Its Vicious Circles.—The numerous vicious circles associated with obesity have been studied by Hurry. The respiratory circles may be combated by measures for promoting the cardiac, pulmonary and diaphragmatic efficiency. Breathing exercises are of value, since they increase blood oxygenation and thus promote fat absorption. The dyspeptic circle can be broken with a little self-denial and self-control. A diet rich in cellulose, such as cabbages, celery, spinach, etc., may be prescribed to stay the pangs of hunger. Laxative mineral waters diminish the absorption of food from the intestine. When the cardiovascular or respiratory systems are involved, the Bergonié system of passive electrotherapy is recommended by Hurry. Massage is also of value.

17. Case of Bilateral Suprarenal Hemorrhage.—A boy, five years of age, said to be suffering from pneumonia and abdominal pain, was referred to Eadie. Except for persistent enuresis the boy had always been perfectly well. When Eadie saw him, he was lying on his back in a somewhat apathetic state, without retraction of the head. His face was of a dusky mottled pallor; eyes closed; lips scaly and dry; tongue dry; every appearance of miliary tuberculosis or typhoid. Pulse, 96; temperature, normal; respiration not distressed. Urine, normal; abdomen, normal in every way; rectal examination, negative. Eye fundi normal. There was a remarkable disparity between the great prostration of the patient and the pulse, temperature and respiration. Nothing being found to account for the condition, an exploratory laparotomy was performed, apparently justified by periodic attacks of acute spasmodic pain referred to the upper abdomen, causing acute flexion of the thighs and ushered in by the *cri cerebral*. These attacks were accompanied by increased pulse rate. The patient did not indicate the locality of the pain, but his movements showed that it was in the upper abdomen. The spasm appeared to be very acute, and recurred about every ten or fifteen minutes. A careful search was made of the entire abdominal cavity but nothing was found that could be taken as a cause for the attacks. Death occurred thirteen hours after operation. Just before death, the boy twice vomited the watery contents of his stomach in forcible spurts. The rectal salines also were squirted with force out of the anus. At the necropsy, when the liver was turned up, a dark red hemorrhagic stain was observed close to the portal vein and extending toward the right suprarenal body. On removing the fat covering, the latter organ was found to look like a dark red clot. The left suprarenal body presented an appearance identical with a blood clot, but the staining had not penetrated through the surrounding fat. The left lung presented at its base a dark red, fleshy patch. A piece of this thrown into water floated. No other lesion was found elsewhere, not even the sexual peculiarities attributed by some to disease of the suprarenal bodies.

Journal of Pathology and Bacteriology, Cambridge

April, XXI, No. 2

- 19 *Incidence of Bovine Infection of Tuberculosis in Man. C. K. Wang.—p. 131.
- 20 *Typhus Fever: Experiment with Vaccination with a Coccus Derived from Human Cases. M. Robertson.—p. 173.
- 21 Colloidal Nature of Wassermann Reaction. R. M. Walker.—p. 184.
- 22 Influence of Temperature on Fixation of Complement. H. R. Dean.—p. 193.
- 23 *Pathology of Worm Infection of Vermiform Appendix. Y. Matsuoka.—p. 221.
- 24 *Primary Tuberculosis of Faucial Tonsils in Children. A. P. Mitchell.—p. 248.
- 25 *Preparation of Solid and Liquid Media for Cultivation of Gonococcus. W. S. Cole and D. J. Lloyd.—p. 267.

19. **Incidence of Bovine Tuberculosis in Man.**—A bacteriologic investigation into 123 strains of tubercle bacilli obtained from 88 cases of tuberculosis in man was made by Wang. All the strains isolated were found to conform, in important respects, to either the human or the bovine type of tubercle bacillus. In no instance was an atypical strain conclusively demonstrated. Out of 68 cases of adults, bovine tubercle bacilli were separated in seven instances, namely, one from 29 sputum cases, two from 4 cases of abdominal tuberculosis, two from 7 cases of generalized tuberculosis, and two from 28 cases in which the only signs of tuberculosis were the calcareous or caseous lesions. Three of these bovine cases gave indication, on postmortem evidence, that the path of the infection was by way of the intestine. Out of 20 cases of children, the bovine type of bacillus was isolated in eleven instances. These were furnished by three out of 4 abdominal cases, three of 5 cases of generalized tuberculosis, three of 5 cases of tuberculous meningitis, and two of 8 cases with only calcareous or caseous lesions. In nine of these bovine cases the primary site of infection was in the intestine. The calcareous or caseous glands or nodules of twenty-eight adults and eight children were studied by Wang. From five of the former and two of the latter, the material conveyed tuberculous infection to the guinea-pig.

20. **Vaccination in Typhus.**—In July, 1914, Penfold isolated a coccus from the blood and from the urine of two patients during the acute stage of the disease, and the same coccus from the urine of a convalescent. Robertson undertook to test the connection of the organism with the disease and investigated the antigenic properties of the coccus as an immunizing agent against typhus. He isolated the coccus from the blood of two cases occurring in 1916, but found that monkeys vaccinated with this coccus had acquired no immunity against a subsequent intraperitoneal inoculation of blood from a typhus patient. No evidence was obtained of a causal connection between the coccus found in the blood and the clinical condition known as typhus fever.

23. **Worm Infection of Appendix.**—Matsuoka examined 103 appendices removed by operation. Worms or their eggs were found in 48; oxyuris in 29, tricocephalus in 2. The oxyuris was found in 9 per cent. of recently inflamed appendices and in 37 per cent. of 70 normal or slightly inflamed appendices. Eggs were seldom seen in inflamed appendices which contained worms. Worms were only exceptionally present in recent recurrent appendicitis, but when this was the case they were found in great numbers. Inflammation never occurred when the worm was in the mucosa. Worms were, therefore, neither directly nor indirectly the cause of acute or of old appendicitis.

24. **Primary Tuberculosis of Faucial Tonsils.**—Mitchell examined the tonsils removed from 100 children and 6 adults. The tonsils were removed either prior or subsequent to the operation for excision of tuberculous cervical glands. Forty-one cases showed undoubted tuberculous lesions in the tonsils; three of these were adults. Of 100 cases of hypertrophied tonsils removed, nine gave histologic evidence of tuberculous disease. In 92 of the 106 cases the inoculation test was employed. Positive results were obtained in 20 cases, the bovine bacillus being present in 16 and the human bacillus in 4 cases. Of the second group of 100 cases, nine yielded positive results on inoculation; the bovine bacillus was present in four cases, the human bacillus in two cases; undetermined in three cases owing to contamination of the cultures. Mitchell concludes that tuberculosis of the deep cervical glands develops from a primary focus in the faucial tonsil much more frequently than is generally supposed. Hypertrophied tonsils more rarely are the seat of tuberculosis. Tonsillectomy is, therefore, essential in all cases of tuberculous cervical adenitis in children. The author also advocates sterilization of milk by boiling for the artificial feeding of children.

25. **Cultivation of Gonococcus.**—The preparation of sterilizable, translucent agar media for the cultivation of the gonococcus and of broths for rapidly testing fermentation reactions is described by Cole and Lloyd. It is suggested

that the fermentation reactions of all suspected organisms in glucose, maltose and sucrose should be tested. The authors claim that the important factors necessary for the artificial propagation of the gonococcus are a suitable hydrogen-ion concentration, a high concentration of free amino-acids and the presence of certain special "growth hormones." The technic of retaining these growth hormones in solution after heat coagulation of blood and tissues is described. The effect of variations in hydrogen-ion concentration on viability is discussed, and it is suggested that too high a concentration inhibits initial growth, whereas too low a concentration favors subsequent autolysis.

Bulletin de l'Académie de Médecine, Paris

July 24, LXXVIII, No. 29, pp. 25-88

26 *Normal Parasitism and Microbiosis. V. Galippe.—p. 30.

27 Availability of Other Cereals to Take the Place of Wheat Bread. (Les succédanés du froment devant l'hygiène alimentaire.) E. Maurel.—p. 77.

28 *Antitetanus Serum in Prevention. A. Cheret.—p. 81.

29 Dermo-Epidermic Grafts in Repair of War Wounds. F. Debat.—p. 82. See Abstract 35 below.

26. **Normal Parasitism and Microbiosis.**—Galippe describes experiments with fruits and animal tissues which confirm the assumption of the existence of various parasites in the normal tissues of the vegetable and animal kingdom. But besides this more or less accidental normal parasitism, he says, there is another order of facts, more general, more constant, and dominating to a certain extent the life of the tissues, namely, the presence in the cell itself of living elements, elements indispensable to its functional activity. He accepts Béchamp's term of microzymas for them, and calls the manifestations of the biologic activity of these intracellular elements, microbiosis. These infinitely minute elements may survive the destruction of the cell, and then may acquire forms and biologic properties which they previously did not possess. They may functionate in a kind of autonomous manner, anarchistic, and may adapt themselves to the new conditions in which they find themselves and continue their evolution. The normal parasitism and the microbiosis may continue their evolution parallel or independently of each other. In his experiments with apples, etc., he relates that he was able to induce the appearance of micro-organisms from the microbiosis while excluding those from normal parasitism. The methods by which he realized this included mechanical trauma, contusions, etc., and he thus was able to trace certain manifestations of intracellular life and observe the appearance and evolution of certain living elements and cultivate them farther. These facts of general biology are applicable to all tissues, he says, all cells, whatever their origin. The most striking example is in war wounds. The crushed tissues in the wounds favor the development of the phenomena due to microbiosis. The danger from leaving these contused tissues in the wounds is recognized now by all surgeons, and the surgical cleansing out of the wound is now the routine practice. But the surgeons do this because they know these crushed tissues form the best culture medium for germs brought into the wound with the projectile. What they do not know, and what Galippe devotes the fifty pages of this monograph to prove, is that on account of the normal parasitism and the microbiosis, the part played by the crushed tissues and the extravasated blood is at the same time more important and more decisive. They may give birth directly and without foreign collaboration to infectious elements, so that an absolutely aseptic projectile is capable of infecting a wound solely by its mechanical action in starting the abnormal evolution of the living intracellular elements already present. The research was done in Landouzy's laboratory, and the data presented corroborate the lessons already learned from clinical observation.

28. **Preventive Antitetanus Serum.**—Cheret relates a number of examples to show the remarkable protection conferred on flocks of sheep and other domestic animals by preventive injection of antitetanus serum when tetanus was prevailing among them. Sheep are almost as susceptible to tetanus as the horse, but the preventive injection seemed to render them absolutely immune.

Presse Médicale, Paris

July 19, XXV, No. 40, pp. 409-416

- 30 Transfusion of Citrated Blood. E. Hédon.—p. 409.
 31 *Slip Noose Deep Sutures. (Sutures profondes, amovibles aux crins de Florence par le procédé du nœud coulant.) H. Chaput.—p. 410.
 32 *Causes of Error with the Wassermann Test. H. Telmon.—p. 411.
 33 Present Status of Administration of Chloroform. G. Lyon.—p. 412.
 July 23, No. 41, pp. 417-432
 34 *Symptoms with Tumor of Third Ventricle. H. Claude and J. Lhermitte.—p. 417.
 35 *Seedling Grafts for Repair of the Skin. (Semis dermo-épidermiques.) P. Alglave.—p. 419.
 36 *Abdominal Hysterectomy for Cancer. F. Jayle.—p. 420.
 37 Epidemic of Bacillary Dysentery in the Somme Region. G. Loygue and J. Haguénau.—p. 421.
 38 The Babinski Toe Sign. E. Landau.—p. 424.
 39 *Alcohol Soap. (l'alcool solidifié.) T. Nogier.—p. 426.

31. **Slip Noose Suture of the Abdominal Wall.**—Chaput says that this method of suturing the deep layers of the abdominal wall has no tendency to induce stitch hole abscesses while it holds the parts firm and immovable as long as is deemed necessary, and then the silk can be withdrawn. The coaptation is better than with wire in the obese; there is no pain when the silk is removed, and the method permits the outer layers of sutures to be undone, in case of trouble, while the deep layers are left unmolested. He pulls through the silk worm gut, holding it in the middle, and passes the two ends through the loop thus formed. Before drawing the loop tight he passes another silk thread through it, tying the ends of this thread and bringing the ends out separately. The slip noose is then drawn tight and the ends are drawn out separately through incisions 1 cm. apart and about 2 or 3 cm. from the edge of the wound. They are tied together and thus hold the noose in the depths very tight and firm, while the wound, sutured separately, can be opened and inspected without disturbing the noose ends. He has found this technic particularly advantageous in laparotomies, herniotomies and for suture of the patella. It takes less time than other methods of suturing, while there is no danger of its being absorbed as too often happens prematurely with catgut.

32. **Causes of Error with the Wassermann Reaction.**—Telmon discusses why the serum may give variable reactions on different days when the conditions otherwise seem to be the same. He ascribes it to the fact that freshly drawn serum may contain an excess of complement which modifies the reaction. To ensure accuracy, this excess of complement should be removed by setting the serum aside at 38 C. for a certain period. He estimates the amount of complement present by the number of minutes required for complete hemolysis when a mixture of 0.1 c.c. of the blood serum and 0.4 c.c. of salt solution—after having been incubated at 38 C. for an hour and a half—is added to 0.1 c.c. of a 6 per cent. solution of rabbit blood corpuscles, and the tube is replaced in the incubator. If the serum hemolyzes in less than five minutes, it is too rich in complement, and it is set aside for a new test twelve or twenty-four hours later. When the hemolysis occurs in seven minutes as the minimum, it is regarded as exactly proper for the Wassermann test. If the procedure has to be hastened, the "ripening" of the serum can be hastened by keeping it at 38 C. for ten or twelve hours. If the complement proportion drops too low, it can be brought up again by addition of a little fresh serum kept unheated for the purpose. By this means the Wassermann reaction can be hastened with no impairment of its precision. This slow inactivation at a comparatively low temperature thus has all the advantages of both the unheated serum technic and the technic with which the serum is heated for thirty minutes to 56 C., while it seems to be free from their sources of error, and respects the fragile specific amboceptors in the serum.

34. **The Infundibular Syndrome.**—Claude and Lhermitte had opportunity to study over a long period, with the necropsy findings, a case of tumor back of the chiasm, pushing apart the peduncles while the pituitary body and the sella turcica seemed to be normal. The cystic tumor had developed at the expense of the lining of the third ventricle, and the set of symptoms induced by this lesion included disturbances in

vision, in articulation of words, and in the character, as well as disturbances in the circulation, in the sleep function and in the regulation of water distribution, polyuria and polydipsia. The clinical syndrome thus confirms the findings with experimental lesions in the ventral region of the third ventricle.

35. **Grafting Method for Repair of Skin Defects.**—Alglave has been using since 1901 a method of "dermo-epidermic seedling," as he calls it, which has given extremely satisfactory results for burns and lacerations in peace and has proved equally useful for repair after war wounds. When other methods have failed and the torpid surface seems to refuse to heal over, this method almost invariably answers the purpose. He hollows out with a curet a cup-shaped hole in the granulations, each hole about 8 or 10 mm. in diameter, and extending down to the aponeurosis or muscle plane of the wound. In this hole he plants a corresponding graft taken from the patient's thigh, including the epidermis and derma but not the entire thickness of the derma. The graft is only 6 or 8 mm. in diameter, and is not quite so thick as the hole is deep. Consequently the graft fits loosely in the hole, and the blood already in the hole clots around it and fastens it in place and also nourishes it. As the graft fits low down in the hole, the edges of the hole extend above it, enough to protect it against friction from dressings and clothing. A number of these holes are scattered over the surface to be grafted, at intervals of 1.5 cm. These dimensions and intervals have proved the best conditions for healing of the grafts in his extensive experience. In a case of which an illustrated description is given, twelve grafts were applied by this "drill husbandry technic," and the patient was up and about, entirely healed, in three weeks. His war wound had shown no tendency to heal during the six months preceding. Alglave ascribes great importance to the use of oiled tarlatan, "taffeta chiffon" which does not stick to the tissues, and can be renewed daily. He washes the surface of the skin with boiled water at each change of dressings, letting the water drop gently on the grafts to rinse off the oozing around the grafts. The grafts do better when taken from the patient himself. One instance is related in which the young mother gave the grafts for the child of 4 and they did not retain their vitality. Two trials failed, and then the grafts were taken from the child, himself, and healing was soon complete. Another case teaches the familiar lesson that when the consequences of an operation or any procedure are different from what we have a reason to expect, we must seek for some disturbing general cause, which in this case, as often occurs, proved to be unsuspected syphilis.

36. **American Surgeons and Abdominal Hysterectomy.**—Jayle seeks to restore to America the priority for the extensive removal with the cancerous uterus of the broad ligaments and the iliac glands. He cites the communication by Ries of Chicago on the subject, March 18, 1895, and Clark's report, April 26, 1895, of two patients successfully operated on by an even more radical method. It was not until three years later that Wertheim performed his first operation of the kind. He says that Wertheim is not even mentioned in Cullen's great work, "Cancer of the Uterus," as Wertheim's first important report on the subject had not appeared when the book was written, 1899-1900. Jayle remarks that there is only advantage in copying good things and in popularizing them, provided one renders unto Caesar that which is Caesar's. The Wertheim operation should be called Clark's operation. The Trendelenburg position was described and illustrated by Rolandus in the twelfth and by Scultet in the seventeenth centuries, and Hirschsprung's disease by Ruysch in the seventeenth century. . . . "Those who like to call their operations by a proper name can speak of doing a Clark and the uterus will only have to behave itself to be free from all danger of being clarked."

39. **Solidified Alcohol.**—Nogier expatiates on the many advantages of the alcohol soap which is proving so useful in the trenches. It lights when touched with a match, and it combines the action of both alcohol and soap in cleansing hands and the field of operation. It is prepared by adding 150 gm. of dry and finely scraped Castile soap to 500 c.c.

lamp alcohol and adding 12 gm. of shellac and shaking well, then heating in a water bath, and pouring the clear fluid into molds to harden.

Progrès Médical, Paris

July 21, XXXII, No. 29, pp. 241-248

- 40 *Suprarenal Dyspepsia. Loeper, Beuzard and Wagner.—p. 241.
41 *Butyric Dyspepsia. Mucous Gastritis and Pylorospasm in Young Infants. F. Chevrel.—p. 242.
42 Old Mistakes in Regard to Physical Training of Soldiers. B. du Coteau.—p. 244.
43 The Psychology Just Before "Going Over the Top." (L'anxiété précédant l'assaut.) L. Huot and P. Voivenel.—p. 245.

40. **Suprarenal Dyspepsia.**—Loeper and his co-workers comment on the gastro-intestinal disturbances which form part of the clinical picture of Addison's disease, and state that similar digestive disturbances are frequently encountered now in the soldiers suffering from the strain of the war or convalescing from disease or infections or wounds. There is nothing characteristic about the digestive disturbances of these "incomplete suprarenal states," as they call them, and we have no clinical means of detecting this relative insufficiency on the part of the suprarenals. But we can turn the searchlight on it by watching the effect of small doses of epinephrin. They have made a practice for several months of administering to their patients with dyspeptic disturbances and obstinate constipation, small daily injections of from 0.1 to 1 mg. of epinephrin. Some were not affected by it in the least, but others were transformed by it. By the third injection the digestive discomfort disappeared, the stools became regular and assimilation more perfect, so that the men soon increased in weight. Along with this the blood pressure rose, the asthenia subsided and in one man with much pigmentation this also cleared up as the intestinal phenomena improved. The improvement under the epinephrin was in striking contrast to the lack of benefit from the usual measures applied to combat the dyspepsia. They explain the benefit by the tonic action of epinephrin on the nervous system, especially the sympathetic system, thus enabling it to modify some of the nervous reactions in the abdomen. An excess as well as a deficit of epinephrin may generate abdominal trouble. We know that epinephrin acts on the smooth muscle fibers of the vessels and bronchi, and probably the smooth muscle fibers of the stomach and bowel do not escape this influence. Insufficiency of the suprarenals may influence the secretory activity of other abdominal glands, and the study of these suprarenal dyspeptics seems to confirm this assumption. The difference between the gastric acidity after a test meal without and repeated with a preceding injection of epinephrin shows an appreciable rise in the acidity under the influence of the epinephrin. Radioscopy also shows a marked regulating influence from epinephrin on the motor functioning of the stomach and bowel. In six of the men in question the bismuth had scarcely reached the transverse colon by the seventh hour, but after a dose of epinephrin it was found in the rectum by the seventh hour, testifying to the acceleration of the passage of the bowel contents.

41. **Mucous Gastritis in Infants.**—Chevrel reports the case of an infant that had vomited incessantly for three months after an attempt at breast feeding, and spasm of the pylorus seemed unmistakable. The child cried after each feeding but seemed to be relieved by the inevitable vomiting. It was much emaciated but the stomach did not seem to be dilated, and no antiperistaltic movements could be detected. Chevrel put the child on a dry diet, giving fresh cheese, "small Swiss cheese," mixed with sweetened milk and occasionally alternated with "legume bouillon." The cheese was retained but the fluids were vomited. After various trials, the diet settled down to a teaspoonful of cheese alternating every two hours with 30 gm. of skimmed milk, and the stomach was rinsed out three times a day to cleanse it of the large quantities of mucus secreted. After a week or two a single lavage a day was sufficient and the child was soon restored to clinically normal conditions. In nearly all such cases, there has been an excess of fat in the infant's food; in the present case the infant had a decided butyric odor. The thick and tenacious mucus may possibly have plugged the opening to the pylorus; in any event it hampered the digestive processes.

Correspondenz-Blatt für Schweizer Aerzte, Basel

July 21, XLVII, No. 29, pp. 913-960

- 44 *Active Versus Conservative Treatment of Abortion. B. Engler.—p. 913.
45 Importance of the Skin Reaction After Inoculation with Tuberculin as a Guide to Treatment and Prophylaxis. E. Lanz.—p. 920.
46 Metal-Albumin Preparation for Diagnosis of Pregnancy. (Sorcyne.) K. Kottmann and F. Thönn.—p. 939.
47 Rare Scalp Diseases. L. Merian.—p. 944.
48 Production of Alcohol from Calcium Carbide. Fleissig.—p. 948.
49 Appendicectomy Through the Hernial Opening in Operating on a Right Inguinal Hernia. M. Schoenbrunn.—p. 950.

44. **Active or Conservative Treatment of Abortion.**—Engler remarks that opinions still differ widely as to whether active or conservative measures are preferable, but at the Strassburg clinic, in charge of Fehling, active treatment is the usual course. A very important guide for the management of the case is what she calls "latent complications," namely, that while nothing pathologic can be palpated, yet the patients complain of pains during internal examination. Tenderness of the vaginal portion of the uterus or tissues around indicates incipient inflammation, showing that the morbid process is not restricted to the endometrium but is extending beyond it. This calls for strict conservative treatment, just as much as exudation in the pouch of Douglas or disease of tube or ovary. In a recent series of 170 abortion cases, these "latent complications" were evident in ten cases; in five all disturbances had subsided in two or three weeks, but four required surgical measures, incision of an abscess in the pouch of Douglas or drainage for peritonitis or removal of an ovarian tumor. The peritonitis was too far advanced for recovery in one case, the only death in the whole series. In all this group the abortion had been induced by intra-uterine injection of soapsuds or wood vinegar. The other 160 women were treated by clearing out the uterus with the curet or the finger. The curet is preferred as it can be introduced with the cervix less widely dilated, the uterus can be cleared out more completely, and general anesthesia is not required; a dose of some sedative fifteen minutes beforehand is enough. The bacteriologic findings were not heeded. In 33 per cent. of the sixty febrile cases the bacteriologic findings were negative, while the women with hemolytic streptococci had a smooth recovery. Of the 100 nonfebrile cases only one developed slight and transient fever, the others rapidly recovered. It is practically the rule at the clinic to curet in the afebrile cases, as this hastens convalescence and possibly wards off trouble later. As the maneuvers to induce the abortion have already injured the ovum, its expulsion is not to be prevented, even although days or weeks may elapse before it is consummated. Hence it seems wiser to empty the uterus without delay after severe hemorrhage or expulsion of large clots. At this early stage the curetting does no harm comparatively speaking; in the series of 100 afebrile cases reported the morbidity and mortality were both zero. In the sixty febrile cases all recovered after a moderately severe course except 3.3 per cent. who presented serious symptoms for a time. The average stay in the hospital was seven days but it was only five or six in the afebrile cases.

Gazzetta degli Ospedali e delle Cliniche, Milan

June 21, XXXVIII, No. 49, pp. 713-720

- 50 *Toxic Meningism. Andruetto.—p. 713.
51 Municipalization of Charity Medical Work in Milan. E. Villa.—p. 719.
June 24, No. 50, pp. 721-736
52 Treatment of Infected Wounds of the Knees. A. Franchini.—p. 723.

50. **Toxic Meningism.**—Andruetto reviews the literature on the subject of meningeal symptoms during typhoid and other diseases when the cerebrospinal fluid was found constantly sterile, also the meningeal symptoms with lead poisoning and uremia. He then reports in detail a case of meningism for which uremia was undoubtedly responsible, the fluid and blood being found constantly sterile. The man had convulsions, and epidemic meningitis was known in the locality but the cerebrospinal fluid persisted sterile and limpid. The urine on the other hand contained many casts and much albumin, and the meningeal symptoms rapidly improved

under treatment for nephritis, venesection and infusion of saline. The lumbar punctures gave great relief, the headache and other symptoms from pressure on the brain showing prompt benefit.

Policlinico, Rome

July 29, XXIV, No. 31, pp. 949-976

53 *Jaundice Spirochetosis. U. Carpi.—p. 949. G. Bompiani and A. Iovene.—p. 955.

54 *Spirochetes in Rats. G. Monti.—p. 962.

July, Surgical Section No. 7, pp. 273-312

55 Varieties of Femoral Hernia. G. Serafini.—p. 272. Commenced in No. 5, p. 280.

56 *Changes in the Sweat Glands with Insufficiency of the Kidneys. I. Montalbo.—p. 284.

57 *Pain and Swelling of the Tuberosity of the Tibia. (Malattia di Schlatter e Osgood.) C. Lollini.—p. 298.

58 Surgical Treatment of Wounds of the Brachial Plexus. S. P. Allegra.—p. 303.

59 Technic for Amputations. G. Lerda.—p. 310. To be continued.

53. **Spirochete Jaundice.**—Carpi reviews his experiences with a recent series of 300 cases of icterogenous spirochetosis. He calls attention in particular to the long incubation, usually from fifteen to twenty days but sometimes from twenty-five to thirty. The glands in the groin and axillae were swollen but not tender, and the blood showed polynuclear leukocytosis, which aided in differentiating it from the leukopeny of typhoid. He found a combination of arsenic and mercury very useful in treatment, the symptoms rapidly subsiding under it with no by-effects, not even when the urine showed much albumin and tube-casts.

54. **Spirochetes in Rats.**—Monti relates that he was able to induce infectious jaundice in guinea-pigs inoculated with spirochetes found in a number among eighty rats examined in the Bergamo district. No cases of infectious jaundice were known in the district or had been known, and yet the rats harbored the parasites.

56. **Changes in the Sweat Glands with Insufficiency of the Kidneys.**—Montalbo's report of much experimental and clinical experience is illustrated, showing the changes in the sweat glands after nephrectomy or with kidney disease. The diversion through the sweat glands of the waste substances normally eliminated through the kidneys leads to irritation of the sweat glands and this in turn to various changes.

57. **Pain and Swelling of the Tuberosity of the Tibia.**—Lollini describes a case which shows, he says, that the trouble to which Schlatter and Osgood called attention in 1903 is the result of disturbances in ossification from some constitutional disturbance. It does not result from trauma or inflammation alone. He gives the roentgenogram of his case. The patient was a young man of a weakly constitution. He fell, injuring the knee, and presented the symptoms of the Schlatter and Osgood lesion, but the Roentgen rays showed the same defect in development in the tuberosity of both legs.

Riforma Medica, Rome

July 7, XXXIII, No. 27, pp. 689-708

60 D. Cirillo, a Pioneer Hygienist and Martyr, 1739-1799. A. Ferrannini.—p. 690.

61 War Wounds of the Limbs. S. Salinari.—p. 639. Commenced in No. 25, p. 654.

July 14, No. 28, pp. 709-728

62 *Diplococcus Erysipelas with Septicemia. A. Connio.—p. 709.

63 *War Nephritis with Uremia but no Edema; Two Cases. L. Eustachio.—p. 712. Commenced in No. 26, p. 674.

64 Social Welfare Work and Ideals of the Medical Profession in America. (Le idealita sociali della medicina nord-americana.) L. Devoto.—p. 720.

65 Present Status of Surgery of Skull Wounds. E. Aievoli.—p. 721.

62. **Diplococcus Erysipelas.**—The patient was a soldier with a history of chronic conjunctivitis and recent syphilis. The pneumonia diplococcus was found in pure cultures in the exudate of the typical erysipelatos lesions on scalp and face and the course was characteristic of diplococcus affections, with a febrile crisis the seventh day.

63. **Nephritis Without Edema.**—Eustachio discusses the literature on the subject of war nephritis, and the various theories advanced to explain it. In treatment, besides the usual measures, repose, warm uniform temperature, etc., the

diet must be regulated by the urea content of the blood and the diastasic ferment in the urine. He warns that salt must not be dropped entirely from the diet. Animals fed without salt are unable to stand this long, and although the tissues in nephritis may be saturated with salt, yet it does not seem to be in the electrolytic condition suitable to carry on the metabolic and other vital functions of the organism. This is the reason, he says, why milk is so excellent in nephritis, as it contains just enough sodium chlorid to answer the demands of the tissues without harming the diseased organ. He thinks the Karell course of dieting admirable for the purpose, restricting the patient to 800 c.c. of milk, given at four-hour intervals during the day for a week. Thirst is combated by moistening the lips, and hunger by chewing a little toast. After a week of this, one egg is allowed, without salt, and other fluids may be substituted as the ordinary diet is gradually resumed, but the total of 800 c.c. must not be surpassed. The food should always be salt-poor but may include meat, fresh water fish, unsalted butter, cheese, eggs, rice, unsalted bread, potatoes, peas, beans, fruit, tea, coffee, chocolate, etc. With the diet thus regulated the heart and kidneys are spared to the utmost. He insists that nephritis without edema should be treated the same as when there is edema.

Rivista di Clinica Pediatrica, Florence

July, XV, No. 7, pp. 337-392

66 *The Serious Forms of Antiserum Anaphylaxis in Man. G. Vernoni.—p. 337. Concluded in No. 8, p. 393.

August, No. 8, pp. 393-448

67 *Nutritional Disturbances in Infants. A. Ravenna.—p. 42.

66. **Serious Forms of Serum Anaphylaxis.**—Vernoni discusses separately the phenomena observed from anaphylaxis at the first injection of the antitoxin or antiserum and on repeated injection, by the subcutaneous, the intraspinal or the intravenous routes. He summarizes the numerous cases on record and emphasizes that it may be possible to give an antiserum intraspinally even in the sensitized when by any other route it would induce serious anaphylactic shock. The antibodies responsible for the shock are diffused throughout the body elsewhere but do not seem to penetrate the meninges unless they are diseased. This method of serotherapy is therefore promising when the meninges are sound, as in tetanus, but the meninges are liable to become permeable under the influence of intraspinal injections. He has compiled from the literature six cases of anaphylactic shock after intravenous injection of antitetanus serum, none fatal, and six cases from his own experience with one death. Unless the Besredka cautious method of fractioned injections can be applied, he advises to avoid the intravenous route and give the serum by the combined technic subcutaneously and intramuscularly, and possibly intraspinally.

67. **Nutritional Disturbances in Infants.**—This is the second of three lectures on this subject delivered before the medical students serving at the front but gathering for the lectures at the camp medical school. Ravenna presents the present status of our knowledge in regard to the various disturbances leading up to athrepsia which, he says, may be regarded as similar in nature to the cachexia of the aged. He does not agree with Finkelstein that it is exclusively of alimentary origin. Among the factors is the "pathologic climate" of the hospital, the orphanage or other institution. Finkelstein's "alimentary intoxication" corresponds to what has long been known as cholera infantum. Here too, various factors are at work. It affects exclusively bottle-fed infants, and the Padua school, to which Ravenna belongs, insists on an infectious factor. In one large epidemic of cholera infantum the milk from a certain model dairy was found to contain a peptonizing bacillus which survived heating to the boiling point. This bacillus was traced to the hay, and when the supply of hay was burned and hay from another source used, the epidemic died out immediately. The bacilli were not in the milk as it was drawn but probably got into it from the air. Investigation has shown repeatedly, he says, that cholera infantum is scarcely known where the cows are kept in pasture. The treatment for this epidemic form of cholera infantum and for Finkelstein's alimentary intoxication is

alike in that it can be only symptomatic after removal of the cause. After castor oil and lavage of the stomach, he gives a teaspoonful of chloroform water every two hours, flavored with syrup of orange flowers; baths with or without mustard, and from two to five drops of 1:1,000 epinephrin solution during the day to combat the low blood pressure. Physiologic saline by the drip method or subcutaneously should be given for three days or until the child can be given water by the mouth, at first by the spoonful. The water, tea or vegetable broth should be given in amounts to correspond to the amount of milk it has been getting. Breast milk gradually resumed is always the ideal, both in the physiologic and the pathologic field. The Padua school regards as a necessary department of every modern hospital for children a pavillion in the country, particularly at a higher altitude, to which the infants with chronic and wasting diseases can be sent, and especially all cases of cholera infantum. An accessory pavillion for the Padua hospital is now being constructed at an elevation of over 3,600 feet above the level of the sea, and much is hoped from this "alpine hospital pavillion."

Prensa Medica Argentina, Buenos Aires

July 10, IV, No. 4, pp. 41-52

- 68 *The Nervous System and the Endocrine Glands in Primary Myopathies. J. C. Navarro and C. Correas.—p. 41.
69 *Injection of Boiling Water into Exophthalmic Goiter. E. M. Olivieri and P. Ronchi.—p. 43.
70 *Differential Value of Dissolved Albumin in Stomach Content. C. B. Udaondo.—p. 45.
71 *Biology of the Tubercle Bacillus. F. H. Jauregui.—p. 47.
72 *Comparative Inefficiency of Normal Beef Serum in Treatment of Anthrax. J. Lignières.—p. 49.

68. **Necropsy Findings with Primary Myopathy.**—Nothing distinctly pathologic could be detected in either the nervous system or the glands with an internal secretion in the case of extremely severe muscular disease reported.

69. **Injections of Boiling Water in Treatment of Exophthalmic Goiter.**—Olivieri and Ronchi give the details of only four cases out of their more extensive experiences as only these four patients were under observation for from four to fifteen months. They injected 10 c.c. of boiling water alternately into each one of the lobes of the thyroid at different points each week. The simplicity of this method of treatment commends it, as all that is necessary is the needle, syringe and rubber gloves to protect the hand. There is no danger from it, and merely a sensation of burning, most marked in the skin. There is sometimes an inflammatory reaction, but this soon subsides spontaneously or under cooling compresses. The improvement that followed was marked, the nervousness subsiding, as also the tachycardia, exophthalmos and goiter in notable degree; the menstruation became regular, and the patients gained from 4 to 13 pounds in weight. They advise a trial of this treatment before operating when medical measures have failed. It will at least aid in getting the patient into better condition to stand an operation later, if deemed necessary.

70. **Dissolved Albumin in Stomach Content.**—Udaondo continues his study of the Wolff-Junghans test for cancer of the stomach, with tabulation of the findings in eight cases of simple functional hyperchlorhydria. The range was from 20 to 200. In forty cases of gastric ulcer, the range was from 100 to 400 in all except three. The range was likewise from 100 to 400 in twelve cases of duodenal ulcer. These findings show that the dissolved albumin in the stomach content—while extremely interesting and instructive in case of anacidity, as it indicates the malignant nature of the achylia—in case of hyperacidity has no diagnostic value whatever.

71. **Biology of the Tubercle Bacillus.**—Jauregui remarks in the course of his theoretical analysis of pulmonary tuberculosis, that we usually make the diagnosis of tuberculosis only when it has reached such a stage as if we diagnosed smallpox only from the pits. He also presents arguments to show that tuberculosis is able to spontaneously confer immunity. Everything tends to prove that we all have been or are or will be infected with tuberculosis, and the fact that so few develop phthisis is incontestable proof that our

organisms have adapted themselves to the tubercle bacilli and got the upper hand over them, and we have thus become immunized.

72. **Serotherapy of Anthrax.**—Lignières as a practical bacteriologist and serotherapeutist of thirty years' experience, protests against some recent publications which assert that normal beef serum is effectual in the treatment of anthrax. He comments on the greater toxicity of beef serum in comparison with horse serum, even when heated, and denies that it possesses the properties against anthrax such as are manifested by any good specific serum from a horse immunized against anthrax.

Semana Medica, Buenos Aires

July 5, XXIV, No. 27, pp. 1-28

- 73 *Pathogenesis and Treatment of Cancer. E. Cisneros.—p. 1.
74 Paraffin and Oil Film Treatment of Burns. J. M. and M. E. Jerez.—p. 20.

73. **Electrocauterization of Cancer.**—Cisneros expatiates on the superiority of electro-ignition or electrocauterization as a systematic treatment of cancer. For eighteen years he has been using this method of treating cancer and has been impressed with its efficacy. The lesion is left open afterward and it is easy to apply the electrolysis anew at the slightest trace of recurrence. The eschar does not invite infection, and there is no danger of injury from radiation as with the actual cautery. The ideal is the combination of surgery and electro-ignition or electrocauterization. This can be counted on to cure 100 per cent. of all operable cases and also cure many considered beyond the pale of operability.

Siglo Medico, Madrid

July 7, LXIV, No. 3317, pp. 485-504

- 75 *Gonococcus Lesions in Periosteum. E. M. Villapadierna.—p. 486.
76 Fractures of the Lower Jaw. J. Losada.—p. 487.
77 Mitral Stenosis Without Presystolic Murmur. R. Villegas.—p. 489.
78 *Coagulation Test for Syphilis. A. Spordelli and G. Fischer.—p. 490.
79 Dietetic Treatment of Diabetes. N. Santos.—p. 500. Continuation.

75. **Gonococcus Localizations in the Periosteum.**—The robust young woman in the second week of acute gonorrhea developed pain at the front of the lower half of the tibia. The skin was apparently normal but the region was tender along with the local pains. Under repose the lesion gradually grew less and less painful until merely a patch somewhat harder than the rest was left by the end of the week. The knee then became affected in the same way, the inflammation restricted solely to the internal condyle of the femur, the rest of the joint normal. There were no signs of syphilis, but gonococci were numerous in urethra and vulva. Under intravenous injection of sodium salicylate improvement followed, and soon no trace was left of the periostitis. Villapadierna has not been able to find any other case on record in which the process was restricted exclusively to the periosteum. Cases of pain in the heel bone for which the gonococcus was responsible have been published. In one such case, unpublished, the clavicle was affected likewise.

78. **Serodiagnosis of Syphilis.**—Sordelli and Fisher conclude from their tests of the Klinger and Hirschfeld coagulation method of differentiating syphilitic serum, that it is specific and sensitive, like the Wassermann reaction. Hence it offers an excellent means for controlling the findings with the Wassermann test.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

June 23, I, No. 25, pp. 1999-2094

- 80 *Typhoid in Surinam. C. Bonne.—p. 2018.
81 *Mortality from Tuberculosis in the Netherlands. R. H. Saltet.—p. 2035.
82 *Recovery from Otogenous Meningitis. F. H. Quix.—p. 2040.
83 Medical Impressions of America. (De Panamakanaal-Zone.) C. W. F. Winckel.—p. 2058. Continuation.
June 30, No. 26, pp. 2107-2190
84 Rembert Dodoens, 1517-1585. E. C. van Leersum.—p. 2103; J. G. de Lint.—p. 2126.
85 Dodonaeus and His Influence on Materia Medica and Medicine in General. (Dodonaeus als kruidkundige.) F. W. T. Hunger.—p. 2118; M. A. van Audel.—p. 2131.

80. **Typhoid in Dutch East Indies.**—Bonne's report deals exclusively with Surinam where fevers of all kinds are exceptionally prevalent. About 25 per cent. of the cases of typhoid in the principal town were in children. The proportion in children throughout the country is probably still higher in reality as many cases must escape recognition.

81. **Mortality from Tuberculosis in the Netherlands.**—Saltet shows by tabulated statistics that the mortality from pulmonary tuberculosis presented a gradual decline from 13.5 per 10,000 inhabitants in 1901 to 10.6 in 1913. The general tuberculosis mortality dropped likewise during the same period from 19.6 to 14 per 10,000 in 1914. But since the war began, the figures have risen respectively to 12.6 for the pulmonary and to 16.8 for the general tuberculosis mortality.

82. **Recovery from Otogenous Meningitis After Repeated Operations.**—The instructive case reported by Quix was in a woman of 25 who for a year had had otitis media with cholesteatoma formation in the mastoid. A radical operation failed to prevent the involvement of the labyrinth and development of Menière's disease. From the labyrinth the process invaded the dura and part of the cerebellum, the lumbar puncture fluid containing many pus cells and diplococci. Operative opening up of the labyrinth gave some relief but did not reach the focus in the posterior cranial fossa. This was then reached and drained separately. By this means the extensive infectious process in the meninges, brain substance and around the spinal cord was finally cured. General anesthesia had been applied on five separate occasions and—except for ligation of the internal jugular vein—about every operative procedure known to the otologist had been applied, as is described in detail. The case teaches that when the cerebrospinal fluid contains abundance of pus cells and bacteria, this indicates a diffuse process in the meninges but that repeated extensive operative measures and ample drainage with rubber drains and gauze above and lumbar puncture below may ensure recovery. It is the first case of the kind in the Netherlands in which the patient recovered after an extensive operation.

Hospitalstidende, Copenhagen

July 4, LX, No. 27, pp. 645-668

86 *Chronic Duodenal Ulcer. T. Rovsing.—p. 645. Commenced in No. 26, p. 621.

86. **Chronic Duodenal Ulcer.**—Rovsing analyzes his experiences with 133 cases of chronic duodenal ulcer, saying that the Bucquoy-Moynihan set of symptoms occurs more frequently with duodenal ulcer than with ulcer elsewhere, but that the very same symptoms may be observed with an ulcer at the pylorus or near it and even higher up in the stomach. Tests of stomach functioning and Roentgen examination often aid in differentiation, as negative findings in the stomach, when there have long been symptoms of an ulcer, certainly suggest duodenal mischief. To blindly follow those who rely on the anamnesis alone, is to mistake a gastric for a duodenal ulcer in many cases. The pain and tenderness with gastric ulcer are usually to the left of the median line and to the right with duodenal ulcer. The quality of the food does not seem to influence the pains, as is liable with gastric ulcer. The appetite is usually unimpaired. Blood in the stools is a far more frequent finding with duodenal than with gastric ulcer; he found it in seventy-four of his cases. In nineteen there had been hematemesis. In his experience, retention in the stomach very rarely occurred with a Bourget test meal even when the operation revealed considerable stenosis of the pylorus. There may be much dilatation of the stomach but retention is exceptional. On the other hand, with gastric ulcer and a similar degree of dilatation there is marked retention. This absence of retention has often proved an instructive differential sign. In three of his cases of perforation the patients insisted that they had never had any symptoms of any kind until the perforation occurred. Besides gastric ulcer, gallstones and nervous dyspepsia, "nervousness" or pure hysteria are the mistakes most frequently made in diagnosis. For many of his patients the bitterest feature of their cases was that eminent medical authorities had decided

that their trouble was due to hysteria. One patient in particular had had for thirteen years his periodic attacks of pains and vomiting and had been examined and treated again and again by leading physicians. As each time the test meals showed normal stomach conditions, his trouble had been declared to be purely nervous. He finally applied to the surgeon on his own initiative, and Rovsing recognized the duodenal train of symptoms. The operation showed a perforated duodenal ulcer adherent to the pancreas. Another patient was a physician and he had decided to take a course of treatment in a hospital for nervous and mental diseases as his disturbances had been ascribed to hysteria. The operation showed the duodenum circularly constricted with an ulceration extending for 4 cm. His delight at being freed from the stigma of male hysteria surpassed his satisfaction in getting rid of his painful and dangerous intestinal lesion.

As to operative treatment, Rovsing has become converted to the superior advantages of excision of the ulcer plus the usual Heinecke-Mikulicz pyloroplasty operation, only modified in that he does not stop with incising the pylorus but prolongs the incision downward into the anterior surface of the duodenum and up into the anterior wall of the stomach. If the ulcer is in the anterior wall, he makes an elliptical incision around the ulcer and continues it up into the stomach. If in the posterior wall, he reaches it through the duodenum, excising it from the mucosa side. A small profusely bleeding ulcer can be drawn up with a pursestring suture and then be sutured together across. This danger of hemorrhage from the ulcer sooner or later is a grave menace; he has lost patients from this cause years after all trouble had apparently subsided after a gastro-enterostomy. Among his twelve patients not operated on, five had threatening hemorrhage later. One succumbed; three recovered under dietetic treatment; one apparently recovered but eight years later had another hemorrhage; the others have had no recurrence to date. By his method of opening up the duodenum for inspection from the pylorus to the papilla and even beyond, he can discover minute ulcers and render them harmless by excision or by drawing them up with a pursestring suture. The latter is otherwise impracticable. If the incision is too long for the Mikulicz technic, the Finney horseshoe anastomosis between the duodenum and the stomach can be applied. His method is particularly advantageous, he reiterates, in case of a perforated duodenal ulcer, as he shows by the tabulated details of twelve such cases, all with prompt and smooth recovery. He tabulates further the outcome in his total 118 cases of duodenal ulcer classified according to the nine methods of treatment applied, the testimony all confirming the promising future of his latest technic, excision of the ulcer, extending the incision up into the stomach, plus transverse suture of the incised pylorus. His total mortality in 133 cases was twelve, and there was recurrence in ten cases. The latter group had all been treated with gastro-enterostomy and entero-anastomosis.

Ugeskrift for Læger, Copenhagen

June 28, LXXIX, No. 26, pp. 1039-1076

87 Psychosis After Gunshot Injury of Brain with Bullet Left in the Skull. M. Anchersen.—p. 1039.

88 *Pluriglandular Insufficiency in Young Woman. Fog.—p. 1046.

89 Threatening Hemorrhage from the Rectum After Self-Introduction of a Thermometer. N. P. Ernst.—p. 1053.

88. **Pluriglandular Insufficiency in Young Woman.**—The girl of 18 had never menstruated, but for the last three years had severe epistaxis once a month. She entered the hospital on account of an abscess in the sacro-iliac region. An illustrated description of the case is given, emphasizing the various signs and symptoms demonstrating insufficiency on the part of certain glands with an internal secretion. The list includes besides hypotrichia, dwarf growth, infantilism and backward mentality, slight pigmentation of the skin, latent tetany, exophthalmos, slight goiter, hyperglycemia without glycosuria, and defective development of the genital organs. There were also congenital heart disease, apical infiltration and scoliosis. None of the other members of the family displayed this glandular insufficiency.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXIX, No. 12

CHICAGO, ILLINOIS

SEPTEMBER 22, 1917

INFLUENCE OF LARGE DOSES OF DIGITALIS AND DIGITOXIN ON THE BLOOD PRESSURES IN MAN*

CARY EGGLESTON, M.D.

NEW YORK

The influence of the several digitalis bodies on the blood pressure in both man and animals has been the subject of considerable study. It is now quite generally agreed that strophanthus, amorphous strophanthin and ouabain do not exert any direct vasoconstrictor action when administered to man in therapeutic doses, and the present tendency is to regard both digitalis and digitoxin as similarly devoid of such action. There is, however, still some divergence of opinion in regard to the latter drugs, and it is my purpose to review the essential literature relating to this question and also to present the results of a careful study of a small group of cases.

Gottlieb and Magnus¹ reviewed the literature in support of the view that digitalis increased the blood pressure, and recorded a series of animal experiments which has done more, perhaps, than any other study to lead to the belief that the digitalis bodies are capable of producing marked vascular constriction through direct action on the vessel walls. Their experiments were carefully executed, and proved that large doses of digitoxin, true digitalin, amorphous strophanthin, ouabain and convallamarin were capable of causing great elevation of the systolic blood pressure when thrown into the blood stream in concentrated solutions. Gottlieb and Magnus used doses of the several drugs which ranged from about five to over fifteen times the minimal fatal doses. They noted particularly that when the smaller amounts were employed the results were not constantly obtained. They were able to show that the increased blood pressure was due to the combination of an increased force and volume output of the heart's systole with a pronounced, direct constrictor action of the drug on the vessels of the splanchnic area. In the case of digitoxin this constrictor action was also exerted on the peripheral vessels generally, while with the other drugs studied such an action on the peripheral vascular system was soon overcome by dilatation, in part through increased pressure, and in part through a reflex from the splanchnics.

Although these experiments clearly showed that the several digitalis bodies employed, and especially digitoxin, were capable of causing in animals both splanchnic and peripheral vasoconstriction and great elevation of the blood pressure, the same results cannot be obtained when these bodies are used in man. Quite contrary to the authors' own conclusion, their observation that doses smaller than about five times the fatal dose often failed to cause the typical response is very strong evidence that therapeutic doses will not cause either vasoconstriction or elevation of the systolic blood pressure in man. This is rendered even more probable when we remember that the full therapeutic dose is usually administered to man in relatively small fractions repeated over a period of several hours or days, so that the drug enters the blood stream very slowly. Finally we have shown repeatedly in the laboratory² that digitoxin and other digitalis bodies leave the blood stream almost immediately after their direct intravenous injection.

The remarks just made apply with equal force to the possibility of drawing conclusions for man from the perfusion experiments of Fahrenkamp,³ who found that digitoxin in a concentration of 1:840,000 sometimes caused some constriction when perfused through the sensitive vessels of the rabbit's intestine, while concentrations of 1:330,000 usually caused marked constriction, though even these sometimes failed. The largest single dose of digitoxin which we have dared to give to a man by mouth was 1.5 mg. to a patient weighing 59 kg. (130 pounds). Starling states the blood volume for man as about 5 per cent. of his weight, so that this patient had about 3 kg. of blood. If the entire amount of digitoxin given could have entered the circulation at once, the resulting concentration would have been only about 1:2,000,000, or considerably less than half the lowest concentration found effective on direct perfusion. But no one pretends that the oral administration of any of the digitalis bodies is followed by its immediate absorption into the circulation, and it is obvious from our experiments just cited that during absorption the drug would leave the blood stream almost as rapidly as it entered.

The experiments of Gottlieb and Magnus and of Fahrenkamp are cited as typical of those on which the argument has been based that the digitalis bodies are capable of causing vasoconstriction in man. It must be quite obvious to any one who gives the matter a moment's thought that it is utterly fallacious to reason from such experiments that similar effects would be produced in man from the therapeutic use of digitalis or its congeners.

* From the Department of Pharmacology, Cornell Medical College, New York.

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Gottlieb and Magnus: Arch. f. exper. Path. u. Pharmacol., 1902, 47, 135.

2. Hatcher, R. A., and Eggleston, Cary: Unpublished data.

3. Fahrenkamp: Arch. exper. Path. u. Pharmacol., 1911, 65, 367.

However, men of wide reputation, whose words have gained authority, do accept the results of these experiments as applying to man. One of the most illustrious of these is Wenckebach,⁴ who says:

However poor our real knowledge of these conditions (vascular) in man may be, we yet may say that there exists a vascular action of digitalis in man. Not only the analogy with experiments in mammals may be called in, but I think every practitioner has experienced the curious fact that one may feel at the radial pulse whether digitalis is given or not. It is not only blood pressure which gives this curious sensation of the digitalis pulse; I think it must be the condition of the wall of the artery altered by digitalis.

Sometimes we may observe even a very strong contraction of the arteries as far from the periphery as the radial and the brachial pulse. I remember very well the case of a lady, in a very bad condition by exhausted and diseased heart, in which a desperate dose of digitalis, given as an enema, caused the radial pulse to disappear by constriction of the arterial wall, the throbbing carotids being filled to a maximum, and the heart working strongly against a very high blood pressure in the aorta, yet not succeeding in pushing a pulse into the peripheral vessels.

These paragraphs illustrate to what extremity so-called clinical observations and deductions can be carried by one of authority. The author lends the weight of his opinion to the belief that digitalis may exert a powerful peripheral vasoconstriction in man and yet he cites no evidence whatever worthy of the name in support of his views, for no one could be expected to accept the ill defined feeling of the pulse as evidence of vasoconstriction, or to take seriously the observations of the effects of that "desperate dose of digitalis" which obliterated the radial pulse. It might be observed that it is just such utterances as these which tend to make thoughtful men look askance at the general run of clinical observations, often to the detriment of accurate studies of real worth.

A number of reports of observations of the blood pressure in man under the influence of therapeutic doses of the digitalis bodies have appeared showing that there may be some increase in the systolic pressure. But the same result has been observed to follow the use of strophanthin, which is generally conceded to be practically devoid of vasoconstrictor action in doses suitable for therapeutic administration. On the other hand, many observers have reported that the therapeutic use of digitalis is not constantly accompanied by any rise of systolic blood pressure and is often associated with a fall or with no change.

As long ago as 1901 Sahli⁵ stated that in cases with circulatory stasis and high blood pressure digitalis not only relieved the stasis, but also very often reduced the blood pressure by from 30 to 40 mm. of mercury. He believed that this was due to the relief of the vascular constriction associated with dyspnea and to a dilatation of the peripheral vessels. Mackenzie⁶ concluded from a painstaking study of the actions of digitalis in cardiac therapeutics that "medicinal doses of digitalis do not affect the arterial walls, or if they do so, their effect is so slight as not to be recognizable." Cushny⁷ stated that in patients the blood pressure was rarely elevated by digitalis and, in fact, it might fall as the general improvement set in. Martinet⁸ pointed out that digitalis might raise, lower, or not alter the

systolic blood pressure, but that it always reduced the diastolic pressure and thereby increased the pulse pressure. He contended that this fall in diastolic pressure indicated a dilatation of the vessels.

Finally, a number of other observers have also dealt with this problem, among whom we might mention Czyhlarz,⁹ Gross,¹⁰ Neu,¹¹ Geisböck,¹² Schwartz,¹³ Fellner,¹⁴ Szinnyi,¹⁵ Price,¹⁶ Lawrence,¹⁷ and Cadbury.¹⁸ The results obtained by all of these observers agree, in the main, with the conclusions of Sahli, Mackenzie and Cushny, but they are summarized in the succeeding paragraph.

We find that the systolic blood pressure was recorded for 181 cases. In sixty-six of these, or about 36 per cent., the systolic pressure is stated to have risen or to have tended to rise; in fifty-seven, or 31 per cent., it fell, and in fifty-eight, or 32 per cent., it is recorded as having shown no change. In 116 instances in which the diastolic pressure is mentioned it is stated to have been increased in twenty-four, or 20 per cent.; to have shown no change in sixteen, or 15 per cent., and to have fallen in seventy-six, or 65 per cent. While the actual extent of the changes is not always stated, it would seem that digitalis is about as likely to influence the systolic blood pressure in one direction as in another, or not to alter it at all. With the diastolic pressure, however, the chances are nearly two to one that digitalis will cause some reduction, and the chances are more than three to one in favor of its reducing it as compared with the likelihood of its raising it. Other things being equal, this evidence certainly does not point to the occurrence of any marked vasoconstrictor action of the drug in man. The opinions expressed by the several authorities cited are in very general agreement that digitalis has little constant influence on the systolic blood pressure when used therapeutically, and some even go so far as to suggest that it actually often causes some vasodilatation, which would account for the reductions observed in the diastolic pressure.

PERSONAL OBSERVATIONS

These observations have been made on a series of fourteen hospital patients under the following conditions of control: No patient was accepted for study who had received any digitalis body within two or three weeks prior to the beginning of the observations. All were kept in bed and given a light diet which varied but little from day to day throughout the entire period of observation, and the amount of liquid which they were permitted to have was restricted to 1,250 c.c. for each twenty-four hour period. In general, all other medication was omitted during the period of observation, though at times it was necessary to give one or two small doses of morphin or codein for the relief of great distress or sleeplessness during the period before the administration of digitalis. The observations covered a period of several days before as well as after the digitalis was given. The blood pressures were read by the auscultatory method, a simple mer-

4. Wenckebach: Brit. Med. Jour., 1910, **2**, 1600.

5. Sahli: Tr. XIX Kong. inn. Med., 1901, p. 45.

6. Mackenzie: Heart, 1910-1911, **2**, 273.

7. Cushny: Am. Jour. Med. Sc., 1911, **141**, 469.

8. Martinet: Tr. XVII Internat. Cong. Med., 1913, section v, part ii, Therapeutics, p. 232.

9. Czyhlarz: Wien. klin. Rundschau, 1900, **14**, 285.

10. Gross: Deutsch. Arch. klin. Med., 1902, **74**, 296.

11. Neu: Blutdruck-Untersuchungen: Inaug. Dissert., Heidelberg, 1902, p. 332.

12. Geisböck: Deutsch. Arch. f. klin. Med., 1905, **83**, 363.

13. Schwartz: Arch. f. exper. Path. u. Pharmacol., 1906, **54**, 135.

14. Fellner: Deutsch. Arch. f. klin. Med., 1906-1907, **88**, 1.

15. Szinnyi: Therap. Monatsh., 1910, **24**, 427 and 472.

16. Price: Brit. Med. Jour., 1912, **2**, 689, and Tr. XVII Internat. Cong. Med., 1913, section v, part ii, Therapeutics, p. 305.

17. Lawrence: Bost. Med. and Surg. Jour., 1914, **170**, 37.

18. Cadbury: Arch. Int. Med., 1916, **16**, 317.

curial manometer with a broad cuff being used. The readings were taken at approximately the same hour each day, by the same observer, or by one whose readings were proved repeatedly to check within 3 mm. of mercury with those of the usual observer. In any given case the same arm was used throughout.

After the readings had become fairly constant, or after not less than three days of preliminary observation, digitalis or digitoxin was administered orally on the basis of the cat unit of activity and the patient's body weight, as previously described.¹⁹ The digitalis used was given in the form of a purified extract, diluted with lactose and made into capsules, each containing 2.5 cat units, or an amount equivalent to 2.5 c.c. of a high grade tincture. This was done to eliminate the possible influence of alcohol in the tincture. The digitoxin was given in the form of tablet triturates or of the granules of Nativelle's digitaline cristallisé, both preparations having been standardized on the cat. The general routine was to give somewhat over half of the calculated total therapeutic dose at 6 p. m.; a large fraction of the remainder at midnight, and to finish the administration in one or more small doses at six hour intervals thereafter. In most of the cases the blood pressures were taken at about 10 a. m. daily. Frequent polygraphic or electrocardiographic records, or both, were taken during the observations.

The rigorous conditions of study just outlined were adopted in order to eliminate, so far as possible, adventitious factors which might influence the results—a detail which seems to have been largely overlooked by most others who have approached this problem. The studies were purposely made of brief duration because it was desired to secure the effects of the drugs as acutely, and therefore as intensely, as possible, for the pharmacologic studies had shown that whatever vasoconstrictor action the digitalis bodies had was elicited only with massive doses and lasted but a short time. For convenience of analysis the cases have been grouped into two classes: those with high, and those with normal or low, systolic and diastolic blood pressures. Brief summaries of four case records are given below. The first two are typical of the entire series, the second two represent the only exceptional results.

CASE RECORDS

CASE 8.—W. A., a man, aged 25, was affected with chronic endocarditis, mitral insufficiency and stenosis. He was admitted, March 14, 1917, with dyspnea, orthopnea and pain in the large joints. He had had acute rheumatism at age of 22 with repeated attacks since. Rest in bed for five days with restricted diet reduced the dyspnea somewhat, but the orthopnea persisted. The patient's weight was 147 pounds.

TABLE 1.—BLOOD PRESSURE IN CASE 8

March	Systolic	Diastolic	Pulse Pressure
15	142	32	110
16	138	30	108
17	132	24	108
19	134	20	114
20	132	20	112
21	140	16	124

Digitalis extract capsules were administered: March 19, 6 p. m., four capsules; midnight, two capsules; March 20, 6 a. m., dose omitted. The dose was equivalent to 15 c.c. of active tincture. The blood pressure was taken daily at 10:30 a. m. March 20, 10:30 a. m., dyspnea and orthopnea were entirely relieved, and there was marked clinical improvement.

19. Eggleston, Cary: Digitalis Dosage, Arch. Int. Med., July, 1915, p. 1.

CASE 14.—J. McK., a man, aged 56, was suffering from chronic interstitial nephritis, hypertension, mitral stenosis and insufficiency. He was admitted, Sept. 19, 1916, with edema of legs, dyspnea and orthopnea. There was no syphilitic or rheumatic history. Rest in bed and restricted diet for eight days produced no material effect. The patient's weight was 154 pounds.

Digitoxin was prescribed: September 27, 6 p. m., 1.5 mg.; midnight, 1.0 mg.; September 28, 6 a. m., 0.5 mg. The total dose was 3.0 mg. in twelve hours. Blood pressure was taken daily at 10:30 a. m. September 28, 10:30 a. m., there was

TABLE 2.—BLOOD PRESSURE IN CASE 14

Sept.	Systolic	Diastolic	Pulse Pressure
23	168	104	64
24	174	112	62
25	178	118	60
26	176	118	58
27	182	120	62
28	190	112	78
29	184	96	88
30	178	94	84

marked clinical improvement, marked diuresis, relief of dyspnea and orthopnea.

CASE 4.—J. M., a man, aged 41, had aortic stenosis and insufficiency, cardiac hypertrophy and dilatation. He had had rheumatism eleven years previously, and several attacks since. He had had chancre twenty years ago; the Wassermann test gave ++++. He was admitted, July 5, 1915, with dyspnea, orthopnea and marked edema. There had been several previous similar attacks. Rest in bed, restricted diet and anti-syphilitic treatment were without effect after seven days. The patient's weight was 119 pounds.

Digitalis extract capsules were ordered: July 12, 6 p. m., four capsules; midnight, two capsules; July 13, 6 a. m., two

TABLE 3.—BLOOD PRESSURE IN CASE 4

July	Systolic	Diastolic	Pulse Pressure
8	130	60	70
9	130	44	86
10	128	50	78
12	126	44	82
13	134	0	134
14	146	0	146
15	132	0	132

capsules, and thereafter one capsule every six hours until midnight. The total dose to 6 a. m. was equivalent to 20 c.c. of active tincture. The blood pressure was taken daily at 10 a. m. Clinical improvement was slight by 10 a. m., July 13; it was very marked, with complete relief of dyspnea and orthopnea and marked diuresis by 9:45 a. m. on July 14.

CASE 6.—J. C., a man, aged 55, was affected with chronic endocarditis, mitral insufficiency and stenosis. Compensation was nearly normal. He had had syphilis twenty-five years previously. Rest in bed and restricted diet for ten days brought no obvious change in condition. The patient's weight was 145 pounds. He was admitted, July 2, 1916.

TABLE 4.—BLOOD PRESSURE IN CASE 6

July	Systolic	Diastolic	Pulse Pressure
10	104	38	66
11	108	38	70
12	106	40	66
13	118*	46	72
14	104	32	72
15	122*	30	92

* Repeated readings.

Digitalis extract capsules were administered: July 12, 6 p. m., five capsules; midnight, two capsules; July 13, 6 a. m., one capsule. The total dose of digitalis was equivalent to 20 c.c. of active tincture. The blood pressure was taken daily at 10:30 a. m.

Digitalis caused slight sinus arrhythmia and only slight clinical evidence of improved heart action.

ANALYSIS OF OBSERVATIONS

The averages for the three days before and the three days after the administration of digitalis have been calculated for the systolic, diastolic and pulse pres-

tures and the heart rate for each case and are given in Table 5. As there was no difference observed between digitalis and digitoxin, the two drugs are

TABLE 5.—AVERAGE PRESSURES FOR THREE-DAY PERIODS BEFORE AND AFTER DIGITALIS OR DIGITOXIN

A. Normal or Low Pressures:								
Case No.	Systolic		Diastolic		Pulse Pressure		Pulse Rate	
	Before	After	Before	After	Before	After	Before	After
1	142*	145*	87*	80*	55*	69*	96*	77*
2	122	113	96	79	27	33	96	76
3	135	144	94	67	41	51	89	86
4	128	137	46	0	82	137	93	91
5	129	134	78	68	51	66	117	117
6	106	115*†	39	36	67	75	93	77
7	113	108	81	63	32	45	88	71
8	135*	135*	22*	18*	111*	118*	80*	76*
B. High Pressures:								
9	167	178	113	116	54	62	108	107
10	246	223	126	117	120	106	...	...
11	168	171	118	105	50	66	90	83
12	208	223	129	129	79	93	119	111
13	180	181	107	91	73	91	87	82
14	179	184	119	101	60	83	83	71

* Averages for two days only.
† Exceptional variation in two readings.

considered together. Since a change in either direction of less than 10 mm. of mercury can hardly be regarded as significant, in view of a possible error of about 5 mm. in reading and of a normal diurnal variation of an equal or greater extent, this has been adopted as the dividing point for the analysis of the results.

Table 6, constructed from the figures of Table 5, shows:

1. Among the group with approximately normal systolic pressures none showed a change in the systolic pressure amounting to 10 mm. of mercury; five cases showed a fall of 10 mm. of mercury, or over, in the diastolic, none a rise and three no significant change; five showed a rise of 10 mm. or over in pulse pressure, none a fall and three no change. All of the cases responding to digitalis with an increase in the pulse

TABLE 6.—EXTENT OF PRESSURE CHANGES (CASE NUMBERS)

A. Normal or Low Pressures	Systolic	Diastolic	Pulse Pressure	Improvement
Rise of 10 mm. or over	.....	.....	1, 3, 4, 5, 7	Marked, 1, 3, 4, 5, 7, 8 Moderate, 2 Slight, 6
Fall of 10 mm. or over	.....	2, 3, 4, 5, 7	.....
Change of less than 10 mm.	1, 2, 3, 4, 5, 6, 7, 8	1, 6, 8	2, 6, 8	
B. High Pressures	Systolic	Diastolic	Pulse Pressure	Improvement
Rise of 10 mm.	9, 12	.....	11, 12, 13, 14	Marked, 11, 12, 14 Moderate, 9 Slight, 13 None, 10
Fall of 10 mm.	10	11, 13, 14	10	
Change of less than 10 mm.	11, 13, 14	9, 10, 12	9	

pressure, and one with no change, showed marked clinical improvement; while of the remaining two cases with no significant change in pulse pressure, one patient was moderately, the other slightly, benefited by treatment.

2. Among the high pressure group the systolic pressure rose 10 mm. or over in two cases, fell 10 mm. or over in one, and showed no change in three; three cases showed a fall of 10 mm. or more in diastolic and three no change; four showed a rise of 10 mm. or over in pulse pressure and one each, a fall and no significant change. Three of the four cases showing increased pulse pressure also showed marked clinical improvement; in the fourth this was slight. The one case with no change in pulse pressure showed moderate improvement, and the only case in either series in which the pulse pressure fell by 10 mm. or more showed no improvement. The last patient grew progressively worse and died about one week later.

In all of the first group of cases the increase in pulse pressure was chiefly due to a fall in the diastolic, though rises of from 3 to 9 mm. occurred in the systolic in four of the five cases. Fall in diastolic pressure also chiefly accounted for the increased pulse pressure in three of the four cases in the second group, the other having been due wholly to a rise in the systolic.

Taking all of the cases together, it is seen that the administration of large doses of digitalis or digitoxin has very little tendency to elevate the systolic pressure, this having been increased by 11 mm. of mercury in one and 15 mm. in a second case. In only one case was the systolic pressure materially reduced, namely, by 23 mm. of mercury. On the other hand, the diastolic pressure was significantly lowered in seven, or 50 per cent. of the cases, while it was never significantly raised.

It is evident, therefore, that digitalis and digitoxin have very little influence on the systolic pressure in either direction, that they tend to produce a significant reduction in the diastolic and, more decidedly, to pro-

TABLE 7.—TOTAL AVERAGE PRESSURES FOR THREE DAYS FOR ALL CASES AND FOR EACH GROUP

Systolic Pressure:	All Cases*	Normal Pressure Cases*	High Pressure Cases
Before	156	124	191
After	156	127	193
Percentage of change	0	+2.4	+1
Diastolic Pressure:			
Before	95	73	118
After	86	64	110
Percentage of change	—9.5	—12	—7
Pulse Pressure:			
Before	62	51	73
After	73	63	83
Percentage of change	+18	+23	+14

* Excluding Case 4.

duce a material increase in the pulse pressure. These facts are brought out strikingly in Table 7, which gives the grand averages of three days' readings of all pressures, both before and after treatment.

Since slowing of the heart is one of the most characteristic actions of digitalis, and as this might account for the diminution in the diastolic pressure, this relation was studied in eleven of the cases. Reference to Table 8 shows that: 1. In the seven cases with a fall of 10 mm. or more in diastolic pressure, the pulse rate was slowed by more than five beats per minute in only four cases. 2. In the four cases without significant fall in the diastolic pressure, the pulse rate was similarly slowed in three. 3. The greatest reductions in diastolic pressure, 27, 18 and 17 mm. of mercury, were associated with reductions in the pulse rate of three, twelve and twenty beats, respectively. 4. The

TABLE 8.—RELATION BETWEEN SYSTOLIC AND DIASTOLIC PRESSURES AND PULSE RATE

Case No.	Systolic, mm. Mercury	Diastolic, mm. Mercury	Pulse Rate
	Rise	Fall	Fall
1	3	7	21
2	..	17	20
3	9	27	3
5	5	10	0
6	9	3	16
7	..	18	17
8	0	4	4
11	3	13	7
12	15	0	8
13	1	16	5
14	5	18	12

smallest reductions in the diastolic pressure, 0 and 3 mm., were accompanied by pulse rate reductions of eight and sixteen beats. 5. In the one case, with no change in the pulse rate, the diastolic pressure fell 10 mm. of mercury.

It is obvious, therefore, that the alterations in the pulse rate do not explain the changes occurring in the diastolic pressure.

Table 8 shows also a similar absence of relationship between the changes in the pulse rate and those in the systolic pressure. And an equal lack of relationship between the changes in the diastolic and the systolic pressures is evident from Tables 6 and 8.

In view of the facts thus brought out, the conclusion seems abundantly warranted that there is no evidence that either digitalis or digitoxin has any direct action on the vessels when given to man even in large therapeutic doses. This agrees precisely with the results of animal experiments, which show that these drugs produce no vascular changes unless given in amounts several times those which are promptly fatal, or perfused through the vessels in concentrations much greater than could ever be reached in man.

To what, then, are the changes in systolic, diastolic and pulse pressures in man due? It is not possible, in the present state of our knowledge, to answer this question categorically, but the following suggestion may be offered: It has been proved that all of the digitalis bodies are capable of increasing the systolic volume output of the heart, and Stewart and Scott²⁰ have been able to demonstrate that digitalis increases the blood flow through the arm in man. It may be suggested, therefore, that:

1. Digitalis, by improving the circulation, leads to improved pulmonary ventilation with the relief of cyanosis and the abolition of the vasoconstrictor effect of carbon dioxide on the center.

2. The improved circulation results in the more normal functioning of the various organs and tissues of the body, and tends to restore to normal the several mechanisms by which the circulation is maintained at its most efficient level.

On this hypothesis, we should expect to find that the net changes in the systolic, diastolic and pulse pressures would differ in different cases in order best to meet the conditions prevailing. This is precisely what is shown to occur in all of the observations here recorded, and explains the apparent divergence in the results of different observers. The observation that the pulse pressure is increased in the majority of cases in which there is material clinical improvement as a result of the use of digitalis is also in harmony with this hypothesis, since the pulse pressure is to a certain extent a measure of the efficiency of the circulation through the periphery.

414 East Twenty-Sixth Street.

20. Stewart and Scott: Jour. Pharmacol. and Exper. Therap., 1915, 7, 263.

Wild Substitutes for Domestic Plants.—One of the projects outlined by the committee on botany of the National Research Council is the search for wild plants which may be used as wartime substitutes for the more costly crop plants. During the Civil War Dr. John Porcher, a southerner, published a book giving a list of wild plants of the South which could be substituted for much needed food and drug plants. *The American Botanist* (Joliet, Ill.) proposes, with the aid of its readers, to compile a similar list. Information is sought as to any plants not ordinarily cultivated which have edible fruits, seeds, roots, etc. It is suggested that valuable knowledge on this subject might be obtained from hunters, trappers, woodsmen, farmers, Indians and the foreigners who pick up considerable food from the countryside. Similar information is desired concerning plants that can be used in medicine.—From the *Scientific American*, Sept. 8, 1917.

THE NEURASTHENIC AT THE THRESHOLD*

FRANK R. FRY, A.M., M.D.

Clinical Professor of Neurology, Washington University Medical School
ST. LOUIS

It is still quite the custom in professional as well as in lay circles to tag the proverbial neurasthenic a physiologic enigma, or a psychologic joke, or some kind of an ill-defined cross between the two. In view of the various and often fanciful versions of his disorder, there is ample room for some public ridicule. It is too bad, however, that the brunt of it should fall on the head of the poor victim and not on his traducers.

The language of some writers implies that we have gone far enough with the explanation of neurasthenia by calling it a fatigue neurosis; that essentially it is an undue fatigability of the central nervous system with morbidly increased sensitiveness or irritability. Others, impressed with the inadequacy of this deduction, especially in accounting for the psychic conditions, undertake to support a psychogenic theory and are willing to define it as primarily a mental malady. A majority of writers declare that the causation is not to be found in tangible or probable structural or anatomic changes, but that the syndrome is the result of a structurally normal organism reacting (organically) abnormally, and that the ultimate or underlying explanation is to be found only in a constitutional defect, a direct hereditary predisposition.

The only possibility of sifting these apparently variant conceptions of essential features is to collect some fundamental or physiologic data as a starting point; enough at least to turn our thought in the direction of a more evident harmony.

For the moment, in this elementary way, we must remember that the fundamental plot of the nervous system is one of defense and that the instincts and their related emotions have had the leading rôle in the evolution of this plot. In the second place we must visualize, as it were, the whole general scheme of reflex performances by which the various species of defense are maintained and coordinated.

Modern physiology undertakes to instruct us concerning the workings of the systems of neural mechanisms by which our orientation with environment is sustained. Therefore, in order to gain conceptions adequate to guide our arguments in this field, we must gain some familiarity and sympathy with physiologic deductions, including the technicalities by which they are presented to us.

For example, in our clinical studies we find the neurasthenic absorbed in his sensations. He is continually disturbed by an abnormal consciousness of them. He is never at par in his subjective condition. This means that he never possesses an emotional equilibrium. In this sense, at least, there is an abnormal psychic condition. As neurologists we all have more or less familiarity with the time-honored contest between psychology and physiology over the causal relations between emotions and visceral reactions and the mental states connected therewith, and from the phases of this argument we may try to derive some coloring for the formation of a lucid theory. Or, again, we notice the fatigue reactions of our neurasthenic patient and are impressed with the fact that to

* Read before the Section on Nervous and Mental Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

a certain extent they may be paralleled with physiologic fatigue, but we are apt to overlook the limits to which these analogies may here be legitimately extended. In short, one of us, affirming a psychic view, fails to sustain his position for lack of a thoroughgoing argument. Another, impressed with the etiologic importance of the physical side of the problem, fails to assemble in proper sequence the data to which he should appeal for defense of his position.

As a result of circumstance, the modern neurologist is a better psychologist than physiologist, at least in a speculative way. The physical side of physiology, so to speak, is his greater stumbling block. We easily neglect the peripheral side of the nervous system, the neural basis, through which the psychic is attained. For example, we cannot grasp the conception of the threshold and the problems of threshold changes unless we know in a physiologic sense something of the range of stimuli and the conditioning of reflex systems thereto, and something of the rules of conduction, and other correlated phenomena of definite value to the equation. In the light of our newer knowledge of certain toxic agents and their effects, I think we are all going to agree that we have reached the place from which we cannot proceed profitably with our argument concerning the interrelations of the psychic and somatic features of neurasthenia and other neuroses without dwelling carefully on questions of threshold.

Our attention in this direction has been particularly stimulated by physiologic and clinical studies of the glands of internal secretion, and especially the physiologic side of this work has led to more definite conceptions, in that these specific substances may determine stimulus thresholds in definite neurons on which their direct stimulative influence falls.

In considering the various clinical syndromes believed to arise from the toxic products of metabolic anomalies and perversions, neurasthenia has received much attention from older writers, who frequently discoursed on its close relationship to arthritism, obesity and other definite syndromes wherein metabolic derangement is the most evident factor. These observations are too fascinating to be neglected, and hence the modern worker is reviewing them in the light of these newer data. Considering the amount of this kind of work now being undertaken, its promising results and its stimulating effects on physiologic work in general, it is not too much to hope that the neurasthenic, and his neurotic associates, are at the threshold of a more fair consideration.

In practical matters of therapy we find promises of the fulfilment of our expectations. Step by step, we are getting away from extremes and beginning to assume a rational attitude. The abuses of the well-conceived rest method began long ago to show us its proper limitations, and to reveal what was fatigue and what was something else in the case of the neurasthenic. The same has happened in regard to psychoanalysis. A superenthusiasm in its attempted application has been replaced by a recognition of its value in leading to certain psychogenic features in neurasthenic conditions. In our present efforts at endocrine gland therapy, we are overreaching again and are probably neglecting some of our older lessons. Yet, through its study we are gaining facts which have direct bearing on questions of diagnosis. For example, having been impressed with the fact that a thyroid intoxication may bring out neurasthenic reactions of

classic type, we are now casting about for other etiologic possibilities of kindred nature, and owing to this fact our view more readily broadens and we gain a wider conception of the neurasthenic reaction, fundamental in its nature, occurring in somatic states variously produced.

THE PSYCHONEUROSES: HOW SHALL WE LOOK ON THEM TODAY? *

THEODORE DILLER, M.D.
PITTSBURGH

Twenty-five years ago practically all the neuroses or psychoneuroses were classified as hysteria or neurasthenia. But for many years past there has been

TABLE 1.—PSYCHONEUROSES, OCCURRING IN ONE THOUSAND CONSECUTIVE PRIVATE CASES BEGINNING IN 1894

	No. of Cases
Neurasthenia	177
Psychasthenia	0
Hysteria	55
Constitutional inferiority	0
Dementia praecox	0
Psychoneuroses (undifferentiated)	0
Total	232*

* Or 23.2 per cent.

a disposition to question and scrutinize these diagnoses, so that gradually the groups have grown smaller and smaller; and today these diagnoses, I suppose, are made very much less frequently than they were twenty-five years ago. This has been my own experience as regards neurasthenia, but not as regards hysteria. An examination of 1,000 cases taken from my private records, beginning in 1894, discovers that the neuroses and psychoneuroses had been classified as shown in Table 1.

Of all cases seen 23 per cent. were psychoneuroses, 17.7 per cent. were cases of neurasthenia, and 5.5 per cent. were cases of hysteria.

TABLE 2.—PSYCHONEUROSES OCCURRING IN ONE THOUSAND CONSECUTIVE PRIVATE CASES ENDING IN 1916

	No. of Cases
Neurasthenia	36
Psychasthenia	130
Hysteria	69
Dementia praecox	68
Constitutional inferiority	16
Psychoneuroses (undifferentiated)	19
Total	338*

* Or 33.8 per cent.

Comparing this list with 1,000 consecutive cases from my private records running back from December, 1916, I find diagnoses made as exhibited in Table 2.

Of all cases seen, 33.8 per cent. were psychoneuroses.

Strictly speaking, dementia praecox ought not to be included among the psychoneuroses, for this is something different. But it is because a certain number of cases have been and are called neurasthenia, hysteria, etc., that I have thought it proper for the purpose of this study to include it in this table.

Comparing Tables 1 and 2, it is seen that neurasthenia has decreased from 17.7 per cent. to 3.6 per cent., while hysteria has increased from 5.5 per cent.

* Read before the Section on Nervous and Mental Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

to 6.9 per cent. But this increase could be explained, I think, by the much larger percentage of damage cases seen by me later as compared with the earlier period.

I do not accept the view which is held by some that it is useless to attempt to differentiate between the psychoneuroses. There are certain clinical and practical differences between neurasthenia, psychasthenia and hysteria which I believe are significant; and yet I am free to confess that I see all sorts of overlapping and borderland cases. In Table 2 it will be noted that I have recorded nineteen cases of psychoneuroses as undifferentiated.

I have looked over some of my old cases and refreshed my memory somewhat to try to answer the question as to why there is such a great difference in the diagnosis of neurasthenia—177 cases in the first thousand, as against thirty-six in the more recent thousand cases. Comparison shows that about four fifths of my cases of neurasthenia have disappeared. Where have they gone? The great majority have been classified in the later records as psychasthenia. Cases which were formerly called neurasthenia have been recognized as cases in which there is such a distinct emotional or intellectual change as to make the diagnosis of psychasthenia more appropriate, and they have been so designated. But not all cases formerly called neurasthenia have been placed in the psychasthenia group. It will be noted that in the recent series of cases the diagnosis of dementia praecox is made sixty-eight times, among which were a considerable number of cases called predementia praecox. While I cannot give exact figures, I should roughly estimate that one-third of these cases would have been designated in my earlier experience as cases of hysteria and some of them as neurasthenia; and still later in my experience some of them would have been called psychasthenia. Probably one half or two thirds of them would have been designated as some form of insanity. I often find in my earlier records the diagnosis of adolescent insanity, which is, after all, not far removed from our present conception of dementia praecox.

I wish especially to call attention in the second group to sixteen cases of constitutional inferiority. Here we have a group of cases, most of which in my earlier experience, I have no doubt, I should have designated as hysteria or neurasthenia or a few as imbecility. The conviction has grown on me more and more that mental inferiority underlies many cases of grave psychasthenia and hysteria; and I look on many of these as cases of constitutional inferiority plus hysteria. The name "moron" is now commonly applied to the slighter degrees of mental deficiency. We have all seen cases that would suggest dementia praecox which did not seem quite pronounced enough to justify that diagnosis, and which have been called by many predementia praecox and by others states allied to dementia praecox. Constitutional inferiority is a condition of deficient intellect along with lowered, deficient or perverted emotional tone and frequently includes cases of potential or predementia praecox or imbecility. There are no definite limits to this classification. It is of great importance to recognize the existing defect, which is constitutional or fundamental in character and which cannot be eradicated or cured any more than imbecility can be cured. The hysterical or other manifestations engrafted on it may disappear, but the underlying condition never does.

There is allied to constitutional inferiority or constitutional defect what is commonly called temperament. Every now and then one sees a psychoneurosis which is chiefly a case of temperament—a thing much to be reckoned with. I recall meeting at a social gathering a bright, intelligent woman who had been a patient of mine some time before, classified as a psychasthenic. I congratulated her on looking so well, and in a joking way asked her if I had not made a pretty fine cure of her. She quickly replied, "You have cured my neurasthenia, but that was only one third of my trouble. I still have the remaining two thirds—my temperament—and you can't cure that."

The differential diagnosis between hysteria and dementia praecox has for many years interested me. I have thought about the subject a good deal, and with my assistant, Dr. George J. Wright, have written

TABLE 3.—REPORT OF THE NEW YORK NEUROLOGICAL INSTITUTE (1916)

House Cases, 2,349.	No. of Cases
Constitutional inferiority	21
Hysteria	48
Neurasthenia	57
Psychoneuroses ..	99
Total	225*

* Or 9.5 per cent.

a paper on the subject.¹ I find the subject a difficult one. *Vorbeireden* and *Dämmerzustand* (mental torpor or twilight state) of Raicke, along with suggestibility, seemed like diagnostic criteria of value indicative of hysteria. I feel that in some cases this differential diagnosis could be made, and several times it seemed to be of real value. In other cases in which a diagnosis of hysteria was made we were compelled to revise it subsequently and make it dementia praecox. But this difficulty has now largely disappeared. I now recognize that, given a faulty fundamental makeup, in some instances dementia praecox will develop and in others, hysteria. I think it is the experience of all of us who have had opportunity for extensive observation to note that hysterical symptoms

TABLE 4.—REPORT OF THE NEW YORK NEUROLOGICAL INSTITUTE (1916)

Dispensary Cases, 5,754.	No. of Cases
Constitutional inferiority	211
Dementia praecox	101
Hysteria	130
Neurasthenia	373
Psychoneuroses	659
Total	1,477*

* Or 25 per cent. of outpatients.

are really common in dementia praecox. Yet there are a few cases in which a differential diagnosis is of scientific and practical importance, because a purely hysterical condition is one in which there is far greater hope for clinical recovery than in the dementia praecox syndrome.

I have now a strong feeling that in cases which appear on the surface as neurasthenia, psychasthenia and hysteria, but in which after careful investigation organic disease is discovered, an attempt should be made to evaluate the underlying mental status of the patient, especially as a basis of prognosis. This will include a careful examination of social and family relationship and inquiry into the sexual life of the individual. The more this is done, the more I believe

1. Diller, Theodore: A Study of Hysterical Insanity with an Especial Consideration of Ganser's Symptom-Complex; Report of Eight Cases, *Jour. Nerv. and Ment. Dis.*, January, 1909.

we shall discover potential dementia praecox or constitutional inferiority as a condition underlying the psychosis or psychoneurosis. Inquiry into psychoses of various types and into alcoholism will frequently disclose an underlying constitutional deficiency. I believe this is being more and more realized, especially as regards alcoholism.

For the purpose of comparison, I call attention to Tables 3 and 4, taken from the 1916 report of the New York Neurological Institute.

While I realize that it is difficult to compare hospital cases with those from private practice, yet there may be some lesson to be drawn from a consideration of the cases from the New York Neurological Institute. Neurasthenia, psychasthenia and dementia praecox taken together constitute a large group of the dispensary cases—25 per cent in all. This does not differ greatly from my own percentage. It will be noted that the large number of 373 cases of neurasthenia are diagnosed in dispensary cases and fifty-seven in the house cases.

Despite all the efforts made to delimit hysteria and neurasthenia, these conditions remain and can hardly be made to disappear from diagnostic tables.

It seems that although we may eliminate in one direction, the cases will appear in some closely allied group. But these cases are here, whether we call them neurasthenia, psychasthenia, potential dementia praecox or constitutional inferiority, or something else.

These classifications are useful if they are not taken too seriously; if we bear in mind that every case is a law unto itself, and that there are all kinds of overlapping to be observed, and if we do not worry particularly because we cannot force a particular case into a given diagnostic grouping, for we ought not to even try to do so in all instances.

SUMMARY

In dealing with all the neuroses and psychoneuroses we must be on the sharp lookout to eliminate all sorts of organic disease, and we must examine and reexamine in order to do this, bearing in mind that by the most acute observers cases have been called hysteria which have afterward been seen by the same observers to be grossly organic—for instance, brain tumor.

Hysterical symptoms may appear not only as an expression of various organic diseases, but as a phenomenon of various psychoses and expressions of constitutional inferiority or of temperament. My main point in this paper is that, after having eliminated organic disease, we should examine into our case to determine as far as possible the original constitution and temperament of the patient, remembering that some of these cases are best designated as constitutional inferiority.

Westinghouse Building.

Suicide More Prevalent Among Men than Women.—Figures compiled by the Metropolitan Life Insurance Company show that suicide is more than twice as frequent as a cause of death among males than among females. This is true at all periods of life except at the ages 15 to 19. The same conditions are found to prevail among the white and the colored races. After early adolescence, the white female suicide rate remains practically stationary, never varying very much from about eleven per hundred thousand. On the other hand, the white male suicide rate increases with each age period. The rate is highest at the ages 65 to 74, when it is over eighty per hundred thousand. Suicide is a common cause of death, nearly five times as prevalent as at the age period 20 to 24.

THE TRAUMATIC NEUROSES

WITH SPECIAL REFERENCE TO THEIR
MEDICOLEGAL RELATIONS *

EDWARD E. MAYER, M.D.

PITTSBURGH

The traumatic neuroses embrace all of the psychoneurotic syndromes which directly follow shock. Under this name one includes especially hysteria, neurasthenia and hypochondriasis that have immediately succeeded a trauma. It is generally agreed, therefore, that this heterogeneous term signifies no disease *sui generis*, but merely a mixture of functional symptoms which are ushered in through the influence of an accident. It does not exclude in the same person other disabilities, mainly surgical, that have resulted from the accident. It does not ignore the possible aggravation by the trauma of previously present cardiovascular-renal or other syndromes. It does not decide the question of dormant nervous symptoms forced into activity by the accident. Unfortunately, also, it does not differentiate between the functional psychoneuroses and brain disorders, like concussion of the brain, which evoke indefinite symptoms resulting from molecular or other definite physical changes.

Not long after 1888, when Oppenheim first used this term though Erichsen years before brought out similar views, it became generally accepted, even though not all were in harmony with his point of view that it represented a specific disease with molecular physical changes in the brain. In recent years, the desire for annuities and compensation for accidents has caused such a misuse of this diagnosis that many physicians have been won over to accept the contention that the traumatic neuroses are merely a collection of imaginative or ideogenous symptoms clustered around a lawsuit. Others again see in it a psychoneurosis which must have been present before, and which has nothing to do with the accident. Hellpach, in Germany, speaks of it as a folkepidemic resulting from their system of annuities. A. Brissaud, in France, coined the word "sinistrosis" to express the fixed determination of a person to secure compensation for having been in an accident, and in the Fourth Chamber of the Tribunal it has been ruled that an incapacity resulting from this obsession does not entitle a workman to ask for the allocation of an allowance (Collie). *Rentenhyserie* and *Begehrungsneurose* in Germany and litigation-hysteria in America are likewise used to express this idea. Moorehead¹ uses the word "traumasthenia."

But the same functional symptoms develop in persons who do not have accidents that involve compensation, and some individuals who after accidents develop a traumatic neurosis never desire and even refuse compensation. Also, notwithstanding a frequently repeated opinion to the contrary, a traumatic neurosis can develop in a person who, before an accident, was absolutely well. The termination of litigation does not always result in a total recovery. My experience, nevertheless, agrees with the experience of those who claim that a large part of the jury awards in our country represent a valuation of the exaggerated rather than the actual symptoms. The intense

* Read before the Section on Nervous and Mental Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Moorehead: *Traumatic Surgery*, Philadelphia, W. B. Saunders Company, 1917.

contemplation of self resulting from the desire for compensation, the overzealous efforts of interested attorneys, physicians and friends to protract an abnormal mental attitude until the pending litigation is over, and the effort to win the sympathy of the jury by making the most of the litigant's ailments cannot tend toward a true picture of conditions. And since most psychoneurotic persons are unduly emotionally reactive, the affective factors which cluster around litigation and control the actions and social relations of the litigant are often vastly more disturbing to the nervous system than the initial shock of the accident.

IS THERE AN ORGANIC TYPE OF NEUROSIS?

Renewed interest in the traumatic neuroses, aside from the factor of litigation, has resulted from the present great war. Oppenheim² reaffirms and amplifies his point of view that after the trauma there is a definite reaction on physiologic functioning which may be either mechanical or physical in action. Either type of causative factor has the same effect on the nervous system. He says:

There is no doubt that the finer organization of the nervous tissue can be directly and indirectly injured, without the occurrence of hemorrhage, inflammation, degeneration and necrosis. I refer to finer physical occurrences. The influence of this overestimated impulse seems to me to be like the removal of a link in a chain, or of the displacement of molecules, or of an inhibition of tracts, a tearing apart of associated functioning parts, a diaschisis—in short, a condition which is not microscopically demonstrable, which does not represent definite alterations of nervous tissue but which in every case produces conduction inhibitions to motor impulses.

He cites the frequently found vasomotor-secretory-trophic disturbances as a further proof; likewise, the hyperthyroidism which often follows shock of an accident. His experience from the war neuroses has fixed more firmly than ever his belief that we are dealing in some of the traumatic neuroses with an overstimulation of the nervous system with a resultant altered function which is not hysterical, implying thereby a psychogenic origin, or neurasthenic, conveying thereby the idea of an exhaustion origin. His observations concerning reflex paralysis and the flaccid atonic paralysis of amnesic akinesia, differing from the hysterical type, its predilection for the left side, its constancy and often accompanying trophic disturbances represent a brilliant though unsuccessful attempt to isolate a syndrome peculiar to the traumatic neuroses. Regis,³ commenting on this question, records a sluggishness of gait not extending to paraplegia in the hind legs, among other symptoms observed in dogs that have been subjected to violent explosions. The dogs that died after three or four days did not have any discoverable microscopic lesions of nervous tissue. Sudden deaths under shell fire have been reported from the front without any injury having been received. They cannot, however, be used, as has been done by Farrar,⁴ in supporting the view of probable minute changes in the central nervous tissue. It is just as probable that myocardial and cardiovascular disease was the cause.

The war neuroses have, on the other hand, accentuated the views of those who see in the traumatic neuroses only a psychogenetic or ideogenous syn-

drome. Lewandowsky⁵ attacks Oppenheim's hypothesis, most drastically asserting that "a mechanical shock to the nervous system by way of sensory and sensorial tracts is unknown to physiology or pathology." In the discussion of Cassirer's paper before the Berlin Neurologic and Psychiatric Association, Feb. 14, 1916, not only Lewandowsky, but also Schuster, Bonhoeffer and Liepmann objected to Oppenheim's attempt to isolate in the traumatic neuroses a syndrome which was organically produced and, not therefore, hysteria.

Though working as an aurist in a base hospital, Wilson⁶ ventures on a hypothesis which presents the same line of reasoning as does Oppenheim. He speaks of three types which he encounters: (1) those with actual nerve deafness; (2) those who recovered hearing, but with fixed ideas of nerve deafness still remaining, and (3) malingerers. I quote the following from him:

The symptoms associated with loss of hearing from high explosives fall within the group of nerve diseases called traumatic neuroses. In many of our cases, there is a recognized physical trauma to the head or elsewhere received during the period of mental excitement. It is well recognized that traumatic neuroses are apt to occur under such conditions. There is unsteady equilibrium with vertigo. There is a concentric narrowing of the field of vision. In many of our cases, fields of anesthesia were present.

He sets up the following explanation:

1. At the synapses, there is a structural discontinuity of the nerves. 2. The results produced by impulses traveling in a nerve depend on the way the fiber ends and not on any differences in the impulses themselves. 3. At the synapses different physiologic systems come in touch with one another and so coordinate action in diverse systems is possible. 4. At the synapses, there is always a spread of nerve impulse and the greater the impulse the greater the spread.

With this basis, Wilson says, we are working on the following hypothesis:

As a result of high explosive with enormous and sudden pressure in the ear, there occurs a dissolution of the permanent auditory pathway and a spread of nerve impulses into the other adjacent pathways. The auditory impulse no longer reaches its goal, and deafness results. Such a dissolution may occur at any one or all synapses.

His reasoning, though conjectural, may be applied to many of the other symptoms of the traumatic neuroses, such as functional loss of vision, functional paralysis, etc. S. Meyer⁷ describes an apathy simulating dementia accompanied by deafness without any central labyrinthine disturbance which he speaks of as a functional inhibition of cerebral activity. This seems to be similar to the Wilson type of traumatic neuroses. Hysteria from shell shock he observed frequently. It was not, however, accompanied by deafness or any profound disturbance of hearing. These cases had nothing in common with his first group of patients, which he considered to be a special type of mental disturbance. It is not a pronounced apathy with a retrograde amnesia producing varied types of pseudodementia such as has been frequently observed in the traumatic neuroses, especially after catastrophes.

The shock hypothesis of Monakow which he calls "diaschisis" seems to me to be a valuable conception.

5. Lewandowsky: *Ztschr. f. d. ges. Neurol. u. Psychiat.*, 1915, **11**, 703; 1915, **12**, 434-439.

6. Wilson: *The Effects of High Explosives on the Ear*, *Brit. Med. Jour.*, 1917, p. 353.

7. Meyer, S.: *The Nervous Symptoms Following Shell Shock*, *Ztschr. f. d. ges. Neurol. u. Psychiat.*, 1916, *Orig.*, **33**, 353.

2. Oppenheim, H.: *Die Neurosen nach Kriegsverletzungen*, Berlin, S. Karger, 1916; *Neurol. Centralbl.*, 1915, **34**, 514.

3. Regis: *Boston Med. and Surg. Jour.*, 1916, **175**, 22.

4. Farrar: *War and the Neuroses*, *Am. Jour. Insan.*, 1917, **73**, 716.

It resembles, but goes farther than the idea of nerve circuits. It is well recognized that any catastrophic event may stop the brain from receiving any information. Diaschisis, therefore, results, not merely after hemorrhage or thrombosis, as Monakow brought out, through a primarily disturbed brain, but secondarily through a failure of the sensorial pathways to properly influence the brain centers.

AN EXPLANATION OF THE PSYCHONEUROSES

We start, therefore, with the assumption that an acute stoppage of cerebral activity may result after trauma. This need not be structural in origin any more than a syncopal attack premises structural brain changes. But it must be of such a degree that the individual cannot adjust himself to it. This disordered situation brings emotional reactions and its motor responses. If the brain adjusts itself, the emotions subside gradually; if not, the attempt to do so increases the emotional reaction. Such emotional reactions represent the strongest drainings of energy to which the nervous system can be subjected. An emotional complex thus produced by an accident nullifies all efforts of the body to adjust itself, acting similarly to emotional reactions produced by various psychogenic determinants. The body vainly tries to secure an adjustment. The glandular secretory organs work overtime. And there results from their overstimulation the same nonintegrations as are produced by the overactivity of these organs from other causes. An ideogenous factor now stepping into play establishes a vicious circle. It is especially an acute and intense emotion, which in not allowing any time for readjustment, quickly drains off neural energy. It cannot be replenished if any factor connected with the accident prevents, whether it be primitive fear, or desire for compensation, or other wish factors.

Such a draining of energy is probably similar in result to the overactivity of cells which in diaschisis produces a physiologic stoppage of function. This is transient if the cells can replenish their energetic substances; permanent, if they become damaged, or if the synaptic connections cannot become reestablished (Sherrington). This draining of energy is typified especially by the clinical syndrome of complete asthenia and need not be marked by any emotional stage. As a rule, however, the ideogenous factors are present from the beginning to exercise their influence on the nervous system, especially the autonomic nervous system. Bivalency of origin is, therefore, generally noted in the traumatic neuroses. The line between stimulation and overstimulation on the physiologic side is hard to establish; likewise we cannot easily differentiate the negative from the positive side of an emotion, a euphoria from a dysphoria, etc. The discrepancies in points of view are due often to the observer overvaluing one valency and neglecting to give the other its proper perspective. Endocrine neurasthenia exemplifies this confusion. Entities should not be raised up which tend to ignore the unity of the entire nervous system.

Once established, emotions functionate and keep up their harmful influence in many ways. "Fixation of neuroses" and shirking and habit reflexes or substitutions are the result. Unconscious wish factors often determine them. And more often the brain defends itself from its enemy by suppressing the content of the emotion. Submerged, it may continue dynamically active and influence the reactions of the individual by

surrogations, projections, introversions, etc. But in all these mental processes the cerebral cortex is activated since it represents the adjuster mechanism of the afferent neurokinesis (Dearborn⁸). Pawlow's conditioned reflex studies help us to understand how these psychokinetic equivalents act. And also Adler's⁹ organic inferiority conception with the psychic factors it involves is likewise a fingerpost on the road to a complete understanding of the psychoneuroses.

SOME ATTEMPTS AT CLASSIFICATION

Grasset¹⁰ groups the psychoneuroses under: (1) the sensory motor (motor sensitive) psychoneuroses; (2) the sensorimotor (motorsensorial) psychoneuroses, and (3) emotional and psychic psychoneuroses.

1. The classical hysterical traumatism or traumatic neuroses. Here we find apparent disability from paralysis, paresis or contractures, anesthesia of the various functional types, psychosplanchnic syndromes, circulatory, respiratory or digestive and neurasthenic syndromes.

2. Sensorimotor psychoneuroses. Under this title are included those psychoneuroses in which symptoms on the part of the special senses predominate: visual symptoms, aural symptoms, disturbances of speech and writing of a functional type and various mimicries.

3. Emotional and psychic psychoneuroses. He places here "persons with hyperalgesia and hyperesthesia whose hysterogenic zones generate emotion but no other disability. They are, he says, not only *angogènes* (hysterogenetic) but *angoissantes* (terrifying). They evince the mimic phenomena of emotion—tremble, perspire, shriek, attempt to flee, etc."

Cimbal¹¹ argues for a more practical classification which will indicate clearly the condition found on examination. (a) Acute nervous irritation is not, he says, a traumatic neurosis. (b) Acute nervous exhaustion is not neurasthenia, inasmuch as it is not developmental and does not deal with constitutional inferiors.

4. Asthenia describes a general exhaustion more clearly than does neurasthenia. Hysteria is too vague and should be divided into fright neuroses, repression neuroses (*verdrängungsneurosen*), inhibitory neuroses (*hemmungsneurosen*), congenital irritability, moods, psychic spasms and displacements (*verschobenheitszuständen*).

5. He separates from the war neuroses also two organic types of neuroses: (a) concussion neuroses of the brain with disturbances of ocular movements, of the visual fields, of audition and of coordination; (b) a cerebral compression type occurring from shell shock with spastic hemiparesis without ankle clonus or a Babinski reflex, but with a positive Oppenheim sign. These must not be called hysteria.

From the Italian war front the observations of Bennati¹² are worthy of comment. He considers that the war neuroses are conditioned by two factors, namely, the numerous catastrophic occurrences and extreme exhaustion, producing structural changes, after the hypothesis of Edinger. Other observers conclude, however, that exhaustion is not as important

8. Dearborn: Affective Physiology, Med. Rec., New York, April 8, 1916.

9. Adler, cited by Mayer, E. E.: Am. Jour. Insan., 1914, 70, 661.

10. Grasset: Les Psychoneuroses de guerre, Presse méd., 1915, 14, 105.

11. Cimbal: Neurol. Centralbl., 1915, 34, 710.

12. Bennati: La Etiologia determinata nella nervosi traumatica di guerra, Riv. sper. di Frenat., 1916, 42, 49.

etiologically as was formerly assumed. In fact, Bonhoeffer¹³ expresses great doubt as to whether we are justified in holding to our older conceptions of an exhaustion psychosis.

Farrar⁴ concludes that among other things:

1. The reactive group is made up essentially of psychoneuroses which may be divided into (a) anticipatory, and (b) trench neuroses.

2. The type of trench neuroses is the condition called "shell shock," which consists of a transitory concussion syndrome followed by a more or less protracted neurotic phase.

3. Trench neuroses occur usually in unwounded soldiers. There is no satisfactory evidence that trauma plays a part in their causation. There are well qualified observers who hold that, as a result of contemporary military experience, the concept of the so-called traumatic neuroses should be abolished.

4. The drift of opinion is unmistakably toward the psychogenic basis of war neuroses of all types, including shell shock. Even in the initial stage marked by a twilight state of some duration, there is evidence that the psychogenetic element may have as great, if not a greater, rôle than the item of mechanical shock, although this is more important.

Regis¹⁴ considers three groups of emotionally produced psychoses:

1. Oneirism with morbid dreams which is akin to the second stage of hypnotism and which increases to hallucinatory oneirism.

2. Mental confusion types, with obtusion, disorientation, agitation or torpor.

3. Amnesia types: (a) The amnesia of cranial traumatism is lacunar, retrograde, antegrade and actual. (b) Battle amnesia is complete with terrifying hallucinations. Regis does not refer to hereditary types, but to emotionally predisposed, impressionable persons. He is in accord with our contention that the neuropathic and psychopathic cannot be separated.

INCIDENCE AND RECOVERABILITY

Because of the various interpretations as to what constitutes a traumatic neurosis, as to how much is due to accident and how much is due to predisposition, and because of the varied laws for compensation, statistical prognoses have only a relative value. Naegeli,¹⁵ a Swiss, states that 93 per cent. return to work after an adjustment. His statistics are at variance with those of others. Returning to work does not necessarily mean a return to health. According to recent statistics (Birnbäum¹⁶) of psychoneurotics in the German army, 9.5 per cent. were returned to active service, 35 per cent. were able to do garrison duty and 55.5 per cent. had to be returned home. Wimmer¹⁷ comments on the increase of neuroses since the German pension system went into effect, and considers that the law and not the individual should be blamed. Sachs¹⁸ favors no compensation, and considers that there would be no bad prognoses were no gain attached to the claim of disability. Billström¹⁹ admits that a traumatic neurosis without damages involved has a better prognosis and presents less severe symp-

toms than a traumatic neurosis in which pecuniary damages are applied for. He considers the prognosis worse among the lower classes and among alcoholic types, and finds that a second accident is always worse than the first. Meltzer²⁰ asserts that an annuity or compensation and accident go hand in hand. He cites Brand's observations of the Austrian pension system established in 1895 to the effect that from 1885 through 1894 no cases of traumatic neurosis following accident were described, whereas from 1895 through 1904, there were forty-six cases. Laudenheimer²¹ divides psychoneuroses among the soldiers into five varieties: (1) depressive-anxiety neurosis, (2) neurasthenia, (3) hysteroid, (4) epileptoid, and (5) psychopathic types. He finds that patients with hysteria were without predisposition and were most severely injured soldiers (shell explosions, etc.). The first class became again fit for service, and 60 per cent. of the second class returned to the front. We cannot follow such attempts at prognostic classifications. Each case must be judged by itself, as endogenous and exogenous determining influences vary considerably independently of the diagnosis.

We need hardly call attention to the fact that were pension and compensation not involved, physicians would not bother to comment on the traumatic origin of a neurosis. Writers often quote Zingerle,²² who reports on the Messina earthquake that he did not find a single case of traumatic neurosis after the shock. Also Bianchi examined, immediately after its occurrence, 500 persons who were in this great catastrophe and found no traumatic neurosis, yet Neri²³ observed many psychoneurotics among the survivors. Stierlin,²⁴ three months afterward, examined 226 victims, and 20 per cent. of them had various objective symptoms of traumatic neurosis. He found also that they had no psychoneurotic symptoms before the earthquake and no history of predisposition. This period of latency, giving the mind time to develop the fright and fear factors of the episode, is considered important by him in the etiology and prognosis. Yet, in his report of the catastrophe, he enumerates many who immediately developed a psychogenetic (traumatic) neurosis from the intense fear state engendered and in whom ideogenous factors seemingly had no chance to develop.

Dercum²⁵ considers that only hysteria—an innate state—is embraced under traumatic neurosis, that the symptoms owe their origin to suggestion, that trauma unconnected with fright plays no rôle, and that in hysteria evoked by an accident and not involving litigation, the interval between accident and hysteria is unusually short, the symptoms rarely pronounced, and these, as a rule, fade and disappear spontaneously or readily under the suggestion of treatment; unless indeed, the treatment and the attitude of the physician and others is such as to confirm the belief in injury.

Suggestion by the physician is not, however, always the producer of anesthesia as Dercum, following Babinski, maintains. Accidents to railway employees do result in traumatic hysteria without litigation or compensation being involved, as I have personally observed, and postlitigation results of traumatic hysteria without other complicating disease are not

13. Bonhoeffer: *Allg. Ztschr. f. Psychiat.*, ref. *Ztschr. f. d. ges. Neurol. u. Psychiat.*, ref., 1916, **13**, 3.

14. Regis: *Psychic and Neuropsychic Affections of the War*, Boston Med. and Surg. Jour., 1916, **175**, No. 22.

15. Naegeli: *Cor.-Bl. f. schweiz. Aerzte*, 1910, No. 2.

16. Birnbäum: *Ztschr. f. d. ges. Neurol. u. Psychiat.*, 1916, **12**, No. 4, 326.

17. Wimmer: *Deutsche Ztschr. unf. H. Krankheiten*, 1913, **49**, 133.

18. Sachs: *Unfallsneurosen*, Breslau, 1909.

19. Billström: *Berl. Klin.*, 1914, **26**, 1.

20. Meltzer: *Aerztl. Sachverst. Ztg.*, 1914, **20**, 19.

21. Laudenheimer: *München. med. Wchnschr.*, 1915, No. 38.

22. Zingerle: *Monatschr. f. Unfallheilk.*, 1911, No. 9.

23. Neri: *Rev. Neurol.*, 1909.

24. *Deutsch. med. Wchnschr.*, 1916, No. 1, p. 6; *The Medical Result of the Catastrophes of Courriers, Haemm, Valparaiso and Messina*, Berlin, 1909.

25. Dercum: *Hysteria and Accident Compensation*, Philadelphia, G. T. Bissel Company, 1916.

always favorable. But it is true that the plaintiff rarely submits himself to treatment and that the symptoms often disappear after litigation is terminated. We do not agree that the type of hysterical disability found in the traumatic neuroses is always accompanied by the so-called character anomalies of congenital hysteria. They often were previously normal, and it is only guesswork to assume that a previous neuropathy existed.

However, we are in accord with his general indictment of the pernicious influences of litigation, and recognize that a large number of claimants for damages are obsessed with the desire for a large monetary compensation. We also agree that the German system of pensions or annuities makes traumatic hysteria a more hopeless malady than with us, since a permanent dysphoria tends to be produced; but in our system the long months of waiting for monetary recompense serves to fix the neuroses almost equally as much.

MEDICOLEGAL CONSIDERATIONS

The right to recover damages for injury due to the negligence of others is incontestable. The increase of industrial machinery and the growth of rapid transportation have filled our courts with suits to recover enormous damages for minor injuries. Street railway corporations yearly pay out from 5 to 10 per cent. of their gross receipts in settlement of claims growing out of accidents. Many attorneys and a few physicians devote practically all their time to this kind of work. Unconscious malingering, manufactured symptoms, exaggeration of those really present, false interpretations of those present, are daily encountered in our courts. Unjust awards result on the part of a bewildered jury.

1. Our method of jury trials in which biased opinions carry as much weight as do more careful, if not more competent ones, are unfair. How to remedy it is not, however, clear. A jury of physicians is unobtainable, and even if it were, would simply multiply the number of physicians in the employ of legal firms and corporations, and the better element of the profession could not be induced to serve. A commission of physicians to report to the judge, whose charge to the jury would be based on their findings, would not secure any betterment. I am convinced that a commission on which each side has appointed a representative, and the court a third member, also fails for obvious reasons to give good service. As Sir James Stephen, K.C., says in his "History of Criminal Law": "The judge and the jury alike are and ought to be, instructed only by witnesses publicly testifying in open court on oath."

2. Since our common law permits each side in litigation to secure as many experts as they desire, the legal firms which specialize in accident cases and others, also, by employing physicians on contingent fees, sometimes unduly large, have always at their call physicians who, sharpened by experience, give their testimony the proper bias to influence the jury. This conspiracy of interests is reprehensible.

A change of law, which would give only the court the right to call experts is impossible to secure, and even if brought about, would not prevent the use of politics by those interested in securing the appointment of the "right kind" of physician. If it were possible to create a law which would have the compensation of all experts a matter of court record, by making it a

part of the expenses of the trial, some improvement over present methods would, however, be attained.

3. Jury awards with us seem to place a premium on exaggeration, and a proper staging of the dramatic possibilities of the client secures an increased verdict. Awaiting for years a settlement nullifies all efforts to bring a claimant for damages back to usefulness, and the psychic effects of not desiring health, together with the bringing on of postural spasms and contractions through fixed positions, often in themselves do much harm. The German system of an indemnity of two thirds of a person's wages after the fourteenth week does not remove these factors. The Danish system of a cash settlement is different from ours in that physicians, not juries, judge the matter, and they accord the claimant a small daily amount until nine months have elapsed when they decide on his compensation, and one and a half years later give a further and final settlement if he has not recovered.

One great suggestive influence in litigation is the blanket indictment of complaints introduced by the attorney. The averment in it that John Doe is a hopeless nervous wreck is read by the plaintiff before he signs it, and the cooperation of a physician who agrees to the truth of such a statement helps to fix this idea in the plaintiff's mind.

4. Working, however, with our present methods I would suggest that all court testimony of physicians be placed on file by their county societies. Publicity would tend to stop a certain class of medical testimony. It would not prevent ignorant or mistaken testimony, but bought testimony and substituted diagnoses would be less likely to be offered.

5. A physician finds great difficulty in securing an opportunity properly to examine a claimant for damages if he is not retained by the claimant's side. The examination may be requested at the attorney's office in the presence of a "runner" who cooperates in the examination. The plaintiff's physician is utilized to suggest both to the plaintiff and to his colleague; and a second examination is often refused. Sir John Collie²⁶ did a great service in England when he insisted that he be given the opportunity for examination without the presence of "runners" and friends, and, if it was an ambulatory case at his office, where he had at hand all instruments of precision. He secured a legal decision, which was affirmed by the higher courts, that a "solicitor's office is not in ordinary circumstances a proper place at which to hold a medical examination of a workman."

6. Medicolegal opinions should never be based on subjective symptoms, and only objective symptoms should be utilized or permitted in making a diagnosis in court. The subjective symptoms are not based on actual facts. They are not the findings of the physician, and they cause the physician to be unduly influenced. I have known physicians to base a diagnosis of epilepsy on the spasms and spells of somnambulism that were manufactured for him; or to base a diagnosis on unconsciousness supposed to have followed an accident which later was shown never to have taken place, or to diagnose "brain abscess from trauma" from a subjective vertigo and head pain and a bradycardia which was familial. Such mistaken judgments would be avoidable if the physician dealt only with facts.

7. Hypothetic questions will continue to be given. Distorted medical facts, exclusion of important symp-

26. Collie, Sir John: *Malingering*, London, Edward Arnold, 1913.

toms, and overemphasis of minor ones make them generally of no value.

If the physician has examined the injured person, he should refuse to answer any hypothetical questions unless they included his objective findings, and his answer should be predicated on them. If the injured person could be examined, and the physician has not done so, the court would probably refuse to permit him to render an opinion. The physician should also insist that the symptoms which are the direct result of the accident should be separated from those which are not or probably are not due to the trauma. Probabilities and possibilities in prognoses should also be definitely separated in any opinion rendered. The law does not require physicians to assume that medicine is an exact science, and honest physicians often do themselves harm in court by being too positive. Often, however, positive statements dishonestly offered secure a bigger verdict for the claimant. Positive prognoses in traumatic neuroses are generally impossible unless the physician has personal knowledge of all medical, familial and social factors. He should, therefore, never give opinions based on hurried examinations or imperfect knowledge of environmental factors.

I am aware that the expert is required to accept as true the evidence of the witnesses incorporated in the hypothetical question. But he is permitted to qualify his answer in order to make it plain that he can have no expert opinion on evidence which does not agree with his objective findings, and he should never be satisfied with categorical answers.

8. No statistics concerning prognosis should carry much weight in court because of the personal equation of the nature of the accident and the social status of the patient, and the different groupings found in statistics and variations in the laws of different countries. The future of each psychoneurotic patient must be determined separately by studying his social habits, age, nature of work, intelligence, emotional complexes, etc., as well as the kind of accident and diagnosis offered. In court, since much of this evidence is not in the hands of the expert, his opinion is to that extent defective. But more defective still is the opinion rendered on the appearance of the patient, subjective symptoms and the sympathies aroused by the litigation. In general, however, the physician is not truthful who renders an opinion that a traumatic neurosis is never a recoverable disease.

9. Perhaps, since the postlitigation results are often so radically different from what is claimed, interested corporations should work to secure a law giving them the privilege of an examination at any future time. The results of such reexamination, if it was revealed that the compensation was based on false claims, should empower the court to reopen the case. I was once interested, for instance, as a witness against a claimant for damages because of inability to use his arm. His physicians testified to a brachial plexus paralysis. I denied this because of no objective findings. The same day after being awarded damages he was using his arm, but the court refused to reopen the proceedings.

10. The need for a more elastic system governing accident compensation is plain. The medical profession must purge itself of some of its mistaken policies, and be more exact in its diagnoses, before we can expect the legal profession to better our position in the courts. The physicians and surgeons in Leeds, England, who consult before the trial and make it an

organization matter that a member shall give full and impartial testimony, have solved much of the problem. Let us hope that our medical societies may at no distant time establish similar standards of honor and professional conduct.

Jenkin's Arcade Building.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. FRY, DILLER AND MAYER

DR. H. T. PATRICK, Chicago: I make a diagnosis of neurasthenia less frequently than Dr. Diller in his second thousand cases. Many cases are too abnormal to be explained simply by fatigue. In some there is constitutional inferiority; in some a decidedly abnormal state of the emotions. Thus we get into something beyond neurasthenia. I make a diagnosis of hysteria infrequently and that of psychasthenia frequently. I think my indeterminate cases would show a higher proportion.

DR. D. S. BOOTH, St. Louis: These patients with so-called traumatic neurasthenia present a puzzling variation, one day in court appearing grave, and several weeks, or possibly days, later, perfectly well. To do justice to these patients we must give them far more attention than we do. These cases should be considered and pronounced on by experts, who alone should give expert testimony. I remember the testimony of a local general practitioner that had more weight with the jury than that given by imported "paid experts." The patient had had Bell's palsy, and the physician contended that it was due to a hemorrhage into the brain. His knowledge of the nervous system is indicated by his testimony that "the third, fourth, fifth, sixth and seventh cranial nerves came out onto the face in the temporal region." Publicity should be given to the testimony of physicians in these cases and, possibly, as asserted by the author of this paper, the evidence should be presented to the local county medical society and then published, so that more careful statements in court would result.

DR. ALFRED GORDON, Philadelphia: Dr. Mayer presented the subject in a most excellent way, with one exception, and that is as to the question of subjective symptoms. If, for example, a woman is injured in a street car and has no objective manifestations, yet cannot sleep, is in a constant state of fear and anxiety, is restless and depressed, is it fair to assume that there is nothing the matter with her simply because there are no external evidences of injury? There are cases in which long after settlement the persons are still sufferers. This is the experience of every impartial observer. I don't think it will be fair, generally speaking, to deny compensation only because there are no objective symptoms.

DR. A. W. IVES, Detroit: Even if there are no objective symptoms, we ought not to refuse to appear in court. There are cases with practically no objective symptoms which have gone on from bad to worse, even after receiving compensation. Compensation by no means always effects a cure. Many persons, after being well compensated, remain psychasthenics all their lives.

DR. D. I. WOLFSTEIN, Cincinnati: My experience tells me that there is a general neurasthenia on a purely physical basis; cases in which there is not the slightest ground for suspecting either a constitutional inferiority or any abnormal mental state. Many apparently perfectly well balanced people mentally, who up to a given time were also physically capable, and who felt no other than physiologic fatigue, are suddenly surprised and saddened beyond measure by the discovery that they can no longer work as before, or find the same *joie de vivre*. Pathologic fatigue has supervened, and that is the prime factor in neurasthenia simplex. There is such a type, and it is, in my opinion, due to some as yet undiscovered toxic factor. Dr. Diller has called our attention to his physical state after what might be called a strenuous day in the life of a Pittsburgh neurologist. This I should not term neurasthenia, but a perfectly earned physiologic fatigue. What is characteristic of neurasthenics is their inverse type; they are tired when the day begins; wake up tired, and as the day progresses, brighten up, so that they feel best in the evening, or at night. They hate to see a new day begin.

In regard to the traumatic neuroses, certainly there is a group of cases wherein damage has followed, even though no sign of organic change has been found. On the other hand, we may not always pay too much attention to the organic signs. Many persons get large awards because there is restriction of the visual field, or because one can stick pins into them. Nothing is more misleading than the disturbances of motion and sensation which may appear and disappear in the neuroses. It is a difficult question and each case must be individually judged.

DR. TOM WILLIAMS, Washington, D. C.: The discussion has misled as regards what Dr. Mayer states concerning subjective and objective symptoms. We need to differentiate etiologically by determining if psychogenetic factors are present or not. Although it is not simply a medicolegal problem, yet in the District of Columbia no compensation can be given unless there is proved physical injury. It is not unusual now for the plaintiff's and defendant's physicians and lawyers to agree to refer a case for impartial neurologic survey and abide by the referee's adjudication. The best procedure could be settled by general medical opinion. So I suggest that Dr. Mayer embody his ideas in the form of a resolution, either that the testimony of physicians be drawn up and filed with their respective medical societies, or that physicians should only appear in court and testify after consultation over the case, as in Leeds, England.

DR. A. L. SKOOG, Kansas City, Mo.: There is one type of neurasthenia that is not, properly speaking, neurasthenia. This is in the individual with lowered vital functions due to alcoholism in the parents or prenatal influence. I have seen a number of cases in which one could trace the etiology to heredity. One can find neurasthenia and disturbance of the nervous system covering short or long periods. In laboratories there are tests for activity of the tissues, such as the biometer to measure carbon dioxide elimination. Carbon dioxide is found to be given off by the nerve cells and fibers at a comparatively greater rate than from other tissues. This fact may be utilized partially to account for the neurasthenic syndrome.

DR. M. S. WOODBURY, Clifton Springs, N. Y.: The type of diagnosis that will direct us to etiology is what we are looking for. I have used as a general classification for practical purposes, (1) fatigue neuroses; (2) affective psychoneuroses, that is, those secondary to psychic trauma; (3) secondary psychoneuroses, with physical foundation, such as infection, thyroid disease, gastro-intestinal states, etc. These types may occur in combination. The main point is that, admitting that most of them are secondary compels us to name the elements which in our judgment are primary.

DR. C. R. WOODSON, St. Joseph, Mo.: Many of these cases of neurasthenia are honestly such. The patients are especially susceptible to suggestion, and the suggestions of the attorney will, in the end, make confirmed neurasthenics. For many of these people adjustment of damages is the best remedy. In regard to symptoms, there is no difference in the symptoms of ordinary and traumatic neurasthenia. The symptoms in traumatic cases are long drawn out. The neurasthenic loses initiative, and takes less and less interest in things, accentuating every ache or pain, hypersensitive, wanting in everything that makes life pleasant, and with mind centering constantly on self.

DR. GEORGE A. MOLEEN, Denver: I should make a distinction between fatigue as such and neurasthenia as such. One speaker mentioned fatigue in the morning, which decreased toward night. A high blood tension will conform to this type of syndrome. The second type is usually deficient in hemoglobin content. Many conditions associated with high blood pressure or anemia, therefore, establish fatigue on the slightest stress. The increase of the hydrogen-ion content will increase fatigue, as is the case in a high altitude, where the subject is not able to do the same amount of work as he can in a low altitude.

DR. BERNARD SACHS, New York: Dr. Diller's tables impress us with the fact that we have made some improvement. Twenty-five years ago we did not know much about dementia praecox and we did not know about psychasthenia. We are

diminishing the cases of neurasthenia, but we still use that title for patients who develop all sorts of neurotic symptoms on the basis of exhaustion—mental rather than muscular or physical.

Dr. Mayer gives us an important medicolegal problem, in view of the compensation laws. We are going to have plenty of trouble if we include the traumatic cases, and we must decide seriously our position when we have to give testimony. The subjective symptoms may be as genuine as the objective, but one can never give testimony that there is an organic lesion, based on subjective symptoms. Often I refuse to give an opinion until the patient is brought to the hospital and kept there, especially where the nature of epileptoid or hysterical attacks is to be determined. It is not the question of indemnity that troubles workingmen so much as the fear that the accident will interfere with the ability to work and to earn a livelihood. Sometimes this fear disappears, but often it remains as a distressing symptom. We must be careful about the stand we take.

DR. THEODORE DILLER, Pittsburgh: There is another diagnosis which I sometimes make which should have been included in the table, and that is asthenia or atonia, to indicate general lack of vital tone. I feel that profound hysteria and dementia praecox are very much the same at the bottom. I have abandoned attempting to differentiate the diagnosis in many of these cases.

DR. E. E. MAYER, Pittsburgh: In answer to Dr. Gordon's inquiry I believe he misunderstands my conception of the objective symptoms, though I thought it was the common one. I thought that the definite evidences of abnormal functioning of the autonomic nervous system—the tachycardia, dilated pupil, the dermatography, the fibrillary tremors and also the signs of motor and nerve irritability—which we find are objective signs. The physician personally observes what is objective. The same is true on the mental side. Dr. Williams has expressed this aspect clearly. If I personally observe delirium, a phobia, etc., it is objective. But how can a physician in a medicolegal case make a positive diagnosis and prognosis for the court on symptoms told to him? What right has he to have an opinion in court concerning reported fatigue, sleeplessness, headache, dizziness, roaring in the head, etc., unless he has objective symptoms to back up an opinion? And did Dr. Gordon or anyone else ever see a so-called neurasthenia which, if an actual one, did not present such objective symptoms?

Much of neurasthenia is asthenia. The entire body is involved, not only the nervous system, and generally too the nervous deficit is not even primary. Constitutional inferiority and maldevelopmental types are different from an acutely arising exhaustion due to either endocrinal or toxic factors. If we speak of asthenia or nerve imbalance, or use some similar expression, we never forget that we have not made a diagnosis, and that we must ferret out the origin. This applies to hysteria too. If we could only drop the word! Inhibition or substitution or situational neuroses, psychogenia, functional neuroses, even psychoneurosis would serve better. Then there are the occupational neuroses. Why did not Dr. Diller mention them separately from his neurasthenic type? At Clifton Springs Sanitarium, for instance, I notice they classify more occupational neuroses than they do of any other type of psychoneuroses. Why, I don't understand. Writer's cramp, for instance, is not ordinary neurasthenia. I know Dr. Diller sees such cases. Where does he group them and why?

Typhus Fever in Turkey.—Typhus fever in 1915 caused the death of some 200,000 to 300,000 people in Turkey. The government, instead of cooperating with foreign medical missions as the Serbian government did in a similar emergency, sent their own physicians to cope with the disease, and of these several hundred took the disease and died. In the Erzerum region, where, on a conservative estimate, between 60,000 and 100,000 died, soap, water and fuel were almost impossible to obtain during the epidemic. Three of our American board physicians in Asia Minor gave their lives to this disease.—A. R. Hoover, M.D., *The Survey*.

OBSERVATIONS ON SURGICAL SHOCK

A PRELIMINARY NOTE*

YANDELL HENDERSON, PH.D.

A. L. PRINCE, M.D.

AND

H. W. HAGGARD, M.D.

NEW HAVEN, CONN.

At the request of the Committee on Physiology of the National Research Council, a cooperative investigation of surgical shock has been instituted in a number of physiologic laboratories throughout the country, and one preliminary report has already been published in *THE JOURNAL*.¹ We have selected as our part in this investigation three problems: (1) the bearing of excessive and prolonged secretion of epinephrin on the production of shock; (2) the relation of acidosis to shock, and (3) the oxidative metabolism in shock.

While pressure of other duties has prevented the completion of these studies, we have obtained data which are of sufficient interest for publication in the form of a preliminary note.

EPINEPHRIN AND SHOCK

The condition of "surgical shock," unless associated with extensive hemorrhage, is always the result of prolonged and severe sensory stimulation. As stimulation of sensory nerves induces discharge from the suprarenal glands, it may be assumed that the rate and duration of secretion is proportional to the intensity of the stimulus. Whether a prolonged condition of excess of epinephrin in the circulating blood can produce shock is one of the questions we have attempted to decide.

The experiments were conducted under ether anesthesia. Cats and dogs were employed. Respiration and arterial pressure were recorded. Epinephrin (adrenalin chlorid solution, Parke, Davis & Co.) of various strengths (usually 1:10 and from 0.5 to 1 c.c. per minute) were infused into the femoral vein, in some experiments at a constant rate, in others intermittently. The blood pressure was thus maintained at a very high level for a period of from one-half hour to two hours. Then the administration was discontinued. Careful observations were made at frequent intervals during and following the epinephrin administration. In none of the experiments did symptoms of shock appear. The only definite symptoms observed were those of edema of the lungs and acute cardiac dilatation. The majority of our animals died suddenly of the latter cause.

We conclude that prolonged excessive secretion of epinephrin (if it occurs under pain) is not a critically important factor in the production of shock. It is therefore improbable that surgical shock is a result of excessive secretion of the suprarenals secondary to sensory stimulation.²

THE RELATION OF ACIDOSIS TO SHOCK

It may be recalled that some years ago a theory of shock was put forward from this laboratory which assigned the development of the condition largely to

decrease in the carbon dioxide content of the blood resulting from the excessive breathing induced by ether, by pain and by fear. Since that series of papers was published, development of knowledge regarding the relations of carbon dioxide in the blood has been rapid and has laid stress first on alterations of the hydrogen-ion concentration involved and recently on alterations of the alkaline reserve. Any one discovering now for the first time that in shock the blood contains less than the normal amount of carbon dioxide would infer from present conceptions that shock involves acute acidosis. The occurrence of acidosis in connection with shock was in fact recognized in the series of papers referred to above.³ It appeared to us important to investigate further the relations of acidosis to shock and to the excessive breathing induced by pain, and by ether.

Our experiments were carried out on ten dogs. The anesthetics used were ether, morphin, chloral and chloretone (each alone, not in combination). After a control period of from two to three hours under anesthesia, shock was induced by exposing and manipulating the intestines. In all cases the blood pressure, respiration and physical signs were observed. Low arterial pressure and absence of reflexes were taken as indications of shock.

At uniform intervals throughout the experiments, about 5 c.c. of blood were withdrawn from the carotid and collected in a test tube under a layer of liquid petrolatum. Without delay a part of this blood was analyzed for its carbon dioxide content. Another part (whole blood, not serum) was saturated with (human) alveolar air containing about 5.5 per cent. of carbon dioxide and analyzed for carbon dioxide in order to determine the "alkaline reserve" as the index of "acidosis." Samples of alveolar air were collected from the animal at frequent intervals by the Higgins-Plesch method, and the alveolar carbon dioxide tension was determined. The methods of blood, gas and alveolar air analysis employed were those described by Henderson and Morriss.⁴ In two experiments the respiratory exchange (oxidative metabolism) was determined by the Douglas bag method.

Morriss⁵ has recently shown that administration of ether induces a fall in the alkaline reserve as determined by the Van Slyke method, and our observations corroborate this. In all of our experiments with (open) ether anesthesia there was during the first hour the usual excessive breathing and a sharp fall both in the carbon dioxide content of the arterial blood and in the carbon dioxide capacity of the blood, followed for several hours thereafter by a less rapid but distinctly progressive and almost parallel fall in both measurements. The alveolar carbon dioxide also followed a closely similar course. There was a corresponding degree of "shock," as judged by fall of arterial pressure and absence of reflexes.

In contrast, in one experiment in which ether was administered by a rebreathing method, we found that when excessive elimination of carbon dioxide was thus in part prevented, both the carbon dioxide content, and the carbon dioxide capacity (alkaline reserve) of the blood as well as the vitality of the subject were much less reduced than under "open" ether conditions.⁶

* From the Physiological Laboratory of the Yale University School of Medicine.

1. Pike, F. H., and Coombs, Helen C.: The Relation of Low Blood Pressure to a Fatal Termination in Traumatic Shock, *THE JOURNAL A. M. A.*, June 23, 1917, p. 1892.

2. Recent observations of Mann (*THE JOURNAL A. M. A.*, Aug. 4, 1917, p. 371) indicate also that deficiency of epinephrin (excision of suprarenals) does not produce shock.

3. Henderson: *Am. Jour. Physiol.*, 1910, **27**, 174.

4. Henderson and Morriss: *Jour. Biol. Chem.*, 1917, **31**, 217.

5. Morriss, W. H.: The Prophylaxis of Anesthesia Acidosis, *THE JOURNAL A. M. A.*, May 12, 1917, p. 1191.

6. Bryant, John, and Henderson, Yandell: Closed Ether and a Color Sign, *THE JOURNAL A. M. A.*, July 3, 1915, p. 1.

In the animals under open ether the institution of shock producing procedures had, and indeed could have, little additional effect in producing acidosis, owing to the intensity of this condition already produced by the anesthetic and its mode of administration.

In view of this fact we turned to experiments under morphin (one experiment), chloral hydrate (one), and chloretone (two), since all of these drugs depress respiration and tend to produce a hypercapnia.⁷ In this connection we would call attention to an observation of Underhill, Blatherwick and Goldschmidt,⁸ which seems to us to suggest that morphin (by means of hypercapnia?) causes a mobilization of the body's alkali.

In the experiment under morphin narcosis, there was no fall, indeed a slight rise (2 per cent.), in the carbon dioxid content and the carbon dioxid capacity of the blood during a preliminary or control period of two hours. Shock procedures were then instituted and were followed by a rapid and progressive acidosis—the carbon dioxid capacity falling to 31 per cent.—together with the usual excessive breathing, fall of arterial pressure, and disappearance of reflexes, ending in death after two hours.

In an experiment under chloretone anesthesia, the carbon dioxid capacity of the blood fell during the preliminary period of three hours only from 48 (practically normal for a dog) to 43 per cent. Shock was then induced. One and one half hours later the carbon dioxid capacity of the blood had fallen to 30 volumes per cent. The animal died half an hour later.

These observations raise a crucial question as to the nature of the relation between the hyperpnea of ether excitement and of pain and the accompanying decrease of carbon dioxid combining power in the blood. Which is cause and which is effect? The acapnia theory assigned a primary rôle to the hyperpnea, while the acidosis theory now current would make the hyperpnea merely secondary. Does the alkali of the blood control the carbon dioxid or the carbon dioxid the alkali? In most forms of acidosis the former is the case. In shock, however, the latter may in part at least be the true sequence. It may be recalled that in experiments on shock previously reported from this laboratory it was found that when excessive loss of carbon dioxid was prevented by rebreathing procedures, the carbon dioxid content of the blood was only slightly lowered, and shock either did not result or was much reduced in intensity. These facts suggest that the acidosis of ether anesthesia is compensatory to or a result of the acapnia produced by the hyperpnea of ether excitement.

Apparently the reduction of the carbon dioxid content of the blood by the excessive breathing under pain or ether excitement results either in loss of alkali (to the tissues?) or a formation or retention of other acids. This acidosis, or reduction of alkaline reserve, whatever its details, is at least in respect to respiration clearly of a compensatory character, for otherwise the intense acapnia would always quickly result in a fatal apnea, as in fact it often does. It is particularly noteworthy in support of this conception that in the experiment with ether in which the animal was made to rebreathe through a long tube, thus keeping the alveolar carbon dioxid tension at a nearly normal level, the rate and degree of ether acidosis were correspondingly decreased.

THE OXIDATIVE METABOLISM IN SHOCK

In the metabolism experiments in which observations of the oxygen consumption and carbon dioxid elimination were made before and after the production of shock, we found that the condition of shock involves a profound depression of metabolism, the oxygen consumption falling 45 per cent. in one experiment and 50 per cent. in another. This depression of metabolism is progressive, and ends in death.

The introduction of the gas mask in warfare has accustomed men to a form of apparatus with which rebreathing can be readily arranged. Fortunately it is easily applicable on the only field where sufficient human material is regularly available for the study of shock. By this means we hope to be able at last to get an adequate test of the very practical question, Will rebreathing prevent or decrease the development of shock in severely wounded men as it does in animals under experimental conditions?

For those already in shock and breathing feebly, rebreathing involves a dangerous limitation of oxygen. In this condition, the administration of percentages of carbon dioxid approximating the normal alveolar air (by the same method that oxygen is usually given) is the measure which in the light of ten years' work in this laboratory is certainly worthy of trial.

BOTULISM

THE DANGER OF POISONING FROM VEGETABLES CANNED BY THE COLD-PACK METHOD*

ERNEST C. DICKSON, M.D.

SAN FRANCISCO

The frequency with which food poisoning is caused by the presence of the toxin of the *Bacillus botulinus* is probably very much greater in this country than has been generally believed, and the fact that the toxin may be formed not only in foods of animal origin but also in certain vegetables and fruits has added much to the importance of recognizing its existence.

A review of the available American medical literature for the past twenty years has shown that there have been at least eleven recorded outbreaks of botulism in the United States during that time, and that at least fifty-two persons have been ill and thirty-two have died from this type of food poisoning.

In a personal investigation¹ of unrecorded cases of food poisoning which have occurred on the Pacific Coast during the past six years, I have located eleven more outbreaks of botulism in which twenty-nine persons were ill and twenty-three died, and in three of these I succeeded in establishing the diagnosis of botulism by the isolation of the *B. botulinus* from portions of the discarded food. In all, therefore, there have been at least twenty-two known outbreaks of botulism in the United States during the past twenty years (Table 1) in which eighty-one persons have been ill and fifty-five have died, a mortality of 67.9 per cent.; and of these twenty-two outbreaks, eighteen have occurred on the Pacific Coast, seventeen in California, and one in Oregon. It is extremely probable that there have been many more outbreaks of botulism

* Aided by a grant from the California State Council of Defense.

* From the Division of Medicine of the Leland Stanford Junior University School of Medicine.

1. The details of the clinical cases and of the experimental work will appear shortly in a monograph entitled "Botulism: A Clinical and Experimental Study."

7. Henderson and Scarbrough: Am. Jour. Physiol., 1910, 26, 274.

8. Underhill, Blatherwick and Goldschmidt: Proc. Soc. Exper. Biol. and Med., 1917, 14, 83.

which have passed without recognition, and that if it were possible to follow up all cases of food poisoning in which the patients recovered, and all fatal cases in which the death certificates give the cause of death as ptomain poisoning or bulbar paralysis, a very large group of cases would be collected.

An important feature of the recorded cases in this country and of those which I have collected is the relatively small number in which the poisoning was caused by food of animal origin. In eighteen outbreaks in which the source of the poisoning was recognized, one was due to spoiled beef, one to minced chicken, one to canned pork and beans, one to tamales, one to sausage (wienerwurst), and two to bottled clam broth; but in all the rest, eleven in number, the food which was responsible for the poisoning was of vegetable origin, one outbreak being caused by home-canned pears, one by home-canned apricots, one by home-canned corn, one by home-canned asparagus, one by commercially canned beans or spinach, and six by home-canned string beans.

In a series of experiments with four strains of the *B. botulinus*, I have been able to show that the botu-

pack method of canning vegetables and fruits. Various methods of sterilization are described in these reports, but the one which can be most readily adopted by the housewife is that of heating the filled jars in a wash boiler at the temperature of boiling water. Tables are given in which the time necessary for heating the different vegetables and fruits is stated.

In order to test the efficiency of the cold-pack method of canning vegetables which may be contaminated with spores of the *B. botulinus*, a number of jars of peas, beans and corn were prepared according to the directions described in the daily press (Table 2). Each jar was inoculated with an emulsion containing spores of the *B. botulinus* before it was placed in the wash boiler. The one quart jars of peas and beans were left in the boiling water for 120 minutes, and those of corn were heated for 180 minutes. The jars were sealed immediately after removal from the boiler and were inverted and placed in a dark closet.

Within three weeks it was noted that the contents of all the jars had undergone a fermentation with the

TABLE 1.—KNOWN CASES OF BOTULISM OCCURRING IN THE UNITED STATES

Date	No. of Cases	No. Fatal	Name of Physician	Address	Source of Poisoning	Reference in Literature
1899	1	—	Lewis	Los Angeles	Tamale	South California Pract., 14 , 464
1903	7	3	Jellinek	San Francisco	Beef	Calif. State Jour. Med., 1 , 121
1907	3	3	Sheppard	Ontario, Calif.	Canned pork and beans	South Calif. Pract., 22 , 370
1910	12	11	Peck	Sawtelle, Calif.	Home-canned pears	South. Calif. Pract., 25 , 121
1911	5	5	Twining	Aspen, Colo.	Canned beans	Cited from Curfman
1912	3	2	Lartigau and Bine	San Francisco	Bottled clam broth	Personal communication
1912	2	1	Holbrook	San Jose, Calif.	Bottled clam broth	Personal communication
?	6	5	Phillips	Amador County, Calif.	Home-canned string beans	Personal communication
1913	12	1	Wilbur and Ophüls	Stanford Univ., Calif.	Home-canned string beans	Arch. Int. Med., Oct. 15, 1914, p. 589.
1913	1	1	Sperry	Hornbrook, Calif.	Unknown	Personal communication
1913	1	—	Stiles	Boston	Minced chicken	The Jour. A. M. A., Dec. 27, 1913, p. 2301.
1915	5	5	Pratt, Reid and Nichols	Fallbrook, Calif.	Home-canned apricots	Personal communication
1915	1	1	Gundrum	Sacramento, Calif.	Home-canned asparagus	Personal communication
1915	1*	1	Hyde and Barrett	Hillsboro, Ore.	Home-canned corn	Personal investigation
1915	2	2	Frost	Los Angeles	Sausage	Am. Med., N. S., 10 , 85.
1915	1	1	Frost	Los Angeles	Unknown	Am. Med., N. S., 10 , 85.
1916	1*	1	Holbrook	San Jose, Calif.	Home-canned string beans	Personal investigation
1916	1	1	Bigelow	San Francisco	Unknown	Personal investigation
1916	1	—	.....	Escondido, Calif.	Home-canned string beans	Personal investigation
1916	1	—	Lancaster	Boston	Unknown	Tr. Am. Ophth. Soc., 14 , 648
1917	7	5	Curfman	Salida, Colo.	Canned beans or spinach	Colorado Med., 14 , 35
1917	7*	4	Crise and Smart	Escondido, Calif.	Home-canned string beans	Personal investigation

* The *B. botulinus* was recovered from remnants of the discarded food.

linus toxin may be formed in a considerable number of vegetables and fruits. In a previous report,² it was recorded that the toxin could be formed in mediums prepared from canned string beans and canned green peas, and in later experiments¹ which are not yet recorded in detail, it was found that that toxin may also occur in mediums prepared from green corn, artichokes, asparagus, apricots and peaches, to which no trace of animal protein was added.

As a result of the shortage of the world's food supply at the present time, there has been a widely advertised propaganda urging that sufficient vegetables and fruits be canned at home to provide for the winter's supply of food. There have been numerous articles in the daily press and in magazines in which the federal authorities have advocated the use of the cold-

formation of gas, and that some of them were leaking. When the jars were opened there was a strong odor which resembled butyric acid, and cultures of the juice from all the jars showed a mixture of *B. botulinus* and *B. subtilis*. Portions of the juice from all the jars were injected into guinea-pigs, and some of the peas were fed to a chicken. All the guinea-pigs died within twenty-hours, and the chicken developed symptoms of limber-neck and died within thirty hours. A portion of the juice from the corn was passed through a diatomaceous filter and injected into a guinea-pig, and the animal died within twenty-four hours. The symptoms of all the guinea-pigs and of the chicken were identical with those produced by the toxin of the *B. botulinus* which is formed in meat broth.

The results of this series of experiments prove that the cold-pack method of canning vegetables is not efficient if the raw material happens to be contaminated

2. Dickson, E. C.: Botulism, An Experimental Study: A Preliminary Report, THE JOURNAL A. M. A., Aug. 15, 1915, p. 492.

with spores of the *B. botulinus*. The fact that both *B. subtilis* and *B. botulinus* were recovered in cultures from the contents of the jars proves that a single sterilization for the time recommended in the published directions is not sufficient to cause the destruction of spores. Fortunately, the number of spore-bearing bacteria which are responsible for producing poisonous changes in food is small, but the *B. botulinus* belongs to this small group, and since it is also an obligative anaerobe, the conditions which exist in the sealed jar or can are ideal for its growth and toxin formation.

It is probable that many persons have followed the directions which have been so widely distributed, and that large quantities of vegetables and fruits have been canned at home by the cold-pack method. It is also probable that a very small percentage of the total number of cans or jars of food are contaminated with

TABLE 2.—DIRECTIONS FOR HOME-CANNING OF VEGETABLES DESCRIBED IN THE DAILY PRESS*

	Scald or Blanch	Hot Water Bath 212 F.	Water Seal Outfit 214 F.	Steam Pressure 5-10 lbs.	Pressure Cooker 10-15 lbs.
			Minutes		
Corn on cob or cut off.....	5	180	90	60	45
Beans, lima or string	5	120	90	60	40
Peas	5	120	90	60	40

* Abstracted from a table which appeared in the daily press, reported to be a letter dispatch from the Department of Agriculture, Washington, D. C. The directions differ from those given on page 17 of Farmers' Bulletin 839, entitled "Home-Canning by the One Period Cold-Pack Method," in that the time for heating peas at 212 F. is given at 120 minutes instead of 180 minutes.

spores of the *B. botulinus*; but the fact that botulism has occurred so frequently during the past few years, especially on the Pacific Coast, makes it necessary that all susceptible foods which have been prepared by this method should be regarded with suspicion.

The botulinus toxin is easily destroyed by heating, and all danger of botulism will be removed from home-canned products if the food is always boiled before it is eaten or even tasted. Under no circumstances should home-canned vegetables which have been prepared by the cold-pack method be served as salad, unless they have been cooked after their removal from the container, and, until it is established what fruits are suitable for the formation of the toxin, it will be safer to reheat all fruits which have been prepared by this method, even though there may be no apparent evidence that the food has spoiled.

2294 Broderick Street.

Soap in Treatment of Wounds.—Patynski has obtained very satisfactory results from the use of soap. He has always made use of the Marseilles soap of commerce, of good quality, and standardized at 72 per cent. This he has employed in the way of lavages, irrigations, and local applications in the form of saturated compresses. For the lavages and irrigations, he utilizes a solution of 25 gm. to the liter of water, either sterilized or simply boiled. The standard strength may even be raised to 5 per cent. without any resulting inconvenience. Compresses are prepared by soaking in a 20 per cent. solution. The soap is sterilized after grating into powder, by exposure in an oven to a temperature of 120 C. for an interval of five minutes. In cases of special urgency the surface of a piece of soap is aseptized by plunging the mass into boiling water. Also, under similar circumstances, the ordinary muslin compresses can be reliably replaced by some other tissue previously boiled. These preparations have always been readily tolerated by the skin, and have not produced any signs of local irritation, even after a continuous application of four, five or six weeks. The technic is described in detail in the *Medical Press and Circular*, Aug. 15, 1917.

THE STIFF AND LAME SHOULDER*

C. HERMANN BUCHOLZ, M.D.

BOSTON

Proper function of the shoulder depends on the intactness of the humeroscapular joint, both clavicular joints, the subacromial bursa and other periarticular structures, and the muscular mechanism. The humeroscapular joint allows a great amount of motion, which, however, is checked to some extent by the acromion, in order to give sufficient stability and strength. Again, a great deal of motion which is checked by the acromion is compensated by the mobility of the scapula, which swings around the clavicular joint and is regulated by the complicated muscular apparatus.

The great frequency of lame and stiff shoulders is easily explained by their complicated apparatus, and by their free exposure to strain and injury. For the latter reason, it is evident that the periarticular structures, especially the subacromial bursa, are much more frequently affected than the humeroscapular joint itself, a fact which the investigations of Küster and Codman have clearly demonstrated. It is particularly through Codman's effort that we have learned to approach certain affections of the shoulder with the knife, and the chances of necropsy have, in turn, helped to give us clearer ideas about the physiology and pathology of the shoulder. In this paper I shall attempt to outline the indications for the treatment, both operative and nonoperative, in those various types of stiff and lame shoulders that come under our observation. The second part contains a description of the conservative method of treating stiff shoulders.

1. *Acute Subacromial Bursitis*.¹—These cases are best treated with rest, preferably with the arm held in a sling or supported in the abducted position. This may be done by simply having the arm rest on a table, or, during the night, somewhat elevated and abducted on a pillow. As soon as the most acute symptoms are over, a mild application of hot air and massage will help to relieve the pain and discomfort. Then the patient may begin to use the arm, and special treatment for the recovery of the function is generally unnecessary. There are, however, a number of patients who hold their arm in a certain muscular spasm, instinctively induced by fear of painful motion. In many of these cases, the condition is easily relieved by a few gentle assistive movements in the lying position. We have frequently seen patients who had not dared to move the arm for weeks, and complained of a great deal of pain from any attempt to raise the arm or to put it on the back. In such cases, it is sometimes surprising for the patient as well as the operator to notice the relief from pain and discomfort by a few simple movements gently guided, from the lying position, or by the following simple exercise recommended by Codman: The patient leans over, forward or sideways, and lets his arm hang down perpendicularly with the muscles completely relaxed. Easy swinging motions may be added from that position. Once started in such a way, movements of the arm will be quickly restored, provided there is no serious lesion of the shoulder joint or bursa present.

* Read before the Section on Orthopedic Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. The headings and the indications for treatment in Types 1, 2 and 7 are taken from Codman's classical monograph.

2. *Subacute or Chronic Adherent Subacromial Bursitis*.—These cases are very frequent. We see at least 100 every year in the medicomechanical department, and many of them represent difficult problems. In the great majority, however, correct exercise, aided by massage and application of hot air, will give good results, though the treatment often requires a long period. As there is a tendency to hyperirritation, it is advisable to begin with treatment of short duration. The technic will be discussed in detail in the second part. When the adhesions prove to be too firm to be loosened by simple manipulations, forcible breaking up under an anesthetic may become advisable, or it may be necessary to open the bursa. We approve of Codman's advice to do even the forcible manipulations under the careful guidance of the finger after the bursa is opened, as evidently less harm is done in that way. From our experience, however, it must be stated that with advanced technic of the exercise treatment those cases have become quite rare, and forcible manipulation in this type of cases is performed in our clinic but very exceptionally.

3. *Stiff and Lame Shoulders Following Injuries of the Upper Extremity*.—A large percentage of stiff and lame shoulders follows injuries to the shoulder region itself or any other part of the upper extremity. In many of these cases, stiffness could be prevented by proper consideration of functional principles during the first weeks after the injury, principles which have been outlined in detail elsewhere.² The stiffness in these cases is caused not so much by adhesions as by retraction of the muscles and the periarticular structures, and from the commonly used method of fixing the injured arm in the adducted and inward rotated position. The retraction is mostly seen in the inward rotator muscles and in the structures in front of the shoulder joint. These retracted tissues generally form a very serious and sometimes insurmountable obstacle to mobilization, and we have seen many cases of this type in which the patients did not regain the function of the shoulder in spite of very persistent and long continued after-treatment. In these cases all depends on the recovery of a certain degree of external rotation; if this succeeds, the other motions will usually follow.

Operative procedures will hardly help much, and forcible manipulation has not given any single good result in my experience. Moreover, it is dangerous, as we have seen a spiral fracture of the humerus, complicated with paralysis of the musculospiral nerve, in a case in which a forcible attempt at external rotation was made. As elsewhere in the body, following injuries, the scarlike, retracted tissues may become so tight that in an attempt to stretch them the atrophic bone gives way rather than the soft tissues. Any one familiar with the nature of these retractions can not doubt that quick stretching will mean more or less laceration of tissue, and hence renewed injury with all its deleterious consequences. As I have stated above, however, by persistent, frequently repeated stretching manipulations, good success can be obtained, provided the alteration of the tissues has not been too severe.

4. *Infectious Arthritis of the Humeroscapular Joint*.—Previous to the publications of Küster and Codman, cases of painful and stiff shoulders have been generally classified as "arthritis," or as the still fre-

quently used term "omarthritis." We know now that the majority of these cases cannot be considered as arthritis in the strict sense of the word, but as peri-arthritis or bursitis. The differential diagnosis between the two affections cannot be made in all cases by the clinical examination of the affected part alone, but only with sufficient consideration of the history and other manifestations of the disease. Monarticular arthritis generally leads toward several definite channels in regard to the nature of the affection, such as tuberculosis, gonorrhea, septic infection, osteomyelitis, and a few of rarer occurrence. These types can be ruled out in most cases without great difficulty, though we have seen cases in which only by long observation or by opening the joint could the diagnosis be made certain.

In polyarticular arthritis, involvement of one or both shoulders should be primarily considered as true arthritis, although the bursae may be likewise affected, and in the treatment for functional recovery this bursitis may cause more difficulties than the arthritis itself, as I have repeatedly noticed. The indications for functional treatment in arthritis are similar to those outlined under headings 1 and 2, only with sufficient consideration of still greater care and gentleness. That in all these cases etiologic factors are sought for and eliminated if possible is understood, and requires no further discussion at this place.

5. *Tuberculosis of the Shoulder Joint*.—Tuberculosis of the shoulder joint may appear as the proliferative fungous type, or as the degenerative dry type, tuberculosis sicca. The former is generally easily recognized, and with the presence of an abscess or sinuses, there can be no doubt as to the diagnosis; but in the other type the difficulties may be great unless the Roentgen ray shows definite signs of destruction.

Generally, however, the atrophy of the muscles and bones is much more pronounced than in any of the other types. In case of doubt, the general and local reaction by injection of tuberculin should be tested, and no exercise recommended before the diagnosis of tuberculosis has been ruled out definitely. The treatment of tuberculosis of the shoulder joint will not be considered in this paper.

6. *Hypertrophic Osteoarthritis*.—Many cases of stiff and lame shoulders are caused by hypertrophic osteoarthritis. It must be remembered, however, that very often it is not so much the affection of the shoulder joint proper which causes most of the trouble, but the bony proliferation over the tuberosity, as several observations have undoubtedly shown. Strange to say, this point has found very little attention in the literature. The publications on "arthritis deformans of the shoulder joint" which I have read do not mention the proliferations of the tuberosity or their close relation to chronic bursitis. I advise looking for these affections in all elderly persons. Generally they cannot be felt from the outside, and even the Roentgen ray does not always give a distinct idea about their size and location. All that we can make out on the plate is the density of the structure of the tuberosity. Generally there are other signs of osteoarthritis seen on the roentgenogram, such as proliferations at the acromioclavicular joint, the lower edge of the glenoid process, and elsewhere. It lies in the nature of the mechanics of the shoulder articulation that bony proliferations nowhere so retard the function of the arm as those over the tuberosity. The

2. Bucholz, C. H.: Manual of Therapeutic Exercise and Massage, and several other publications.

shoulder capsule itself is fairly loose, and needs considerable alteration before the function of the arm is so much handicapped as to be alarming to the patient. The same is true for the acromioclavicular joint; proliferations over the tuberosity, however, represent a much greater danger for the function, because, after having reached a certain size, they will materially narrow the space between humerus and acromion. Moreover, hypertrophic osteoarthritis stamps the tissues affected to a much greater susceptibility to traumatic damage. The tuberosity, anyway one of the most frequently injured parts of the body, when inflicted with the changes of osteoarthritis, is likely to react much more violently than under normal conditions.

Of still greater importance, however, is the intimate connection of those proliferations over the tuberosity with chronic inflammation of the bursa. We may even say that the amount of pain and discomfort depends more on the consequent bursitis than on the bony proliferations, while the amount of stiffness is the result of both these factors in addition to the condition of the capsule and the other articular and periarticular structures.

Without discussing the general principles of treatment in these cases, I shall briefly state my opinions in regard to the local treatment. Any evidence of hypertrophic arthritis in a case of stiff and lame shoulder leads us on a very conservative track. We should avoid all irritative measures; applications which in other cases act soothingly may cause irritation in a hypertrophic shoulder. Therefore we give baking of shorter duration than usually, apply massage with less force, and do not use that deep friction over the bursa which is so effective in many other cases. Exercise is used chiefly in form of gentle resistive movements with careful guidance of the finger over the tuberosity.

We have operated in two cases, which are briefly outlined:

CASE 1.—A strong and healthy laborer, aged 46, who had injured his left shoulder five years before without lasting symptoms, complained of considerable pain in the same shoulder for one month which, starting after a hard day's work, prevented him from work and often kept him awake at night. At the operation the subacromial bursa was found somewhat inflamed and its walls slightly thickened, but the most conspicuous feature consisted in a number of bony proliferations along the crest of the tuberosity. In abduction and elevation the space between the humerus and acromion was markedly narrowed, and therefore some of the most prominent proliferations were removed from underneath the floor of the bursa. There was no immediate relief from the operation, but the condition improved gradually by baking and massage for several weeks.

CASE 2.—A rather feeble and sickly looking man, aged 55, who was run over by a light wagon six months previously, had since that time suffered from pain and stiffness in his shoulder which did not respond to the usual conservative treatment. He had a certain amount of hypertrophic arthritis in this and other joints, as shown by the Roentgen ray. On account of his general poor health, the subacromial bursa was opened under local anesthesia. The bursa was inflamed and slightly thickened, the walls were partially glued together about the edges, and a few soft bands were stretched from the inner to the outer wall. Marked bony proliferations were noticed along the crest of the tuberosity, and in moving the arm it was quite evident that the motion was mostly limited by the bony overgrowth. This was not removed because of the patient's condition, but the soft tissue adhesions were gently loosened and the bands excised. The patient was subjectively much relieved, though the function of the shoulder was not much improved.

7. *Chronic Nonadherent Subacromial Bursitis (Codman's Type III).*—These cases, which represent approximately 5 or 10 per cent. of all our cases of bursitis, are characterized by a more or less constant pain and soreness, which is most intense in forward elevation with inward rotation, often leading to a spasmodic contraction of the shoulder muscles to avoid painful motion. The basis of these symptoms consists of thickening of the bursae, fringes, bands or other pathologic products which obstruct the tuberosity on its way underneath the acromion. It is obvious that a simultaneous osteoarthritis may still increase these symptoms, and in most cases it may not be easy to state definitely which of the symptoms is due to one or the other. However, the roentgenogram, the amount of mobility beyond the horizontal line and osteoarthritic manifestations in other joints may allow a certain conclusion.

At any rate, in cases with a definite manifestation of osteoarthritis, a certain conservative reservation should prevail, while in the others operative repair may be suggested as the quickest and surest way to recovery, although, as Codman states, many of these cases heal in time without any treatment. Baking and massage may relieve the pain; exercise in any form is contraindicated.

The following cases seem to belong in this class:

CASE 3.—A laborer, aged 45, fell from a ladder six months previously, landing on his left shoulder and hip. Since that time he had had pain and discomfort at night and in moving the arm. The motion was almost free except in extreme inward rotation, but there was marked crepitation in abduction, and tenderness over the bursa. At the operation, two bands were found stretched between the inner and the outer walls of the bursa, which was otherwise somewhat inflamed and slightly thickened. The bands were removed and the operation was followed by a quick and perfect recovery.

CASE 4.—A farmer, aged 56, who had injured his right arm eight years before, complained that he had had pain at the right shoulder, radiating downward to the elbow at night and in moving the arm, for about four years. At the operation, five small villous tabs were found on the posterior wall of the bursa near the crest of the tuberosity. These were removed, and the operation was followed by a perfect recovery within a few weeks.

8. *Lime Salt Deposits at the Subacromial Bursa.*—More has been written of these cases than of all other types of subacromial bursitis, and still a certain dissension of opinions exists in regard to the seat and nature of these deposits and their best method of treatment. In regard to details of this discussion, I refer to the papers of Codman, Brickner, and others and shall but briefly state my own experience. I have studied only four cases of this type, in two of which I have operated. In both cases the deposits were beneath the floor of the bursa, in one, seemingly in the tendon sheath of the supraspinatus, while in the other, that part of the tendon which is nearest to the insertion was perforated like a sieve, the holes being filled with caseous deposits. Both these cases, therefore, support Brickner's statement that the lime salt deposits have their seat in the tendon of the supraspinatus or other tendons or their sheaths. In both cases the deposits have been scraped out as much as possible, but the end-results have been very unsatisfactory, in regard both to pain and to function. This experience has led me to choose a conservative treatment in two other cases in which there has been a perfect, or almost perfect, recovery.

9. *Rupture of the Supraspinatus Tendon and the Roof of the Capsule of the Shoulder Joint.*—Codman has shown that these cases are more frequent than has hitherto been believed, but we are still far from knowing definitely how frequent they are, as their diagnosis is often quite difficult. Risley goes so far as to set a time limit of three months. Careful observation, however, has enabled us to make the diagnosis in one case fairly early. Two patients entered the outpatient clinic on the same day with almost the same history, and very similar symptoms. Both reported a severe strain of the shoulder a few weeks previously, disabling the arm completely as far as elevation and abduction were concerned. Both were suspected to have a ruptured supraspinatus, and I treated them with massage and very gentle active-passive movements. In one case the symptoms cleared up within three or four days, and the patient was completely relieved within two weeks, whereas in the other, the lack of action, elevation and abduction persisted, and the pain was not much relieved. In the latter case, therefore, an operation was done which revealed rupture of the supraspinatus tendon.

REPORT OF CASES

CASE 1.—A healthy man, aged 50, injured his left shoulder three months previously. In lifting a heavy harness above his head to a rack, his foot slipped, and he felt something give way in his left shoulder. He managed to lift the harness up on the rack, but afterward could not raise his arm. His left shoulder was sensitive, and showed almost complete absence of active and passive motion. A diagnosis was not made until, after several weeks' treatment, a certain amount of passive motion was restored, but active function did not return along with the passive motion.

An operation was therefore advised; the subdeltoid bursa was opened in the usual way, and after exposure of the subacromial space, it was found that the supraspinatus tendon was torn loose from its insertion for about two thirds of its width. There was also a large hole in the capsule so that the subacromial and the shoulder joint connected through a hole the size of a quarter. The torn ends of the capsule and tendon were sewed down to the tuberosity, and the arm put up in abduction for about five weeks.

Motions of the arm were begun two weeks after the operation, and within six months the patient's shoulder was perfectly restored as to motion and strength.

CASE 2.—A healthy man, aged 60, while pulling on a truck two weeks previously, received a severe pull on the shoulder, and felt something give way. This was followed in two days by another injury to the shoulder, and the patient was forced to stop work on account of the severe pain which radiated down from the shoulder to the outside of the elbow. He said that he had had a certain limitation in motion of the right shoulder for a year, and occasionally little pain. The patient was unable to raise his arm actively, but in stooping over could abduct his arms almost to right angle without pain. There was a painful swelling over the right shoulder.

Roentgenoscopy revealed hypertrophic changes about the greater tuberosity, and at the acromioclavicular joint, and a free mass in the latter joint.

On account of these signs, the diagnosis of rupture of the supraspinatus was made, and operation advised. Operation was performed by Dr. R. B. Osgood, using the "saber-cut" incision across the acromion and through the acromioclavicular joint. The roof of the bursa was adherent to the deltoid. The capsule was seen to be ruptured, and the supraspinatus found to be torn off at its attachment to the bone. The tendon and capsule were sutured by silk and kangaroo tendon.

After-treatment was started as in Case 1, but the functional recovery was not quite as satisfactory, probably on account of the marked hypertrophic changes.

CASE 3.—A bartender, aged 53, was struck by an automobile five months previously. He was unconscious for a

few moments, but thinks that the automobile struck the right shoulder directly. He went to a surgeon, who made a diagnosis of dislocation of the humerus, and replaced it under ether. A Sayre adhesive dressing was applied for five and one-half weeks without change, leaving the whole arm stiff from the shoulder to the fingers. When the patient entered the hospital, therefore, the correct diagnosis was not possible; but when, by persistent treatment with massage and exercise, the passive mobility had been improved to a certain extent, but active abduction still was impossible, the diagnosis became suggestive of a ruptured supraspinatus, and operation was advised.

The clinical picture was complicated by an unreduced dislocation of the acromioclavicular joint, the outer end of the clavicle riding almost over the acromion. The Roentgen ray revealed hypertrophic arthritis with intensive spur formation on many joints, including the acromion, with bony atrophy of the head of the humerus and the glenoid process.

The subdeltoid was opened as in Case 1. There was a very extensive laceration of the supraspinatus and capsule, making a connection between the bursa and joint almost the size of a silver dollar. By the unreduced dislocation of the clavicle, the replacement of which was not attempted, the space was markedly narrowed, and the torn tendon and capsule were markedly retracted, so that only with great difficulty could silk strands be passed through its edges. Even with full abduction, complete apposition seemed hardly possible.

After-treatment was begun in a way similar to the first case, and the patient made a good recovery, though a certain amount of stiffness persisted. Six months after the operation, however, he was able to raise the arm with considerable strength far beyond the horizontal line, and used the arm almost as before.

THE CONSERVATIVE METHOD

The technic of conservative treatment of shoulder lesions is not so easy as is frequently believed, and from our experience with more than 2,000 cases, we venture to say that, perhaps with the exception of the hand, there is no articular mechanism of the body to which more harm is done by irrational treatment. A glance at the anatomy of the subacromial bursa and its function will make this at once evident. In abduction and elevation of the arm, the tuberosity of the humerus has to glide more or less underneath the acromion, and it is the function of the bursa to make this motion possible. It acts almost like a joint, and may be justly considered a semi-joint. As we can see on the opened bursa, the space between the acromion and the humerus shows considerable variation in different positions. With the arm hanging down, and the humerus inwardly rotated, the space is quite large, allowing the finger to pass between the bones. The more the arm is rotated outward, the smaller the space will become; but still a fairly good sized space exists even in full outward rotation.

With elevation of the arm, the mechanical relations of the humerus and acromion change considerably. Here, just on the contrary, the space is relatively greatest with the arm in outward rotation, while with the arm inwardly rotated and elevated the space becomes so narrow that hardly a probe can be passed between the humerus and the acromion. These are the relations under normal conditions. When the walls of the bursa and the adjoining structures are changed in thickness, the space between the bones may change considerably.

When examining a stiff shoulder for the first time, it is, offhand, difficult if not impossible to obtain a clear idea about those relations of the bones, and only by careful observation do the mechanical conditions become distinct. Another point will also be

evident, namely, that the chances of recovery of the elevation are the better the more free the rotation. Hence the prognosis is generally better when the rotation is not, or not much, restricted than when both elevation and rotation are limited. Cases in which the elevation is free and the rotation greatly restricted are rare. We see them sometimes in the after-care of cases which have been treated for some time with immobilization in full abduction when motion in the frontal or sagittal direction has been restored first.

These anatomic remarks may give a certain idea of the great variability of the subject, and may prove that each case needs individual attention and careful study. Often it is only by prolonged observation that we obtain a certain knowledge of the mechanical conditions. Admitting, therefore, the difficulty of giving routine prescriptions, I shall try to outline the method of treatment as it is carried out in our clinic. In a case in which motion is limited in all directions, the first rule is to find out how much of the restriction is due to muscular contraction, and how much to adhesion or retraction of tissues. Examination of the function of the shoulder at first in the standing and then in the lying position may give a certain idea of the amount of muscle spasm, as in the latter position, by means of more favorable leverage conditions, the deltoid and supraspinatus muscles can work with less strain to the bursa and joint, and this difference will often become more obvious after the pain-lessening application of hot air and massage. We remember patients who, at the first glance, showed a perfectly stiff and rigid shoulder, but gained motion of 40 or 50 degrees during the first treatment. The prognosis in these cases is generally good, but one must take great care to give the treatment a soothing character, and avoid all rough handling. Hot air should be applied for not more than fifteen minutes with a temperature of not more than 180 F.

The exercise should be done as slow resistive or assistive movements, and at least in the beginning not beyond the range of discomfort, that is, when rotation is 50 degrees free, the resistive exercise should not be done more than 45 degrees. When in such a case the stage of muscular restriction is passed, and that of adhesions or retraction is reached, greater force may be applied, provided lasting pain is avoided.

The treatment then will be carried out in the following way:

The shoulder is baked for fifteen minutes, followed by a gentle rub, massage applied to the muscles of the shoulder and upper arm. Then the patient is placed on a couch or table with a pillow under the head and shoulder, and a smaller pillow under the elbow, thus bringing the humerus in a horizontal position. The operator, standing on the side of the affected shoulder, grasps with one hand the patient's forearm, which is flexed in the elbow, while the other hand steadies the scapula, and at the same time one finger rests on the acromion and another on the tuberosity for an exact control of the motion. Now the operator demonstrates to the patient inward and outward rotation, and makes at first a few light active exercises. Then three or four slow resistive movements are made with complete relaxation of all muscles after each single movement. A few gentle massage manipulations follow, and such are frequently repeated especially with those muscles which show most tendency to spastic contraction. Then, in the same slow

manner, abduction, elevation and combined motions are practiced with the fingers, carefully guarding the effect of these exercises on the tuberosity, and its relation to the acromion in every single step.

With progressive improvement, the range of motion and the force applied to the resistances may be increased, and quicker motions, pendulum and other apparatus, cane and pulley exercises, applied as the case may require; but we advise against a too early use of such appliances because they are likely to act irritatingly on the bursa, causing pain and muscle spasm and restriction of motion.

These represent the majority of cases of subacute or chronic bursitis, and a certain part of cases of infectious arthritis. In those cases in which adhesions and retraction of tissue are chiefly responsible for the treatment, the prognosis depends, of course, on the actual changes; but even here, by persistent resistive exercise, concentric and eccentric, good function can be restored. The fact that within the last year or two we have not had occasion to use forcible manipulation under an anesthetic may serve as proof that we have been sufficiently satisfied with our conservative method. Two patients who seemed to respond rather slowly had been manipulated in my absence, but were evidently not relieved; on the contrary; the enormous aggravation of the pain and muscular rigidity following the manipulation has furnished us renewed proof of the great superiority of the slower, conservative method which, in most cases, will prove the quickest in the end.

ABSTRACT OF DISCUSSION

DR. WALTER TRUSLOW, Brooklyn: It is rather unfortunate that the reader of the paper could not have had opportunity to develop his full classification. I was interested, however, to note that in the first part the paper failed to give us the etiologic background of some of the conditions dealt with. I want to speak strongly of the use of massage, muscle training and gymnastic work, which Dr. Bucholz so liberally uses. The oculist objects to the indiscriminate sending of patients to the optician, and rightly so; the orthopedic surgeon objects to the ignorant sending of patients to the brace-maker with instructions to make a brace for some part of the body, and rightly so. We all object to the attitude of the osteopath, the chiropractor and others, in claiming everything for gymnastics and passive motions, and rightly so; but do we do our duty in the matter? Do we train ourselves to do this work properly? As muscle training and massage are so valuable for many orthopedic conditions, should we not train ourselves to do them?

Dr. Bucholz points out that massage and passive motions for the stiff shoulder must begin slowly, carefully and progressively. The medically trained man must actively supervise this.

DR. WALTER M. BRICKNER, New York: I think that Codman's classification of subacromial bursitis into acute adherent, chronic adherent and chronic nonadherent types, which Dr. Bucholz has adopted, has no basis in the pathology of this condition. I would ask both of these gentlemen whether they have ever *seen* a chronic subacromial bursitis that was not adherent. I have operated in eighteen of these cases in all stages, acute and chronic, and in every one of them the bursal walls were adherent! The mere absence or presence of adhesions is not to be hypothecated on the basis of motion or lack of motion. Nonadherent subacromial bursitis has not been demonstrated. The adhesions of the bursal walls can be shown very clearly, with the location and the extent of the lime deposits that are found, underneath the bursa, in many cases. These adhesions may be found and the symptoms may be present, whether there is a lime deposit or

not. On the other hand, a lime deposit in the supraspinatus tendon is occasionally found without any bursitis.

As Dr. Bucholz mentioned, Codman suggested a gravity test and a gravity exercise in these cases, in order to overcome the limitation of abduction, namely, having the patient bend forward with the arms dependent. I have tried this, and found that it did not work out well. I think that the automatic abduction method in bed, which I described two years ago, and which usually works rapidly and well, is much better. Instead of attempting to use the gravity of the arms, I use the gravity of the body. The moment the patient is recumbent, there is an improvement in the abductibility of the arms. I have the arm abducted on pillows as far as the patient can comfortably abduct it himself, fasten it in that position by a sling to the head of the bed, elevate the head of the bed, and let the patient alone. As the body slips down gradually in bed, the patient's arm goes up. The result is that frequently a patient who has not been able to raise his arm more than 45 degrees in six months can in one or two days abduct it completely. This accomplished, exercises follow. If this method fails, the patient needs other treatment. I have read with great pleasure the book of Dr. Bucholz on massage, especially the chapter on the treatment of shoulder derangements. I have not been convinced, however, that massage does the work. In the cases recorded in his book the recovery was slow; it took several weeks. With the automatic abduction method in bed you will often accomplish this in two or three days. It seems to me that it was not the massage in Dr. Bucholz's cases, but the gentle passive movements and the encouraged active movements that accomplished the results.

DR. WALLACE BLANCHARD, Chicago: I had the pleasure of seeing Lieut.-Col. Robert Jones make instantaneous reduction in a case of chronic subdeltoid bursitis, the patient being a colonel in the British Army and 50 years of age. He had not been able to lift his left elbow level with the axilla for ten years. Robert Jones said that relief of these cases was rapid and easy. He stood the patient with his back against a door casing; with his left hand he steadied the patient's right shoulder and proceeded with his right hand to push the patient's left elbow back until he had thrown the head of the humerus forward onto the anterior rim of the glenoid cavity. In about two seconds Jones said, "You are cured. Come again tomorrow and swing your arms." The colonel came back the next day and could swing his left arm freely in all directions. That was an instantaneous cure.

DR. MELVIN S. HENDERSON, Rochester, Minn.: I should like to emphasize what Dr. Blanchard has spoken of. I have often seen Mr. Jones treat cases in that manner, and I have myself treated them in that way. Give the patients a few whiffs of ether, until they get primary anesthesia, and then put the arm up sharply and break the adhesions. This is to be followed by active motion. I agree with Dr. Bucholz that muscle training, etc., is a good thing, but it takes much time and attention; and you can, by this method of Jones', practically cure patients within twenty-four hours.

I wish to relate the case of a man of 50 who came to the clinic six months ago and showed a stiff shoulder that he had had for six months. I suggested manipulations but he said that he could not spare the time. He was a farmer and the next week while descending the hay loft ladder his foot slipped and he fell, necessitating his weight being sustained by his injured shoulder. His arm immediately straightened out; he felt the adhesions break; and within two weeks he was absolutely well.

I think that the question of the bursa that Dr. Bucholz wrote of is very interesting. In some cases, the bursae are affected, while in some other cases the injury is about the joint and there are adhesions.

DR. E. D. OPPENHEIMER, New York: In the clinic here we have large numbers of cases of the mild type, but not of the severe form that Dr. Bucholz has spoken of; and I think that we see early cases of disability from this cause. We are not able to make the diagnosis of its being limited to the subdeltoid bursa, and I think that periarthrititis of the shoulder is a more correct term, because, in all these cases, the

symptoms are pain and sensitiveness over the anterior part of the shoulder, inability to make full abduction and an area of paresthesia corresponding to the distribution of the circumflex nerve. Some of these cases present concretions in the shoulder joint. I do not think that we can draw any inferences with regard to the presence of this calcareous concretion. We try to use the abduction treatment. Few of the patients are sick enough to stand the restriction of having their arms in the abduction splint.

What has been said with reference to stretching of the joint applies only to the older cases, in which the disease has passed and adhesions alone are causing the disability. I believe that the larger number of shoulder cases are instances of the mild type, and that no positive diagnosis can be made.

DR. ROLAND MEISENBACH, Buffalo: In considering our shoulder cases, I believe that we should carefully decide whether we are dealing with a real and primary traumatic shoulder, or whether we have an early diseased joint. I have found that the symptoms of an early osteo-arthritis, and also of an early tuberculous shoulder joint, may be the same as those of the traumatic; this is especially true of the traumatic bursitis class.

DR. C. HERMANN BUCHOLZ, Boston: In regard to Dr. Brickner's statement about our inability to recognize any nonadherent type, I would say that I think we can recognize nonadherent bursitis as a clinical type to some extent. I have operated on several patients without limitation of motion, and found adhesions; so I will admit that, from a pathologic point of view, we should not consider this type; but still I agree with Codman that clinical observations justify us in making such a group.

In regard to the time required for the treatment, I admit that I see, in my department, the worst cases. Patients are sent to me from other departments, frequently after not having well responded to quicker methods. The problem is quite large; for example, stiffness resulting from fractures or other injuries of the shoulder cannot, as a rule, be relieved by such quick methods as Jones and others recommend. In these cases we have to do with the actual retraction of the tissues, and these retractions are sometimes very hard.

PRESERVATION OF COMPLEMENT

A PRELIMINARY REPORT

B. W. RHAMY, M.D.

FORT WAYNE, IND.

In making routine Wassermann tests, a considerable factor of the necessary preliminary work is the killing of at least two guinea-pigs a week for the necessary fresh complement. As all serologists know, complement kept in the ice box can be used only on two successive days, after which its activity rapidly decreases, and anticomplementary substances develop in the guinea-pig serum. A reliable method, therefore, for preserving complement, which would not interfere with the working of the Wassermann test, would be a great saving of time, expense and guinea-pigs.

Several methods have already been tried. Noguchi dried guinea-pig serum on filter paper, but this proved to be worthless. Freezing ($-15^{\circ}\text{C}.$) is said to be effectual, but most laboratories are not equipped to produce this temperature. Extra sedimentation has been claimed to prolong complement activity. Austin¹ advocated 40 per cent. dilution of guinea-pig serum in 25 per cent. sodium chlorid solution, but this method did not survive. In my hands it was unsatisfactory and was soon dropped. (Salt in excess is inhibitory.)

1. Austin, F. D.: A New Method for Preserving Complement for Making the Wassermann or Noguchi Blood-Test, *THE JOURNAL A. M. A.*, March 14, 1914, p. 868.

In the hope of finding some substance which would preserve complement adequately, I systematically tested a great number of substances for hemolytic and anti-complementary activity. It was found that sodium acetate, chemically pure, possessed no hemolytic power and did not interfere with the hemolytic system, even when present in excess or in crystalline form. A tentative solution of 10 per cent sodium acetate in 0.9 per cent. sodium chlorid solution was prepared and repeatedly tested for hemolytic power and anticomplementary action with negative results each time. This solution was then used as a diluent for guinea-pig serum in preparing the usual 40 per cent. dilution for complement and *parallel* tests were made with this and the regular 40 per cent. dilution in sodium chlorid solution on all complement fixation tests.

In no case has the result of the Wassermann reaction varied as between the two complement solutions (unless perhaps a tendency of the acetate complement to give clearer cut reactions), and the unit of complement of both solutions was always the same. Guinea-pig serum thus diluted to 40 per cent., with 10 per cent. sodium acetate in 0.9 per cent. sodium chlorid solution, whose unit was found to be exactly 0.1 c.c., was placed in an ordinary refrigerator and tested from time to time for loss of strength. At the end of five days the unit remained constant at 0.1 c.c.; at ten days the unit is 0.11 c.c., and there was no bacterial clouding. This slight loss in ten days is so small as to be insignificant as compared to the practicability of saving over *fresh* complement for a week or more, the procedure is so simple, and the reactions from this preserved complement so clear cut, that I believe a preliminary report should be made at this time, so that other workers may try it out and have the benefit of its use, is satisfactory to them, especially during the hot season, when complement deteriorates rapidly. Further investigation will show what strength solution is most efficient. This diluent works equally well with alcoholic extract or with cholesterin antigen. This 10 per cent. solution of sodium acetate in 0.9 per cent. sodium chlorid solution has the same hydrogen ion concentration as the blood ($H_p + 7.6$). Collaboration is invited.

SUPPLEMENTARY

In preparing the acetate diluent it is well to sterilize the solution to prevent the growth of fungi.

Solutions stronger than 20 per cent. form a crystalline precipitate which tends to retard hemolysis. On sedimentation the supernatant fluid contains the active complement.

Strong acetate complement dilutions keep better than weak dilutions, but lose the complementary power suddenly, in two or three weeks, without germ growth.

Weak dilutions (less than 5 per cent.) work well but are spoiled in about a week by germ growth.

Acetate solutions of from 8 to 15 per cent. are best for regular use, the 10 per cent. solution from present experience being probably best.

As examples of the efficiency of this complement preservative: A guinea-pig serum taken July 19, 1917, diluted to 40 per cent. with 10 per cent acetate solution, showed a unit of 0.1 (titration included normal serums and antigen in regular test). August 21, the unit showed 0.125.

August 16, a 15 per cent. acetate complement showing a unit of 0.1 (made the same way) was placed

in a west sunlit window at room temperature (74 F.). August 27, the unit was 0.15.

Experiments have been undertaken as to the value of this acetate complement dried on paper.

CONCLUSION

Complement diluted with 10 per cent. sodium acetate will keep perfectly until used up in routine work, and will work perfectly.

THE RETENTION OF DEVITALIZED TEETH WITHOUT DANGER OF FOCAL INFECTION *

M. L. RHEIN, M.D., D.D.S.

Lecturer on Dental Pathology, Department of Dentistry, University of Pennsylvania

NEW YORK

The accumulated evidence both in research work and from clinical data has established the fact that many infective lesions of vital parts of the body can be traced to focal infections at the ends of the roots of teeth. The great amount of attention that has been brought to this important subject has resulted in the usual exaggeration, not only by the laity, but by many physicians. Consequently, it is timely that it should be made very clear that all cases of endocarditis, arthritis, ulcers of the stomach, etc., are not of dental origin.

The value of the natural teeth in the maintenance of health should not be overlooked, and they should not be extracted in a wholesale manner on insufficient evidence of their being a menace to life.

It should be understood that the evidence of a roentgenogram requires corroboration, that poor roentgenograms are apt to be most common, and that a picture in which the tissues cannot be histologically studied is unreliable.

The correct reading of such a picture for the purpose of making such a diagnosis is dependent on the definition and detail of root, alveolar process and lining membranes being absolutely clear. Even then it may be necessary to obtain other pictures at varying angles, and finally only a man thoroughly familiar with the histologic appearance of these tissues is capable of a fair interpretation of the same. Even when a roentgenogram has demonstrated the presence of focal infection in the alveolus, it does not prove it to be the etiologic factor sought for. On the other hand, it may be a contributory cause together with some other focal infection.

Too little attention in this period of quick action is being given to the making of a differential diagnosis. In this respect the value of the *Streptococcus viridans* complement fixation test is worthy of serious attention. In view of the fact that more than 150 strains of this group have so far been isolated, we must bear in mind that if it has a value, a negative result is by no means conclusive that a later test with some new strain may not show a positive fixation. I am firmly convinced from corroborating clinical evidence that the test has a certain diagnostic value. When a positive result is obtained there remains the self-evident fact of the value of an autogenous vaccine from this source.

* Read before the Section on Stomatology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

Whenever a diagnosis of a focal infection at the end of a root has been made we must give due consideration to the question of immunity. The transitory character of immunity must never be forgotten, just as we must remember how much we still have to learn about immunology. Consequently, it follows naturally from this, that given a focal infection in the alveolar region, it must, as a question of prophylaxis, be cured or the tooth should be extracted.

Where corroborative evidence points to this pathologic site being the cause of metastatic disturbances of a serious nature, it should prompt the cure of the infection as rapidly as possible. In such cases immediate extraction of the diseased tooth is frequently made necessary on account of the time required to eradicate such an infection and leave the tooth in a condition free from the danger of reinfection.

On the contrary, where no metastasis is discovered it leaves the dentist ample time to attempt to properly preserve such a diseased tooth.

Perhaps the greatest reason why this operation is done so imperfectly, even at the present time, by very capable men, is on account of the fact that in the majority of cases it is one of the most difficult of operations and often requires many hours of patient labor divided into different periods of time. This is due to the fact that in so many cases calcification has blocked the root canals, and it makes no difference how extensive this calcification has become, it is essential that every canal must be explored until a broach can pass through the foramen. This can only be accomplished by Roentgen-ray checking at every stage of the operation. It is most difficult to have the average operator understand that certain definite results must be attained regardless of time consumed.

I have been frequently criticized for the length of time I have taken in certain cases, but would state here that perhaps these men, many of them thoroughly conscientious, would think further if they could see some of their failures that had been rectified, failures that were due entirely to their unwillingness to take the time necessary to explore canals to their end. The great expense, necessitated by the amount of time consumed, prohibits the operation in a great many cases. Too many men are easing their conscience by doing better work than formerly, and yet not obtaining correct results. This, however, should not suffice any longer; the principles are now understood, the Roentgen ray reveals the result, and if we make any pretense to honesty we must cease allowing imperfect root canal work to remain in the mouths of people who leave the dentist deluded into thinking that the disease has been eradicated. Remember, after all has been said, that our first duty is not to ourselves, not to our colleagues, but to the community at large.

With this understanding let us consider the principles, technic and final result to be attained.

The first thing to remember is that every step and stage of our work must be done under the most thorough aseptic surroundings. The mouth should be thoroughly sprayed at the outset of every sitting. The gingival border of the root to be operated on should be painted with iodine and the rubber dam should invariably be applied.

It is not feasible here to elaborate the varying details of removing pulp tissue from roots that deviate from the normal type and that exhibit different pathologic characteristics. Let it suffice at this time to say that every particle of organic pulp tissue must be removed,

however intricate and tortuous the canals may be; all bay-like recesses and divergent canals must be cleared of organic matter. Unless this can be accomplished it is useless to proceed further.

When it is desired to make a complement fixation test, the utmost care in the way of asepsis should be taken in regard to the removal of pulp tissue. No chemicals of any kind can be employed on account of the danger of destroying any existing bacteria. When the roentgenogram shows that a sterile broach can be passed through the foramen, a fine iridoplatinum wire previously heated is passed through the foramen and turned around a number of times in the periapical region. This is now withdrawn with care so that the inoculated wire should come in contact with nothing prior to passing into an agar-agar tube, or better still, in a sterile broth tube. The carefulness of our technic alone will determine the value of the culture produced.

The therapeutic agents used to remove pulp tissue are the sodium and potassium alloy and dilute sulphuric acid. No therapeutic agent should be used in the canal which will affect any pathologic condition, which might otherwise interfere with a correct diagnosis. This especially precludes the use of all preservatives such as creosote or the phenols, which will in addition prevent an ideal hermetical sealing of the canals at a later stage.

The galvanic current is now brought into use for the purpose of zinc ionization. Without going into the details of ionic therapeutics, it can safely be said that all of the infected area can be made sterile in this way. It is all dependent on the amount of ionization used. Where there is any uncertainty as to periapical sterility, it should be determined by taking a culture from this area which should show absolute sterility. This necessarily means a delay of at least ten days when, if no culture has shown, the part should be again sterilized prior to sealing the canal. So far no investigation has shown how long such an area will remain sterile. Until this has been definitely solved, it is important that the root canal sealing should immediately follow the last ionization of a given part. In multi-rooted teeth the ionization should be carried on through each separate canal which should immediately be filled before another one has been ionized.

Every step having been so far satisfactorily carried out, we reach the final and most important stage of the operation, that of the root canal filling. This material should be nonirritating, unchangeable in character, and should so homogeneously and hermetically seal the interior of the canal as to safeguard against any infection through the tubuli from the cementum. Its most important function, however, is to seal the outside of the end of the root against two important factors. The first one is to defend the slightest opening of a foramen against the invasion of bacteria. The second, and equally important factor, is to hermetically seal any exposed surface of cementum or dentin against osteoclastic invasion.

The encapsulation of the end of the root with gutta-percha accomplishes both of these purposes. No stage of the operation requires so ideal a maintenance of asepsis.

The proof that such an operation as above described will eradicate the disease, consists in the fact that this granuloma area disappears and is replaced by new alveolar structure.

Anything that interferes with the success of these steps is liable to make the operation a failure.

The most common cause of failure among the men skilful in this operation is an imperfect encapsulation, which oftentimes cannot be detected until it is discovered that the new bone has not regenerated.

It does happen that regeneration of bone proceeds for a given time, perhaps for a year, and then on account of imperfect encapsulation, a new infection has started up, showing by evidence of new rarefaction; or absorption of the root starts in at some point because there has been an exposed point of cementum not sealed by gutta-percha.

On this account it is both unwise and not safe to be positive of success until the part has been under roentgenographic observation for a couple of years. Patients should be instructed to come back for these pictures at least every six months until assured that the new bone is a permanent addition.

If it is found impossible to effect the permanent regeneration of new bone in this way there still remains a final operation by means of which the root may be maintained in a healthy manner.

The amputation of the diseased end of the root and thorough curettement of the periapical region has become a well-recognized procedure, but should be a measure of last resort.

Many apicoectomies brilliantly done eventually turn out failures, because of root absorption due to the action of iconoclasts on the exposed cementum or dentin on the stump of the root.

This should be obviated by permanently insulating this dentin surface from the body tissues. This has been done in the past by an amalgam filling over the stump which entirely covers it. An easier method and one more compatible to human tissue is to dry the surface of the stump and cover it with a few coats of a chloroform solution of gutta-percha. The rapid volatilization of the chloroform produces a dehydration of the surface and the gutta-percha is left firmly glued to the end of the root.

Of course the same follow-up roentgenograms must be taken after this operation. When none of these methods produce permanent alveolar regeneration it becomes our duty to see that the tooth in question is extracted.

38 East Sixty-First Street.

ABSTRACT OF DISCUSSION

DR. M. I. SCHAMBERG, New York: It is evident that an immense amount of work is being done to clarify the atmosphere as far as focal infections are concerned. I fear that too little attention has been given to the areas of infection that occur in the mouth that do not show in roentgenograms; in other words, where teeth are pulpless and show no evidence of infection at the end until they are removed and the tips of the roots snapped off and cultured. The same thing applies to the cases of incipient gingivitis which have not really reached the stage of having become definite cases of pyorrhea; cases in which there is no pus discharge, but in which there is, however, a breeding space for the lodgment of organisms that are a menace to the health. The mouth is definitely the slum district of the body, and in that mouth we have all the criminal organizations that tend to invade the system, and produce the havoc that we have heard so much about. In spite of excellent work done by Dr. Rhein and his followers, I am inclined to favor only a more definite method of curing apical infections—that the vast majority of practitioners be not permitted to deal with pulpless teeth. I believe that at least 75 per cent. are failures in spite of all that we have learned, and these conditions are a great menace to the health where they are directly or indirectly responsible for the numerous secondary involvements.

DR. T. W. BROPHY, Chicago: The most essential step to be taken in the prevention of these diseases is the training of parents as to hygienic methods. When the time arrives, Dr. Atkinson used to say, that the members of the profession and the public are brought to realize the serious consequence of dental caries, and its sequelae, then we will have arrived at a time when these diseases will be less numerous. I was further impressed with the feeling that the class of infections that have been discussed constitute a class of infections and diseases that has not received the attention that its importance demands on the part of medical teachers. One of the greatest difficulties with which I have had to contend is to find that interns, who are among the best educated of the medical graduates, have never had instruction, with few exceptions, on the diseases incident to the teeth; when they come in touch with these maladies they are not qualified to make a diagnosis or to express an intelligent opinion as to the best course to pursue in the management of their patients.

DR. LOUIS GOLDSTINE, New York: I have been dealing with chronic conditions in cases that have gone a little too far for the dental man to do much good. I have examined hundreds of roentgenograms in trying to see the percentage of infections in these chronic cases relative to the cases of healthy persons, and I find that in the 200 or 300 cases that I have gone over, about 95 per cent. of the arthritis patients have two or three abscesses in their mouths, and I think we will find this in cardiacs as well. Of course in these cases little can be done by clearing up the abscesses to cure the conditions, as the arthritic conditions are beyond redemption.

DR. FREDERICK B. MOOREHEAD, Chicago: There are certain fundamental facts that we must all face in this whole question. First, the fact of focal infections as an established truth in pathology; second, the incidence of chronic mouth infections, in relation to general infections; third, we must all agree that any infection, wherever found, should be removed. These are postulates which we must accept as a working basis. Now, the question arises, how shall this be done? For the most part by the extraction of teeth.

Dr. Rhein has indicated the possibility in the hands of an expert of saving a few teeth. He failed to tell us how many times he fails to do the thing he showed us on the screen this morning. I know he has a good percentage of failures, and he removes the teeth when treatment fails. An expert giving a lot of time in saving a few teeth does not determine an average for the profession. I am perfectly willing to admit that where teeth can be handled by a man as expert as Dr. Rhein, badly infected teeth may be saved in many cases. A specialist has many advantages over the general practitioner, both in opportunity and the class of patients who come to him. Where the patient's health is not put in jeopardy, while infected teeth are being treated, and where the case is carefully checked up by the Roentgen ray, no one has any complaint to make; one may develop a highly specialized technic in root canal management if he is willing to give thought and attention to it; but how many have developed such skill? Not many! How many people are there who may be served by that type of men? What about the great population of foreigners? What about the poor? What about the people who are bedridden in our hospitals; what about people suffering from general chronic infections? Are we going to subject them to any detailed régime? Certainly not. Reduced to fundamental facts, it becomes evident, after all, that, for the most part, teeth that are badly involved in chronic infections will have to be extracted.

DR. ARTHUR ZENTLER, New York: After what we have seen, what right have we to believe that in spite of good technic we will have no infection around the apex of these roots?

DR. MEYER L. RHEIN, New York: I am in thorough sympathy with what Dr. Moorehead has so well said in a general way, except that I think he goes a little to extremes. I think he overestimates the lack of men who are doing good root-canal work at present. I know that personally I have trained and educated over 200 men in this very district that we reside in, who are doing first class root-canal work. There is a great deal that he has said, however, that it is not thought advisable to debate on. I would especially refer to the

difference, the unwillingness of a man, after he has spent two hours, or twenty hours, on a good tooth—and that has happened many times with me—then to tell the patient that the operation is a failure and that the tooth must be removed. That is the difficult point to make the dentist understand. It is a simple thing with the surgeon, and his confrère, the physician. Dentists have been brought up to look at these things as jobs, mechanical jobs; and they are afraid to tell their patients that the operation is a failure and that in the interest of their health the tooth must be removed. That is the point I want to emphasize in regard to what Dr. Moorehead has said.

I was disappointed not to hear from Dr. Goldstine on remedial efforts by means of extraction in some of these cases. This is a criticism against the institution with which he is connected. I have discussed that question with the managers of institutions many times, and found it difficult to resort to extraction because they had no money at their disposal to supply patients afterwards with artificial teeth. I have a long history of arthritis cases of many years' standing, many of them as bad as Dr. Goldstine will find in his institution, in which the patients have been absolutely cured by the removal of every focal infection in their mouths. This is no criticism of the gentleman; I am simply making it broadly against the lack of means that these institutions have for the completion of such an effort.

DR. KURT H. THOMA, Boston: I am connected with an institution which deals with chronic infectious cases, and most of the patients suffer from chronic arthritis of long standing. Our hospital is in a position to give these patients the very best attention in all respects.

From the beginning I have practiced radical extraction of all abscessed teeth, and in order to restore the patient's masticating efficiency, which is, of course, of great importance, we have a dental intern who supplies plate and bridge work after the extractions.

The dental department of the hospital has existed for about two years and in looking back on the many cases under our observation we find that we did not get the results which we first expected. We thought we would cure a large percentage of the patients and, although we have not done this, we find improvement in many cases. The acute symptoms of pain and swelling have improved, but they have not been entirely corrected. This is due to the fact that the destruction in the joint, or other part, where the infection is located, has progressed to such an extent that anatomic restoration is impossible. However, we do look for improvement of a more physiologic nature. The purpose of correcting abscessed teeth, infected tonsils and intestinal disorders is to improve the patient's general condition and from this and improved nutrition, in which masticating efficiency plays an important part, we expect improvement of the chronic disease. We find that we are able to put the patient in a condition which, though not ideal, enables him to do some kind of work to a limited extent, thus making a self-supporter out of a man who would otherwise be a burden to the community.

DR. T. W. BROPHY, Chicago: Dr. Thoma, in removing the teeth about the ends of the roots of which you have an abscess, what do you accomplish by that?

DR. THOMA: After I remove the tooth I get rid of the infection.

DR. BROPHY: Well, the bone is affected, is it not?

DR. THOMA: Of course by removal of teeth I mean not only extraction of the tooth, but all that goes with it, the curetting of the cavity, and the treatment of the wound until it is thoroughly healed.

DR. BROPHY: Curetting of the cavity ought to be brought out.

DR. THOMA: I both extract the tooth and curet the cavity in every case.

THE ROENTGEN-RAY TREATMENT OF ACNE VULGARIS

H. H. HAZEN, M.D.

Professor of Dermatology, Georgetown University School of Medicine
and Howard University School of Medicine

WASHINGTON, D. C.

The etiology of acne vulgaris is now firmly established. The disease is conceded to be due to the acne bacillus, although it is generally believed that the staphylococcus is responsible for the secondary supuration. There can be no doubt that the first named organism grows much better in an oily medium, both in vivo and in vitro.

Clinically, acne occurs almost exclusively in those persons who have oily skins, and in whom there is evidence of overactive sebaceous glands. For years, it has been realized and taught that any treatment that would free the skin from this grease furnishes the best means of combating the disease. It is now well known that the Roentgen rays will cause a permanent atrophy of glandular structure; hence their use in acne is theoretically justified. From a practical standpoint, many dermatologists have reported good results from such treatments; but up to the present time, no report has appeared in the literature of the treatment of a series of cases by the single dose method. For two years I have been using this method, and the excellent clinical results seem worthy of being placed on record.

METHOD OF TREATMENT

The technic employed is that which MacKee has advised in a series of articles. An interrupterless transformer, capable of backing up a 10 inch spark gap, and a Coolidge tube have been used in all cases in this series. At first, each dose was measured with a Holzknecht radiometer, but as experience increased, it was found that with a carefully standardized technic this was unnecessary, and that one could depend on the so-called indirect method in the vast majority of cases. In all cases the attempt was made to give just under an erythema dose, since a dose less than this was not so promptly effective, and as even one erythema dose might eventually cause telangiectases. As measured by the Holzknecht radiometer, the proper dose was three units, with the pastille at skin distance. This reading was made on the full distance scale of the instrument, not on the separate and distinct half distance scale, on which the reading would have been only one-fourth so great. In terms of the indirect measurement, the technic was as follows: The focal skin distance was nine inches, a spark gap of $7\frac{3}{4}$ inches; and a milliamperemeter reading of 4 with no filtration was invariably employed. The time was forty-five seconds. With the same technic, it requires one minute and ten seconds to produce complete epilation of the scalp.

In regard to filtration, various experiments have been made, both with aluminum and with chamois filters, but at the present time, there seems to be no advantage in their use, although theoretically it should be possible to atrophy the glands with less danger of injuring the skin when they are employed.

Respecting the number of treatments and the interval between each, the standard has been to give one treatment every three weeks. However, it is a question whether or not the use of a little over a third of the dose described above given once a week would not be better, and this method is now being tried. There are

Centralization of Medical Work.—Specialization has not tended to decentralize, but rather has been one of the most powerful incentives for centralization in medical work.—J. E. Tuckerman, M.D., *Journal of Sociologic Medicine*.

several reasons for this change. The single dose method is very close to the margin of safety, and, if the patient used an irritating preparation, an erythema might result; the second reason is that the patient can be watched more closely.

In no case has sole dependence been placed on the Roentgen rays: in all the cases the digestion has been watched, constipation corrected, and the ingestion of an excess of carbohydrates, especially chocolate, forbidden. Locally, the comedones have been thoroughly removed. No other treatment has been given, either local or general, with the exception of the free use of soap and water, and the rubbing in of a small amount of very weak sulphur ointment, when the skin became excessively dry from the roentgen therapy.

RESULTS OF TREATMENT

In the treatment of thirty-four cases, in which at least two exposures were given, the results were as follows: Twelve patients were completely cured so

no difference in respect to the age of the patient, or even the duration of the disease. Twenty-four of the cases were of the ordinary papulopustular type; of these, eleven patients were cured, eleven patients were greatly improved, and two patients markedly improved. Of the seven cases of acne indurata, one patient was cured, four patients were greatly improved, and two patients but slightly helped. Of the three cases of acne exclusively of the back, two patients were greatly improved, and one patient but slightly aided. It should be stated that in all three of these cases it was impossible to get the patients to take treatments with regularity or perseverance.

NECESSITY OF CAUTION

There are several unpleasant features that may be associated with the Roentgen-ray treatment of acne. If the hair of the scalp and eyebrows is not carefully protected by lead, the treatment will cause it to fall temporarily; in those cases in which there is a marked

REVIEW OF THIRTY-FOUR CASES OF ACNE SHOWING THE RESULTS OF TREATMENT BY THE ROENTGEN RAY AS COMPARED WITH THE USUAL DERMATOLOGIC TREATMENT

Case No. and Sex*	Age	Duration	Type	Predisposing Cause	Response to Usual Treatment	No. of Exposures	Result
1.—♂	22	10 years	Papulosa	None	Slight	2	Great improvement
2.—♂	20	3 years	Papulosa	None	None	3	Great improvement
3.—♂	17	3 months	Papulosa	None	.....	4	Great improvement
4.—♂	23	3 years	Papulosa	Overwork	Fair	4	Cure
5.—♂	21	3 years	Papulosa	Constipation	Fair	3	Cure
6.—♂	36	10 years	Back	None	Fair	3	Great improvement
7.—♂	24	3 years	Papulosa	Constipation	Fair	1	Great improvement
8.—♂	23	2 years	Papulosa	Constipation	Fair	4	Great improvement
9.—♂	22	5 years	Indurata	None	None	9	Great improvement
10.—♂	31	10 years	Papulosa	None	.....	2	Great improvement
11.—♂	20	5 years	Indurata	Constipation	None	4	Cure
12.—♂	21	3 years	Papulosa	None	Slight	3	Cure
13.—♂	22	4 years	Indurata	Overwork	Slight	7	Improvement
14.—♂	22	6 years	Papulosa	None	None	3	Cure
15.—♂	23	6 years	Papulosa	None	.....	3	Great improvement
16.—♂	26	3 years	Papulosa	None	Slight	3	Cure
17.—♂	26	3 years	Papulosa	None	.....	3	Great improvement
18.—♂	26	5 years	Papulosa	Constipation	Slight	3	Great improvement
19.—♂	28	10 years	Papulosa	Constipation	Slight	3	Cure
20.—♂	17	1 year	Papulosa	None	None	3	Cure
21.—♂	18	4 years	Indurata	Constipation	None	2	Slight improvement
22.—♂	21	5 years	Indurata	Constipation	.....	5	Marked improvement
23.—♂	20	3 years	Indurata	Constipation	Fair	2	Marked improvement
24.—♂	22	6 years	Papulosa	Constipation	Fair	4	Cure
25.—♂	22	4 years	Papulosa	None	Fair	1	Marked improvement
26.—♂	16	1 year	Papulosa	None	.....	3	Cure
27.—♂	26	5 years	Back	None	None	2	Slight improvement
28.—♂	22	4 years	Papulosa	None	None	4	Marked improvement
29.—♂	22	5 years	Papulosa	None	None	3	Cure
30.—♂	27	6 years	Papulosa	None	Fair	6	Great improvement
31.—♂	21	5 years	Indurata	None	None	5	Great improvement
32.—♂	25	8 years	Papulosa	Constipation	.....	4	Great improvement
33.—♂	25	7 years	Papulosa	None	Fair	2	Cure
34.—♀	34	4 years	Back	None	Fair	2	Great improvement

* In this column, ♂ denotes male and ♀ female.

that not a trace of the disease remained three months after the last treatment; fifteen patients were so greatly improved that they would not have more than two or three pustules in the course of a month; four patients showed marked improvement, but the disease would relapse from time to time, apparently because of indigestion or indiscretions in diet, and the remaining three patients were but slightly benefited. In two of these cases, a sufficient chance was not given to show what the Roentgen rays really would accomplish, while the other was a remarkably resistant case, in which the patient would show considerable improvement only again to relapse as soon as treatment was discontinued. The average number of exposures given in the cured and greatly improved cases was three and one third.

From the standpoint of sex, there was practically no difference in the results obtained. Both men and women responded equally well. Likewise there was

“cowlick” and a bad acne of the forehead, it is sometimes extremely difficult to secure complete protection. The eyebrows and lashes are very easy to protect, but when pustules exist in the eyebrows, they will continue to form even when the remainder of the face is well. If one uses a considerable amount of filtration and a consequent large dose of the rays, a temporary swelling of the parotid glands may occur; but, with the standard technic described in the foregoing, this has never happened. The employment of the rays will frequently cause the appearance of numerous freckles. In many patients, considerable temporary tanning results, and this may be disfiguring since the protecting lead foil will keep some parts of the face white. It is not at all unusual for a dose which is too small to cause a temporary exacerbation of both the grease and the eruption. Any size dose will not infrequently cause the appearance of a large crop of small, very superficial pustules, that greatly annoy the

patient. The most serious danger is that of permanently damaging the skin as the result of an overdose. This may take the form of atrophy with wrinkling, or of telangiectasia associated with atrophy. In one of my cases, a piece of protecting lead slipped so that one area of skin received a double dose; the result was atrophy with wrinkling over a small area. In another case of very severe indurated acne, in which the scarring was already severe and, in fact, was threatening to become appallingly disfiguring, several erythema doses were intentionally given, as smaller doses had no result. Fortunately, only several slight telangiectases resulted, and these at the depths of already existing pits.

CONCLUSIONS

The use of the Roentgen rays in acne is justified as a routine procedure by those who are absolutely certain of their Roentgen-ray technic, and by no others, since much damage can easily be done by an inexperienced operator. The proper use of the rays affords much the quickest and surest way of controlling the disease.

COINCIDENT PREGNANCY AND TABES DORSALIS*

EDGAR M. ALLEN, B.A., M.D.

LOS ANGELES

Pregnancy rarely occurs in the tabetic for several reasons: (1) because tabes occurs about ten times more frequently in men than women; (2) because decrease in sexual desire and power may be an early symptom of tabes, and (3) because a majority of the cases occur between the thirtieth and fortieth years of life, when the frequency of pregnancy is waning. Classic texts on obstetrics scarcely refer to the coincidence of tabes with pregnancy and labor. Grenier de Cardenal¹ in 1902 found only fifteen cases in the literature, and Jacob² says that only eight cases occur in the German literature up to that date. No one has reported any series of cases, for obvious reasons.

Fruhinsholz and Remy report a case in which the diagnosis of tabes had not been made before the occurrence of labor. The woman was a quadripara, aged 36. During pregnancy she had gastric crises which were considered as due to the pregnancy. She had no eye symptoms, and in fact no symptoms of tabes that could be noted by other than a careful neurologic examination. When labor occurred she had no pain with the contractions, and when examined, it was found that dilatation was already complete. Delivery was normal and painless, while previous labors had been very painful. These facts led to a neurologic examination which resulted in the diagnosis of tabes. Fruhinsholz and Remy note that cases have been observed of false labor in tabetics in which there were crises similar to gastric crises, which affected the uterus, and caused the patient to believe she was about to undergo labor.

Camp recently reported a case of tuberculous meningitis and tabes dorsalis in a woman eight months pregnant. The woman was aged 29, and died from lobar pneumonia a week after entering the hospital.

The necropsy showed chronic meningitis of brain and cord and tabetic degeneration of the posterior columns of the cord. The spinal fluid gave a positive Wassermann reaction.

Jacob² reports a case of an octipara, aged 36, who came to his clinic with tabes dorsalis in full evolution. She felt no pains except at the moment of the passage of the head. The after-course was normal.

Routh³ says:

In pregnant women affected with paraplegia from injury or disease in the dorsal region of the cord, labor may commence at the normal term of gestation and progress in an approximately normal manner without sensation of pain. Involution and lactation are also normal.

Webster⁴ says:

In cases of paralysis due to brain and spinal cord lesions, pregnancy is not usually interfered with if the woman lives. When the lesion is higher than the lower lumbar region, labor may go on satisfactorily even though the abdominal muscles may be paralyzed.

From the foregoing brief digest of a meager literature, it is apparent that such cases as the one which I have recently observed through the courtesy of Dr. Lyle McNeile in his service at the Los Angeles County Hospital are deserving of more than passing notice, and I therefore will endeavor briefly to set forth what seem to me the most important facts in connection with it. I feel that there is nothing really new about this case, except possibly the advantageous use of pituitary solution in the indolent labor which occurred. This stimulant has, to be sure, not been available many years.

REPORT OF CASE

The patient, aged 37, has one child, born, July 3, 1914, and the one born March 9, 1917. She was married, Sept. 26, 1913. Since the first child she has had two miscarriages at approximately three months each. These were spontaneous, and did not follow a fall or other traumatism. They were absolutely painless. With the first labor, the bag of waters ruptured at 3 or 4 p. m., of July 2, and the patient had no pain until 8 a. m. of July 3. Then she had a slight pain about every five minutes until 12 noon, when her physician applied forceps and used chloroform as an anesthetic. The patient says that he did not remark that she was having any unusually small amount of pain. The baby soon after birth had a rash and would not nurse well, but no treatment for the rash was instituted by the physician whose attention was called to it. The rash soon disappeared. The child has had average health to date. The patient entered the Los Angeles County Hospital, Jan. 14, 1917, because of a seven months' pregnancy, and complained of difficulty in walking for the last three months. She also complained of difficulty in descending stairs and in balancing herself while standing erect, especially in the dark. She further complained of shooting pains in the legs and thighs rather frequently for two years previous to her admission to the hospital. These were diagnosed as rheumatism by her attending physician, but were knifelike in severity and were apparently increased by sitting outdoors too long on cool evenings, and by hot baths. She also complained of slight pain in her left chest, in the subscapular region, which was accompanied by coughing and was worse on deep breathing. It was diagnosed as dry pleurisy before she entered the hospital, and largely subsided under counter-irritant treatment, and immobilization.

She first began to be bothered by her shooting pains about January, 1915. These have continued to date. In, or close to, January, 1916, when at a neighbor's, she heard her baby cry, and tried to run home, but found she could not do it. She

* Read before the Los Angeles Obstetrical Society, April 10, 1917.

1. Grenier de Cardenal: *Rapports du tabes avec la grossesse et l'accouchement*, Thèse, Bordeaux, 1902-1903.

2. Jacob: *Schwangerschaft und Geburt bei Tabes dorsalis*, Zentralbl. f. Gynäk., 1911, 35, 1273.

3. Routh: *Am. Jour. Obst.*, 1897, 36, 384.

4. Webster: *Textbook of Obstetrics*, Ed. 1, W. B. Saunders Co., 1903, p. 287.

could walk as usual, but her legs absolutely refused to go fast, as she expressed it. She has tried several times since, and each time has been unable to run. As early as seven or eight years ago, the patient first noticed an occasional sharp, cutting pain running down the leg. There was no gradual increase in the frequency of these occasional pains, and as they gave little inconvenience, the patient gave them no attention. In July, 1904, she also experienced sudden pain in her right eye with rather marked impairment of vision. The latter continued for about four weeks, and then disappeared. Her other history is rather unimportant, except that she admits illicit intercourse at the age of 19, with the appearance of a red macular rash on her body about four or five months later. It was distributed over the trunk, especially the back, and over the face. She was treated at that time in Vienna, Austria, by mercurial inunction, and discharged in six weeks as cured. There is no history of a sore throat at that time, and she can remember no adenopathy. Her hair has fallen out freely, more when a young girl of about 20. Since the disappearance of her rash, the patient has had unusually good health. She has had no difficulty in urination, except during the last few weeks of her pregnancy, and no difficulty on defecation, though after catharsis perhaps greater difficulty than normal in retaining feces. The diagnosis of locomotor ataxia was made on the basis of the history as cited above, and the physical findings, especially Argyll Robertson pupils, absent knee-jerks, Romberg sign, ataxic gait and positive Wassermann test both of the blood and the spinal fluid.

During the first pregnancy the patient had nausea and vomiting for three or four months, but no gastric crises. She could eat comfortably in the afternoon and evening, but not in the forenoon. In the last pregnancy she probably vomited during four months, but never had any sharp pain above her thighs.

For the pregnancy recently terminated she was unable to supply accurately the date of her last menstrual period, but thought it was May 9 or June 9, 1916, which would have made her due to deliver about February 15 or March 15. She did not know her quickening date. The date of lightening was not determined. She carried her first child nine months, probably. Physical examination led us to believe that she was due to deliver about the first week in March.

March 6, the patient was placed on the table and examined by Drs. Allen and Bashor. The perineum bulged slightly every few minutes. The cervix was soft, and there was approximately 1½ inches dilatation. Effacement was not complete. Sagittal suture was easily palpable, and the head was movable. The fetal heart rate was 146; the quality of the tones was good. The patient was having no pain, but was in labor. She was not disturbed, but allowed to walk.

March 7, the patient was observed to have had irregular uterine contractions all the morning, but no pain, though she said she frequently felt as if the baby were moving.

March 8, the uterine contractions were of much less force. A rectal examination showed no increase in the original amount of dilatation. The head was very movable. The fetal heart tones were of good quality, and the rate was 152. At 11:30 a. m. a medium sized Voorhees bag was inserted. At 7:30 p. m. the bag was expelled with considerable fluid. At 8 a. m., March 8, a rectal examination showed no further increase in cervical dilatation and no easily palpable uterine contractions. The fetal heart tones were 156. At 3 p. m. 5 grains of quinin were given with no painful effect following, though at 4:30 p. m. dilatation was nearly complete. An attempt was then made to hasten delivery by inserting a De Ribes bag, but it twice expelled itself immediately, that is, would not stay inside the cervix. I accept this fact, aside from palpation and its evidence, as an absolute criterion of practically complete cervical dilatation, yet up to this point there had been absolutely no pain. Five-tenths c.c. of pituitary solution was now given hypodermically at about 6 p. m. After approximately fifteen minutes, pains began, and a 7 pound boy, 24 inches in length, was born spontaneously at 7 p. m. The pains were probably two-thirds as severe as ordinary labor pains. No anesthetic was used. The placenta

delivered spontaneously twenty minutes later. The subsequent pathologic report stated that it was somewhat smaller and denser than normal, but microscopic examination by Drs. Hammack and Bashor found no syphilitic lesions. Mother and child had an uneventful afebrile puerperium. Lactation was somewhat subnormal, but involution seemed normal. The baby was breast fed during the first month, though it had supplemental feeding, and gained during that time 1 pound and 11 ounces. Nursing was then discontinued by the patient because of scanty milk and for economic reasons.

The outstanding features of the case were the spontaneous onset of the indolent labor of probably seventy-two or more hours' duration, the absence of pain until the head was on the perineum, and then less than might be expected, and the promptness and efficacy of the action of pituitary solution.⁵

800 Auditorium Building.

MALIGNANT DISEASE OF THE THROAT AND SINUSES

REVIEW OF CASES TREATED BY RADIUM AND ROENTGEN RAYS*

HENRY K. PANCOAST, M.D.

PHILADELPHIA

At the present time, no single method of treatment is adaptable to all cases of malignant disease. Of the many procedures now employed, surgery has the widest adaptation in cases in which the growth is accessible and can be completely eradicated, with the possible exception of superficial epitheliomas in certain localities. In many instances, the lesions must be attacked by a combination of several of the procedures now at our command. Radium and Roentgen rays, while by no means the only agents that may be employed in cases not suitable for operative procedures, have probably the widest field of application next to surgery. When large surfaces must be exposed, as in the treatment of mammary carcinoma with its many harbors of metastasis, and when intensive deep cross-fire radiation is essential, as in the treatment of mediastinal, abdominal or pelvic tumors, Roentgen therapy is the method of choice between the two agents. When growths originate in cavities such as the mouth, throat and ear, deep cross-firing by Roentgen rays, or possibly by radium, is an essential part of the treatment, but the possibility of adding to the dosage and to the efficiency of the treatment by direct local applications of radium has a distinct advantage.

I have selected as a basis for this report a group of cases peculiarly adapted to combined radium and Roentgen treatment or to radium therapy alone. In each instance the direct application of radium to the

5. In addition to the references already given, the following will be found of interest:

Dufour and Cottenot: Soc. de neurol., Paris, 3, December, 1908, and Bull. Soc. med. d. hôp., Paris, 1909, 11, 211-214.

Medail: Tabes—Grossesse intercurrente, Soc. anat. de Bordeaux, 1885, p. 231.

Heitz: Grossesse et accouchement chez les tabétiques, Gaz. de med. et chir., Bordeaux, July, 1902, 13.

Offergeld: Ovarialkrisen im Verlaufe der Tabes dorsalis, Beitr. z. Geburtsh. u. Gynäk., 1911, 16, 373.

Penkert: Tabes dorsalis im Geschlechtsleben der Frau, Monatschr. f. Geburtsh. u. Gynäk., 1909, 29, 141.

Abadie and Grenier de Cardenal: Accouchements indolores et crises douloureuses de faux accouchement dans le tabes, Province med., 1906, No. 38, p. 446.

Mirabeau: Schwangerschaft und Geburt bei vorgeschrittener Tabes, Zentralbl. f. Gynäk., 1902, No. 5, p. 125.

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

primary growth was indicated, although not always followed, and cross-fire radiation by radium or Roentgen rays was employed for the effect on metastases or the primary lesion, or both. Operation was either undesirable, or a complete extirpation of the growth was impossible. In the selection of the two agents employed, we now believe that when cross-firing is desirable or is possible only over a comparatively small and superficial area, rather large amounts of radium with heavy filtration can be used to better advantage than Roentgen rays. When the area is larger and the lesion deeper, Roentgen rays are indicated as the agent of choice.

The outcome in the cases in this group was not successful in every instance, but the failures, of which there were more than are here reported, were of great assistance in the development of a more effectual technic which proved more efficacious in other cases. The clinical diagnosis was, in some instances, not confirmed by a pathologic examination of tissue, as the removal of a section was not always possible or desirable, but the nature of the condition was beyond question to all the consultants concerned.

REPORT OF CASES

CASE 1.—*Sarcoma of the right tonsil with metastasis to cervical lymphatics.*—Aman, aged 47, referred by Drs. J. A. Babbitt and J. B. Deaver, had a marked enlargement of the lower part of the tonsil extending into the root of the tongue, with lymphatic enlargement under the ear the size of a small fist. The pathologic diagnosis was that of round-cell sarcoma. The growth was first noticed about six weeks before presentation. Treatment: Radium element, 110 mg., distance filtration, thirty-nine areas one and one-half hours each over face and neck, followed in a few days by 90 mg. in two platinum tubes buried in the growth at two points for twenty-five hours. This was not followed by sloughing. There was an immediate effect on the external growth, and the tonsil became about one-half the original size. At the end of two weeks a 50 mg. tube was buried in the tonsillar mass for twenty-four hours. Later experience with other cases proved that this should have been done at once. By the thirty-ninth day the reaction had subsided and external cross-firing, followed by burying a tube in the tonsillar mass was repeated, but with diminished dosage. At the end of fourteen weeks the tonsillar growth had disappeared and only a small mass the size of a walnut remained back of the angle of the jaw. This was excised by Dr. Deaver, and a 50 mg. tube of radium inserted for twenty-four hours. About two weeks later a very rapid metastasis appeared in the front and base of the neck. Under combined radium and Roentgen applications this disappeared within twenty-four hours. The patient was also exhibiting signs of cerebral metastasis and died two weeks later. There was no recurrence in the neck or tonsil.

Comment.—Later experience demonstrated that: 1. This growth was too long in its disappearance and too much time was allowed for metastasis. 2. The growth should have been attacked more vigorously at the start when it was found not to subside more rapidly. (A tube of radium might have been inserted in the tonsillar mass at once. Only those cases responding promptly are likely to be cured.) 3. When there is decided cervical gland involvement in such cases, more distant metastases are likely to be present and treatment should be directed toward them.

CASE 2.—*Sarcoma of the left tonsil with metastasis to cervical lymphatics.*—In a patient referred by Dr. B. A. Randall, examination revealed a large sloughing mass involving the left tonsil and soft palate and almost closing the fauces, with lymphatic enlargement under the ear. This seemed a hopeless case. The patient was in a very weak condition and hardly able to swallow or speak. The Wassermann test proved negative, and there was no response to treatment with mercury and iodid. Treatment: Radium element, 90 mg., aluminum filter, 2 mm., was applied to twenty-nine areas both sides of

neck, seventy-five minutes each. Immediate improvement was noticed, swallowing was easier and the patient could talk. Dr. Randall feared to adopt my suggestion to bury some radium in the tonsillar mass lest the sloughing already present should be increased. Later experience showed that this would probably not have occurred. In three weeks the tonsillar mass was about one-third smaller and the external glandular mass had nearly disappeared. Although a second series of external applications was made a week later the patient died soon afterward.

Comment.—This case is cited as an example of the effect of cross-fire radium radiation and its value as a part of the technic. Although this case was probably hopeless from the start, a more decided influence on the primary growth could no doubt have been obtained by direct applications in addition.

CASE 3.—*Carcinoma of the left tonsil.*—In a patient referred by Drs. George P. Müller and W. Estell Lee, examination revealed a large sloughing mass in the region of the left tonsil, with no apparent cervical glandular metastasis. Treatment: Radium in platinum capsule was buried twenty-four hours in the growth by Dr. Müller and repeated in three weeks, and again at the end of seven weeks. Four weeks later a short superficial application was made to the only remaining portion of the growth and again about three weeks later. A few days later there was a sudden swelling of the peritonsillar tissues and of the neck, and it was thought that extensive sloughing from too vigorous treatment was the cause. The patient died shortly after this, and necropsy disclosed no evidence of local recurrence. The unfortunate terminal phase of the case was found due to a very rapid and deep extension of the growth into the neck posteriorly.

Comment.—This case, one of our earliest ones, demonstrated the fact that too much attention was paid to the primary growth and too little to possible metastases, which must always be suspected, even though not apparent. We must also recognize the possibility of stimulation of distant parts of the growth beyond the reach of the destructive dosage. Even though this was a case of carcinoma, and not so amenable to treatment as sarcoma, it proved a valuable lesson in the perfection of our technic in connection with subsequent cases of this kind.

CASE 4.—*Sarcoma of left tonsil.*—In a patient on the service of Drs. Charles H. Frazier and George P. Müller, examination revealed a large tonsillar growth extending past the midline. There was no sloughing, but there was probably some cervical glandular metastasis which became visible later. Treatment: Radium element, 50 mg., in platinum tube was buried twenty-four hours in the tonsillar mass by Dr. Müller. This was repeated ten days later and smaller amounts were similarly applied four times during the following three months. When seen at the end of five months, all evidences of the growth had disappeared, but there was still some resistance under and behind the angle of the jaw. Cross-fire radiation was employed over this area and the side of the neck, and repeated seven weeks later as a precautionary measure. The patient is now perfectly well at the end of two years, and during this time has been a useful citizen engaged in the making of heavy guns.

Comment.—This was also one of our early cases, and had the growth been carcinoma instead of sarcoma we probably should not have succeeded. Comparing this with the cases that follow, it will be seen that implantation alone is insufficient for a rapid cure, which is far more safe than the slow reduction of a growth over a period of several weeks or months.

CASE 5.—*Sarcoma of the left tonsil with metastasis to cervical lymphatics.*—A man, aged 74, referred by Drs. R. E. Buckley and John B. Deaver, had a large growth in the left tonsillar region extending to the midline, with no sloughing. There was very evident glandular enlargement in the neck under the ear. Treatment: Radium element, 110 mg., aluminum filter, 2 mm., was used in cross-firing from both sides of the face and neck and a tube of 35 mg. in a platinum capsule was implanted eighteen hours in the tonsillar growth. The patient was sent home and returned for inspection in sixteen days. No evidence of the growth remained. A second series

of cross-fire applications was administered at the end of three weeks and a third at the end of fifteen weeks, although there was no recurrence. A fourth series will be given later.

CASE 6.—*Postpharyngeal lymphosarcoma with metastasis to cervical lymphatics.*—A man, aged 56, referred by Drs. Howard Whittaker and Francis R. Packard, had a large mass completely occluding the fauces and apparently springing from the pharynx back of and above the left tonsil. It bulged into the mouth, but more into the posterior nares, and pushed the soft palate downward. The eustachian tubes were obstructed, breathing was difficult, and only liquids could be swallowed. Punctures by another physician showed no suppuration. In addition, there was a large glandular swelling below and back of the angle of the jaw about the size of an egg. The Wassermann test was negative. The patient had lost 40 pounds in four weeks. Treatment consisted of external application over the left side of face and neck by 110 mg. of radium element, 2 mm. aluminum filter, thirty-five areas, one hour each; 35 mg. radium in platinum tube was implanted eighteen hours in growth in throat, and cross-firing by Roentgen rays was applied through the right side of the face and neck and the thorax. In less than two weeks all evidences of the growth had disappeared. The external radium and Roentgen applications were repeated a month later, and a third series was administered in another month. At present, three and one-half months after the first treatment, the patient is apparently entirely well and has gained 41 pounds. Another series of applications will be given later.

Comment.—This patient received as vigorous treatment as it is possible to administer. There was no sloughing in the throat, and the skin reactions, while quite marked, were well within the bounds of safety.

CASE 7.—*Sarcoma of left turbinates and antrum.*—A woman, aged 51, on the service of Dr. Charles H. Frazier, University Hospital, had large turbinates blocking the left side of the nose, with granular surface and not shrinking under cocaine or epinephrin. Roentgenogram showed dense clouding of the left antrum. The pathologic report on section removed was sarcoma. Treatment: Radium element, 75 mg., in two platinum tubes was placed twenty-four hours above and below the lower turbinate. About two months later, 25 mg. were again inserted in two areas twenty-four hours each. The antrum was now open. A month later the antrum still contained sarcomatous tissue, and there were some metastatic enlargements in the neck. Applications were made over these glands, over the antrum and in the antrum, for the last time. Later another series over the cervical enlargements failed to affect them materially, and a block dissection was performed nearly eight months after the first admission. Subsequently a post-operative series of applications was made. The patient was last seen, April 1, 1917, twenty months after beginning treatment, and there has been no recurrence.

Comment.—Experience with this and similar cases has shown that implantation alone is not always sufficient to control such a growth that is not very definitely localized. It is a wise precaution to employ radium or Roentgen-rays over the neck even when the primary growth is in such a locality as in this case.

CASE 8.—*Carcinoma of the left auditory canal, with metastasis to cervical lymphatics.*—A woman, aged 54, referred by Dr. B. A. Randall to the service of Dr. Charles H. Frazier, had a sloughing red mass projecting from and entirely occluding the external auditory canal. Under the ear there was a metastatic cervical enlargement the size of a walnut. The pathologic report was carcinoma. Treatment: Radium element, 25 mg., in a platinum tube was inserted twenty-five hours into the mass in the auditory canal. The cervical enlargement was treated by cross-fire radium radiation. In five weeks the latter had entirely disappeared, and the canal was open. The same treatment was repeated. Five weeks later, Dr. Randall reported too much granulation tissue in the canal, and a radium tube was again inserted for twenty-eight hours. There was no recurrence in the neck. When last seen, about one year after admission, the canal was clear, though there was still a little discharge, and there was no cervical enlargement.

CONCLUSIONS

1. In the treatment of inoperable malignant growths originating in cavities such as the mouth, throat and ear, radium therapy is an extremely valuable adjunct for the reason that it can usually be applied directly to the growth, which is more or less inaccessible to direct Roentgen-ray exposure. This alone is not sufficient, and the growth should also be attacked from every possible direction by cross-firing either by radium or by Roentgen rays or both. Any nearby area in which metastasis is likely to occur should also be exposed.

2. When implanted directly into sarcomatous tissue, radium usually causes little or no sloughing if the growth responds promptly.

3. It is advisable to produce as rapid subsidence of the growth as possible in order to minimize the possibility of metastasis during the period of treatment.

4. Our experience has seemed to prove that growths insufficiently treated at the periphery may be stimulated to more rapid proliferation at this portion.

5. Sarcomatous growths, especially in the tonsillar region, are more amenable to treatment than carcinomas.

6. It would be best to continue treatment for some time after the apparent complete disappearance of the growth.

3400 Spruce Street.

THE TRUTH ABOUT RADIOACTIVE THERAPY IN MALIGNANT GROWTHS *

ARTHUR FENWICK HOLDING, M.D.

AND

WILLIAM BAYARD LONG, M.D.

NEW YORK

Ever since the days of the ancients the medical mind has been interested in the subject of the possible cure of cancer, and each generation has had its hopes raised on high, only to see them dashed again to earth. Of all the methods for cure that have been offered, the only one that has endured to the present day is that of radical surgical removal, recommended by Hippocrates, and adapted and perfected into its modern form by the persistence of the surgeon himself aided by the researches of a Vesalius, a Pasteur and a Lister. And yet, after centuries of effort by the most brilliant surgical minds of succeeding generations, the results are far from perfect, and even the surgeon admits that, if further improvement is to follow, it must result from work along educational lines leading to earlier access to the patient, with all that this implies diagnostically.

The surgeon has for centuries past found himself in the pleasant position of being the arbiter of the destinies of all new suggestions for cure. He has weighed and balanced them with what he could accomplish himself and has always been able justly to discard the proposed method in favor of his own. With the advent of the radioactive methods some twenty years ago (Roentgen ray, 1895, and radium, 1905), it was natural that enthusiastic advocates of these methods should claim more for them than they

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

actually were able to accomplish. At least, that has been the history of all new therapeutic procedures. Once again the surgeon looked on in his properly critical attitude and decided that they would not do. "Into the discard with them." But this time his judgment was probably a little premature, although correct from his particular angle. With the exception of basal cell epitheliomas and certain growths with the morphology of sarcomas, but with a low grade of virulence, we doubt that radioactive measures per se ever cure malignant tumors, except in the most infrequent instances; and surgery is still the proper method to which we must resort.

In making this statement we have in mind patients who, treated by surgery and by Roentgen rays or radium, have relapsed after being symptomatically cured for ten, thirteen and even seventeen years, and also those occasional cases of spontaneous cures which occur in the practice of every surgeon of wide experience. The surgeon's attitude of mind is induced, no doubt; by having to pass judgment on so many worthless and widely advertised "cures"; but still we think the orthodox surgical attitude is somewhat faulty. Might it not have been better for the surgeon to say, "These things do not cure cancer, consequently it is better to operate when we can. But perhaps there is something to radioactive measures after all, and possibly they may prove to be the very thing I need to help me prevent recurrence after the main mass is removed, or to help ameliorate the condition of the poor afflicted individual with inoperable growth, for whom my surgical skill can do nothing."

Such an attitude has been the exception, not the rule, with the result that progress has been slow. Workers with the Roentgen ray and radium have by no means been exempt from criticism as regards the reports of their work. On the other hand, many sincere and honest workers in this field have had their results pointed at with a finger of scorn and disbelief with the result that a spirit of antagonism has developed in the very place where it should be conspicuously absent. Fortunately, in the last few years, a better spirit has prevailed. Surgeon and radio-therapist stand side by side and compare results, laboratories are being equipped with proper apparatus for experimental work, an occasional hospital equips its operating room with such apparatus, and altogether a spirit of toleration and conservatism prevails which leads us to hope that whatever of truth there is will be speedily demonstrated.

At the present time we know certain definite facts about the physiologic activities of radium and the

Roentgen ray, and it may be stated here that as regards therapeutic activity they may be favorably compared. The two main effects of their physiologic action are seen in the effects on the nucleus of the cell and on the walls of the small blood vessels.

The effect on the cell nucleus is seen in preventing a consummation of the mitotic process after that process has once started. There is probably no direct effect on the resting nucleus except by very large doses. Furthermore, it is almost certain that if sufficient dosage is used to destroy the resting nucleus, it will also destroy the nuclei of cells of normal structures.

On the endothelial lining of capillaries the effect is expressed by a swelling of the lining cells that, in the case of poorly formed new vascular channels, such as are a notable feature of all rapidly growing neoplasms, may go on to complete occlusion, with the result that large numbers of tumor cells are destroyed indirectly by the action of the rays because their source of nourishment is impaired and destroyed.

We believe that all the effects of radioactivity as shown on neoplasms can be explained by these two hypotheses. Certainly it is true that the most marked effects of the rays are seen in those new growths in which such conditions obtain, that is, those which show a structure composed mainly of nuclei and rich in mitotic figures and which at the same time are growing rapidly and consequently are rich in small, poorly formed vascular channels. In addition it may be stated that the more nearly embryonal in type the cell is, the more easily it is influenced by the rays. This is merely a restatement of what has already been said when it is realized that the cells of the

ovary, testicle, thymus, lymph nodes, etc., are just those which of necessity must mature early and be rapidly reproduced in order that the functions of these organs may persist. If these statements are true, it would seem a simple problem to elucidate the cause of success or failure in any given case, as well as to account for the phenomenon of failure after apparent clinical cure.

Let us consider the squamous cell epithelioma, a neoplasm which because of its structure and clinical behavior, constitutes a most unsuitable type for radiotherapy, composed as it is of relatively few cells, densely packed together, with a cell body composed mainly of keratin, with few mitoses and nourished by well formed vascular channels. We can state that we have never seen either radium or the Roentgen ray affect these growths unless the dosage was pushed to such a point that to the physiologic action of the



Fig. 1.—Basal cell epithelioma before and after treatment by Roentgen rays.

ray was added the action of a caustic. Compare this type with the basal celled epitheliomas, which are rich in nuclear figures, rapidly growing at the periphery and consequently poorly nourished by immature vascular channels. Here the effect is striking with no more dosage than is necessary to produce a physiologic effect.

Compare also the adenocarcinoma or medullary carcinoma of the breast with the true scirrhus type. I hardly think any one will dispute the superior primary results in the former type.

Consider the response of the papillary adenocarcinoma of the ovary, the carcinoma of teratoid origin of the testicle; in fact, any tumor composed of cells of the embryonal type.

Then consider the sarcomas. First, let us take the sarcomas of connective tissue origin, such as the spindle and round cell sarcomas of fascia and bone. Here we see this to be true also, for the more nearly the growth approaches the pure fibroma in type the less response is seen to the ray. Then compare these results to those seen in sarcoma of lymphoid type in which the above mentioned conditions obtain (predominance of nuclei, vast numbers of mitotic processes, very numerous poorly formed blood vessels). Surely the primary results are hardly comparable.

Again, why is it that it is always easier to reduce a metastasis than the primary growth itself, unless it is true that these cells, because of their recent advent in a given locality, have not had sufficient time to establish vascular relations with the stroma and consequently such vessels as do exist are apt to be rudimentary in structure and thus easily obliterated? If small metastases are treated with heavy doses and then removed, such cells as do persist in a viable condition, as shown by their subsequent reactions, are always found in close proximity to the vessels which have persisted, because their structure or size or both was such that obliteration could not be achieved.

Assuming that the foregoing hypotheses are true, and we believe them to be so, what conclusions may we safely draw from them and what postulates may we lay down to govern our conduct as radiotherapists? We offer the following as a summary of our beliefs regarding the application of radiotherapy in malignant growths:

1. All operable tumors, basal cell epitheliomas excepted, should be treated surgically at the earliest

possible moment, but all such cases should receive the benefit of preoperative and postoperative raying with radium or the Roentgen ray or both. Furthermore, no case of operable tumor has had the benefit of all that can be done unless such procedure is followed; and the surgical statistics will materially improve if this be done.

2. All instances of inoperable tumors, of whatever nature, should be given the benefit of radiotherapy. For, while in the present state of our knowledge we cannot hold out any great promise of cure, we certainly can do more with this method to relieve these poor sufferers from pain, fetid odor, discharge, etc., than in any other way, and we can prolong life over a period varying from months to years.

3. We feel urged to suggest to hospital authorities in general, and medical boards in particular, a more enlightened attitude toward radiotherapy. Radium is expensive, we know, but the Roentgen ray, compared to the good it does, is a very inexpensive therapeutic measure.

4. We desire to urge that the many laboratories devoted to cancer research be equipped with men and apparatus in order that the many still unsolved problems of radiotherapy may be solved, as well as possible advances made in therapeutic technique.

53 West Fiftieth Street.—
1257 Washington Avenue.

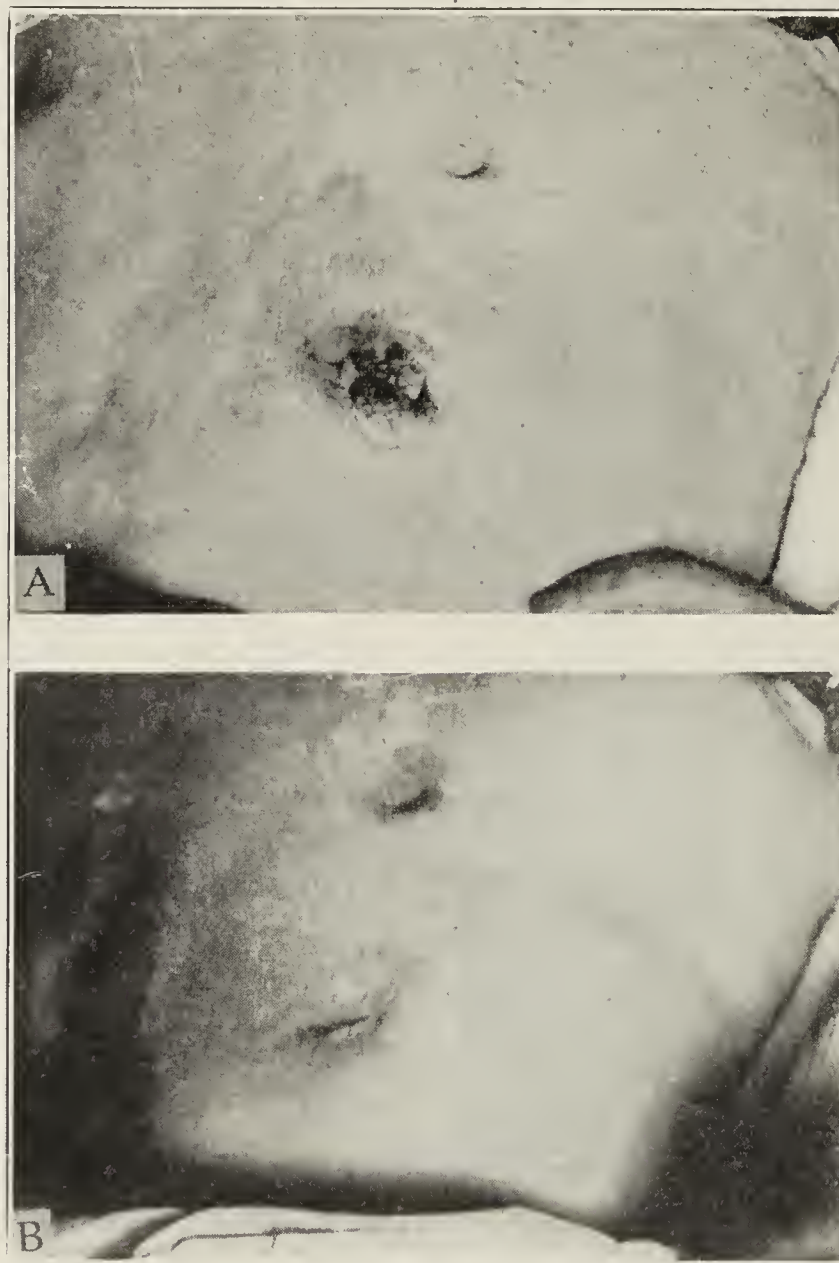


Fig. 2.—Squamous cell epithelioma of abdominal wall before and after treatment by coagulation and Roentgen rays.

New Food Grains.—Looking forward to the time when increased food supplies for the population will be really necessary, investigations have been carried on in many quarters to discover products which may be available but which have not hitherto been used to any extent for human food. In the Oklahoma Agricultural College such investigations have been carried on looking to the adaptation of

grains raised in that state and in the southwest which have heretofore been used almost exclusively as stock food. Among these grains are kaffir corn, millet, milo, feterita and the various sorghums, in addition to cottonseed, which has been available heretofore in the form of the oil, and which has been used to a certain extent in the culinary arts. Cottonseed meal is said to contain 51 per cent. of protein, a vastly larger percentage than meat, and when mixed with kaffir corn meal and other meals is said to make a palatable and highly nutritious bread. The other grains mentioned, by mixing, it is said may be used for bread making with success. When it is considered that the state of Oklahoma alone in one year produced 30,000,000 bushels of grain sorghums and the other grains which can be converted into flour for bread making, the importance of this addition to the wheat supply will be seen, especially when supplementing the immense crops of Indian corn always raised in this country.

THE POSSIBILITIES AND LIMITATIONS
OF ROENTGEN THERAPY IN
MALIGNANT DISEASE*

GEORGE E. PFAHLER, M.D.

PHILADELPHIA

Roentgen therapy has passed through many changes in its development. Generally speaking, a period of discouragement has followed one of enthusiasm, but enough truth and real value has always remained, and has been demonstrated withal, to produce today the greatest period of enthusiasm that has yet occurred. During this wave of enthusiasm that is passing over the entire country, and that previous to the war had just begun in the countries of Europe, it is well for us to stop and take account of the possibilities and limitations of the Roentgen rays in the treatment of malignant disease. A statistical review would be of little value and would be most difficult to obtain.

It would be of little value, first because since the beginning of the use of the Roentgen rays in the treatment of malignant disease, the technic has passed through a number of stages and it would be totally unfair to compare the results that were produced early in the work with those that can be produced today. Likewise, the technic and skill of individual operators have been so varied that a comparison of results would be almost worthless. Therefore, in outlining the possibilities and limitations of Roentgen therapy in malignant disease, I would have it understood that I am only expressing my own opinion based not only on a rather large personal experience, but also on the reading and observation of the very excellent work done by others both in this country and in Europe.

SUPERFICIAL EPITHELIOMAS

The possibility of curing superficial epitheliomas depends today on (1) the type of epithelioma, (2) its location, and (3) its extent.

The Type.—(a) Basal Cell Epithelioma: Fortunately in the larger proportion of the patients that report to us for treatment the lesions are of this type, and if they are treated early, while they are still superficial and before they have invaded the cartilage or mucous membrane, they can practically all be cured.

Pusey¹ says:

With an experience now of hundreds of epitheliomata treated with x-rays, I can still say that I have seen practically no cases in which the epitheliomatous tissue in the skin could not be made to disappear with the x-rays.

When I make the statement that practically all can be cured I know it will sound ridiculous to men who have seen patients that were not cured under Roentgen ray treatments. I, too, have seen a considerable number that did not recover under Roentgen-ray treatment, and yet when properly treated, even though the disease had existed for a considerable time, they did get well.

While I say that practically all of these patients do get well, I do not believe that it is wise to depend on the Roentgen rays alone for the best results, because it is often tedious, time consuming, and expensive; therefore, in practically all cases at present, it is my

practice to first destroy these epitheliomas completely so far as one can tell macroscopically, by means of electrocoagulation, curet the destroyed tissue away, and then follow with a full dose of deep Roentgen therapy. One or two subsequent doses of deep Roentgen therapy will usually be sufficient to bring about a permanent cure, and by this process, I believe that all patients can be cured. The electrocoagulation is a painful procedure unless either local or general anesthesia is employed. In nearly all instances one can do the work under local anesthesia. The pain will vary with the extent of the disease.

(b) Squamous Cell Epithelioma: It is generally recognized that squamous cell epithelioma is more difficult to cure, no matter what the method used. It is of a distinctly more malignant type. A squamous cell epithelioma develops more rapidly, recurs more frequently and persistently, and gives rise more rapidly to metastasis.

The Location.—The location of epitheliomas as influencing the possibilities of treatment by Roentgen therapy is intimately connected with the type of epitheliomas, for basal cell epitheliomas are very much more frequent in certain places and squamous cell epitheliomas more frequent in others.

In nearly all instances the epitheliomas involving the cutaneous surface of the nose, the face, the cheeks and the forehead are of the basal cell type, and the patients recover under treatment by the various methods; none of which, I believe, are quite so satisfactory as the Roentgen rays or the Roentgen-ray treatment combined with electrocoagulation.

The squamous cell epitheliomas are found most frequently on the posterior surface of the hand, mucous membrane of the lip, tongue, gums, and in fact, the mucous membrane anywhere. Those located at the inner canthus of the eye, the nasolabial fold, and about the alae, the ear or the eyelids may belong to another type. I believe that in these types a most guarded prognosis must be given. I believe that generally the Roentgen rays alone should not be depended on to cure epitheliomas in these regions.

Pusey says:¹

Rodent ulcer tissue yields, as a rule, more readily than squamous-cell carcinoma in the skin, but in the skin squamous-cell epitheliomata may be destroyed by Roentgen rays with definite certainty.

The combination treatment that impresses me as the best in this group of cases is that of electrocoagulation, by which the macroscopic disease is totally destroyed locally, followed by deep Roentgen therapy locally, and in the glandular area leading therefrom. If for any reason electrocoagulation cannot be applied preceding Roentgen therapy, then excision is best. If metastasis has already taken place, or if there are enlarged glands in the lymphatic area draining from the location of the lesion, these glands should always be excised by the surgeon, even if the local disease is destroyed by electrocoagulation. It is my experience in the treatment of metastatic glands associated with superficial malignant disease, that the Roentgen therapy applied over the glands tends to localize them, and under the influence of the rays they very generally break down, become necrotic and form abscesses, but the deeper portion of the posterior wall of the gland does not completely heal, and later the disease spreads. Therefore, if there are any palpable glands present I immediately, at the beginning of treatment of the

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Pusey, W. A.: Jour. Cutan. Dis., February, 1913.

patient, request a surgeon to excise them. In one patient whom I treated successfully there was an epithelioma involving the angle of the mouth, the inner side of the cheek and the surface of the alveolar process; there was present, also, a single metastatic gland, not in the neighborhood of blood vessels or nerves, and I destroyed this gland successfully by plunging the electrocoagulation needle directly into the gland and cooking it locally. This sloughed away and healed perfectly, without the involvement of any other glands and without any appreciable scar, the scar remaining smooth and almost invisible. In this case, after the electrocoagulation I, of course, applied also the Roentgen rays both locally and over the glandular area.

DEGENERATING MOLES

All moles should be removed from the skin, if practical, before there has been an opportunity for degeneration or before they have become bruised or partially removed. If an attempt is made to remove them it must be a thorough process, and if excised, they must be excised wide of the lesion. I believe that the best means for the removal of moles is by desiccation or electrocoagulation.

They can be destroyed by electrocoagulation no matter how large. In my experience there has been no hemorrhage and no recurrence. If they are destroyed by electrocoagulation they should be destroyed thoroughly, and yet when they are removed for cosmetic reasons and there is no tendency to malignancy, one need not sacrifice unnecessarily the tissue round about. Generally, if they are small they can be removed without leaving an appreciable scar. A large pedunculated mole can easily be removed by the destruction of the peduncle. The large moles, and especially the black moles

occurring in older people, should be destroyed or excised and this should be followed by deep Roentgen therapy. Ordinarily a single full dose of deep Roentgen therapy immediately following the excision or destruction is sufficient. It is probably safer to follow the destruction of all moles by a dose of deep Roentgen therapy locally, for the reason that occasionally a keloid tendency develops. The moles that have already degenerated should be destroyed very thoroughly, followed by deep Roentgen therapy, repeated two or three times, according to the indications in the individual case.

DEEP-SEATED MALIGNANT DISEASE

Carcinoma.—While in the treatment of superficial malignant disease the possibilities are very great, in the treatment of deep-seated malignant disease the limitations are correspondingly great. Deep-seated carcinoma should be further divided into (a) those that are operable and (b) those that are inoperable.

(a) Operable Carcinoma: In the past it has been, and at the present time still is the practice of con-

servative men to have the malignant disease thoroughly removed in all operable cases, and then followed by deep Roentgen therapy. This is undoubtedly the best procedure based on our knowledge today. While we have all seen patients who have apparently recovered from deep-seated malignancy under Roentgen therapy alone, the number of cases is too small to justify us at the present stage in recommending Roentgen therapy to the exclusion of operative procedures in an operable case. If operation is performed, it should be radical and complete. The Roentgen rays should not be depended on to eliminate part of the disease when the surgeon has removed only part of it. I should much rather treat a case without any operation whatever than one in which the surgeon has removed only a portion of the disease. An exception to this can be made when this operation is done purely for cosmetic purposes; that is, if a patient has a large sloughing gangrenous or necrotic carcinoma of the breast, it is sometimes best to eliminate this foul mass, not so much for the sake of the patient as for those around, because very generally this patient will not completely recover under any combination of

treatments, and the patient and friends may as well have the benefit of cleanliness rather than the foulness associated with a necrotic carcinoma of the breast.

In every case of malignant disease in which operation is performed, whether by surgery or by electrocoagulation, the operation should be followed by thorough deep Roentgen therapy. This Roentgen therapy should be applied most thoroughly over the operative field and over the lymphatic areas immediately adjoining the operative field. I believe that the beneficial end-results of an operation can be doubled if thorough postoperative

treatment is given. For example, it is generally admitted today by those surgeons who are most competent to speak that in cases of carcinoma of the breast in which operation is performed after the skin or glands have become involved, only about 22 per cent. of the patients recover permanently. It is my impression that this percentage of permanent recovery can be doubled with thorough postoperative Roentgen-ray treatment.

The postoperative treatment, however, should be given as soon after the operation as possible; in fact, I believe that the best time to give this treatment is before suturing the open wound, provided the equipment and the Roentgenologist can be at hand so that no time is lost. If all preparations are made in advance, this after-treatment should not require more than approximately twenty minutes of added etherization. This immediate postoperative treatment is given just before closing the wound. After the artery clamps have been removed and all bleeding points have been controlled, the skin flap is thrown back and

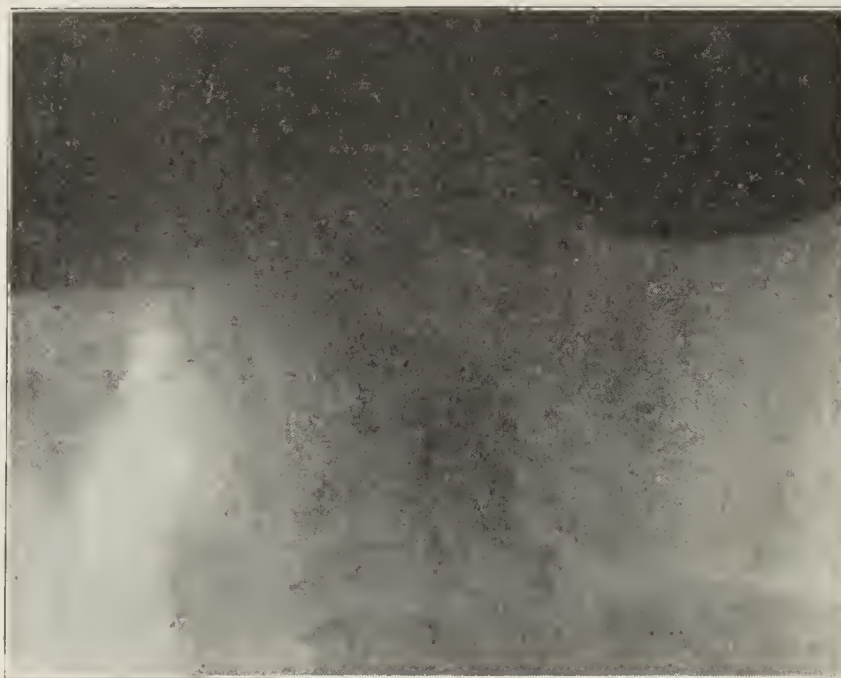


Fig. 1.—Metastatic carcinoma showing complete involvement of the whole of the cervical vertebrae developing five years after amputation of the breast with no previous recurrence, all other metastases being associated with disease in two dorsal vertebrae; patient unable to support the head; head supported by a celluloid cast.

the whole area covered with sterile towels, and the treatment given directly through the towels. This eliminates danger of infection, and the only disadvantage is that of prolongation of the anesthetization for an additional period of approximately twenty minutes. At present such cooperation is generally not practical, though I believe it can be made so. When such immediate treatment is not practical, I believe it should be given as soon after the operation as the patient can be removed to the Roentgen treatment room. This will certainly be in less than two weeks, even though the patient must travel a distance to get the treatment. Primary treatment of deep-seated malignant disease is generally confined to the inoperable, recurrent and metastatic cases.

(b) Inoperable Deep-Seated Carcinoma: In this general group one can never expect brilliant results. One may see occasionally remarkable or almost miraculous results, but they are not permanently brilliant. These patients rarely get entirely well, excepting in those cases in which the inoperability was not a question of extent of the disease. Cases with malignant disease are inoperable for more than one reason. 1. They are inoperable because the disease has extended so far as to involve essential organs, or it may have infiltrated the surrounding tissues so thoroughly as to make it impracticable to eliminate all the disease. 2. They may be inoperable because of some associated constitutional disease, such as serious cardiac disease, serious pulmonary disease, diabetes or advanced arteriosclerosis. 3. They are inoperable at times because the patient absolutely refuses to be operated on. This third group is just as inoperable as any of the others, because in America today we cannot operate on a patient without the consent of either the patient or the guardian (when the patient is incompetent.) The patients who refuse operation are probably rare, but they do occur. Surgeons may dispute this fact, but surgeons and others should bear in mind that when patients consult a surgeon they have already made up their mind, at least one half, to be operated on. This was bluntly expressed some time ago by a surgeon, when a patient consulted him and refused operation. The surgeon said: "Why did you consult me if you did not want to be operated on?" I have sent patients away from my office who refused operation when I believed operation was the best procedure. One patient who thus refused operation died from the malignant disease without any other effort at treatment.

In the group of patients that are inoperable because of the advanced disease, the limitations of Roentgen therapy are great. The disease can often be made to disappear completely. At other times, however, it is only decreased in quantity. In carcinoma of the breast, for example, large masses of carcinomatous

tissue shrink; the ulcerating areas heal; the mass becomes movable; metastatic glands, or at least palpable glands in the lymphatic areas, may be made to disappear, and the life of the patient may be prolonged in comfort for eight or ten years, but very generally these patients will ultimately die of the disease. There are exceptions to this rule, of course. Occasionally one of these patients may be treated in such a manner as to transform an inoperable case into an operable one. This has been my experience in several cases. It has also been the experience of Boggs,² and some others.

When the disease has shrunk to a small fibrous movable mass, and all the metastatic glands have disappeared, it is sometimes practicable for the surgeon to remove the disease locally; that is, remove the shrunk fibrous mass which remains. Very generally when this shrunk fibrous mass is examined under the microscope, the pathologist will find a small nest of malignant cells surrounded by a great deal of fibrous tissue. It is possible that such a nest of cells might lie dormant for the remainder of the patient's life, and the patient might die of some intercurrent



Fig. 2.—The recalcification of the dorsal vertebrae one year later, with disappearance of the patient's symptoms and with a reasonable amount of movement of the cervical vertebrae, both bending and rotation.

disease, but very frequently these malignant cells in some way or other break their bounds and the disease recurs either locally or generally. I believe, therefore, that when malignant disease under treatment has shrunk to a point at which it remains at a standstill, if practicable the surgeon should remove the remaining disease. There should be a moderate amount of post-operative treatment then given because in operating the surgeon is in danger of cutting through some of these encapsulated groups of cells. If such should occur, malignant cells are liberated

and may become reimplanted into the soil which is already favorable for growth.

In one such case which was at first inoperable, operation was performed by Dr. Wayne Babcock. The patient lived six years after the treatment and operation, and then died with obscure symptoms which may or may not have been due to metastatic malignant disease. There was never any local recurrence, nor any recurrence in the palpable areas following this amputation or removal of the breast.

In another case, Dr. Laplace and I consulted preceding any treatment. We both concluded that Roentgen therapy gave the best outlook, for breast and axillary glands and supraclavicular glands were involved. After the disease under treatment had shrunk to a small fibrous mass, and after the axillary and supraclavicular glands again appeared normal, Dr. Laplace at my request removed the disease locally. This patient has remained perfectly well for four years, the scar is smooth and all the tissues are freely movable. The patient developed carcinoma of the oppo-

2. Boggs, R. H.: New York Med. Jour., Nov. 12, 1910.

site breast subsequently and during my absence from the city consulted Dr. Laplace, who removed this right breast, doing a radical operation without any preliminary treatment and without postoperative treatment. There was a recurrence following this operation, and the patient has been under treatment over the right side during the past eighteen months; at first at intervals of a month, and later she was seen every few months. This recurrence disappeared locally, but a general metastasis developed in the bones, and treatment has been discontinued. This is a striking example of the value of Roentgen-ray treatments preceding operation in originally inoperable cases and also the value of postoperative treatment. The second operation was done and was not followed by postoperative treatment until signs of recurrence had developed. The local recurrence disappeared, but the general metastasis which had developed could not be controlled.

2. *Cases Inoperable Because of Constitutional Disease.*—In this group one of course finds all varieties and all stages of the disease. In some instances the patients appear early, in others the disease is very advanced when they report to us for examination and opinion. In the advanced group, I believe that some benefit can be obtained in practically all cases. In the early group, I believe that a considerable number can be cured. In general, the beneficial results to be obtained will vary with the extent of the disease and the degree of malignancy. The results will, of course, vary also greatly with the skill and judgment used in the treatment of the case, also very much with the amount of treatment actually given, for I find repeatedly that patients are being treated by the Roentgen rays in a supposedly efficient manner when they are in fact obtaining only a fractional portion of the amount of treatment that they should have to accomplish the results at which the physician is aiming.

3. *Patients That Absolutely Refuse Operative Procedure.*—This group is small and can be further reduced by more tact in presenting the subject of operation to the patient. In this group one likewise finds all stages of the disease. One may see very early cases in which, as a result of the cancer propaganda, patients will sometimes consult the roentgenologist or physician because of a lump in the breast. It may be so early that no one can definitely make a diagnosis either of malignancy or nonmalignancy. Many of these cases are of course only cases of abnormal involution.

In this group I believe that the majority can be made to disappear under thorough and proper Roentgen therapy. Since surgeons believe that sooner or later all this group is liable to become malignant, if the patients absolutely refuse operation, it is our duty to give them at least the benefit of the Roentgen therapy, and I believe in the great majority of instances they will recover. In making this statement I must not be misunderstood. I am not recommending Roentgen therapy in early cases of carcinoma, and it is my practice when these patients consult me at my office to send them to the surgeon for opinion and operation. I believe that if a consultation is held between the surgeon and the roentgenologist in these early cases when patients refuse operation, and in all cases of advanced disease, better results will be obtained, and fewer mistakes will occur.

In general, a closer cooperation between the surgeon and the roentgenologist will produce more satisfactory results. The inexperienced roentgenologist is more apt to rush into the treatment of early cases of tumors of the breast than the more experienced. One would think, of course, that the opposite should be true. I find frequently, as I am sure all surgeons find, that the most common mistake made in the treatment of malignant disease is the mistake of lack of early diagnosis. As a result of this lack of early diagnosis, the patients are first treated by massage, poultices, and caustics, until the disease has become so advanced that they can often make a diagnosis independent of the physician, before more expert opinion is asked.

Carcinoma should be thought of in connection with every lump in the breast. Carcinoma should be considered in every slowly healing ulcer, every ulcer that persists over a period of six weeks, especially if the mucous membrane is involved, and sarcoma should be taken into consideration in every tumor that develops outside of and very often when it involves the lymphatic glands.

Carcinomas involving the internal organs can generally not be cured by Roentgen therapy, and the treatment of this group of cases should certainly be limited to the inoperable or recurrent case. We should, therefore, urge operation in all cases of carcinoma of the internal organs if they are in an operable stage. However, if they are inoperable, some benefit can generally be obtained by Roentgen therapy. The progress of the disease can be delayed, the patient can be made more comfortable, and for a time all symptoms may be dispersed. Some brilliant results have been recorded as the result of Roentgen therapy in the treatment of carcinoma of the uterus. In only one case of carcinoma of the stomach have I seen anything that seemed brilliant.³

In October, 1904, I was called to a hospital in a neighboring city to see a white man, aged 64, on whom an exploratory operation had been performed three weeks previously for carcinoma of the stomach. Dr. Joseph Brice, who operated, found the lesser curvature involved by a large carcinoma. He made no attempt to remove it, and did not open the stomach. The man had complained of symptoms referable to his stomach for a year previously. He had two severe hemorrhages.

At the beginning of treatment by means of the Roentgen rays he was bedfast, and very cachectic and emaciated. The red blood corpuscles numbered 3,200,000, and hemoglobin 55 per cent. After six weeks of daily treatment he was able to walk, had gained in weight, and gained 1,000,000 in red blood corpuscles and 20 per cent. in hemoglobin. He came to the city three times a week for treatment, and at the end of six months was attending to some business. He then developed symptoms of appendicitis. Dr. Price again did an exploratory operation. He found no appendicitis and no carcinoma. He found adhesions at the site of the original operation, which he liberated. The patient died in about three weeks, and no necropsy was permitted. This case had at least the outward appearance of success.

Deep Seated Sarcoma.—Sarcoma is generally much more responsive than carcinoma to Roentgen therapy. In general, I believe the majority of sarcomas can be made to disappear under Roentgen therapy with modern technic. It is my opinion that Roentgen therapy is more satisfactory than surgery except in periosteal sarcoma, but I believe that in all instances an operation for sarcoma should be followed by thorough postoperative treatment over the wound.

3. Pfahler: Am. Jour. Med. Sc., April, 1909.

Grouping the cases of sarcoma according to their responsiveness to Roentgen therapy. I would place first the medullary sarcoma of bone, second, the sarcomas involving the soft tissues and third, the periosteal sarcomas. The last group can rarely be expected to disappear under Roentgen therapy, and since this group of sarcomas commonly affects the extremities, amputation should be advised as early as the diagnosis can be made, and in each instance the operation should be followed by thorough deep Roentgen therapy, for we all realize the likelihood of metastasis and recurrence in this group of cases.

CONCLUSIONS

1. It is possible to cure the majority of cases of superficial malignant disease by Roentgen therapy, and it is possible to cure, I believe, all cases of superficial malignant disease by a combination of electro-coagulation and Roentgen therapy if applied before metastasis has taken place—deep tissues are involved.

2. Combined treatment should be used wherever the end-results will be improved, and this will apply in the majority of instances. There should be a combination of either electro-coagulation and Roentgen therapy or operation and electrotherapy.

3. In the great majority of cases when the malignant disease has extended to the glands, to the bones or to the internal organs from the breast, for example, or from the uterus, the patient cannot be permanently cured by the Roentgen rays. The patient can, however, be greatly benefited even in these advanced cases.

4. The Roentgen rays with proper technic can be expected to cure the majority of cases of sarcoma, the most responsive to the treatment being medullary bone cases, the sarcomas involving the soft tissues, and least of all the periosteal sarcomas.

1321 Spruce Street.

NEW GROWTHS OF THE MEDIASTINUM

WITH SPECIAL REFERENCE TO THEIR TREATMENT
WITH RADIUM *

CURTIS F. BURNAM, M.D.
BALTIMORE

While the sole purpose of this paper is to show through the detailed report of individual cases that radium may be used as an effectual remedy for many primary mediastinal new growths, an incurable habit of introduction seems to make indispensable a few preliminary statements dealing broadly with the clinical and pathologic aspects of the diseases under consideration.

Malignant new growths are much commoner than benign in the mediastinum. Metastatic lymphosarcoma, Hodgkin's disease, carcinoma and sarcoma are very frequent, while primary mediastinal malignancy is rare. In these secondary cases, however, the primary lesion almost invariably dominates the clinical picture, from the standpoints both of diagnosis and of treatment.

A roentgenographic examination of the chest should be made before the treatment, operative or

otherwise, of any malignant growth is undertaken, particularly in cases of tumors of the thyroid, ovary, breast and testicle. The very interesting data which we have accumulated as to the effects of radium on these secondary mediastinal tumors will be considered not in this paper, but in subsequent reports dealing with the classes of neoplasms to which they belong. The primary tumors of the chest wall, of the pleura, of the esophagus and of the lungs will also be excluded from this paper, but reported in separate communications to appear later.

So far as I have been able to ascertain, there has never been a surgical cure of a malignant mediastinal tumor. A number of operations have been done to relieve acute pressure symptoms, and an excellent statement of this kind of work has been made by Friedrich.⁶ Several cases of great improvement or cure through Roentgen-ray treatments are on record.

Not much detail is at hand in regard to any of these patients, and in only one was a histologic diagnosis available.

In addition to the conditions described, it should be remembered that large mediastinal masses due to tuberculosis and syphilis are occasionally observed. Martini,¹² in a series of fourteen mediastinal tumors, describes three syphilitic tumors, two tuberculous tumors, three lymphosarcomas, two sarcomas other than lymphosarcoma, one carcinoma, one hypertrophied thymus, one retrosternal thyroid, and one undiagnosed tumor.

Of the various kinds of tumors which occur in the chest, perhaps the most frequent is aortic aneurysm. In every differential diagnosis of mediastinal tumor, aortic aneurysm must be ruled out, which can usually be done from the clinical history and physical examinations.

Great reliance is placed on the fluoroscopic demonstration of expansile pulsation. It is of interest to note that in Case 5 of the series herein reported, an apparent expansile pulsation led to an incorrect diagnosis of aneurysm. Quite recently we made a positive diagnosis of solid tumor in a patient in whom no pulsation was visible, but changed our decision when the necropsy revealed an immense aneurysm, which had ruptured at one point.

SYMPTOMS

The initial subjective disturbances of mediastinal tumor are quite variable. Slight discomfort in the chest on exertion and a cough are the most common; sometimes there is hoarseness due to vocal cord paralysis, as in Case 4; occasionally difficulty in swallowing; nausea and abdominal pain, as in Case 7, or spastic paralysis of the lower extremities, as in Case 2. One quite recent case of mediastinal Hodgkin's disease was treated for months by skin specialists for pruritus before the true nature of the disease came to light.

In the later stages, dyspnea, cyanosis, dilatation of the veins of the face and the chest, and disturbance of the heart and aorta, severe pain and inanition may arise. Fluid in the pleural and pericardial cavities is quite common. The benign growths may give only mild disturbance for many years, but the malignant tumors usually advance rapidly. Death is most frequently from asphyxia.

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

* On account of lack of space, this article is abbreviated in *THE JOURNAL*. The complete article appears in the reprints, a copy of which may be obtained on application to the author.

6. Friedrich, P. L.: *Beitr. z. klin. Chir.*, **93**, 312.

12. Martini, Piazza: *Ann. d. Clin. Med.*, 1914, **5**, Nos. 2 and 3.

DIAGNOSIS

The recognition of a mediastinal tumor rests on: (1) ordinary physical examination of the chest; (2) roentgenographic and fluoroscopic examinations, and (3) direct examinations of the larynx, trachea and esophagus in patients in whom pressure symptoms on either the trachea or esophagus have developed.

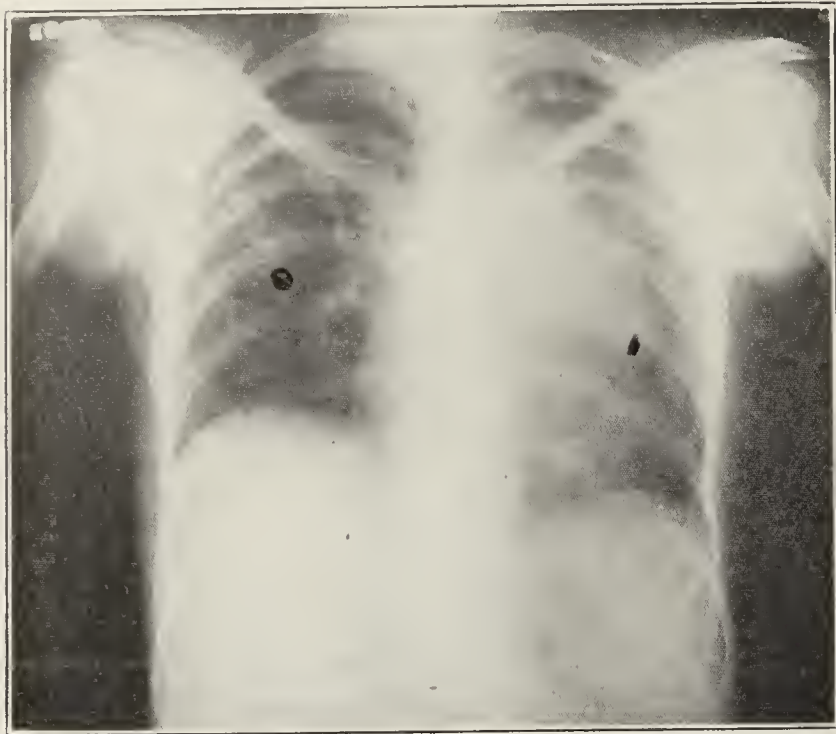


Fig. 5 (Case 3).—Large lymphosarcoma which bulged above the clavicle exteriorly, June 4, 1913.

The differentiation of the primary from the secondary tumors is made by an exhaustive general physical examination to exclude carcinoma or sarcoma elsewhere than in the chest. The general examination, plus the history and the Wassermann and tuberculin tests, may differentiate mediastinal tumor from tuberculosis, syphilis or ordinary abscess. A history of pruritus and a blood picture, such as Bunting describes as typical for Hodgkin's disease, is very suggestive of that disease. It would seem, however, that the blood picture alone can never be conclusive when the tumor is limited to the mediastinum.

If the tumor has grown up through the thorax into the neck, or lies directly against the chest wall, or has metastasized to a superficial gland, an operation and removal of tissue for histologic study is indicated, and will usually allow a positive classification of the neoplasm.

TREATMENT

In view of our experiences, I believe that as soon as a diagnosis is made, treatment with radium should be instituted promptly and, when this is not available, the Roentgen ray should be tried. In the series of eight cases reported in this paper, two patients (Cases 4 and 8) had had Roentgen-ray treatments without benefit before the radium was started.

Considerable amounts of radium (a gram or more, if possible) are necessary properly to carry out the treatments. In order to secure penetration into the depths and to avoid injury of the skin, lead filters to absorb all but the penetrating gamma rays should be used, and a fixed distance from the skin established. In none of the reported cases was the slightest irritation of the skin produced by the treatments. The exact technic employed in each case is given with the case record. As will be seen, the treatments have been variable, depending in part on the response

of the patient and in part on the radium available for use.

RESULTS

After a preliminary nausea for a day or two following the treatment (this condition was present in only half of the cases), the subjective symptoms were usually greatly relieved.

1. With the exception of the first, in each of the eight cases the patients have continuously improved (Figs. 1 and 2).

2. One patient has now been under observation for three years (Fig. 3). As a result of the treatment, the paralysis is entirely relieved, and there is no evidence of the presence of the disease except as shown by the roentgenogram (Fig. 4).

3. In one patient the lymphosarcoma has been gone for four years after treatment was started (Figs. 5, 6 and 7).

4. Vocal cord paralysis has cleared up in another patient, and evidences of the mediastinal tumor have been absent for more than a year (Figs. 8 and 9).

5. In a fifth case (Figs. 10 and 11), although treatment thus far given has been insufficient, the patient is free from all subjective disturbances and the growth has become markedly reduced in size eighteen months after the treatment was instituted.

6. One year after treatment was begun, the roentgenogram in a case of mixed-cell sarcoma (Figs. 12, 13 and 14) show but little sign of the tumor, and the patient has symptomatically recovered.

7. A desperately ill patient with a granuloma, probably Hodgkin's disease, is apparently in perfect health one year after treatment was started (Figs. 15, 16 and 17).

8. Thirty months after the beginning of treatment, a patient who had a mediastinal tumor with hydrothorax is now apparently fully recovered (Figs. 18 and 19).

In addition to these eight cases, it should be stated that two patients with tumor of unknown type improved greatly, but have withdrawn from treatment; one patient with sarcoma improved greatly until a burn precluded treatment, and the tumor has since grown much worse; one small growth of unknown

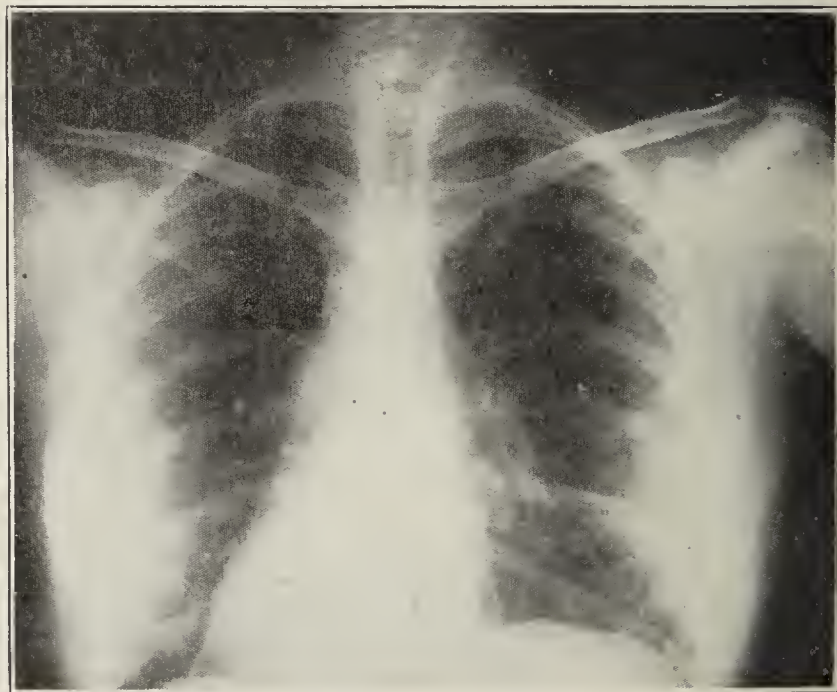


Fig. 7 (Case 3).—Tumor, April, 1917, practically cleared up under radium therapy.

character has been uninfluenced by treatment, and has remained stationary for more than a year; and one spindle-cell sarcoma of the heart was not benefited.

REPORT OF CASES

CASE 1 (872).—*Malignant mediastinal tumor, probably of thymus origin. Marked improvement of symptoms as a result of treatment. Final death of patient.*

History.—R. W., girl, aged 4, was admitted to the hospital, June 2, 1914, with a severe cough and great difficulty in respiration.

Examination.—The patient was well nourished and well developed, with good color. She was suffering with a severe cough and a tendency, on the slightest movement, to great shortness of breath and severe dyspnea. The condition was

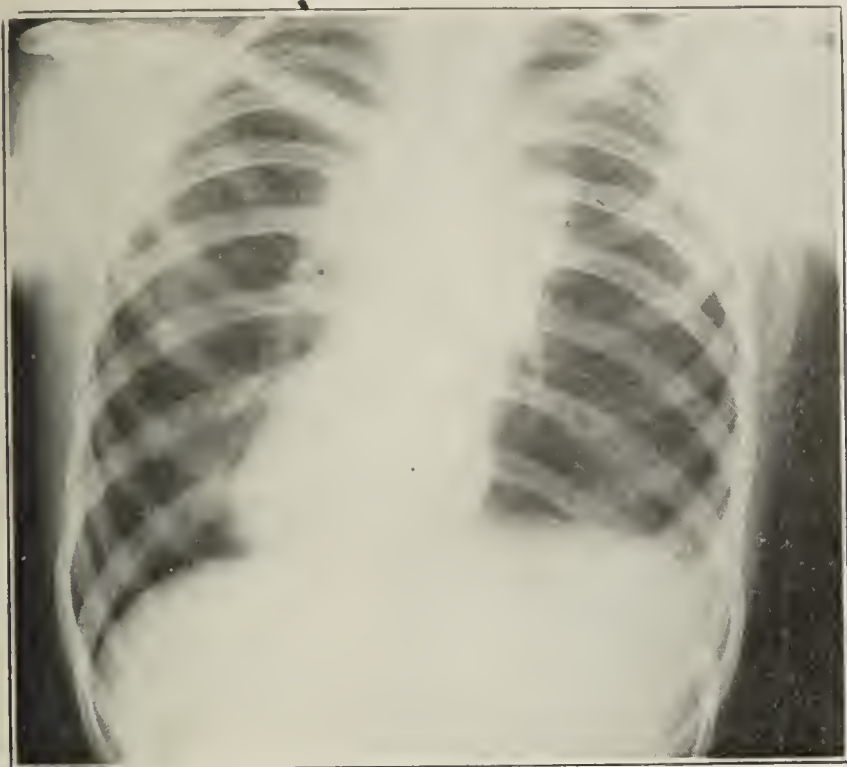


Fig. 8 (Case 4).—Extensive tumor of the mediastinum, April 27, 1916, which extends out into the lung tissue.

rapidly growing worse. A roentgenogram of the chest disclosed a definite mass behind the manubrium.

Treatment.—On the morning of June 2, 1914, 1,911 mg. of radium, screened with 3 mm. of lead and $1\frac{1}{2}$ inches of gauze were applied over the sternum for one and one-quarter hours. There was no nausea or general discomfort following this treatment, and the next morning the patient was breathing comfortably. Within four or five days after the treatment, the child had apparently returned to normal health. At the time we believed that we were probably dealing with a simple hypertrophy of the thymus gland.

The patient remained comfortable and in good health until the latter part of July, when she apparently took cold. Then the cough and difficulty in breathing returned, but in a milder form. July 30, the patient received a second treatment, identical with that given June 2. Again there was a subsidence of symptoms, but the parents were instructed to bring the child in for further treatment. August 12, treatment with 1,911 mg. of radium, filtered by 3 mm. of lead and $2\frac{1}{2}$ inches of gauze, was given for three and three-quarter hours on the upper chest, particularly over the front and from behind. August 18, the patient was again treated with 1,911 mg. of radium, filtered by 3 mm. of lead and $2\frac{1}{2}$ inches of gauze, for four hours. Roentgenograms and other examinations at this time revealed no evidence whatever of disease.

The patient had no further respiratory trouble, but early in January she began to suffer with nausea and vomiting, and a large abdominal mass appeared. She died the latter part of January, 1915, from general weakness.

CASE 2 (1010).—*An extensive sarcoma of the posterior mediastinum, leading to paralysis of the legs and difficulty with the vesical and rectal sphincters. Entire relief of symptoms, although the roentgenogram still shows a shadow three years after the first treatment.*

History.—Miss M. V. J., aged 19, complained of pain in the back and legs, and of paralysis of the legs. She was admitted to the hospital, Feb. 13, 1914. No history of malignant tumors in the family was given, and the patient had always been healthy, with the exception of pneumonia at the age of 14, until the present trouble developed. Her present illness began in December, 1912, with a dull aching pain in

the back, which was worse when she was on her feet. There was increased frequency of voiding and a numb feeling below the waist. Her gait became unsteady, and finally she was unable to move her legs or even her toes.

Examination.—She was well nourished, had excellent color and did not seem ill except for the paralysis.

Between the date of her admission to the hospital and March 25, the patient grew steadily worse as far as the paralysis was concerned. A diagnosis of chest tumor was made, and an exploratory operation was done, March 25, by Dr. J. M. T. Finney, through the left side of the back, and a large, extremely vascular tumor was found, from which a piece was removed. Unfortunately, this specimen was lost, so that a diagnosis as to the exact nature of this growth is not obtainable. Following this operation, the patient was a little better for two weeks, but she again became worse.

Treatment.—The patient was given radiation, May 21, 1914, with 1,583 mg. of radium through 3 mm. of lead and 1 inch of gauze on each of 12 areas, on the back and left chest, one hour over each area. She was very much nauseated and upset by this treatment for several days. However, the condition began to improve, and within three weeks she could move her feet and legs in bed and was beginning to be able to stand. July 27, 1914, a second treatment of twelve and one-half hours was given with 1,911 mg. of radium, screened by 3 mm. of lead and 6 inches of gauze, over the site of the tumor through the back. Dec. 20, 1914, the patient was again treated with 1,911 mg. of radium, screened by 3 mm. of lead and 4 inches of gauze, over one area in front and one area on the back of the left chest for a total of fifteen hours. During the fall of 1914, the patient's improvement continued, and she was able to walk easily and resume her duties at home. Between Dec. 20, 1914, and December, 1915, the improvement continued steadily. There was not the slightest difficulty in walking, running, dancing or any physical exercise. The reflexes were still somewhat exaggerated. The patient's



Fig. 9 (Case 4).—Marked reduction in the size of the tumor, March 15, 1917 following the application of radium at intervals for about five months.

general condition was most excellent. The roentgenogram which was taken showed a moderate decrease in the area of the shadow. There was no further treatment given until March 26, 1916, when the treatment was 2,017 mg. of radium, screened with $1\frac{1}{2}$ inches of gauze and 3 mm. of lead over

nine areas on the left side of the thorax for a total of two hours. The patient reported to me in May, 1917, still having good health, and with the breath sounds much clearer in the area in the left back, the fulness being only partial, and with Roentgen-ray findings as shown in Figure 4. She is in business, in which she has been actively engaged for more than one and one-half years.

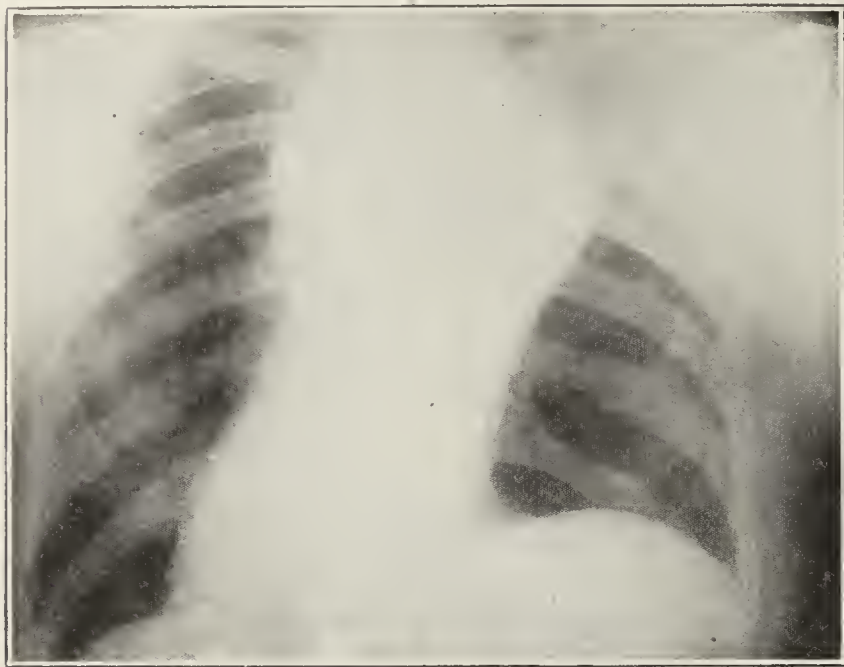


Fig. 10 (Case 5).—Huge mediastinal mass which, on fluoroscopic examination, Oct. 15, 1915, was seen to pulsate.

CASE 3 (126).—*Sarcoma of the anterior mediastinum, probably lymphosarcoma. Treated first with radium, July 9, 1913. In May, 1917, the patient was in excellent condition, and there was no evidence of growth.*

History.—Mrs. R. W. L., aged 30, was admitted to the hospital, July 9, 1913, complaining of swelling above the left clavicle, and pains in the neck and shoulders.

Examination.—The patient was medium-sized, slender and delicate looking. Special examination of the eyes, nose, throat and larynx revealed no trouble. No enlarged glands were found in the neck, axillae or groins. The heart sounds were clear. The pulse rate was 72 and equal on the two sides. There was no elevation of temperature. Immediately above the sternal end of the left clavicle could be felt a mass the size of a small hen's egg, projecting up from the mediastinum. This was hard and fixed, and was continuous with an area of dulness behind the sternum. The dulness extended 7 cm. to the right of the sternum and 5 cm. to the left. Fluoroscopic examination revealed no pulsation of the very extensive mass disclosed by the roentgenogram (Fig. 5). Under local anesthesia a small piece of tissue was removed from the mass in the neck. This proved on microscopic examination to be sarcoma. The classification was difficult, but we were inclined to believe that it was probably lymphosarcoma.

Treatment.—On July 9, 1913, the patient was radiated with 441 mg. of radium through 3 mm. of lead and 1½ inches of gauze for twenty-two hours. The day after this radiation, July 10, 1913, a treatment was given with 400 mg. of radium through 3 mm. of lead and 1½ inches of gauze over three areas for twelve hours. A few days after these treatments, all symptoms of pressure and pain had disappeared, the growth in the neck had diminished in size, and the mediastinal dulness had greatly subsided. Aug. 16, 1913, a radiation with 593 mg. of radium through 3 mm. of lead and 2 inches of gauze for thirty-two hours was carried out. Roentgenograms, Jan. 14, 1914, showed that the chest was clear. The same was true, Jan. 26, 1915. At that time, however, the patient was given a prophylactic radiation with 1,799 mg. of radium for a total of nine hours over five areas at 1 inch distance. An examination of the patient, March 15, 1916, revealed the same excellent condition in the mediastinum, there being no symptoms or disturbance of any kind.

Roentgenoscopy did not reveal any sign of tumor until the spring of 1917. Then, on the plate, a slight disturbance could

be made out in the upper right mediastinum, and a small gland could be felt just above the clavicle on the right side. The patient returned, and in March, April and May had four radiations of the chest and neck. It is not certain that the gland felt above the clavicle was a return of the growth. It disappeared after the first radiation. At the present time, the patient shows a perfectly normal chest, and seems well in every way (Fig. 7).

CASE 4 (2270).—*Probable sarcoma of the mediastinum growth disappearing under radiation.*

History.—Miss N. C., aged 25, had hoarseness and discomfort in the chest with loss of weight, and was admitted to the hospital, Jan. 27, 1916.

Examination.—The patient was an extremely thin and delicate looking young woman. The eyes were slightly prominent, but showed no other abnormality. The nose, mouth and throat were negative except for a complete paralysis of the left vocal cord. The thyroid was slightly enlarged. One or two palpable glands were made out in the left cervical anterior chain, and one in the left axilla. These were just palpable and not hard. A slight diminution in respiratory movements was noted in the left side of the chest. The heart sounds were clear. There was a definite increase in the retrosternal dulness extending 7 cm. to the right of the sternum and 5 cm. to the left. This dulness rose and fell as the head was thrown back or lowered on the chest. Abdominal and pelvic examinations were entirely negative. The roentgenogram revealed an extensive tumor of the mediastinum apparently extending out into the lung tissue (Fig. 8).

Treatment.—The first treatment was given, Jan. 27, 1916, with 2,495 mg. of radium, screened with 3 mm. of lead and 4 inches of gauze, applied to one area on the back and one area on the chest for seven hours each. Following this treatment the patient was greatly nauseated and upset for four or five days, and lost from 2 to 3 pounds in weight. She then, however, began to gain weight and improved markedly in general appearance. There was also a gradual subsidence of the percussible area of dulness and marked reduction in the shadow.

March 24, 1916, the entire chest, front and back, was radiated over eight portals with 2,558 mg. of radium through

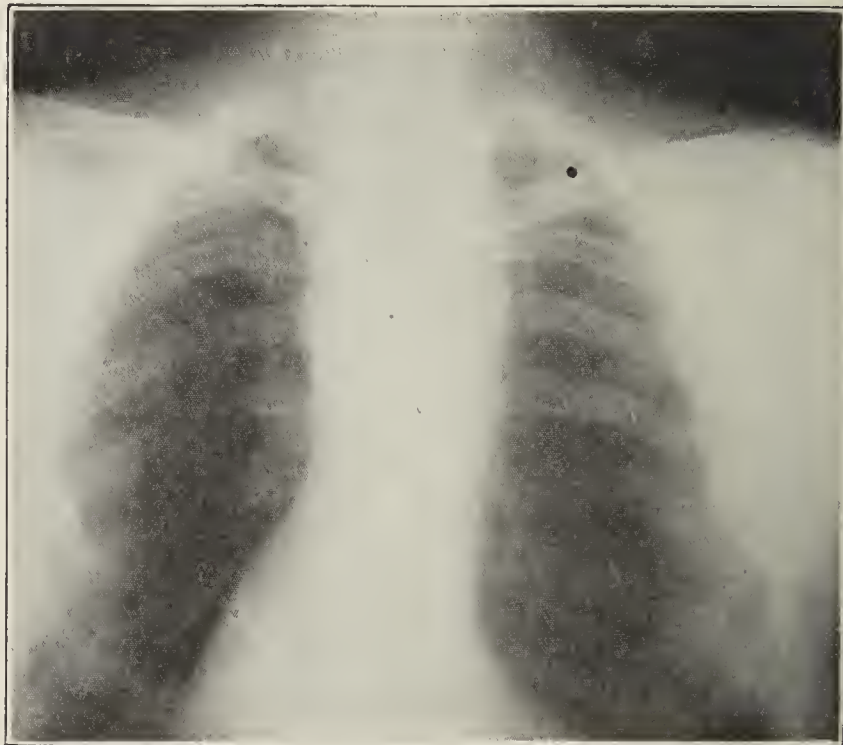


Fig. 11 (Case 5).—Slight thickening in the mediastinum, May 21, 1917; symptomatically the patient has no evidence of the disease.

3 mm. of lead and ¾ inch of gauze for two hours on each portal. The same general malaise and disturbance were noted after this radiation as after the first. The patient then began improving again in weight and appetite. The final treatment was given, May 15, 1916, with 1,969 mg. of radium screened with 3 mm. of lead and 3 inches of gauze on the front of the chest for four hours, and on the back of the chest for four hours.

The condition at the last roentgenographic examination made at the hospital in May is shown in Figure 9. The vocal cord paralysis had entirely disappeared. The patient then returned West, and is now in the Philippine Islands. She still is reported to be quite thin, but has no cough. A roentgenogram of the chest shows, if anything, a slight improvement in the condition over that of the last examination.



Fig. 12 (Case 6).—Immense shadow showing a large growth, May 15, 1916, in the mediastinum.

CASE 5 (1965).—*Extensive mediastinal tumor with marked respiratory distress, greatly improved by treatment.*

History.—G. J. S., man, aged 49, had a sensation of pressure in the chest with inability to breathe without great difficulty and severe cough.

Examination.—The patient was very well nourished in spite of the fact that he had lost 20 pounds in weight. His chest was broad and muscular; there was marked distention of the veins in the neck, and a bluish cast to the countenance. A frequently repeated harsh cough distressed him. He was able to sleep only in the sitting posture.

Treatment.—The first treatment was given, Oct. 11, 1915, with 1,856 mg. of radium through 3 mm. of lead and 2 inches of gauze over five areas for a total of twelve hours. Oct. 13, 1915, a second treatment of 1,744 mg. of radium was given through 3 mm. of lead and 2½ inches of gauze over six areas for two hours each, totaling twelve hours. Oct. 16, 1915, a third treatment of 1,918 mg. of radium through 2 inches of gauze and 3 mm. of lead was given on four areas on the back for one and one-half hours each, totaling five hours. Following the second treatment, there was a tremendous improvement in the patient symptomatically. His cough subsided and he was able to sleep lying flat, for the first time in some weeks. There was not the slightest nausea or discomfort following the treatment. The difficulty in swallowing entirely disappeared. Oct. 18, 1915, seven days after the treatments were instituted, there was a marked reduction in the size of the mediastinal shadow as shown on roentgenographic examination. The patient returned, Feb. 7, 1916, and received radiation with 2,465 mg. of radium through 3 mm. of lead and 4 inches of gauze on two areas, each six and one-half hours. At that time, he was feeling very well indeed. The patient has continued to feel comfortable and well, and has been working at his business. He returned to the hospital, May 21, 1917, and roentgenoscopy revealed the mass in the chest to be as shown in Figure 11. He was given, May 21, at a distance of 4 inches, a radiation for thirteen and one-half hours, with 1,115 mg. of radium. He is to return shortly for a repetition of this treatment. Except for a slight thickening in the roentgenogram (Fig. 11), and a slight increase in retrosternal dullness, the patient shows no evidence of disease. We, however, propose to carry on the treatments to a complete resolution if possible.

CASE 6 (2511).—*Huge mixed sarcoma of the mediastinum. Apparent cure.*

History.—J. H. L., man, aged 36, was admitted to the hospital, May 15, 1916, complaining of a lump in the chest.

Examination.—The patient was strong and healthy-looking. He was hoarse, but had no difficulty in respiration or in deglutition. An examination of the eyes, nose, throat, larynx and pharynx revealed nothing abnormal. Several small, soft palpable glands were felt in the right and left sides of the neck, especially over the sternal end of the clavicle. No axillary glands were palpable. The inguinal glands were small. There were no abdominal masses, and no tenderness of the abdomen. Rectal examination showed normal pelvic organs. Lying just below the sternal end of the clavicle and bulging out of the front chest wall was a projecting tumor which measured 3 inches across the base and about ½ inch high.

Treatment.—The first treatment was given, May 15, 1916, with 2,905 mg. of radium through a filter of 1 inch of gauze and 3 mm. of lead on two areas of the neck for one hour each, and two areas of the chest for three and one-fourth hours through 2 inches of gauze and 3 mm. of lead, making a total of eight and one-half hours. May 23, 1916, through 3 inches of gauze and 3 mm. of lead, one area of the chest was radiated for three and three-fourths hours. June 5, 1916, 3,049 mg. of radium were applied screened with 3 mm. of lead and 2 inches of gauze on two areas of the back, three and three-fourths hours each. July 15, 1916, 2,938 mg. of radium screened with 3 mm. of lead and 1¼ inches of gauze were applied over two areas on the neck, two areas on the chest, and on two areas on the back to each axilla and to each groin, for one hour. Sept. 18, 1916, 928 mg. of radium were applied through 3 mm. of lead and 1¼ inches of gauze to three areas on the neck for three-fourths hour each; and 3,118 mg. of radium through 3 mm. of lead and 1¼ inches of gauze were applied on two areas of the neck, each axilla and each groin for three fourths of an hour each. Nov. 18, 1916, 2,715 mg. of radium were applied through 3 mm. of lead and 4 inches gauze on one area for eleven hours.

This patient invariably had some nausea and some vomiting for a day or two after each radiation. However, from the beginning the symptoms steadily improved and have continued to improve up to the present time. The patient now



Fig. 14 (Case 6).—Marked shrinkage of the tumor, Jan. 24, 1917, following the institution of radium treatment.

has no cough, no expectoration, no visible tumor on inspection of the chest, and no palpable lymph glands. A roentgenogram of the chest obtained, May 19, 1917, is shown in Figure 14. The last treatment was given, May 10, 1917, with 1,034 mg. of radium through 3 mm. of lead and 3 inches of gauze, six hours over the front of the chest and six hours over the back of the chest.

While it is yet too early to be dogmatic, it seems reasonable to assume that we shall secure a permanent cure in this case.

CASE 7 (2471).—*An infection, probably Hodgkin's disease, associated with enormous enlargement of the mediastinal*

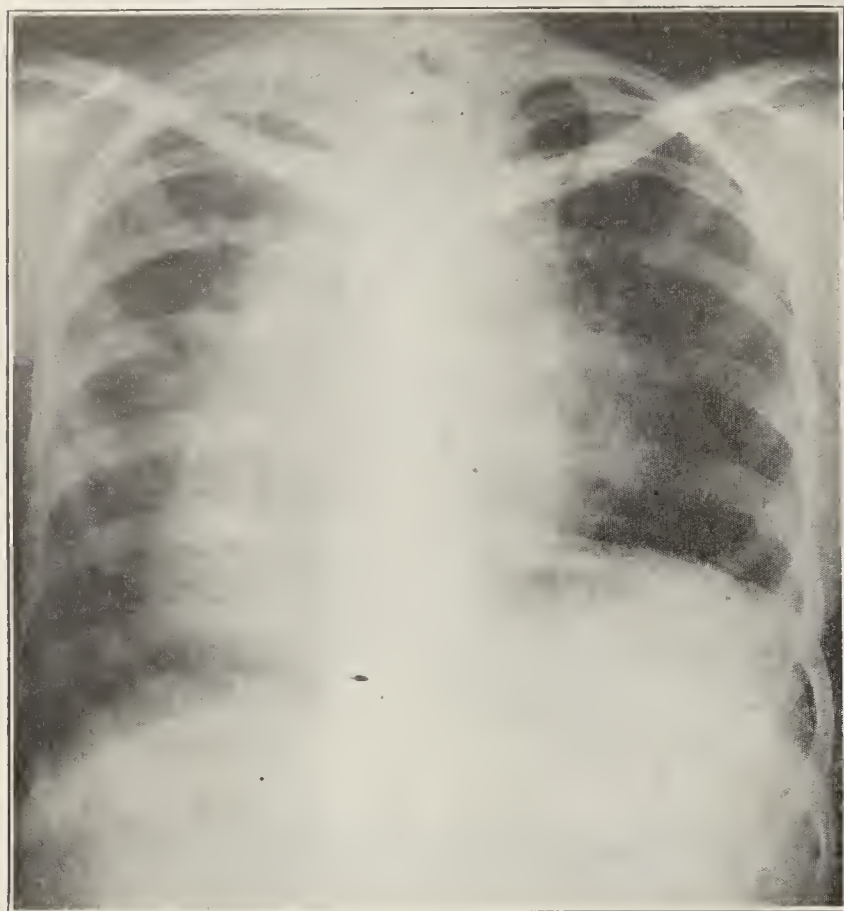


Fig. 16 (Case 7).—Very large mediastinal tumor, April 7, 1916.

glands and liver. Patient apparently well thirteen months after radium treatment was instituted.

History.—Miss R. F., aged 18, had chills, fever, cough and pain in the back and legs and was admitted to the hospital, April 6, 1916.

Microscopic Diagnosis.—A cervical lymph gland which was removed for examination showed Hodgkin's disease.

Examination.—At the time of admission to the hospital, April 6, 1916, the patient presented a picture of grave illness. She was very much emaciated and toxic; the temperature was 102 F.; the pulse rate 130. There was slight clubbing of the finger nails, the skin was lemon color. A number of enlarged lymph glands were palpated in the neck on both the right and left sides. The axillary lymph glands were also palpable; the epitrochlear glands were not enlarged; the inguinal lymph glands were just palpable. Examination of the eyes, mouth, nose and throat disclosed no abnormality. A marked pulsation of the heart and vessels in the neck was noted. The heart was normal except there was a harsh rasping first sound. The retrosternal dullness was markedly increased both to the right and to the left, and a large hard mass was palpated in the left lobe of the liver. The abdomen exhibited no other mass or abnormality. The roentgenogram of the chest obtained, April 7, 1916, showed a huge mediastinal tumor (Fig. 16).

Treatment.—Beginning April 7, 1916, 2,543 mg. of radium, screened with $\frac{3}{4}$ inch of gauze and 3 mm. of lead, was applied for three-fourths hour to each of sixteen areas over the front and back of chest. The patient was not markedly upset by the treatment, and in four or five days began to take nourishment in a way she had not taken it for several months. Ten days after this treatment, both the pulse and the temperature had returned to normal, and up to the present time, there has not been any fever or rapid pulse rate. Roentgenograms made at frequent intervals demonstrated that the tumor mass in the chest was rapidly decreasing in size, and palpation showed the return of the liver to normal size in less than three weeks. The second treatment was given, April 21, 1916, with 2,148 mg. of radium screened with 3 mm.

of lead and 1 inch of gauze on six areas one hour each, totaling six hours. April 28, 1916, the third treatment was given with 2,702 mg. of radium filtered with 3 mm. of lead and $1\frac{1}{2}$ inches of gauze to six areas, one hour each, totaling six hours. May 28, 1916, the patient had a treatment with 2,561 mg. of radium screened with 3 mm. of lead and $1\frac{1}{4}$ inches of gauze applied to six areas on the neck and chest and two areas on the epigastrium, one hour each, making a total of eight hours.

During a month's stay in the hospital, the patient was completely transformed physically, her color became rosy, she gained in weight, the glands disappeared from the neck and axillae, and the tumor from the chest.

This patient has been under observation from time to time since she left the hospital. At present, she shows no evidence of the growth. In February, 1916, one or two small glands appeared in the left side of the neck, but disappeared spontaneously. Blood examination in January, 1917, revealed: red blood cells, 4,670,000; white blood cells, 10,000; hemoglobin, 83 per cent.; polymorphonuclear neutrophils, 74 per cent.; polymorphonuclear eosinophils, 1 per cent.; polymorphonuclear basophils, 0; small lymphocytes, 12 per cent.; large lymphocytes, 5 per cent.; transitionals, 8 per cent.

A roentgenogram of the chest obtained, March 7, 1917, shows the condition as in Figure 17. The patient seems in robust health.

CASE 8 (1284).—*Mediastinal sarcoma, possibly Hodgkin's disease. Patient was first treated Sept. 1, 1914, and is now entirely well.*

History.—G. W. T., man, aged 45, had noticed difficulty in breathing and swallowing, and swelling of the face and hands. On admittance to the hospital, Sept. 1, 1914, no history was obtained of any member of the family having had tumor, tuberculosis or syphilis; in fact, the patient has enjoyed exceptional vigorous health.

*Examination.*¹³—The patient was very well nourished. He sat propped up in bed, breathing with a little difficulty, and the face and neck were slightly edematous and quite cyanotic. The right arm was somewhat swollen. The chest was covered with dilated venules and there were large dilated veins in the right neck. The eyes were normal. The nose, pharynx and mouth showed no abnormality except very bad teeth. The

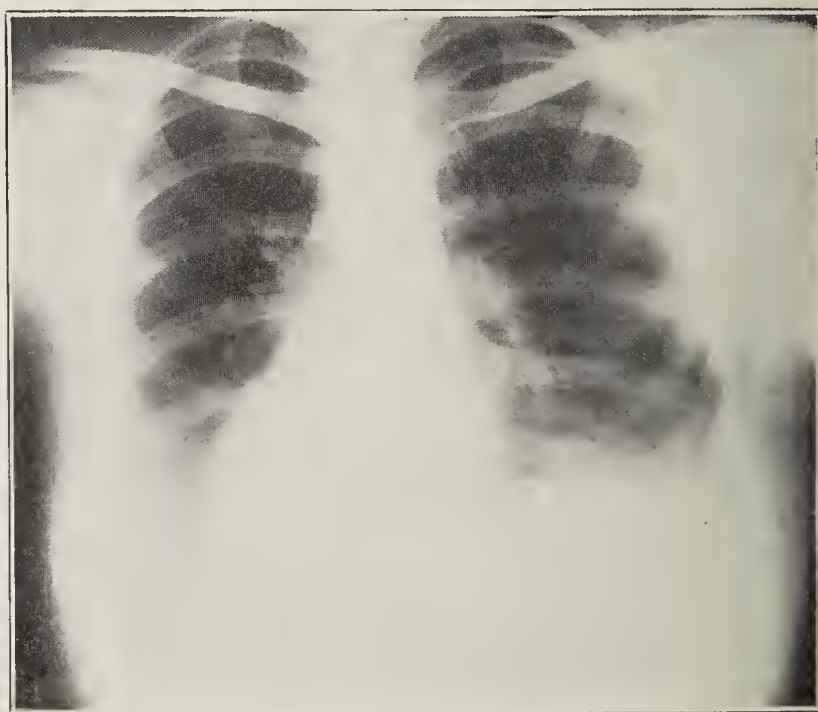


Fig. 17 (Case 7).—Roentgenogram made March 2, 1917, about one year after radium treatment was begun. Practically the entire disappearance of the tumor has occurred.

vocal cords were normal. The patient had a brassy cough. A bronchoscopic examination made by Dr. Samuel Crowe revealed the posterior wall of the trachea pushed forward

13. For the details of the physical examination, I am indebted to the records of the Johns Hopkins Hospital, the patient having been examined by many members of the medical staff, and the Roentgen-ray and laryngological staffs.

at a point 15 cm. above the bifurcation. There was no enlargement of any of the lymph glands of the neck, axillae or groins. The abdominal examination failed to disclose any abnormality. The pulse was equal at the two wrists. The heart beat was regular; there was a marked systolic murmur at the apex. There was a marked extension of retro-sternal dulness, particularly to the right side, and in the left pleural cavity, there was complete dulness due to fluid.



Fig. 18 (Case 8).—Deep-seated mediastinal tumor which caused difficulty in deglutition, Nov. 27, 1914.

Between the time of admission to the hospital, September 1, and the date on which I first saw him, Nov. 26, 1914, the patient had had the chest tapped, several Roentgen-ray treatments and rest in bed. However, his condition had remained very much the same (Roentgenogram of the chest is shown in Figure 18).

Treatment.—He was treated, Nov. 26, 1914, with 1,911 mg. of radium through 3 mm. of lead and $2\frac{1}{2}$ inches of gauze over six areas on the front and back of the chest, each treatment being for three hours. Following this treatment, there was a very marked improvement in the subjective symptoms, cough almost disappeared, and the patient was easily able to sleep flat on his back. Prior to this radiation and subsequent to the treatment, a great number of total and differential blood counts were made. Both the Wassermann and the tuberculin reactions were negative. A typical blood count was as follows: red blood cells, 5,120,000; white blood cells, 5,280; hemoglobin, 90 per cent.; polymorphonuclear neutrophils, 77 per cent.; eosinophils, 2 per cent.; basophils, 0; small mononuclears, 15 per cent.; large mononuclears, 5 per cent.; transitional cells, 1 per cent., and many blood platelets. One of the slides was submitted to Bunting of Wisconsin, who decided that the blood corresponded to Hodgkin's disease. The right pleural cavity reaccumulated fluid and was tapped again, Dec. 31, 1914. Feb. 18, 1915, there was still fluid at the base of the right lung, but small in quantity. Feb. 19, 1915, the second treatment with 1,799 mg. of radium through 3 mm. of lead and 2 inches of gauze was given over four areas for a total of ten hours. After this treatment, the patient went home and reported by letter that he was much improved. The patient returned, May 20, 1915, and was treated with 1,619 mg. of radium through 3 mm. of lead and $\frac{3}{4}$ inch of gauze over six areas on the chest, one hour on each area. July 19, 1915, he was treated with 2,214 mg. of radium screened with 3 mm. of lead and 1 inch of gauze over six areas of the chest and back for one hour each. Nov. 8, 1915, he was treated with 2,148 mg. of radium through 3 mm. of lead and 2 inches of gauze through four portals for a total of ten hours. April 18, 1916, the patient was treated with 2,668 mg. of radium, screened with 3 mm. of lead and 1 inch of gauze over ten areas for one-half hour each. Nov. 2, 1916, he was treated with 451 mg. of radium through 3 mm. of lead and 2 inches of gauze through four areas, three hours each. April 22, 1917, the patient received treatment with 997 mg. of

radium through 3 mm. of lead and 3 inches of gauze, six hours on each of two areas. After May, 1915, the patient ceased to have any symptoms of the disease. The roentgenogram, obtained Oct. 31, 1916, showed no evidence of hydrothorax. At the present time, he is apparently in perfect health, able to work and to walk. He takes exercise equal in vigor to that taken by most of the farmers of his locality. He has no cough and no tumor, as shown by the roentgenogram (Fig. 19). In this case it would seem that we are quite justified in believing that a permanent cure has been obtained.

1418 Eutaw Place.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. HOLDING, PFAHLER, PANCOAST,
BURNAM AND SHORTLE

DR. WILLIAM BENHAM SNOW, New York: Dr. Burnam has given us something absolutely new with reference to the possibilities of radium as affecting the cavities of the body. I understand he is getting these results from heavy doses and at a great distance. I was under the impression that radium should be placed in the affected tissues, but in these cases where tumors of such size and extent were reached by radium with the results shown, it seems there must be something more to be known in the technic. Dr. Shortle's subject is of importance in reference to roentgenology. The sun's rays make it possible for the surface to receive those radiations without too much blistering or action of the rays. I question the effect of the chemical rays. The noticeable effects of the ultraviolet rays, which are the sun's rays in distinction from the radiations from artificial sources, constitute really the point of consideration. I have been using light for a great many years and believe in it as one of the most important agents. As to how it affects tissues is a question. Clinically it has given these results. Radium penetrates into the tissues; the chemical rays do not penetrate. It either acts by reflex stimulation, which action is general, or stimulates metabolism. It is due to the effect on the whole body rather than by the local effects, as shown by the treatment of patients in the Alps. These children lie in the sunlight every day and all day. This can be done in the office with exposure to artificial light. In a rarefied atmosphere the lymphocytes



Fig. 19 (Case 8).—Almost complete disappearance of tumor Nov. 8, 1915, as a result of about six months' radium treatment; complete recovery of patient.

are more numerous and there is a greater effect on the tuberculosis. The real effect is due to hyperemia and metabolism. The best results are obtained when we employ the Roentgen ray in the treatment of the chest. I have been treating a group of patients in whom I have made a careful study of the effects of the Roentgen ray and light. I employ the Roentgen ray in these cases over the chest and light over the

rest of the body, realizing that the two effects counteract each other.

DR. JOHN A. P. MILLET, Buffalo: If we take the stand that the effect of radium application is due entirely to its local action, we are on dangerous ground. When we consider the profound effect of this substance on the blood-forming organs it does not seem unjustifiable to assume that at least some of its effects are due to a stimulation or depression of the immunologic forces of the body cells. This supposition is strengthened by the familiar fact that it is by no means possible to foretell the result of all applications on the basis of past experience. Two individuals having the same clinical condition may react quite differently to radium treatment. Using 50 mg. radium, we have been able to demonstrate profound changes in the blood picture of the patient under treatment, both during the application and for many weeks afterward. I was much interested, however, in Dr. Holding's description of the local effects as demonstrated histologically. In many cases, notably those of lymphosarcoma, we see huge masses disappear under the Roentgen ray or radium, while the patient goes rapidly down hill and dies. I should like to hear suggestions as to the mechanism of this breakdown of the body's defensive forces. Is it always due merely to absorption of toxic material, or may not the defensive forces in such cases have been injured by the intended remedial agent?

DR. ALBERT SOILAND, Los Angeles: There is a little friction between the schools of roentgenotherapists and radiotherapists. As Dr. Pfahler said, he uses Roentgen ray in some cases and radium in others. Why use both agents superficially? If there is a therapeutic difference on the skin, let us learn this difference. Personally, I have used both agents, but the Roentgen ray more extensively, and the results differ in no way from those obtained by Drs. Pfahler, Burnam and Holding, wherein radium has been the active agent.

DR. C. E. ALLIAUME, Utica, N. Y.: It seems necessary that every paper on the treatment of cancer or deep seated morbid growths by radium should be prefaced by a paper on the physics of radium, because the subject is usually not understood. It has been demonstrated that the rays of radium are more penetrating than those of the Roentgen ray. The gamma rays from a certain quantity of radium will penetrate 12 inches of solid lead or steel, and if this is true it is possible for the radium rays to penetrate through any part of the body. One of the reasons why a good photograph cannot be made with radium is because it is so penetrating that it does not throw the same shadow as the Roentgen ray.

DR. GEORGE E. PFAHLER, Philadelphia: In answer to some of these discussions, I should first like to make it clear that I believe radium and the Roentgen rays should never be used together through the same area of skin, because we are then using two agents which produce similar effects, and in which the dosage of each is difficult to measure and estimate. The action of radium and Roentgen rays are approximately the same if like character of rays is used, and in like quantity. The Roentgen-ray spectrum runs through a whole scale from soft to the most penetrating ray, and exciting a Coolidge tube with 100,000 volts produces almost the same rays as the gamma rays of radium. Even when 100,000 volts are passed through a Coolidge tube there are also produced a great many soft rays, in addition to the hard or penetrating rays, and likewise, with a specimen of radium, one gets a small quantity of hard and extremely penetrating rays and a much greater quantity of soft and slightly or moderately penetrating rays. Therefore, the ultimate action is similar with the same selection of rays and the same quantity. I am glad to speak on this point, and hope Dr. Burnam will contradict me or confirm what I say.

With reference to mediastinal growths, one cannot get such results as Dr. Burnam has described with small quantities of radium such as 25 mg. With a great mass of radium, which will permit of much filtration, one can, of course, produce such results. When using the Roentgen rays, however, one has a much larger volume of penetrating rays and all of Dr. Burnam's results can be produced by the Roentgen

rays if efficiently given. When both are inefficiently given, neither will produce results.

DR. CURTIS F. BURNAM, Baltimore: I had not intended to make any comparison between the efficacy of Roentgen rays and radium rays. It is not true that they are physically the same thing. The hard gamma rays from radium are much more penetrating than the hardest Roentgen rays. My own experience would lead me to consider the gamma radiation from radium more effectual biologically than the Roentgen ray in connection with the treatment of new growths. This may not, however, be an actual qualitative difference, but due to the difference of technic in radiation. The Roentgen ray employs a large quantity for a very short interval; the gamma radiation a similar amount for a longer interval. It is certain that with 100 mg. of radium at a given distance for ten hours, one secures a more pronounced biologic effect than with 1,000 mg. for one hour.

In the cases which I have reported I feel that the results could be duplicated by the use of 3 or 4 mg., although I have used myself as much as a gram or two with some of them.

I should like to emphasize the point that there have been seven apparent cures out of eight cases, and these apparent cures have extended over considerable periods of time. So far as I have been able to ascertain from the literature, there has not been a single case of cure of a malignant mediastinal neoplasm through surgical means. I find that there are four or five cases reported in the last four or five years as healed or benefited by Roentgen-ray treatments.

Dr. Holding, I feel, goes too far in saying that no squamous cell cancer can be cured by radiation. They are unquestionably much more resistant than the basal cell type. In treating them the single dose method is much inferior to a frequently repeated dose. Care should be taken, however, never to produce irritation or the treatments will have to be interrupted and a complete result will not be obtained. It is highly important, as Dr. Holding has said, to have accurate histologic studies made of each growth before undertaking treatment, and I feel that the technic of treatment will vary with the type of growth. As Dr. Mallet has pointed out, and as I firmly believe, there are other factors connected with the resistance of the patient which are most important. The only clinical condition, however, which has impressed me as being of value in the prognosis is that a growth of a given type, which has recurred late after operation, or which is growing very slowly, is much more likely to be favorably influenced than one which is growing rapidly.

The Fourth Thousand Cases at Paignton.—Major D. Pearce Penhallow, chief surgeon of the American Women's War Hospital, Paignton, South Devon, England, has published an analytical report of the fourth thousand cases treated at the hospital between Aug. 20, 1916, and May 29, 1917, inclusive. Of the 650 surgical cases, 395 were cured, 243 were improved, ten were unimproved, and two died, one from cerebral abscess following a shrapnel wound of the skull, and the other from pulmonary embolism after a gunshot wound of the chest. Of the 350 medical cases, 120 were cured, 220 improved, eight unimproved, and two died, one from cerebrospinal meningitis and one from nephritis. Of the surgical cases the majority were brought to the hospital within five to twenty days from the time they were on duty. Of the medical cases the majority were brought to the hospital from seven to twenty-seven days after the beginning of their illness. The average time spent in the hospital was fifty days. Of the 104 in the hospital for ninety-eight days and upward, four were under treatment for more than ten months; seven from eight to nine months; eighteen between six and seven months; eighteen between five and six months; twenty-five between four and five months, and the remainder between fourteen weeks and four months. During this period there were fifteen convoys received from France, the patients in each convoy varying from 160 to thirty-eight and amounting in all to 1,184. At the beginning of the period there were 212 patients in the hospital, and at the close of the period there were 184 patients.

Clinical Notes, Suggestions, and New Instruments

VOLVULUS: REPORT OF A CASE

G. H. EDWARDS, M.D., ORLANDO, FLA.

Volvulus is one of the rarer conditions of the intestinal tract which produces ileus. The case herein described is of unusual interest because of the nature of the onset and the portion of the intestine involved and its position.

E. S., a man, aged 62 years, worked for forty years in cotton mills as operator and later as overseer. He has had hemorrhoids and chronic bronchitis for forty-five years, but rarely consulted a physician for these conditions and never for any other. In December, 1915, while digging a path in the snow, he had a sudden attack of pain in the abdomen which disappeared in a few moments. Later, tenderness developed, followed by pain and vomiting. A diagnosis of appendicitis was made. Operation was advised but refused. Two hypodermics of morphin relieved the pain, and after two days' repeated use of high enemas, the bowels began to move. The patient was in bed most of the time for six months thereafter with a marked obstipation, and usually with distention and pain on the left side. He was told that this was due to a "twist of the gut." Since that time he has had more or less tenderness in the abdomen, with increased formation of gas in the stomach and a gradual loss of weight.

The present disturbance began June 8. The patient worked in his garden until 10 a. m. The sun was bright and he stopped work because he felt dizzy. Half an hour later he had a copious bowel movement and shortly afterward began to have a sense of discomfort in the abdomen. This increased gradually until 4 p. m., when he went to bed, thereafter spending most of his time in a modified knee-chest position, the assumption of which gave him some relief. Although the same medication was instituted which relieved his first attack, that is, paregoric and high enemas, without hypodermics, however, at midnight the pain became intense and the patient began to vomit. The first enema was colored and brought away a little gas, but the others had no effect. I saw the patient at 2 a. m., when the pulse rate was 70, respiration 28, and temperature 99.5. There was a soft fluctuating mass distending the abdomen on the left side, tender on pressure and tympanitic. A diagnosis of intestinal obstruction was made, probably due to volvulus. Operation was advised, and refused, because of recovery eighteen months before. Three-eighths grain of morphin by hypodermic gave some relief. I saw him again at 8 a. m. and 2 p. m. The condition was unchanged, the patient having dozed at intervals since the hypodermic. Operation was still refused. At 2 p. m. a second hypodermic of one-eighth grain of morphin was given and the family was advised to get another physician in consultation unless consent was given for operation. At 6 p. m. I was asked to come in a hurry as the patient had vomited fecal material. The tumor was still present, pulse 110, respiration 34, temperature 101. Consent was given for operation.

At 7:30 p. m. the patient was opened in the midline. A distended loop of large intestine filled the left side of the abdomen. This was delivered with difficulty and proved to be the cecum, about 15 inches long and 8 inches in diameter. The tip of the appendix, about 6 inches long, was in a mass of adhesions attached to the sacral prominence in the midline, and apparently around this point as a fulcrum the cecum, with its tremendously elongated mesentery, had made a half turn and lodged on the left side. There was no gangrenous tissue from the strangulation. By a simple twist the cecum fell into its normal position and its contents could be forced into the transverse colon. As the patient was moribund the appendix was hurriedly removed, a small reef was made in the mesentery, and the abdominal incision rapidly closed. The patient's life hung in the balance for five hours, since which time there has been progressive recovery.

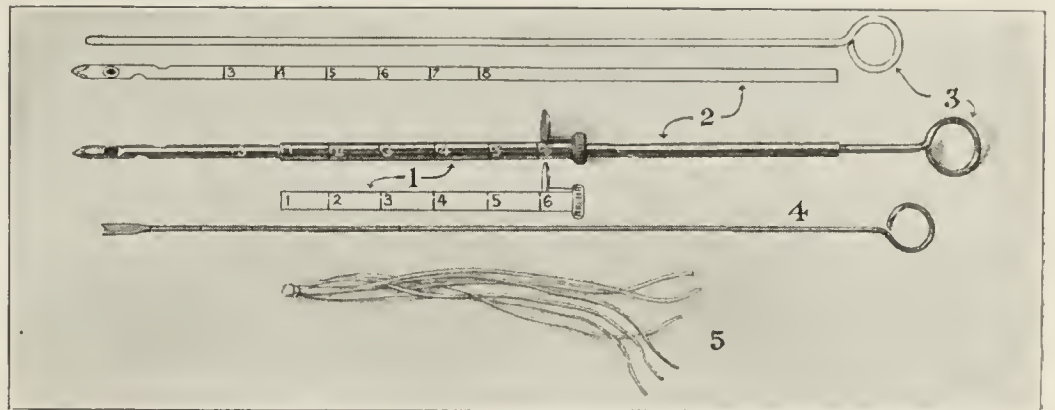
A NEW APPARATUS FOR INTRAVENTRICULAR DRAINAGE

Y. C. LOTT, M.D., NEW YORK

House Resident, Neurologic Surgery, New York Polyclinic Medical School and Hospital

This instrument has been devised for exploring different regions of the brain and also as a means of instituting permanent ventricular drainage in cases of internal hydrocephalus, on the service of Dr. William Sharpe.

It consists of a dull-pointed ventricular puncture needle, 15 cm. long, with two eyelet openings near the end; a forked stylet 15 cm. long; a casing 6 cm. long; and a probe 15 cm. long; all are graduated in centimeters. When the ventricular cavity is entered, the stylet is removed, allowing the fluid to escape. If a permanent drainage is desired, the depth of the cavity is ascertained, Stylet 3 is removed, and the outer casing, 1, 6 cm. long, and also graduated in centimeters, is inserted over the puncture needle, 2, to the desired depth. There the casing is held in the proper position by means of the handle, and the puncture needle is now removed, leaving the casing, 1, in situ; a forked stylet, 4, graduated in centimeters, and 15 cm. long, carries the linen strands to the desired depth in the ventricles, and is held in place while the casing, 1, is withdrawn. Then the stylet, 4, holding the linen strands, 5, in the proper place and depth, is removed, and the linen strands are brought out through the cerebral cortex, the temporal muscle and fascia under the skin. The linen strands are very slowly absorbed (in from five to seven months), and in the meantime this artificial cortical channel is lined with endothelium about the linen strands, and permanent drainage



Details of apparatus for intraventricular drainage.

of the cerebrospinal fluid is thereby obtained. With this drainage apparatus, a minimum amount of trauma is done to the brain tissue, and the drainage material is left in situ at the point desired in the ventricles.

A RACK FOR FACILITATING THE HANDLING OF SMALL DEEP SKIN GRAFTS

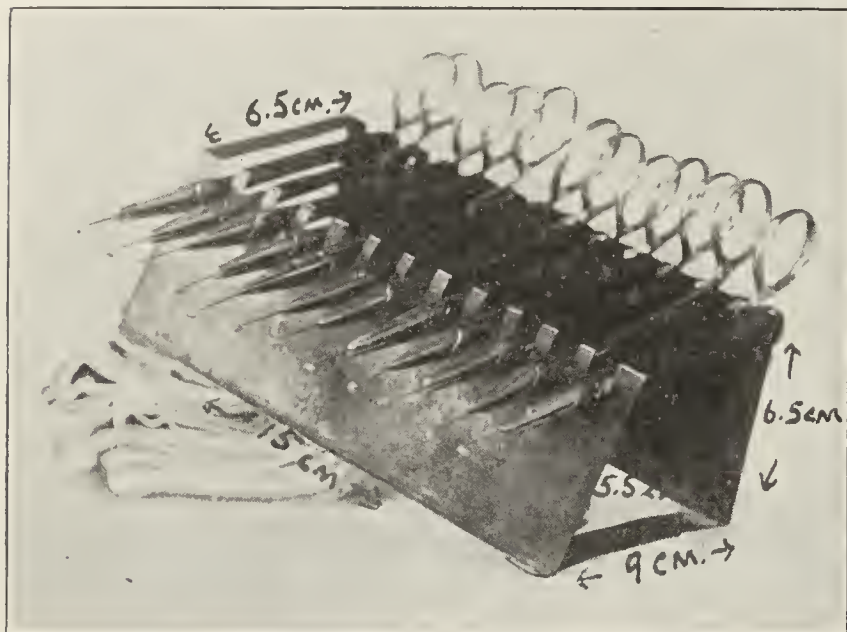
JOHN STAIGE DAVIS, M.D., BALTIMORE

The appliance here illustrated is for facilitating the handling of small deep skin grafts. When two or more are working on a large wound, the grafts are often cut faster than they can be applied. As a rule there is no convenient location to stack the artery clamps holding needles and grafts. In consequence an instrument is often upset or slips; the graft is brushed off, and is either lost, or much time is wasted in trying to pick it up. In order to eliminate this inconvenience, I devised this slotted metal rack to hold the clamps. The rack is made of 18 gage sheet copper, so bent that the end view shows the form of a trapezium. The longest side of this figure is used as the base, and to facilitate cleaning is open, except for three strips which are necessary to brace it. The twelve slots are made on the side opposite the base, and each is wide enough to admit the ordinary Halsted artery clamp.

The measurements are: base, 9 cm. long; surface carrying slots, 6.5 cm. long; sides, 5.5 and 6.5 cm. long. The full length of the rack is 15 cm. Longer racks may be made, but the size described is convenient for ordinary use.

The rack can be used with great comfort when one man is cutting and also placing the grafts. The twelve slots are filled and the rack is then moved close to the wound to be grafted, and all these grafts are then applied. This maneuver can be repeated as often as necessary, and it can be readily seen that an enormous amount of labor is saved, as without this frame each graft would have to be placed on the wound as it was cut.

When a large wound is being grafted with small deep grafts, the method of procedure is as follows: The rack, with



Rack for facilitating the handling of small deep skin grafts. In the illustration the rack is tilted in order to show each slot. Note the dimensions. The rack is filled with Halsted clamps, each carrying a straight intestinal needle. The handles of the clamps are on the highest side of the rack. The slope is sufficient to prevent them from sliding, and thus brushing off the grafts, which can be seen on each needle.

its highest side toward the operator, is placed in a position convenient for him. Then as the grafts are cut the clamps are dropped into the slots, and when the cutting is faster than the placing, the clamps are moved along progressively toward the placer, by the nurse, so that those grafts first cut will be applied first.

1200 Cathedral Street.

AN ACID POLYCHROME-METHYLENE BLUE SOLUTION FOR ROUTINE AND SPECIAL STAINING *

E. W. GOODPASTURE, BOSTON

This solution has been found useful in staining frozen sections for rapid diagnosis, and as a differential stain for secretion granules, following eosin.

When methylene blue is boiled with an alkali, the two dyes, methylene violet and methylene azur, and probably others, are formed by oxidation. Unna recognized that this change gradually takes place in old alkaline solutions of methylene blue, and he utilized the resulting "polychrome-methylene blue" for special staining purposes. These dyes in combination with eosin (Romanowsky stain and modifications), applied to cells and tissue with proper technic, afford a great deal of differentiation and pleasing contrast.

The following method has been devised for the staining of frozen sections fixed in liquor formaldehydi and for staining paraffin sections fixed in liquor formaldehydi, liquor formaldehydi-Zenker or alcohol after eosin staining.

An acid polychrome-methylene blue solution is made from methylene blue (Koch f. bac.), 1 gm.; potassium carbonate, 1 gm., and distilled water, 400 c.c., dissolved thoroughly and boiled in a flask for thirty minutes. The methylene blue will be polychromed, and most of it precipitated from solution. When the solution is cool, glacial acetic acid, 3 c.c., is

added. The whole is shaken thoroughly until the precipitate is dissolved, and then boiled gently for five minutes, or until the solution is concentrated to a volume of 200 c.c. It is cooled in tap water. The solution is ready for use immediately. It may be used over and over again; it does not precipitate, and it keeps indefinitely.

For staining frozen sections, a few cubic centimeters of the polychrome methylene blue solution are placed in a dish, and in this the sections are stained for one minute. They will not overstain if left much longer. They are then washed in water and mounted in water or glycerin, better in water. A good contrast is obtained in this manner. Nuclei are stained deep purple and connective tissue a bright rose red.

An acid polychrome methylene blue and eosin stain will be found very useful for staining differentially the zymogen, and the alpha and beta granules in the pancreas, after fixation in neutral liquor formaldehydi-Zenker, or liquor formaldehydi-bichromate. The fresher the tissue, of course, the better the preparation.

Forty per cent. dilution of liquor formaldehydi may be kept neutral with an excess of calcium carbonate or lead oxid. Immediately before the tissue is to be fixed, 10 c.c. of neutral liquor formaldehydi are added to 90 c.c. of Zenker's solution without acetic acid, or to 90 c.c. of 2.5 per cent. potassium bichromate. Pieces of tissue from 3 to 4 mm. in thickness should be used. They are fixed for twenty-four hours, washed in running water twenty-four hours, dehydrated in alcohol and embedded in paraffin.

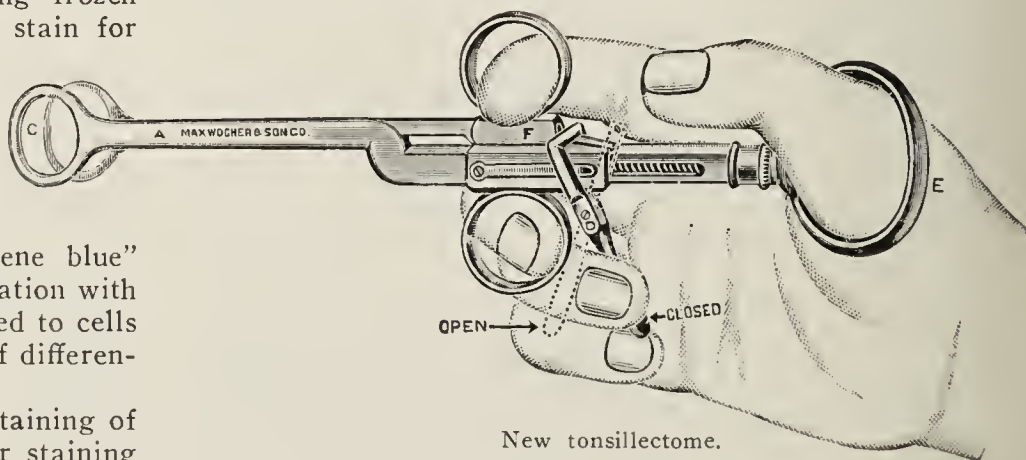
Paraffin sections are treated with: (1) potassium permanganate, 1 per cent., one minute; (2) oxalic acid, 5 per cent., one minute, and are (3) washed thoroughly in water; then with (4) an aqueous solution containing 1 per cent. eosin and 1 per cent. potassium bichromate from one to five minutes; (5) washed hastily in water; then with (6) acid polychrome methylene blue, from one to five minutes; they are (7) washed hastily in water and differentiated rapidly in 95 per cent. and absolute alcohol, and treated with (8) xylene and balsam.

In properly stained sections, zymogen granules stain deep purple, protoplasm light blue, nuclei light purple, alpha granules brick red, and beta granules dark blue.

A NEW TONSILLECTOME

FREDERICK W. LAMB, M.D., CINCINNATI

I have been using Beck's tonsillectome with satisfaction for several years. However, I have had difficulty at times with the wire loops. It is annoying to have the wire slip out from under the set screw or slip through the hole in the stylet when it should be closing down behind the tonsil.



New tonsillectome.

To obviate this difficulty I have devised a blade to take the place of the wire. The cutting edge is dull and rounded so that in effect it is much the same as a wire. It is held in place by a set screw which passes entirely through a hole in the blade; therefore it cannot slip. It is in reality a permanent, nonbreakable, "nonslippable" snare which never requires rethreading. I have used this instrument in a great many cases and find that it enucleates the tonsil thoroughly and completely in its capsule leaving a smooth clean fossa and with a minimum amount of hemorrhage.

* From the Pathological Laboratories of the Peter Bent Brigham Hospital and the Harvard Medical School.

A CONVENIENT METHOD FOR RECORDING DATA ON
ROENTGEN-RAY PLATES

C. D. BLACHLY, B.S., M.D., DRUMRIGHT, OKLA.

The articles necessary are a special ink described below, a stub pen, lead filings and a small blank card.

The ink is made by dissolving one part of liquid glue in five parts of water and adding sufficient carbolfuchsin or other dye to color it. The lead filings are made by filing metallic lead with an ordinary 8 inch steel file; one even finer is better.

The name, date, part to be photographed or other data required are written on the blank card in a round, plain, heavy script. The card is covered with the lead filings while the ink is still wet, and let stand for a moment. The filings which are not held by the glue in the ink are shaken off, and the card is ready for use. The card is laid on any convenient part of the plate while the plate is being exposed. When it is developed, the data will show up in clear, white letters that will not rub off or become dimmed by handling.

A NEW AND SIMPLE METHOD FOR COUNTING BLOOD
PLATELETS*

REUBEN OTTENBERG, M.D., AND NATHAN ROSENTHAL, M.D., NEW YORK

A simple and easy method of counting blood platelets is greatly to be desired. The methods at present available are either too inaccurate or too difficult and time-consuming. The result is that platelet counts are not done as a routine and that our knowledge of their clinical significance is still rather meager.

The well known preservative effects of sodium citrate toward blood platelets suggested to us its use in counting them; and the obvious advantages of counting them in the same counting chamber as the red blood cells led us to devise what we believe to be the simplest and most accurate method.

This method has the advantage that it does not involve any additional step in a blood count, as the red cells are counted at the same time as the platelets. The trifling work required to count the platelets by this method should lead to the general adoption of the platelet count as a necessary part of a full blood examination.

The method consists of the use of 3 per cent. sodium citrate as diluting fluid. The blood is diluted 1:200 in the hemocytometer pipet as though for a red cell count, and a drop is put on the counting chamber cell in the usual manner. The counting chamber must rest for ten minutes before the count is made, to allow time for the platelets to settle to the level of the rulings. This is essential.

The platelets are counted in the same manner as red cells, and the calculation is the same except that for accurate work it is necessary to count at least twice as many squares, and when the platelets are diminished in number, three or four times as many squares as in counting red cells. The calculation then consists of dividing the total number of platelets counted by 2, 3 or 4, as the case may be, and then figuring as though counting red blood cells.

It is important for the beginner to learn to recognize platelets and to distinguish them by their size (which varies but little) and by their peculiar slightly greenish hyaline appearance, from granules or other foreign particles which may accidentally be present.

The count is made with the high dry lens (one-sixth inch is best) and preferably, though not necessarily, with a rather high power eye piece (No. 4, for example).

If desired, the platelets can be made to stand out more sharply by the addition of a stain to the diluting fluid. Cresyl blue (1:500) and methyl violet (1:500) are the best. The disadvantage of the stain is that the fluid has to be made up fresh each day, as a precipitate forms on standing. The addition of the stain, however, is by no means necessary.

We have used citrate solution in counting blood platelets for over two years, and have found that the results with it

correspond closely in normal and pathologic cases with the results obtained by the Wright and Kinnicut method which we had previously used and considered the most accurate method then available.

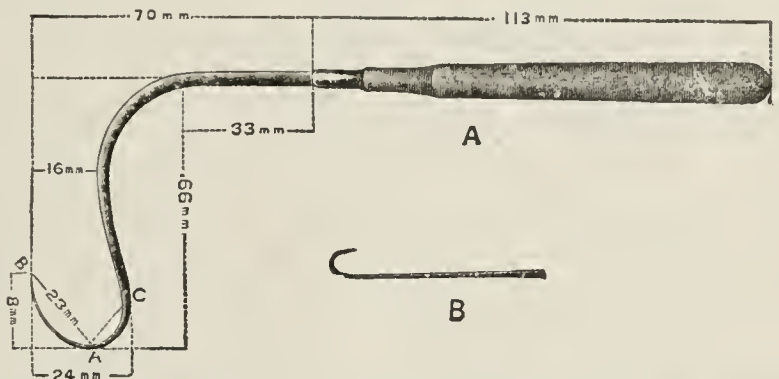
The counts in normal cases have varied from 200,000 to 400,000. The lowest counts were in cases of purpura, in three of which we obtained counts of 1,500, 10,000 and 45,000. The highest count was in a case of pernicious anemia after splenectomy, 970,000.

A TONSIL SUTURE INSTRUMENT

GEORGE E. HOURN, M.D., ST. LOUIS

This instrument was evolved as a result of several experiences in the control of postoperative hemorrhages following tonsillectomies occurring in the practice of Drs. Sauer and Burns of St. Louis.

With the suture needles to which we had access, there was an embarrassing difficulty in passing the needle through the posterior pillar near the base of the tonsillar fossa and then spanning the space to the anterior pillar near the base. When this instrument is introduced with the axis of the handle at right angles to the plane of the posterior pharyngeal wall, there is no difficulty in transfixing the posterior pillar at any point, even though the pillar projects but little above the pharyngeal wall surface. Then by swinging the handle through an arc of 90 degrees, the operator can with equal facility pass the needle through the floor of the tonsillar fossa and the anterior pillar. One can thus span across a space of approximately 23 mm. (A to B) without putting an undue



Tonsil suture instrument: A, the instrument, with measurements in millimeters; B, the hook for picking up loop of suture material.

tension on the pillars while picking up the loop of the suture material from the needle with a hook. With this object in view, it is important that the curve C A B is approximately as illustrated. The arc A C is that of a circle with a radius of 9 mm., and the arc A B is that of a circle with a radius of 19.5 mm.

The chief advantage of the instrument is its adaptability in passing the suture material through either the posterior or the anterior pillars at any point.

In catching the loop of suture before withdrawing the needle from the pillars, there is some advantage in using a hook, the free arm of which is bent slightly to the side, away from the plane of the handle; that is, one which has very much the shape of a minnow fish hook without its barb.

201 Humboldt Building.

Social Welfare and the Profession in the United States.—

The pioneer clinic for industrial affections, the Clinica de Lavoro at Milan, has had to be taken for other purposes as the war advanced, and the public lectures delivered there have been suspended for the present. The concluding lecture by the founder and chief of the clinic, Professor Devoto, was an enthusiastic recital of what has been accomplished in the United States in the last five years in the line of protecting and caring for industrial and other workers. Devoto remarked parenthetically that very few, too few, medical women in Europe devote themselves to the study of hygiene, and yet this is a particularly promising field for them. "Where in Europe," he exclaimed, "is a medical woman to be found who has done among us what Alice Hamilton has done in Chicago."

* From the Pathological Laboratory of Mount Sinai Hospital.

Military Medicine and Surgery

TRIPLE TYPHOID VACCINE (BACILLUS TYPHOSUS, B. PARATYPHOSUS A, AND B. PARATYPHOSUS B.)

OBSERVATIONS ON THE RESULTS FOLLOWING INOCULATION OF MAN, WITH SPECIAL REFERENCE TO THE REACTIONS PRODUCED AND ANTIBODY FORMATION *

CHARLES F. CRAIG, M.D.

Lieutenant-Colonel, Medical Corps, United States Army

FORT LEAVENWORTH, KAN.

The necessity for protecting our oversea troops against the paratyphoid fevers has rendered inoculation against *Bacillus paratyphosus* A and *Bacillus paratyphosus* B imperative; and the fact that these infections occur also in our own country and will undoubtedly appear, sooner or later, in our large cantonments, made it advisable that the entire army should be inoculated as a prophylactic measure. The no less than wonderful results that have followed preventive inoculation against typhoid fever with the Army vaccine first prepared by Colonel Frederick F. Russell have encouraged the belief that preventive inoculation against the paratyphoid fevers would also prove as successful; and from the experience gained in the prompt stopping of epidemics of these fevers among our troops both in Mexico and in Texas by the use of a vaccine composed of the two paratyphoid organisms, our hopes have been realized. However, when the question arose of inoculating the entire new army with all three of the bacilli, it was realized that, from an administrative standpoint, a combined vaccine containing the three organisms would be preferable, as it would obviate a double series of injections and save much time and trouble from a military point of view. The use of such a combined vaccine would be justifiable only if the results, as regards protection from typhoid and paratyphoid, were comparable to those obtained with the use of the separate vaccines, and if the reactions, both general and local, following the injections, were not so severe as to preclude the use of the combined vaccine.

In order to obtain some accurate data on the question, I was requested by Colonel Russell to make a study of fifty men inoculated with the triple vaccine with special reference to the general and local reactions following its use, and the formation of agglutinins, and this contribution embodies the results of this study.

The Vaccine.—The triple vaccine was prepared at the Army Medical School, Washington, D. C., and contains 1,000 million typhoid bacilli, 750 million paratyphoid A bacilli, and 750 million paratyphoid B bacilli per cubic centimeter. The first dose is 0.5 c.c. and the second and third doses each 1 c.c. The inoculations were made subcutaneously and at intervals of seven days. Agglutination tests were made on twenty-five of the fifty men inoculated, the first test being made before the first inoculation, the second before

the second inoculation, the third before the third inoculation, and the fourth and fifth at intervals of seven days following the third inoculation.

Material.—Fifty men were selected for the observations, twenty being provisional lieutenants attending the training school at Fort Leavenworth, twenty enlisted men of the Signal Corps, and ten reserve officers belonging to the Signal Corps Reserve. None of these men had been previously inoculated with typhoid or paratyphoid vaccine; none had previously suffered from typhoid fever, and all were in good health at the time of the inoculations. The temperature was taken before the inoculations and twelve hours and twenty-four hours afterward. Severe physical exercise was forbidden for twenty-four hours after the inoculations, and the men were excused from drill, but attended to all their other duties as usual.

GENERAL REACTIONS

It may be stated that the general reactions following the use of the triple vaccine were no more severe than those that follow the use of the typhoid vaccine alone, and did not appear to be as severe as those following the paratyphoid vaccine alone. This point was very carefully studied, and I have no hesitation in making the foregoing statement. This result was both surprising and gratifying as, from personal experience on the Mexican border with the paratyphoid vaccine, it was expected that the combined vaccine would give a considerable degree of general reaction. As stated, however, the reaction following the inoculation of the triple vaccine was no different than when the typhoid vaccine was alone used. An analysis of the symptoms observed after the inoculations is of interest, and demonstrates that the general reaction following inoculations of this vaccine, in the vast majority of cases, was so slight as to be almost negligible.

It may be stated here that it has been my experience that if typhoid vaccine is very carefully injected *subcutaneously*, the general as well as the local reactions are slight as compared to those observed after intramuscular injection or injection into the substance of the skin, and the severe reactions following intravenous injection are well known. This point is worthy of great emphasis, for there is no doubt that most severe general and local reactions are due to careless injection of the vaccine into the muscles or skin; and what is true of the typhoid vaccine will be found to be true also of the triple vaccine. In the only severe general reaction observed in this series the vaccine was apparently injected into a small vein, as the symptoms developed very promptly after the inoculation.

Temperature.—In the majority of cases the temperature was but slightly elevated after the inoculations, as shown in Table 1. The temperature was taken twelve hours after the inoculations and again in twenty-four hours after the inoculations. From this table it will be noted that 86 per cent. of those inoculated showed some rise in temperature after the second inoculation, but that only 32 per cent. showed a rise after the first dose, and only 18 per cent. after the third dose. Had the temperature been taken at hourly intervals up to the end of twelve hours, it is probable that all of the cases would have shown some

* From the Department Laboratory, Central Department, U. S. Army.

rise after the second injection; but those men that did not show any at the end of twelve hours stated that they had had no fever, so far as they were aware; so that if a rise did occur it must have been slight and transient.

It will be noted that the majority of the men showing a rise in temperature did not go above 100 F., and that in only a few did the temperature go above 101 F., even after the second injection, when the greatest rise in the temperature occurs after the injection of the straight typhoid vaccine. The one case showing a rise in temperature to 104 F. followed the intravenous injection already mentioned.

In almost all cases the rise in temperature was transient and had disappeared at the end of twenty-four hours, when the temperature was again taken. After the first dose of the vaccine only three cases showed any rise in temperature at the end of twenty-four hours; six showed a rise after the second dose, and none after the third dose. All six cases showing a rise of temperature at the end of twenty-four hours after the second dose were instances of delayed reaction, which will be mentioned later.

TABLE 1.—TEMPERATURE FOLLOWING INJECTION OF THE TRIPLE VACCINE

Temperature, F.	After First Dose		
	No. of Cases with Rise	Total No. Injected	Percentage
99 to 100	6	50	12
100 to 101	5	50	10
101 to 102	4	50	8
102 to 103	1	50	2
Total with fever after first injection..	16	50	32
After Second Dose			
99 to 100	28	50	56
100 to 101	9	50	18
101 to 102	4	50	8
102 to 103	1	50	2
103 to 104	1	50	2
Total with fever after second injection	43	50	86
After Third Dose			
99 to 100	6	50	12
100 to 101	2	50	4
101 to 102	1	50	2
Total with fever after third injection	9	50	18

Headache.—After the first dose of the vaccine, twenty-one of those inoculated complained of headache, sixteen stating it to be slight and four pronounced, but not severe. All the others stated that they had no headache. After the second dose, twenty-five or 50 per cent., stated they had headache, of which number three stated that it was severe, six moderate, and sixteen slight. After the third dose only two men complained of headache, slight in character.

Pain in Back.—After the first dose, five of those inoculated complained of pain in the back, in the lumbar muscles, and one stated that it was severe. After the second inoculation only two men mentioned this symptom, and after the third dose, none.

Pain in Legs.—Three of those inoculated complained of pain in both legs after the first injection, and six after the second injection. These pains developed some hours after the injection, and in two instances were stated to be severe and neuralgic in character.

Diarrhea.—Of those inoculated, seven had diarrhea after the first dose of the vaccine and three after the second dose. In only one of these persons was the

symptom stated to be severe, and he had partaken of food, which was probably a partial cause of the condition.

General Malaise.—General malaise was noted by twenty-five men after the first injection and by thirty-six after the second injection. After the third injection only three or four stated that they noted any disagreeable symptoms. In the vast majority of those noting general malaise it was slight in character, most of them stating that they felt tired or as though they were developing a cold; but in eleven cases the symptoms were quite marked and in eight sufficient to keep them in bed for an hour or two of the day following the inoculations.

Other Symptoms.—Of other symptoms noted or spoken of by those inoculated, the following deserve mention: cramps, in two cases; dizziness, in three cases; nausea, in ten cases; vomiting, in one case; chills, in one case, and polyuria in one case. The man showing chills, nausea, vomiting and polyuria was the one receiving the intravenous injection, and these symptoms are almost always present following the accidental inoculation of the vaccine into a vein. Nausea, always slight in character, appeared to be quite a common symptom after the second dose of this vaccine.

Delayed General Reactions.—While in most of the men inoculated the rise in temperature and other symptoms noted occurred within twelve hours after the dose of vaccine was received, a delayed reaction was observed in six cases, in which the rise in temperature did not occur until about twenty-four hours after the inoculation and the symptoms persisted for several hours after that period. In these cases the reactions were no more severe than those observed in the usual cases, the onset of the reaction simply being delayed. These delayed reactions appeared to be more numerous following the triple vaccine than after the typhoid vaccine.

LOCAL REACTIONS

The local reactions following the inoculation of the triple typhoid vaccine were no more severe than those following inoculation with the typhoid vaccine alone, as judged by my experience, and may be dismissed with a few remarks. The local reaction following the first dose was generally slightly less marked than that following the second, but in many instances there was practically no difference. After the third dose the local reaction, in the vast majority of cases, was practically nil.

Size of Areola.—The size of the areola showing congestion following the first injection varied considerably but, in the majority of cases, measured from 6 to 8 cm. in diameter. The swelling was not marked, and in only one instance did it involve more than the area mentioned, following the first injection. Following the second injection the congested areola, in a few instances, was from 1 to 2 cm. larger; but in most instances no difference in size could be noted.

Induration of Inoculated Area.—Slight induration occurred in the inoculated area in almost every instance; but in none was it marked.

Soreness.—All of those inoculated spoke of soreness on pressure over the congested area in which the

inoculation was received and of a sense of stiffness and slight pain on moving the inoculated arm. In none of the cases was the soreness anywhere near so marked as after smallpox vaccination, nor was there any pain in the arm at all comparable to that which often occurs after the latter vaccination.

Swelling of Axillary Glands.—Swelling and tenderness of the axillary glands on the side of the inoculation was noted in the majority of those inoculated. Thus after the first dose, twenty-five complained of soreness and enlargement of these glands; after the second dose, thirty-two presented these symptoms; but after the third dose, only six showed any swelling of the axillary glands. In none of the cases were the symptoms caused by the enlarged glands enough to cause much discomfort. An interesting point was noted in five cases in which the axillary glands of the opposite axilla were also swollen and tender.

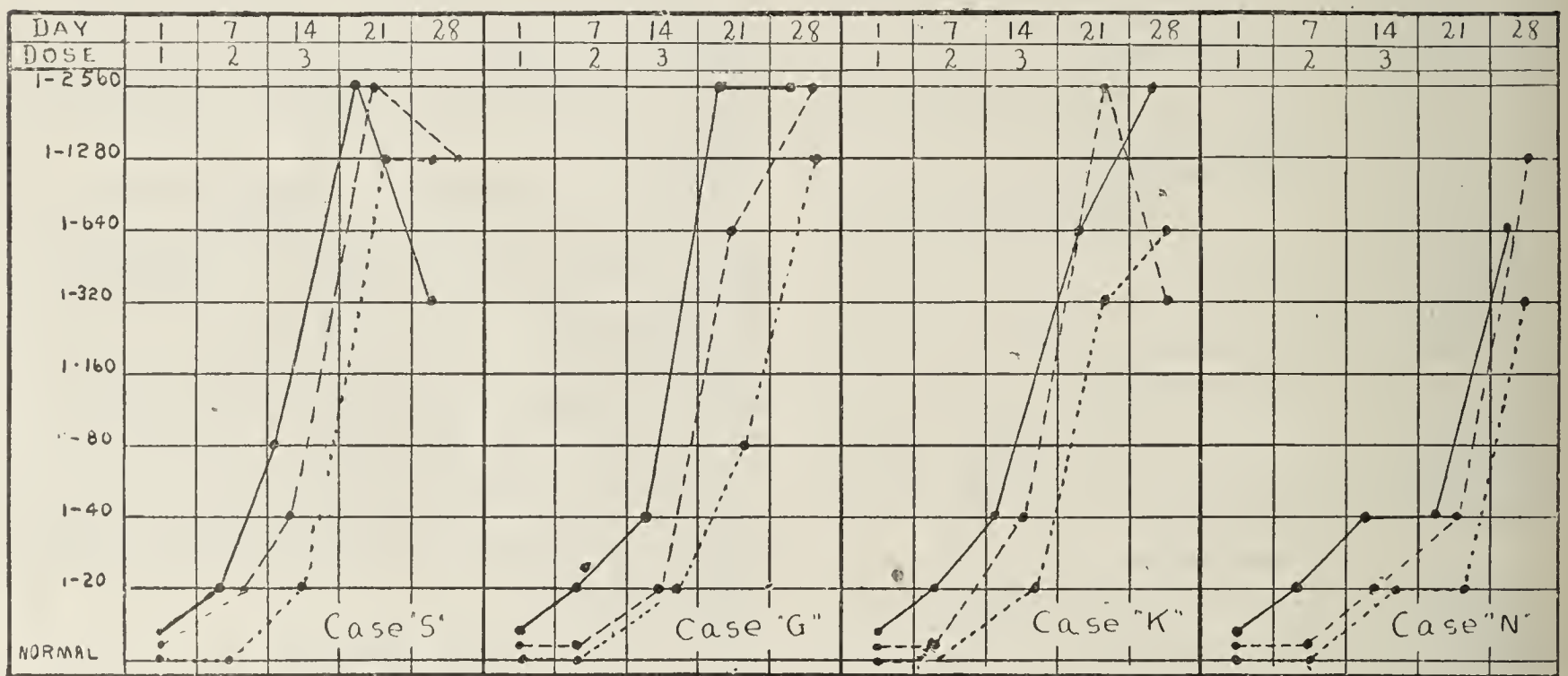
No other local symptoms were noted in this series of fifty cases of inoculation.

ANTIBODY FORMATION

No attempt has been made in this study to demonstrate the formation of other antibodies than agglutinins; but as the agglutinin titer of a serum is a good index of what is occurring as regards the formation of other antibodies, it has been used to determine whether the triple typhoid vaccine gives rise to antibodies as readily as the straight typhoid vaccine.

Agglutination tests were made, as has been stated, on the day of the first dose of vaccine, before it was administered; at the end of seven days, before the second dose; at the end of fourteen days, before the third dose, and at the end of twenty-one and of twenty-eight days, making five agglutination tests in all.

As the agglutination tests are an index of antibody formation, we were especially interested in observing whether agglutinins were formed for each of the organisms in the vaccine and whether the agglutinin titer for the typhoid bacillus was influenced in any way by the combination with *B. paratyphosus* A and B.



Agglutination titers after administration

In concluding this discussion of the general and local reactions following the injection of the triple typhoid vaccine, I may say that, with the exception of the occurrence, perhaps more frequently, of slight nausea, and the delayed reactions referred to, the reactions have not differed from those that I have observed after the use of the typhoid vaccine alone, nor have either the general or local reactions been any more severe than those usually observed in the same number of persons inoculated with the typhoid vaccine. In fact, the majority of those receiving the triple vaccine did not themselves complain of any discomfort, and leading questions had to be asked in order to ascertain just what symptoms were really present. An interesting psychologic observation noted was that the young provisional lieutenants apparently noticed their symptoms, as evidenced by their speaking of them, much more than did either the enlisted men or the older reserve officers. Most of the enlisted men stated that they had no general reaction whatever, although at the time most of them were having slight fever, and, on inquiry, other symptoms could be elicited.

paratyphosus B. Charts were prepared in twenty-four cases in which the men were thus tested. The charts in all of the cases show conclusively that the combination with the paratyphoid bacilli does not interfere in the least with the production of agglutinins for *Bacillus typhosus*, and that the agglutinin titer obtained for each of the three organisms is satisfactory and indicates that the combined vaccine produces antibodies to all three organisms as well as when each is injected alone.

In making the agglutination tests the macroscopic method was employed in all instances, a formalized emulsion of the respective bacilli being used, and the agglutinations being read after twenty-four hours at incubator temperature. The readings were made each week without reference to the reading of the week before, and were checked by more than one observer, in most instances.

The charts of all the cases exhibit a remarkable uniformity as regards the agglutinin titer for each of the three organisms, and the following general discussion may prove of interest.

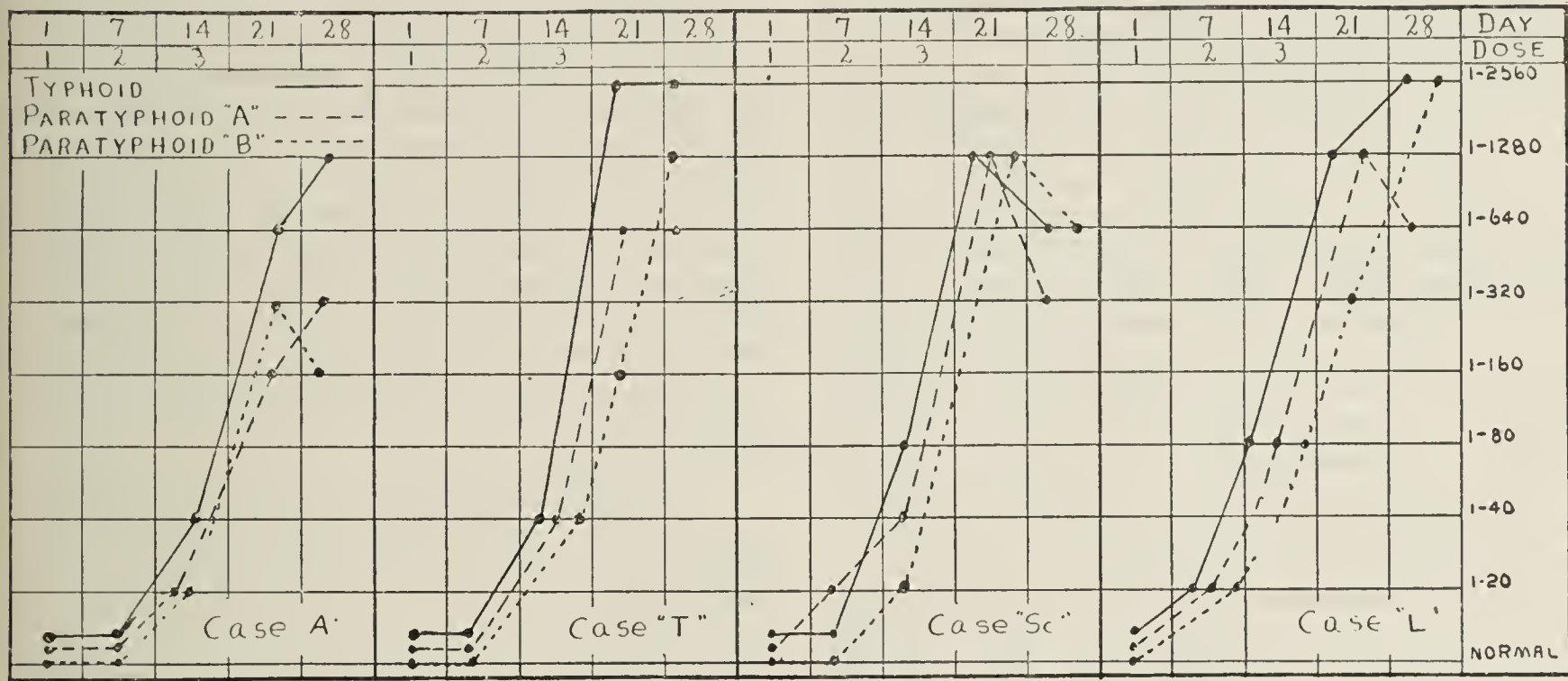
The average agglutinin titer for *B. typhosus*, after the three doses of vaccine, and at the end of the four weeks, was from 1:640 to 1:1,260, seven of the men showing the former titer and seven the latter. Five men reacted as high as 1:2,560, and four showed a titer of 1:320. In one case the titer never went above 1:80, and it is interesting to know that this man gave a very severe general and local reaction.

The agglutinin titer for *B. paratyphosus* A gave eight positive cases in a dilution of 1:2,560; four in a 1:1,280 dilution; six in a 1:640 dilution; four in a 1:320 dilution and two in a 1:160 dilution. As a whole the paratyphoid A series gave a slightly higher average agglutinin titer than did the typhoid.

The agglutinin titer for *B. paratyphosus* B was lower than for either *B. typhosus* or *B. paratyphosus* A. This is not in agreement with the results of some English observers who found that the titer for B was higher than for A, but it may be that the tests made at a later period would have shown a higher titer for B,

Our observations show that no agglutinin production for *B. paratyphosus* B occurred until after the third injection in most instances, and that the greatest rise in agglutins occurred one week after this injection. On the other hand, agglutins for *B. typhosus* were demonstrable even a week after the first injection, in several instances, and the rise after the second injection, in the majority of cases, was rapid. In seven instances the agglutinin curve for *B. typhosus* became stationary or began to descend two weeks after the third injection of the vaccine. The response to agglutinin formation was also more rapid in *B. paratyphosus* A than in *B. paratyphosus* B.

As stated, twenty-four of the inoculated men were tested as regards their agglutination curves; it was intended to test twenty-five of those receiving the vaccine, and in reality this number was selected, but one of the men was ordered away before the series was completed. This officer had received his third dose of the vaccine, and his blood was tested two days after-



of triple typhoid vaccine.

as it will be noted that the response to agglutinin formation is much slower, in nearly all instances, with paratyphoid B than with either typhoid or paratyphoid A. Of the paratyphoid B series, four gave a positive reaction in a dilution of 1:2,560, at the end of the four weeks; five, in a dilution of 1:1,280; four, in a dilu-

TABLE 2.—AGGLUTIN TITER OF CASES OF ADMINISTRATION OF TRIPLE VACCINE

Dilution	No. of Cases Typhoid	No. of Cases Paratyphoid A.	No. of Cases Paratyphoid B.
1:2560	5	8	4
1:1280	7	4	5
1:640	7	6	4
1:320	4	4	6
1:160	0	2	1
1:80	1	0	3
1:40	0	0	1
Total	24	24	24

tion of 1:640; six in a dilution of 1:320; one in a dilution of 1:160; three in a dilution of 1:80, and one in a dilution of 1:40.

Table 2 illustrates the agglutinin titer for the three organisms at the end of the observation period, four weeks after the first dose of vaccine, and two weeks after the last dose.

ward and found to give a positive reaction in a dilution of 1:5,120, the highest agglutinin titer observed in this series. At the same time his agglutinin titer for *B. paratyphosus* A was 1:1,280, and the same for *B. paratyphosus* B.

CONCLUSION

The observations here recorded prove conclusively that the triple typhoid vaccine, with which I worked, and which is the vaccine now adopted for immunizing our entire army against typhoid and paratyphoid fevers, gives as good results in immunization, so far as can be judged by agglutinin curves, as does the typhoid vaccine alone, and that neither the general nor the local reactions following its injection are different in any degree from those occurring after the inoculation of simple typhoid vaccine. The results, both from a practical and from a theoretical point of view, are all in favor of combining the three organisms in a single vaccine, and it is believed amply justify the use of the triple typhoid vaccine in immunizing our troops against typhoid and paratyphoid fevers.

THE VENEREAL DISEASES

CHANCROID

(Continued from page 911)

NOTE.—This is the second of a series of four articles on the management of venereal diseases with special reference to military practice. The first article on "The Diagnosis and Treatment of Syphilis" appeared September 15, p. 907. The articles have been prepared under the direction of the Surgeon-General by the Advisory Committee on Venereal Diseases, Dr. William Allen Pusey, Chicago, chairman; Dr. Francis R. Hagner, Washington, D. C.; Dr. Grover W. Wende, Buffalo, Dr. Sigmund Pollitzer, New York, and Dr. Henry H. Morton, Brooklyn, with Lieut.-Col. F. F. Russell in charge of Infectious Diseases. The series is published with the permission of the Surgeon-General, and will include the following: Treatment of Syphilis; Chancroid; Balanitis Gangrenosa; Acute and Chronic Gonorrhea, with its complications. The complete series will be issued in the form of a manual.—ED.

Chancroid, more than gonorrhea or syphilis, is a disease of the careless and dirty. It is relatively uncommon among clean people. It is readily prevented by prompt prophylactic treatment: simple washing with soap and water after coitus greatly reduces the risk of infection with it.

Diagnosis.—Always in the presence of chancroid, a careful search should be made to determine whether or not there is also an infection with syphilis. In a very considerable proportion of cases, there is. One cannot rest safe with a diagnosis of chancroid, even when repeated examinations fail to discover the *Spirochaeta pallida*. The incubation period of the chancre is from two to three weeks longer than that of the chancroid, and it may emerge only in the healing chancroid, and then escape detection. Every chancroid must be regarded, therefore, as a potential case of syphilis; in addition to repeated examinations for spirochetes, Wassermann tests should be made at weekly intervals for six weeks, and the patient kept under observation for syphilis for two months.

General Treatment.—In order to hasten recovery, the patient with chancroid should be put to bed, kept clean, and given a nourishing diet. Rest not only makes for a prompt healing of the chancroid, but greatly reduces the danger of bubo. Destructive chancroids are seen in the dirty and debilitated. If patients with chancroids are kept clean and well nourished, healing is usually prompt, and extensive ulceration very rarely seen.

Local Treatments.—Abortive Treatment: In a certain proportion of cases of chancroid, abortive treatment is successful. The principle of all methods of abortive treatment is to convert the infected ulcer into a sterile one by the use of some destructive agent. This may be either the actual cautery, or one of several strong chemical caustics.

The thermocautery is perhaps the best agent for this treatment. The ulcer is thoroughly cleaned and well dried. Then the entire area of it is seared with a cherry red cautery. Every particle of diseased tissue must be destroyed. It should be done under a general anesthetic, preferably gas.

Chemical cauterization is done as follows: The ulcer is well cleaned, being first irrigated and then dried. Then a pledget of cotton wet with 5 to 10 per cent. solution of cocain hydrochlorate or novocain is applied to it. After anesthesia is produced the ulcer

is dried as thoroughly as possible, preferably with blotting paper, in order to prevent the running of the chemicals subsequently to be applied. After it has been thoroughly dried, the entire surface of the ulcer, both edges and base, is touched with pure liquid phenol (carbolic acid) applied on a small cotton swab, care being taken to let no infected point escape. Then the excess of phenol on the surface is taken up, and nitric acid is applied lightly in the same way. The ulcer should be flushed immediately with sterile water to stop the action of the acid. Instead of nitric acid a saturated solution of zinc chlorid can be used. This is as active a caustic as nitric acid, and its action should be stopped as quickly after application by flushing with water.

After cauterization in any of these ways, the wound should be dressed with cold compresses of boric acid solution or similar bland solution. There results an acute inflammatory reaction, the slough is thrown off, and in successful cases, a healthy granulating surface is left.

The advantage of these methods of treatment is that, in successful cases, healing takes place quickly and the danger of bubo is almost eliminated. Their success depends on thoroughness in destroying the infected area. If the procedure fails to do this completely, it does less than good, because it produces a larger ulcer, which becomes infected from the focus of disease that has been left. Attempts at abortive treatment with superficial caustics, such as silver nitrate, are always failures. Attempts at abortive treatment should not be made unless the prospects of complete destruction of the diseased tissue are good.

Abortive treatment is contraindicated under the following conditions:

1. When the diseased area or areas are so extensive or so situated that the destruction produced by this treatment would result in considerable deformity. The chief situation in which it is contraindicated is in chancroid at the meatus.

2. When the inflammatory reaction is already intense and there is much edema. These would be increased by cauterization.

3. When there is inguinal adenitis. This would be aggravation by cauterization.

4. In healing chancroids. Here the infection is already under control and nothing would be gained by cauterization.

Abortive treatment will, of course, interfere with any further search for spirochetes. For this reason it should never be undertaken until every reasonable effort to find the spirochetes has been made. The early diagnosis of syphilis is so much more important than the prompt healing of a chancroid, that efforts to heal the chancroid should be given no consideration until the question of diagnosis is settled as far as possible. And after successful abortive treatment, there should be no relaxation in the weekly Wassermann tests or in the clinical observations until syphilis can be finally ruled out.

In all cases, except those favorable for abortive treatment, reliance is placed on cleanliness, the use of antiseptics, and measures to promote healing. The first principle in treating chancroids is to keep them as free as possible from pus, both to promote healing

of the ulcer and to prevent infection of the lymphatics. In all cases, for the effect of the heat as much as for cleansing effect, the patient should hold the penis in hot water for half an hour several times daily. Then the lesion should be given a copious warm irrigation with boric acid solution or mercuric chlorid, 1:10,000, or potassium permanganate, 1:3,000 or some other nonirritating antiseptic solution. Then the ulcer should be dusted with an antiseptic, such as iodoform (the preferable antiseptic), thymol iodid, calomel or argyrol. After this there should be applied a moist dressing of one of the solutions which are used for irrigating the ulcer. In very acute cases, a good dressing is one wet with aluminum acetate solution, one part of the 8 per cent. solution of aluminum acetate to seven or fifteen of water. The dressings must be kept continually moist and changed frequently enough to prevent accumulation of pus on the ulcer.

When for any reason it is impracticable to keep a wet dressing constantly applied, the next best course to pursue is to dust the ulcer after irrigation with a suitable antiseptic powder and then cover it with gauze, spread with petrolatum. Dry powders alone are not good applications for chancroids. They cake into crusts, under which the pus accumulates, and this materially increases the risks of infection of the lymphatics and the occurrence of bubo.

Occasionally in the course of healing of chancroids, the granulations become sluggish; in such cases, stimulation by the application of balsam of Peru works well, or the granulations may be touched occasionally with silver nitrate. If there is an overgrowth of the unhealthy granulations, they should be trimmed off with a knife or razor or seared with a cautery, and then dressed with iodoform and a wet compress.

In chancroids under a greatly swollen or long, tight prepuce, wet dressings cannot be used. In these cases prolonged soakings in hot water several times daily are particularly serviceable. After each soaking the preputial sac should be cleaned by inserting into it a catheter or a long flat syringe nozzle and thoroughly irrigating with hot antiseptic solution. After the irrigation there should be injected into the preputial sac from 2 to 4 c.c. of a suspension of antiseptic powder in oil or glycerin, such as 20 per cent. calomel, 10 per cent. thymol iodid or 10 per cent. iodoform in oil or glycerin. Of these, 10 per cent. iodoform in glycerin is best.

In patients with a long prepuce it is best not to make a dorsal slit, if progress can be made without so doing; for if a dorsal slit is made, the whole surface at once becomes chancroidal. Not infrequently in cases with intense reaction and great swelling no headway can be made while the prepuce is intact; in other cases the reaction becomes so exaggerated that, unless relief of tension is given, sloughing of the prepuce will occur. Under these conditions a linear slit along the dorsum of the prepuce should be made, and the case then treated as an open chancroid. A complete circumcision should never be attempted until the infection has entirely disappeared.

BUBO

Under the usual conditions of treatment of chancroids, when patients are not in bed, suppurative ingui-

nal adenitis occurs in from 30 to 50 per cent. of the cases. But the factors that predispose to bubo are muscular activity and accumulation of pus on the chancroid; so that with patients in bed and with their chancroids kept free from pus, bubo is a relatively infrequent complication.

When bubo threatens, extra care should be used to see that there is no absorption of pus from the chancroid; the patient should have complete rest; and hot applications should be applied. If fluctuation develops, the hot applications are continued until the gland has fully broken down. When it is soft throughout and full of pus, a small incision with a double edge knife should be made, and the pus evacuated. Iodoform glycerin, 10 per cent., is then injected into the cavity. The emulsion should be injected three times at the first sitting. The first two injections run out and the last one remains in. The wound is then bandaged with gauze, moistened with solution of aluminum acetate, one part in seven of water, or boric acid solution, or some other antiseptic solution. On the following day, the wound is emptied by squeezing, and iodoform emulsion injected once and left in. The bandage is then applied, and in five or six days the wound is closed and healed. If after a week the wound is not closed, it should be injected again; this will usually result in healing in five or six days.

The method of injecting the wound with silver nitrate solution has been abandoned on account of the pain that it causes and because it is no better than the injection with iodoform.

The plan of encouraging suppuration and evacuating the pus through a small incision is satisfactory in most cases when the glands break down rapidly. But sometimes suppuration goes on very slowly; and in these cases, it is better to make a free incision, evacuate the pus, and dissect or curet out the partially broken down remains of the glands. Then the wound is packed with gauze and allowed to heal by granulation. It is better to avoid this course if possible, as the subsequent healing takes six or eight weeks, and requires daily dressing.

It was the practice a few years ago to endeavor to prevent suppuration in the glands by dissecting them out and trying to get a clean wound which was closed by suture. This practice has now been abandoned because it was found that a solid edema, or elephantiasis, of the penis and scrotum and inguinal region often followed, in consequence of the obliteration of the lymphatic vessels in the area of the wound. Another objection was that, when patients came to operation, suppuration had nearly always begun in the center of the gland, even though no fluctuation was evident; the wound was not aseptic and could not be closed, but had to be left open for the slow process of healing by granulation.

BALANITIS GANGRENOZA: EROSIVE OR GANGRENOUS BALANITIS

In connection with chancroid, attention is called to this venereal infection, which, while rare, is important, because of its destructive course if unrecognized and treated as chancroid.

(To be continued)

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address . . . "Medic, Chicago"

Subscription price Five dollars per annum in advance

*Contributors, subscribers and readers will find important information
on the second advertising page following the reading matter*

SATURDAY, SEPTEMBER 22, 1917

THE OBJECTIONS TO RAW EGGS IN THE DIET

In the classic experiments on digestion in the human stomach which Dr. William Beaumont conducted nearly a century ago on Alexis St. Martin, the patient with a gastric fistula, it was noted that native egg white leaves the stomach very rapidly in comparison with other foods, including cooked egg white itself. This observation has repeatedly been confirmed in experiments on animals, and is doubtless correct. It is furthermore the presumable basis for the widespread impression that raw eggs are very easily digested, "inasmuch as they are 'chymified' in one and a half to two hours as against three for soft-boiled eggs."

Experiments conducted in vitro with raw egg white have demonstrated that this mixture of proteins is notably resistant to the digestive action of the gastric enzyme, pepsin, and likewise exhibits conspicuous antitryptic power. These are properties indicating sufficient obstacles to digestion in the case of the native product to place it almost in a class by itself among albuminous substances. Several years ago, Mendel and Lewis¹ of Yale University called attention in a casual way to the poor utilization of raw egg white in animals as exemplified by the diarrheas to which it can give rise. In the same laboratory, Bateman² has made an extensive study of this phenomenon. Native egg white was found to be a decidedly indigestible substance in dogs. When fed in any considerable quantity it invariably caused diarrhea and sometimes induced vomiting. The severity of the symptoms depended largely on the amount of material ingested, but also, to a less extent, on the individual susceptibility of the subject. After the ingestion of even small amounts of native egg white, the latter could be recovered unchanged in small quantities from the stools of the experimental animals; and when the amount ingested was large, the proportion of coagulable protein in the feces was correspondingly increased. Even

when the feces appeared normal, undigested egg white could usually be recovered, in contrast with the fact that as a rule albumin is not found in normal feces. Strangely enough, a tolerance to the raw egg white seems to be developed in the course of a few days, although prior to this an albuminuria may sometimes be detected. Even after an apparent tolerance manifests itself, the utilization of the egg white protein has not been found to exceed 85 per cent.

According to the report of Bateman,³ this deportment of egg white noted in several species is by no means unknown in man. He cites numerous instances to show that raw eggs may cause diarrhea and vomiting, and that the utilization of the native whites in the human alimentary tract is often found to be as low as 50 per cent. All of this information may seem somewhat startling in view of the reputed prescription of raw eggs in dietotherapy and its recommendation by prominent writers in this field. Without quoting the seemingly fabulous advice of Ely⁴ that physicians should throw away their tonics and "lead the stomachs of their patients up to the egg-an-hour practice," we may remind our readers that the use of from six to twenty-four whites daily is still advocated in widely read texts on the therapy of tuberculosis, the advice being to employ the raw product.

It should be clearly understood that although it is not difficult to find indications of the poor utilization of native egg white, so that one wonders whether such indigestible protein may not frequently reach the large intestine and become pabulum for putrefactive bacteria, the same criticism does not apply to the cooked product. Heating to 70 C. (158 F.) removes the partial indigestibility and puts egg white into the category of readily assimilable nutrient. Acids and bases likewise can effect a change in the same direction. The resistant properties of the egg white appear to be associated with the albumin fraction. The effect is not peculiar to the egg of the common fowl, since it has likewise been observed after feeding uncooked egg white from the egg of the duck. In contrast to egg white, egg yolk appears to be well digested and utilized.

Various considerations now make the popular advocacy of raw eggs seem inadvisable. Bateman³ has summarized the problem as follows: "A substance which fails to stimulate a flow of gastric juice and is antipeptic, which hurries from the stomach, calls forth no flow of bile, and strongly resists the action of trypsin, which is poorly utilized and may cause diarrhea, has evidently little to recommend it as a foodstuff of preference for the sound person, let alone for the invalid. And when the native protein needs only to be coagulated at 70 C. in order to obviate almost all the effects mentioned, there appears to be still less.

1. Mendel, L. B., and Lewis, R. C.: Rate of Elimination of Nitrogen as Influenced by Diet Factors, *Jour. Biol. Chem.*, 1913, **16**, 55.

2. Bateman, W. G.: The Digestibility and Utilization of Egg Proteins, *Jour. Biol. Chem.*, 1916, **26**, 263.

3. Bateman, W. G.: The Use of Raw Eggs in Practical Dietetics, *Am. Jour. Med. Sc.*, 1917, **153**, 841.

4. Ely: The Fable of the Egg, *New York Med. Jour.*, 1903, **78**, 928.

reason for using it uncooked." This does not mean, of course, that raw egg is toxic in the correct sense of the word. The reputed relation of excess of egg white to renal damage and the frequent occurrence of hypersensitiveness to its proteins offer additional reasons for debating the wisdom of a liberal use of raw eggs.

EVERY DAY IS FISH DAY

In the search for new or little appreciated sources of palatable foods to meet the shortage that the war has brought to the entire civilized world, some consideration has already been given to fish. From a physiologic or nutritional standpoint, this type of animal food commends itself on account of its comparative richness in precisely those nutrients—proteins and fats—which at present command the highest prices. The fact that no special feeding or nurture is required to produce the common fish of our markets puts them into striking contrast, from an economic standpoint, to the various types of meat that are obtained as the result of the prolonged feeding of animals originally valued at a liberal price, through a period of growth and the process of finishing for the market. The cod, the mackerel and the shad, for example, require no management comparable to the methods of animal production in farm practice. The essential features of expense lie in the capture and marketing of the food.

Beef contains from 2 to 3 ounces (from 60 to 90 gm.) of protein per pound; fresh fish, such as cod, haddock, halibut, mackerel, perch, salmon and shad, furnish from 1½ to 2½ ounces, while the commoner dried fish contain as much as 3 ounces. From the standpoint of cost, on the other hand, 25 cents will purchase about as many calories of energy, and far more protein, when expended for salted cod at 15 cents a pound, and decidedly more nutrients when expended for smoked herring at 16 cents a pound, than can be obtained in the form of medium fat beef at 35 cents a pound. Admittedly it is not always justifiable to compare foods on the basis of price and calories alone, for there is a quality as well as a quantity factor involved. But with fish and other forms of flesh, the chemical features of the tissues are far more nearly alike than would be the case in a comparison of, let us say, corn meal and beef. For, after all, muscular tissue is chemically much the same in the vertebrate animals, the chief variations being in the unlike content of water or of fat.

Professor Ward¹ of the University of Illinois has pointed out that an entirely unjustified prejudice, or rather a series of prejudices, has stood in the way of the more widespread use of fish as food. In commending the new slogan, "Every day is fish day," Ward indicates the serious objection to the custom of

purchasing fish only on Friday. The work of the fisherman, he rightly says, covers more than a single day in the week, and to be efficient from the economic standpoint and satisfactory for the public, the fish business should be encouraged by the distribution of the demand over a larger part of the time.

The food purchasers of this country are losing valuable opportunities to extend the variety of edible products in this period of stress through an ignorance of the advantages or possibilities offered by some of the little used fishes. The prejudices engendered through ignorance or tradition in turn limit the satisfactory development of the fish-producing and fish-distributing industries. Even inland the opportunities are not so limited as is commonly supposed, so that a more liberal use of fish is not necessarily restricted to the regions bordering on the coast line of this country.² As instances of such neglected nutrient products Ward mentions the burbot, a fresh-water fish belonging to the cod family, which is sufficiently palatable to be regarded as a delicacy in continental Europe. The bowfin is a Mississippi basin fish that yields a smoked and salted product of satisfactory flavor. The carp, which is caught far inland, likewise has acquired an undeserved prejudice. Among ocean fish the tilefish and the sable-fish are destined to come into popular favor; while the rapidly increased demand for the grayfish, a new candidate for recognition in this country, though long used along the Mediterranean, suggests something in the nature of psychologic popularity promoted by the familiarity with whitefish and bluefish.

If butter substitutes can become popular despite the prejudice that was long created and maintained against them, if other cereals can win their way as competitors of wheat for popular favor in human nutrition, surely widespread reminders of the value of fish can and ought to create a demand for these wholesome products even in cases of little recognized merit. Strange names have not militated against many other novelties that have become household words. As Ward says, most families plan for fish once a week or less frequently; if they do not find just what they want available, they are apt to pass by, and meat is substituted. Thus for one cause or another the average fish consumption in the interior portion of the country falls far below that which obtains in the Old World, or that which should exist here when our extensive and splendid supply of fish food is taken into account. Fish are worthy of a more prominent place in the dietary despite the fact that they are not the unique "brain food" that an antiquated fancy would have them be, and despite the unsupported belief that they are concerned in the transmission of cancer. Like other perishable products they are liable to

1. Ward, H. B.: *The Housewife and the Fish Problem*, Jour. Home Economics, 1917, 9, 369.

2. The Bureau of Fisheries has recently published a series of economic circulars for the purpose of educating the public on the value of various fish and the best methods for preparing each kind.

objectionable decay; but this is not an insurmountable obstacle with present methods of food hygiene and practical conservation. Hence we accept the slogan, "Every day is fish day."

THE SIGNIFICANCE OF CREATINURIA

Although creatin cannot be called a normal constituent of the urine in the same sense in which the invariably occurring creatinin, urea or uric acid are so designated, it is nevertheless found under circumstances that are strictly physiologic in character. Creatin is present only occasionally and in small quantity in the urine of adult men. It occurs in the urine of women post partum, and is usually present in the urine of children in which it may be equivalent in amount to a considerable portion of the closely related creatinin. In disease, particularly such types as are attended with partial starvation, creatin is also likely to make its appearance in the kidney output.

The explanation of the origin of this unquestionably important product of metabolism has remained a puzzle for many years. Nothing is known of the function of the creatin in the muscle and other organs; and it cannot be stated even yet whether creatin is a waste product or a substance that plays some direct regulatory or constructive part in the workings of the tissues. Quite as undetermined is the meaning of the excretion of creatin under what apparently are very special physiologic conditions. Hypotheses have not been wanting.¹ Thus, Mendel and Rose, among others, have suggested as a result of their experiments on starving subjects that creatinuria is in some way closely connected with the metabolism of carbohydrates. The excretion can often be repressed by liberal feeding of sugar. The occurrence of creatin in the urine of diabetics has tended to substantiate this theory. McCollum and Steenbock have obtained results which point to a connection between creatinuria and protein metabolism. Recently Underhill has suggested the possible connection between creatinuria and acidosis.

The investigations of Denis² at the Massachusetts General Hospital tend to lend additional weight to the alleged intimate relation between creatin excretion and protein intake. As Denis points out, the conditions under which creatin excretion has been noted in man, namely, in starvation, in childhood, in pregnancy, in fevers, and in hyperthyroid disease, are all conditions accompanied by a high level of protein metabolism. The observations of Krause that small quantities of creatin are frequently found in the urine of women may also possibly be attributed to the relatively high

protein intake of women when considered from the standpoint of their muscular development.

It has been noticed that creatin sometimes occurs in the urine in cases of hyperthyroidism. Such patients often exhibit an insatiable appetite. Denis has now collected results in five cases of exophthalmic goiter in which it is shown that the amount of creatin excreted by these individuals is dependent on the intake of protein, being increased by high protein feeding and decreased or even eliminated by low protein feeding. Comparable results have now been obtained for children, in whom it is shown that the amount of creatin found in the urine is directly dependent on the intake of protein, being high when large quantities of protein (creatin-free) are ingested, decreasing and in some cases disappearing entirely when the child is fed on a diet of an extremely low protein content. As a working hypothesis it has been suggested that on the ingestion of protein some fraction of this is transformed into creatin, transported to the muscles, and there absorbed. If so much creatin is manufactured that the muscles become supersaturated, creatin is excreted by way of the kidney. What would constitute supersaturation would depend not only on the total mass of muscle, but also on the capacity for creatin absorption possessed by the muscles. Creatinuria in normal children is therefore due, the Boston investigators venture to assert, to the relatively high protein intake which is the rule with practically all children; that it may also be due to the low saturation point of immature muscle is suggested by the small creatin content of the muscles of children and by the relatively low level of protein consumption at which appreciable quantities of creatin are excreted. In the light of such intimations it is not impossible that the elimination of creatin, in contrast with creatinin, may in ultimate analysis furnish some physiologic index to the quantitative need of protein at various ages and in various conditions of well-being.

THE USE OF VOLATILE IRRITANTS IN COLLAPSE

Any one who has followed the results of the modern scientific study of drugs which have long had a place in empiric medicine must have been impressed with many unanticipated disillusionments. The alleged remedial virtues of more than one widely heralded "vegetable remedy" have persistently avoided the inquiring search of the unbiased therapeutic investigator. Alcohol, long vaunted in its various guises as a prince among stimulants, has been forced to accept the demonstrated rôle of a depressant. Alleged antiseptic washes have proved to retain essentially the hygienic value of cleansing water. The searchlight of truth has no respect for traditions, alone.

These lines are inspired by a timely investigation of the effects of volatile irritants which are among the sub-

1. Some of these are summarized by Denis, W., and Kramer, J. G.: The Influence of Protein Intake on Creatine Excretion in Children, *Jour. Biol. Chem.*, 1917, **30**, 189, from which those mentioned above are quoted.

2. Denis, W.: The Influence of the Protein Intake on the Excretion of Creatine in Man, *Jour. Biol. Chem.*, 1917, **30**, 47. Denis, W., and Kramer, J. G.: The Influence of Protein Intake on Creatine Excretion in Children, *ibid.*, p. 189.

stances in common use to combat conditions of threatened or actual circulatory failure.¹ It has truly been said that the clinical use of the so-called circulatory stimulants, such as the volatile substances of a highly irritant nature which are given by subcutaneous or intramuscular injection in shock or allied conditions, is based, not on exact experimental observation, but on casual bedside impression and tradition. It is conceivable that they may act directly on the circulation; or they may provoke a reflex action as a result of the intense irritation of sensory nerve endings which is well known to lead to rise in blood pressure.

At the Department of Pharmacology in the College of Physicians and Surgeons, New York, Lieb and Herrick¹ have watched the effects of injections of alcohol, ether, camphor and ether, camphor and oil, and turpentine in animals decerebrated so that the pain factor would be entirely excluded. When these irritants were introduced directly into the blood stream no direct action on the circulation, other than threatened or actual collapse, could be observed. Injections at various regions of the skin provoked a reflex rise in blood pressure. The sensibility of the sites varied in accord with earlier observations on the comparative sensibility of various parts of the body surface, in the following tested order: (1) the nasal septum; (2) pads of the feet; (3) pads of the hands, and (4) the general body surface. The duration of the response was brief at best, usually less than fifteen minutes, and often so transient that only a few seconds were involved. Any measure which destroyed or profoundly depressed the function of any part of the reflex arc involved prevented any blood pressure raising effect from the subcutaneous injection of the volatile irritants. The investigators, therefore, cannot escape the conviction that the transitory rise in pressure which these medicaments produce is entirely reflex in character. The heart plays little or no part in the process, the response being effected through the vasomotor apparatus.

It seems impossible to overlook the bearing of such carefully controlled observations on the use of camphor in oil, alcohol, and allied irritants in clinical routine. They may find a place in cases in which, as the New York pharmacologists express it, with cutaneous sensibility present and reflex irritability preserved, an irritant injection may rouse flagging energies for a momentary emergency. Yet in conditions of abolished reflex irritability, as in anesthesia and shock, the effect is nullified; and in conditions of hemorrhage with falling blood pressure the irritants are of little avail. The possibility of actually inducing shock by the traumatism of the injections should not be lost sight of. For the clinician we must therefore commend a careful consideration of these statements of Lieb and Herrick: In circulatory deficiencies, the

result of traumatic or toxic insult to the central nervous system, an irritant injection may fairly be called an added burden and may well accelerate oncoming shock. It is a two edged sword and may be an instrument of collapse. The use of such a measure to stimulate an anesthetized or profoundly prostrated or unconscious patient has no experimental justification. This places a serious burden of proof on the clinical enthusiast.

Current Comment

A BRITISH COMMITTEE OF INQUIRY

August 3 the Central Medical War Committee, which acts as an advisory body to the English government on medical matters connected with the war, addressed a note to the Secretary of State for War informing him that in its opinion no more medical men could be called on, to take commissions in the Royal Army Medical Corps without seriously endangering the supply of physicians for the treatment of the civil community, and that further depletion would only be effected on the responsibility of the government after carefully comparing the military with the civil needs. Following this a series of questions were addressed to the War Office and the House of Commons by a member of the latter in which it was alleged that the number of medical officers claimed by the military authorities for use abroad and at home was in excess of actual requirements. Our readers may remember that some time ago we published a rather long abstract of a report on conditions medical in France by Lord Charnwood. This, if we mistake not, was supposed to be an exhaustive report and one that would satisfy those who were criticizing the British medical military administration. This, however, does not appear to have been the case. A Committee of Inquiry into the Army Medical Service has been constituted, and has gone to France.

It has been directed to inquire into various matters connected with the personnel and administration of the Army Medical Service in France, and afterward to carry out similar investigations in the United Kingdom. The committee consists¹ of a general officer who has held many important military commands in peace and war, Sir Francis Howard, and the secretary,

1. The Committee of Inquiry is composed of the following members: Major-General Sir Francis Howard, K. C. B., K. C. M. G. (chairman); Sir Rickman John Godlee, Bt., K.C.V.O.; Sir Frederick Taylor, Bt.; Sir William Watson Cheyne, Bt., K.C.M.G., C.B., M.P.; Lieut.-Col. H. J. Stiles, M.B., C.M., F.R.C.S.; Dr. Charles Buttar; Dr. Norman Walker; and Dr. J. B. Christopherson, F.R.C.S., F.R.C.P. (secretary). Sir Francis Howard, who distinguished himself in the Sudan campaign of 1898 and during the South African war, was Commander-in-Chief of the Western Command in 1905-7, and Inspector of Infantry 1914-15. Sir Rickman Godlee, Sir Frederick Taylor, and Dr. Buttar are members of the Central Medical War Committee, the last named being Chairman of its Executive Committee. Sir Watson Cheyne, who is a consulting surgeon R.N., as well as M.P. for the Universities of Edinburgh and St. Andrews, is a member of the Reference Committee of the Royal Colleges in England, as are also Sir Rickman Godlee and Sir Frederick Taylor. Dr. Norman Walker is convener of the Scottish Medical Service Emergency Committee. Lieut.-Colonel Harold J. Stiles is the well-known Edinburgh surgeon who in addition to other war work is Deputy Inspector of Military Orthopedics (for Scotland). Dr. Christopherson, the secretary, saw service during the South African war, and is Director of the Khartoum and Omdurman Civil General Hospitals.

1. Lieb, C. C., and Herrick, W. W.: The Reflex Action of Volatile Irritants on the Circulation, Arch. Int. Med., May, 1917, p. 811.

Dr. Christopherson, well known for research work and as an administrator in the Sudan. Of the six medical members, five are members of one or more of the committees which act in an advisory capacity to the Army Medical Department, the Central Medical War Committee, the Committee of Reference of the Royal Colleges in England, and the Scottish Medical Service Emergency Committee. There is no doubt that this committee will secure much information of value to the British government and to its allies.

"O WAD SOME POWER . . ."

This pertinent comment and well deserved criticism appeared in a recent issue of the *New York Medical Journal*:

The logic of the advertiser, particularly a certain sort of advertiser, is indeed weird. In an advertisement of a health (?) food in the *American Review of Reviews* for August we find a testimonial from Arnold Bennett, as follows: "The tonic effect of ——— is simply wonderful!" The advertiser then goes on coolly to say, "In the face of such unparalleled proof, etc."

And turning listlessly through the advertising pages of the same issue of the *New York Medical Journal* we select, from many of the same type, an advertisement of "Ammonol, The Stimulant, *Ethical* Antipyretic and Analgesic." There we learn, in part, that this very ordinary mixture of acetanilid, ammonium carbonate and baking soda "is a specific in Fevers, Neuralgia, Atonic Dyspepsia, Pneumonia, Gastralgia, Bronchitis, Coryza, Catarrhal Influenza, La Grippe, Rheumatism, Hysteria, Alcoholism, Amenorrhea, Dysmenorrhea, Uterine and Intestinal Colic, Obstinate Vomiting, Catarrh of the Bile Ducts and Jaundice." Then we appreciated that, as the *New York Medical Journal* said, "the logic of the advertiser, particularly a certain sort of advertiser, is indeed weird." We would also hazard that the logic of certain editorial writers — possibly it would be more correct to say publishers — is also weird. Or is it possible that our contemporary obeys the injunction, Let not thine editorial right hand know what thine advertising left hand doeth?

THE LIE WITH CIRCUMSTANCE

"The Commissioner of Health directs me to call to your attention the enclosed advertisement issued by T. B. Wheeler, M.D., Company, Montreal, Canada, in which the name of the Association's JOURNAL is being used."

Accompanying this brief note to THE JOURNAL from the secretary of Dr. Haven Emerson, Commissioner of the Department of Health of the City of New York, was a four page leaflet devoted to the exploitation of "Wheeler's Tissue Phosphates." The trend of the circular is to lead the average reader to infer that THE JOURNAL of the American Medical Association has endorsed Wheeler's Tissue Phosphates. For example, in describing the preparation one reads:

"It embodies . . . the best recent scientific opinion concerning the treatment of the disease (tuberculosis) as stated . . . by the official JOURNAL A. M. A."

Elsewhere in the circular THE JOURNAL's criticisms of the hypophosphites and the glycerophosphates (proprietary preparations which are competitors of the Wheeler product) are quoted and twisted into a tribute to the ingredients of Wheeler's Tissue Phosphates. Garbling quotations, distorting statements, separating phrases from their contexts and omitting qualifying clauses, all for the purpose of making out a case for some proprietary remedy is a trick as old as quackery itself. That it should be used in advertising Wheeler's Tissue Phosphates is entirely fitting. Obviously, the T. B. Wheeler, M.D., Company esteems the opinion of THE JOURNAL on pharmacologic matters. This being the case, it should, in the interest of truth and scientific accuracy, publish in its advertising circulars just what THE JOURNAL has said about Wheeler's Tissue Phosphates. It could not do this better than by quoting from a recent editorial note which commented on a report of the Chemical Laboratory on this preparation.¹ Here is part of the THE JOURNAL's comment:

"'Wheeler's Tissue Phosphates' is an unscientific shotgun mixture whose most active and powerful drug is the alcohol it contains. That it was not years ago relegated to the realms of obsolete and discarded preparations is a commentary alike on the lack of scientific discrimination and on the power of advertising."

Here we have "Wheeler's Tissue Phosphates" stripped of the verbal camouflage with which its exploiters have invested it.

AMERICA—THE MEDICAL MILITARY UTOPIA

Under the heading "Medical Activity in America," the *Medical Press and Circular* comments:

The rapid strides that medical organization has taken in the few months since the declaration of war, are a source of wonder to the slower moving bodies on this side of the Atlantic. 'Sinapis,' in a leader of some weeks ago, alluded to the absolute necessity of having medical representation in Parliament if organized medical effort is ever to be effective here. In hoping that we may be able soon to thank fortuitous circumstance for such a blessing, we symbolize the nature of our progress under tradition-bound administration. In the States, the lessons of the Spanish-American war were not forgotten, and the inclusion of numerous medical men in the highest war councils was the first step toward an almost magical transformation in medical circles that has become a reality, even though immense distances and scattered cities militated against easy organization. These results are seen in every American medical journal that reaches us. Base hospitals in large numbers have arrived at the Front, many thousands of surgeons and physicians have gone to France secure in the knowledge that all has been done by the State to safeguard their interests in every way. Not only have the medical rank and file been mobilized and prepared, but the governing provisional councils have laid out a program which includes a most detailed preparation for the medical requirements of a great army, from provision as to hastening medical graduation, to the establishment of special colleges for the immediate education of nurses, and of all who can possibly be trained to lighten the work thrown upon the men who are left behind. And all this has taken place without a hitch, while here, whole countrysides are deprived of medical aid, while the powers that be content themselves with a policy of steady negation without the saving clause of an alternative method.

"And all this has taken place without a hitch." Who could believe it? Apparently it is necessary to go

1. Wheeler's Tissue Phosphates, THE JOURNAL A. M. A., May 5, 1917, p. 1337.

abroad to find out what is going on at home. We thought that *THE JOURNAL* was keeping up; now we see that it is hopelessly behind and we despair of ever catching up with the speedy progress outlined by our British contemporary.

GERMANY AND SURGICAL PROGRESS

Many years ago the late Dr. Nicholas Senn said that America led the world in surgical achievement. We have been led to believe by others that Germany was the fountain head of surgical knowledge and the source of all scientific wisdom. Sir Berkeley Moynihan is inclined to disagree so far as Germany is concerned. In a recent article¹ he asks:

"What, then, has been Germany's part in all the astounding progress of modern surgery? It has been the same in surgery as in every other science. Almost all fundamental discoveries in science, Dugald Clark tells us, have originated in England, France and Italy. In capacity for original thought the German mind is lacking. The brilliant and happy inspiration, the penetrating insight, the new vision are things for which we seek almost in vain in all German scientific literature. The fertile new thought giving a fructifying impulse to the work of others is rarely indeed of German origin. The German mind is of quite a different order. It is avaricious, industrious, methodical; it collects, if it does not accurately appraise, the work of others. It tabulates and registers and explains; it furnishes an intricate analysis, and illustrates by copious reference any subject with which it may deal. The new idea, originating almost always elsewhere, is given eager hospitality, is dissected and discussed at inordinate length; it may be put into practice with various alterations of technical procedure, and before long is claimed as a home product."

For this act of intellectual dishonesty Sir Berkeley Moynihan would not blame many of the German writers, although a study of the literature of almost any subject in medicine, chosen at random, will show the amazing infrequency of any reference to English or American literature, and very few indeed to the French.

1. *The Institutes of Surgery*, Brit. Med. Jour., Aug. 11, 1917, p. 171.

Physiologic Observations on Body Temperature.—The temperature of the human body is not constant, but is known to exhibit a distinct cycle during the twenty-four hours, the maximum appearing between 4 p. m. and 8 p. m., and the minimum between 2 a. m. and 6 a. m. The difference, although the actual maxima and minima are not the same in different persons, may be said to be between 1 and 2 degrees F. The natural explanation of this cycle is that it reflects the diurnal variations of bodily combustion, in particular that going on in the muscles; and this surmise is borne out by numerous observations, such as those of Simpson and Johansson to the effect that absolute muscular rest in the fasting condition greatly reduces the amplitude of the daily variation. Gibson, Osborne and Simpson have also shown that the temperature cycle conforms to local time; that is to say, if a person's day maximum has been found to occur at 6 p. m. (New York time) in New York, it still occurs at 6 p. m. (Greenwich time) when he comes to Glasgow, and not at 1 p. m., as it should were the rhythm independent of bodily activities. It ought, therefore, to follow that the temperature cycle in a man who works at night and sleeps by day is reversed, the maximum appearing in the early morning and the minimum in the early evening. Some observers, such as Jaeger, who reported on army bakers, claimed that the expected reversal really occurred; but their methods were inexact, and the careful observations of Benedict led to the conclusion that the curve was modified, but not reversed.—Report of British Health of Munition Workers Committee, July, 1917.

Medical Mobilization and the War

EXEMPTION OF MEDICAL STUDENTS AND INTERNS

Regulations Concerning Procedure

Additional methods of procedure for carrying out the regulations prescribed by the President for exempting medical students and hospital interns (*THE JOURNAL*, Sept. 8, 1917, page 830; also, Sept. 15, 1917, page 917) have just been issued by the Surgeon-General's Office.

APPLICATION OF INTERN OR STUDENT NOT CALLED

Interns and students who shall not have been called by a local board may enlist in the Medical Enlisted Reserve Corps, such enlistment entitling them to discharge from draft if thereafter called.

An application for enlistment under this paragraph must be forwarded to the Surgeon-General with the affidavit of the applicant, supported by the certificates of his school authorities, showing his present status as intern or student, and particularly how long he has been an intern in the one case, or the year of the medical course that he is pursuing in the other.

INTERNSHIP LIMITED TO ONE YEAR

An intern who has served one year or more as such will not be enlisted in the Medical Enlisted Reserve Corps under this regulation.

MAY ENLIST LATER IN MEDICAL RESERVE CORPS

An intern who is enlisted in the Medical Enlisted Reserve Corps hereunder will be called into active service under his enlistment, if his services are needed, at the end of one year of internship. Applications for commission in the Medical Reserve Corps, from interns who at the expiration of one year's internship are called for duty as members of the Medical Enlisted Reserve Corps, or from interns whose year of internship is about to expire, will receive proper consideration.

MEDICAL STUDENT MUST COMPLETE COURSE

A medical student (undergraduate) who is enlisted in the Medical Enlisted Reserve Corps hereunder will be called into active service under his enlistment, if his services are needed, on failing to pass from one class to another, or on failing to graduate.

THOSE CALLED BY DRAFT BOARD

Interns and students who shall have been called for service by a local board under the selective draft law, may be discharged from the draft, on condition that they shall enlist in the Medical Enlisted Reserve Corps.

CALL TO ACTIVE DUTY

It will be the policy of the Surgeon-General as a rule to recommend discharge from the draft on the condition indicated, the discharge to be followed by a call to active duty under the enlistment in the Medical Enlisted Reserve Corps at the expiration of a complete year of internship or on the failure of the student (undergraduate) to pass to the next higher class or to graduate.

REPORTS OF STATUS NECESSARY

Interns and students who are enlisted in the Medical Enlisted Reserve Corps by virtue of these regulations, and are not called into active service under such enlistments, are required to report their status to the Surgeon-General as follows:

Interns, at the end of each three months' period, such report to show the total amount of internship since graduation, and to be countersigned and attested by the medical superintendent of the hospital.

Students, at the end of each semester, such reports to show whether the students qualified for advancement, and to be countersigned by the deans of their respective schools or by subordinate officers representing the deans.

RECOGNIZED INTERNSHIPS

In the execution of these regulations the department will not recognize internships in hospitals, sanatoriums or other institutions conducted for profit, or in small private hospitals (fifty beds or less), or new internships established or added since May 18, 1917, to those previously existing, at any hospital, excepting such as may have been newly established and added by reason of a proportional increase in the bed capacity of such hospital; nor will it recognize internships in the case of any graduate appointed thereto later than August 1 following his graduation.

NEWS OF THE TRAINING CAMPS

At Fort Benjamin Harrison

Changes continue the rule in almost every company of the training camp. Two of the companies have lost two of their four instructors, while two others have lost their entire instructing staff, the officers concerned being in every instance recalled to their National Guard units. There have been two new companies formed, and one of the original companies has been split up and distributed among the others. The total number of student officers, including those attached to detached units, is 1,203.

PISTOL PRACTICE

Pistol practice has now been indulged in by all the older companies. The story is current among medical circles in the Army that permission to use the range in the past has been denied the medical brethren because general anxiety was felt lest their marksmanship should grow to exceed their professional skill and render them dangerous rivals to their fellow officers of the line. This makes a good story, but it would hardly seem justified in point of fact, if we are to judge from the majority of the scores registered in the recent trials. A great deal of credit, however, must be given to those officers who through incessant patience and vigilance were able to carry the trials through without the occurrence of any untoward incident.

EQUITATION

Equitation continues to absorb the attention of those of the companies which have been fortunate enough to reach that part of the camp schedule. It is surprising to learn how many of the men have never ridden a horse before, but it must be gratifying to Major Snyder under the circumstances to see how well these initiates manage to stick on. From all accounts the instruction is highly practical, to say the least of it.

LECTURES

An illustrated lecture was given during the early part of the week of September 9, on the subject of "Typhus in Serbia," by Lieutenant Mitchell, who was sent out under the auspices of the American Red Cross after the preventive measures instituted by the American commission had accomplished their end. His description of the enormously high incidence of the disease at the height of the epidemic was startling and went far to emphasize the acknowledged achievements of Dr. Strong and his associates.

One of the instruction companies had the privilege of listening to a splendid address by M. Jean Alcide Picard of the French Quartermaster Corps, formerly a lieutenant of infantry at Verdun, on the subject of pro-German propaganda. His suggestions for the suppression of propagandists were interesting, especially in that they showed how great an importance is attached to this phase of enemy activity by our transatlantic allies. M. Picard is at present traveling under the auspices of the Young Men's Christian Association, and spends all his time addressing troops in the various camps and cantonments.

A description of the Albee technic for bone-graft surgery was read to the student officers, followed by a moving-picture reel illustrating a transplant of bone from the tibia to a fractured humerus.

PERSONAL

Capt. Russell M. Wilder, assistant adjutant, is still absent on leave, but is expected to return shortly.

Lieut.-Cols. van Pool and Shockley have been assigned to duty at the training camp as instructors.

Capt. E. B. Moss and Trautman and Lieutenants Burt, Cromwell, Mead, Ross, Boyle, Lewis, Hayes, R. Ballantyne and Martin have been relieved of duty as instructors and ordered to rejoin their respective commands.

Major C. Frothingham, M. R. C., has been appointed instructor of Company 11, and is to be assisted by Lieuts. A. Bowen and E. W. Phillips.

Lieut. M. C. James has been appointed instructor of Company 8, to replace the officers ordered away.

COMPANY NEWS

Company 2 has been so depleted by assignments of its members to detached commands that the remnants were scattered on Saturday, September 15, and distributed between the various other companies. On Saturday night the remaining members gave a farewell dinner in honor of Major Baehr, the company instructor, at the Hotel Severin, Indianapolis.

Companies 4 and 7 bivouacked together one night last week on the estate of Capt. F. Hutchins. Their example was

followed later by Companies 1 and 5. The camp was named Camp Scott in honor of Colonel Scott, who planned and led the expeditions.

Company 8 was given a lecture and practical demonstration of the method of erecting a field hospital by Major Creighton last week. This exercise proved most instructive.

At Fort Oglethorpe

Doctors, short and tall, thin and stout, old and young, optimists and pessimists, a conglomerate mass, 1,200 of them, down here to do their bit and incidentally to get a new grip on life: they go at things with an avidity that is surprising. They all realize that this is the opportunity of their lives to give abused bodies and minds a new lease on life. The majority are woefully "out of whack." Sedentary life has put some of them in the invalid class but few are so far gone that they have "cut their bridges behind them." What a jolt they get when they are informed right at the beginning of the course of instruction that their new duties will be 95 per cent. military and 5 per cent. medical! They are here to receive orders and not to give them and this makes them feel that "the worm has turned."

At 5:45 a. m. the recruit is routed out of bed to go through a series of setting-up exercises. He strips of all superfluous clothing and for twenty minutes he squats, bends, twists, squirms, crawls, hops, jumps till he cries enough. During this period the enthusiasm is unbounded and the recruit returns to the barracks rejuvenated and with a feeling of well being that he had not known was possible. A month of this work does wonders. Protuberant abdomens disappear, and the protuberance appears higher up between the shoulders. Stiffness gives way to elasticity, and coordination takes the place of awkwardness. The doctor undergoes a metamorphosis so that his patients would not recognize him. One prominent physician from Philadelphia lost 25 pounds in weight, reduced his waist measure 9 inches and improved his general appearance to such a degree that when he went home on a leave of absence, his children hung on to his wife's skirts and wanted to know who that strange man was.

The *esprit* in this camp is splendid and I have seen very few individuals who had the proverbial "streak of yellow." Every man does his work (and it is real work), uncomplainingly and ungrudgingly. All feel that they are interested in a common cause and each man is putting his shoulder to the wheel.

Our working day is not determined by any labor union; we are at hammer and tongs from sunrise to sunset. Between setting-up exercises, drills, lectures, quizzes, French and other studies, we have no time to give way to morbid introspection. The mess call is the most popular call in camp. Food never tasted so good as it does here in camp. This is due in part to the fact that combustion in each one of us is very active, but the food is judiciously selected, properly prepared and with the right combinations in the menu. The physical training of the camp is under the supervision of Capt. Albert McConaghy of Philadelphia. His methods of whipping men into shape are unique and are based on sound physiologic principles. He explains that it is his purpose "to so guide and direct the doctors along the lines which make for a healthy action of all the functions of the body, combined with a proportionate symmetrical development, as to produce that fulness of bodily health and muscular activity which are the natural birthright of every normal man, woman and child."

At Fort Riley

There are today 1,020 physicians from private life undergoing training in this camp. It is a big melting pot, into which professional men from all parts of the country, of every degree of standing, are thrust for three months—more or less—intensive instruction and drill to be transformed into officers for the Army. It is a big task. To take Dr. Brown of Paducah Center, Neb., away from his country practice and from the comforts and coddling of his family and subject him to the discipline and discomfort of a soldier—to teach a man who has been accustomed to submit to no superior control to sink his individuality and become an efficient unit in Uncle Sam's great war machine—this is the task the Medical Department of the United States Army is performing here.

The first lesson, and perhaps the hardest, for the doctors to learn is that they are no longer doctors but army officers. They have not only to learn how to act as such, but the military spirit must become a habitual attitude of mind.

They must learn how to obey commands instinctively and unquestioningly so they may be able to command such instructive and unquestioning obedience from the men who are to be placed under their control. The majority of these medical reserve officers are to command units of the medical department of the new conscript army, and on them will devolve the responsibility for the efficiency of these units in the field of operations. They must learn how to provide rations, clothing and shelter for their men, they must learn how to obtain and account for their medical supplies, they must learn all the details of field army operations so that their units may coordinate perfectly with the line organization in combat. Knowledge of medical and surgical technic is of subsidiary importance. The Army takes it for granted that all of us already are sufficiently well equipped as professional men. It is of the highest importance, however, that an officer should know how many rations each of his men is entitled to and where they come from, where he is to obtain his medical supplies, and how he is to dispose of his sick and wounded.

As soon as this fact percolates into the reserve doctor's mind, he understands the significance of the training given him here, and enters into the work with a loyalty and good will that produce rapid results. It is a strenuous life. The first note of the bugle sounds at 5:15 a. m., and from then till taps at 10 p. m., the student officer has hardly a moment of leisure. There are two hours of drill. No matter how hot the day, back and forth the one-time doctors tramp. It is "fours right" and "about face"—over and over again—and the drill instructors explain and explain again the movements and then scold and storm because awkward feet do not promptly obey the command. Then there are classes in which the instructors try to cram into the heads of their pupils the dry and intricate details of army organization and field tactics. One of the biggest tasks is to learn the exact minutiae required in Army correspondence. To the average physician, who notoriously is careless in the keeping of accounts and records, this is doubly difficult. But it must be learned. To the dotting of an "i" and the crossing of a "t" the Adjutant-General's Office requires the most painstaking attention to detail in the making out of reports, requisitions, etc. Any inattention to detail is sure to bring the letter or report back for correction. And Uncle Sam keeps a watchful eye on all of his property. Every tent peg, every penny must be accounted for.

What perhaps impresses the student medical officer most strikingly here is the physical training. Most of them come here with flabby muscles and protuberant abdomens, stooped shoulders and weak calves. They have ridden in automobiles, eaten heartily, smoked heavily and perhaps were accustomed to a good deal of alcoholic stimulation and have never taken any exercise to amount to anything. Here the first thing every morning is physical exercise when a lot of muscles whose use had almost been forgotten through neglect are again brought into play; and the last thing in the afternoon is an hour and a half of "hiking" over the hills, facetiously called "equitation." So far, few of the officers have got anywhere near a horse. It is "shank's mare" they ride, and a poor steed she proves to be at first. We doctors are not only made to walk, but we are run until our tongues hang out and the sweat streams down our backs and soaks through our puttees. Many of the heavy weights straggle by the wayside, winded, and all except the young men come in thoroughly tired. But a cold shower has surprising restorative powers, and after a hearty supper and a night's sound sleep, few there are who do not awaken fresh and vigorous for another day's grind. Men who have been here since June are brown and hard, trained to a physical efficiency that will be able to undergo any test the battlefields of France may offer.

It is not like home here. It is no picnic. It is a foretaste of war; and we can expect that Sherman's dictum will prove true. An Army reserve officer who expects to have a private room with bath and linen and silver dining table service had better disabuse himself of the idea at once. Here they live in barracks built a good deal like sheep sheds, 130 men to each barracks, and crowded so closely that only about 12 inches is allowed between cots. In the mess halls there is hardly elbow room and, of course, the furniture is of the crudest sort. But the food is good and plentiful, and the hard exercise and outdoor life give keen appetites and excellent digestions. Under such conditions, dyspepsia is almost unknown. Should these student officers never see a battlefield, this physical training will be of inestimable value to them. They will have learned how to keep strong and healthy.

An Oculist in a Cantonment Camp

The following is part of a letter from Dr. Casey A. Wood of Chicago, who writes from Camp Sherman, Chillicothe, Ohio. The letter was not written for publication.

"It is rather hard on the old man to rise at 5:30 in a 'well ventilated,' fireless building and go outdoors to another, also fireless, building for washing purposes, including an ice-cold shower bath if one has the heart and nervous system for it. It will require one week more of work to finish our special eye, ear, nose and throat hospital, but when it is equipped it will be admirably adapted to our needs. As there are only about 4,000 troops here, I have had very little to do, except to get acquainted with my surroundings and my colleagues—among the latter are our genial and hard working commander, Major Kinnard; C. R. Holmes of Cincinnati; J. A. Harvey of Chicago; Roger S. Morris and Alfred Friedlander of Cincinnati; Charles E. Barnett of Fort Wayne, and many others. The hospital has 1,000 (expansible to 1,500) beds, comprising 55 buildings, all connected by glassed-in corridors. The officers' quarters are good and the victuals of the best. We expect to get into permanent quarters, with a real table, chair and perhaps bed—I would like a cot just as well—and wash-stand, in about ten days. Sanderson's Evanston and N. W. University Unit volunteered in a body today; they are quartered next to our building, to act as noncommissioned and privates. We need about 400 in the Base Hospital Service. Outside, the 4,000 are drilling, drilling from morn to eve. Officers say they are more enthusiastic than regulars."

MILITARY SURGEONS AND CIVILIAN GUESTS TO HOLD SPECIAL MEETING AT FORT BENJAMIN HARRISON

CAMP FIRE AND BARBECUE

The Association of Military Surgeons will hold its annual meeting in the Medical Officers' Training Camp at Fort Benjamin Harrison, near Indianapolis, Ind., October 8 to 10. Aside from the papers to be furnished by the program committee there will be much of interest to all physicians in the exhibition of the work of training of physicians to become medical officers which is going on at this camp. There will be displays of the organization and field work of regimental detachments, field hospitals and evacuation hospitals. Instead of the usual social diversions and receptions accompanying the meetings of the association, it is planned to have the evenings spent in the open about great camp fires with songs, vaudeville and talks by officers who have had service in the present war. For one evening a big barbecue is planned.

SPECIAL ARRANGEMENTS FOR CIVILIAN PHYSICIANS

Civilian physicians will be welcome to attend the meetings, and those bringing their own blankets or cots and mattresses can be accommodated with lodging and food in the camp at a cost of \$1 per day. The number of officers in the camp at this time, together with the visitors, will exceed 1,300.

Physicians Recommended for Commission in Reserve Corps

During the week ending Sept. 15, 1917, 420 physicians were recommended to the Adjutant-General of the Army for commission in the Medical Reserve Corps, the proportion being eleven majors, fifty captains and 359 lieutenants.

Red Cross Division for Work in Belgium

A special department under the American Red Cross Commission to France to direct all Red Cross activities in Belgium was recently announced. Dr. Ernest P. Bicknell, formerly director-general of the civil relief of the American Red Cross and now deputy commissioner to Europe, is to be placed in charge of the work in Belgium. Assisting Dr. Bicknell will be Rev. John Van Schaik of Washington, D. C.

Intensive Training in Orthopedic Surgery for Special Medical Officers

For those members of the Medical Officers Reserve Corps, or those intending to apply for commission, who have had only a general surgical training and who desire to be assigned to the orthopedic service of the Army, a course of intensive instruction in the fundamentals of orthopedic surgery, as

related to the military service, has been arranged. This course is of about six weeks' duration, and will be given at various universities. Those interested may obtain full information from Major E. G. Bracket, director of the Department of Military Orthopedic Surgery, Surgeon-General's Office, Washington, D. C.

Red Cross Issues Manuals for Making Surgical Dressings

The American National Red Cross has issued 500,000 manuals on the making of surgical dressings. These are now being sent out to the various Red Cross chapters throughout the country. The manual was prepared by Dr. John A. Hartwell, New York, and a committee of surgeons, nurses and lay workers, on the basis of recent hospital experience both in this country and in the war zone.

Casualties in Base Hospital No. 5

The War Department announces the following supplementary list of wounded at Base Hospital No. 5 following the air raid, September 4, at 11 p. m.: Lieuts. Ray W. Whidden, M. R. C., New York; Thaddeus D. Smith, M. R. C., Neenah, Wis.; Clarence A. McGuire, M. R. C., Kansas City, Mo. It was in this same attack that Lieut. William D. Fitzsimmons, M. R. C., of Kansas City was killed. Two privates of the medical department and one of the medical enlisted reserve corps were killed, and several other privates and nurses were wounded.

St. Louis Contribution to the Medical Reserve Corps

The last number of the weekly *Bulletin* of the St. Louis Medical Society states that out of its membership of 850, 134 have applied for commission in the Medical Reserve Corps. Their names are listed in the *Bulletin*, and those who are already in active service are indicated. There are sixty-nine of the latter. This shows who are not slackers in the St. Louis Medical Society. We commend to other societies that issue bulletins this idea of publishing the names of those who have accepted commission in the Medical Reserve Corps.

Medical Sections of State Councils of National Defense to Meet

The Committee on State Activities and Examinations of the General Medical Board has decided to bring together for conference the members of the various state committees, medical section, Council of National Defense at the Clinical Congress of Surgeons of North America which is to be held the week of October 22 in Chicago.

The committees will assemble on October 22 in the hall provided for the purpose in the Congress Hotel of Chicago, where booths will be assigned to each committee. Here they may receive and give information to medical men attending the congress from their respective states, and arrangements will be made to conduct examinations for enrolment in the Medical Reserve Corps.

On the afternoon of October 23, a general business meeting of the committees will be held with the chairman, Dr. Edward Martin, presiding, at which time matters of importance will be discussed and provisions made for a later meeting in the week to carry out plans that may be necessary as a result of the discussion at the preliminary meeting.

Organization of Senior Military Medical Association

Surgeon-General Gorgas recently called a representative committee of the older physicians to Washington for conference, and it was there arranged that an organization of the physicians past the age of 50 years (the age limit for admission to the Army and Navy Reserve Medical Corps) should be formed, and that it should also admit physicians under 55 years if they are kept at home by reason of teaching in medical schools or being unable to pass the severe medical examination required for admission to said Medical Corps. At this meeting the Senior Military Medical Association was formed. The purpose of the association, it is stated, is to serve the government by performing such medical work as the members are capable of, especially at or near the member's residence. Its members mostly can do only part-time work, but some are able to go from home and do full-time service. The arrangement will probably be a contract with the government to do special service, with a military grading.

The pay will be according to the grading and work performed. It is felt that the members of the association can act as consultants in general and special physical conditions of recruits and conscripted men; also, in matters of sanitation and hygiene, and in making general physical examinations and mental and special examinations and in working in local hospitals or established places or cantonments where the sick or injured men may be sent; or those where fitness may be brought about in men medically rejected from admission to the service; also in performing any other work they may be capable of by the direction of the government.

Men may apply for admission to the S. M. M. A. by filling out the blank card which will be supplied on request to Dr. Alexis Dupont Smith, secretary, and returning it properly filled out with \$1, the annual dues made necessary to cover postage and incidental expenses.

For the present, residential limit of eligibility for membership includes Pennsylvania, New Jersey, Delaware and Maryland. When points remote from Philadelphia have organized units or branches of the S. M. M. A., membership may be transferred.

The following officers were elected: president, Dr. W. W. Keen; secretary-treasurer, Dr. C. B. Longenecker; chairman, executive committee, Dr. William Duffield Robinson, all of Philadelphia, and secretary, executive committee, Dr. Alexis D. Smith, 5926 Greene Street, Germantown.

Orders to Officers of the Medical Corps

Col. G. A. Skinner, M. C., in addition to his other duties, is designated as post surgeon, Fort Sam Houston, Texas.

Lieut.-Col. T. L. Rhoads, M. C., to Syracuse, N. Y., reorganization camp, for duty.

Capt. Francis X. Strong, M. C., from El Paso, Texas, to Washington for duty.

Lieut.-Col. Louis T. Hess to duty at Charleston, S. C.

Capt. A. D. Davis, M. C., to Tenaflly, N. J., for duty as camp sanitary officer during the construction of cantonment at that place.

First Lieuts. R. D. Bryson, E. B. Erskine and C. O. Reed, M. C., Neb. N. G., to Nebraska N. G., Field Hospital No. 1, Fort Riley, for duty.

Col. Guy L. Edie, M. C., is relieved from the further operation of Par. 35, S. O. 296, Dec. 19, 1916, War D.

Lieut.-Col. H. H. Baily, M. C., to Camp Grant, Rockford, Ill., 86th Div., for duty.

The promotion of Major E. B. Vedder, M. C., to be lieutenant-colonel in Medical Corps from May 15, 1917, is announced.

Officers of M. C. to duty as follows: Lieut.-Col. Orville G. Brown to Camp Greene, Charlotte, N. C., 41st Division, as chief surgeon; Major L. O. Tarleton to Tenaflly, N. J., for duty as camp sanitary officer during construction of cantonment.

Capt. A. D. Davis, M. C., to Linda Vista, Calif., Camp Kearny, for duty.

First Lieut. Robert H. Wilds, M. C., to Manila for duty.

Orders to Officers of the Sanitary Corps

First Lieut. A. W. Gauger, San. Corps, to Fort Sill, Okla. for duty at the gas school.

First Lieut. H. R. Ralfe, San. Corps, to New York, for duty.

First Lieut. C. Parker, San. Corps, to field medical supply depot, Washington, for duty.

Orders to Officers of the Medical Reserve Corps

ALABAMA

To Atlanta, Ga., for duty, Major E. D. Bondurant, Mobile.

To Camp Kearny, Linda Vista, Calif., for duty Lieut. W. S. Johnson, Notasulga.

To Macon, Ga., Camp Wheeler, for duty as chief of the surgical service, Major Herbert P. Cole, Mobile.

To Syracuse, N. Y., for regimental duty, Lieuts. D. B. Faust, Clayton, and F. H. Craddock, Sylacauga.

ARIZONA

To report by telegraph to commanding general, Southern Department, for duty, Capt. A. L. Tilton, Kingman; W. M. Randolph, Tombstone; Lieuts. T. Watkins, Bisbee; C. B. Wiley, Oldtrails; W. E. McWhirt, Safford, and R. G. Bazell, Winslow.

ARKANSAS

To Fort Ethan Allen, Vt., for duty, with First Vermont Inf., B. G. Lieut. L. M. Lile, Jonesboro.

CALIFORNIA

To American Lake, Wash., for duty, Capt. R. Cadwallader, W. B. Deas, San Francisco; Lieuts. R. M. Jones, Fresno, and E. C. Houston, San Francisco.

To Camp Kearny, Linda Vista, Calif., for duty in the cantonment laboratory, Capt. Robert L. Tebbitt, Los Angeles.

To Linda Vista, Calif., for duty, Lieut. H. S. Keyes, Los Angeles.

To report by telegraph to commanding General, Western Department, for duty, Capt. B. P. Stookey, Lieuts. A. M. Tweedle, Los Angeles, and D. Dwire, San Pedro.

COLORADO

To Denver, Colo., to examine applicants for appointment in the Officers Reserve Corps, Capt. Cuthbert Powell, Denver.

To Fort Douglas, Utah, to make examinations in his specialty, Lieut. Phillip Work, Pueblo.

CONNECTICUT

To Fort Snelling, Minn., and report in person to the commanding officer of that post for duty with the Forty-First Infantry as assistant to the surgeon and by letter to the commanding general, Central Dept., Lieut. Frederick G. Goodridge, Pomfret Center.

To New Haven, Conn., for duty, Lieut. H. S. Arnold, New Haven.

To Rantoul, Ill., and report in person to the commanding officer, Signal Corps Aviation School, for duty as post surgeon and by letter to the commanding general, Central Dept., Capt. Richard Blackmore, Norwich.

DISTRICT OF COLUMBIA

To Syracuse, N. Y., for regimental duty, Lieut. L. H. English, Washington.

FLORIDA

To Anniston, Ala., base hospital as roentgenologist, Lieut. J. D. MacRae, Tampa.

To Atlanta, Ga., Emory University, for duty, Lieut. J. H. Hall, Sopchoppy.

To Baltimore, Md., Phipps Clinic for a six weeks' course of training, Lieut. B. A. Burks, Titusville.

To Fort Sill, Okla., for a course of instruction in gas defense, Lieuts. G. C. Tillman, Gainesville; R. Leffers, Lakeland, and L. J. Efrid, Tampa.

To Syracuse, N. Y., for regimental duty, Lieut. J. S. Coker, Gardner.

GEORGIA

To Camp Kearny, Linda Vista, Calif., for duty, Lieut. Charles M. Remsen, Atlanta.

To Montgomery, Ala., for duty, Capt. Y. A. Little, Milledgeville.

To report by telegraph to commanding general, Southern Department, for duty, Lieut. C. R. Bullock, Atlanta.

To Syracuse, N. Y., for regimental duty, Lieuts. O. F. Keen, Brewton; B. H. Clifton, Lyons, and J. F. Arthur, Quitman.

ILLINOIS

To Des Moines, Iowa, for duty, Capt. T. S. Crowe, Chicago.

To Fort Constitution, N. H., Springfield Armory, Mass., for duty, Lieut. W. P. MacCracken, Chicago.

To Fort Riley, for a course of instruction, Lieuts. Frank A. Chapman, Chicago, and Thomas O. Craig, Wheaton.

To Houston, Tex., for duty, Lieut. T. J. Riach, Kankakee.

To Louisville, Ky., Camp Taylor as chief consultant in otolaryngology, Major F. Menge, Chicago.

To Rockford, Ill., for duty as chief consultant in otolaryngology, Capt. Norval H. Pierce, Chicago; for duty, E. W. Fell, Elgin; Lieuts. O. Like, and A. B. Morrill, Chicago.

To report by telegraph to commanding General, Western Department, Capt. T. W. Bath, Bloomington.

To Waco, Tex., for duty, Capt. C. F. Sanborn, Chicago.

INDIANA

To Fort Benjamin Harrison for duty, Lieut. K. C. Eberly, Ft. Wayne.

To Fort McPherson, Ga., for duty, Lieut. M. R. Combs, Terre Haute.

To Houston, Tex., for duty as chief of medical service, Lieut. F. N. Shipp, Indianapolis.

To Rockford, Ill., as chief of the surgical service, Major J. W. Sluss, Indianapolis.

To Spartanburg, S. C., for duty as chief of medical service, Lieut. L. E. Jewett, Wabash.

IOWA

To Baltimore, Md., Phipps Clinic, for a six weeks course of training, Capt. R. G. Eaton, Cherokee.

To Camp Dodge, Des Moines, Ia., for duty, Lieut. R. F. Throckmorton, Derby.

KANSAS

To Ann Arbor, Mich., State Psychopathic Hospital for a six weeks course of training, Lieut. G. E. Hesner, Topeka.

To Camp Pike, Little Rock, Ark., for duty, Lieut. N. A. Seehorn, Hutchinson.

KENTUCKY

To Fort Sill, Okla., for a course of instruction in gas defense, Lieut. J. W. Galvin, Louisville.

To Garden City, N. Y., 26th Division, Nat. Guard, Lieut. W. E. Baxter, Louisville.

To Houston, Tex., for duty, Capt. R. M. Taylor, Naceo.

To Louisville, Ky., for duty, Major M. Board, Louisville; as chief of surgical service, Capt. P. H. Stewart, Paducah; for duty, Lieut. E. Moorman, Harned.

To Syracuse, N. Y., for regimental duty, Lieuts. E. C. Brandon, Elizabethtown; H. T. Alexander, Fulton, and S. B. Casebolt, Pikeville.

To Washington, D. C., for duty, Lieut. O. R. Miller, Louisville.

LOUISIANA

To Fort D. A. Russell, Wyo., to make examinations in his specialty, Lieut. Louis V. J. Lopez, New Orleans.

To Fort Riley, Kan., to make examinations in his specialty, Lieut. Ralph C. P. Truitt, Jackson.

MAINE

To Camp Devens, Ayer, Mass., as chief of the surgical service, Major W. L. Cousins, Portland.

MARYLAND

To Camp Meade, Annapolis Junction, as chief of the surgical service, Capt. A. M. Shipley, Baltimore.

To Fort Oglethorpe and report in person to the commanding officer, medical officers' training camp, for a course of instruction, Lieut. Edward A. Looper, Baltimore.

To Fort Sill, Okla., for a course of instruction in gas defense, Major E. S. Linthicum, Baltimore.

To Garden City, Long Island, N. Y., 42d Division, for duty, Capt. C. H. Conley, Frederick.

To Syracuse, N. Y., for regimental duty, Capt. T. M. Shorkley, Kensington; Lieut. I. M. Zimmerman, Williamsport.

To Washington, D. C., Major T. C. Janeway, Baltimore.

MASSACHUSETTS

To Allentown, Pa., for duty, Lieut. Otho L. Schofield, Newton.

To Anniston, Ala., for duty, Lieut. H. Caro, Palmer.

To Ayer, Mass., for duty, Capt. D. A. Thom, Worcester.

To Boston, Mass., Boston Psychopathic Hospital for a six weeks' course of training, Lieuts. E. H. French, and H. R. Viets, Boston.

To Camp Devens, Ayer, Mass., for duty, Capt. J. H. Wright, Brookline, and J. V. May, Worcester.

To Charlotte, N. C., for duty, Lieut. A. P. Chronquest, Hathorne.

To Chillicothe, O., for duty, Capt. H. L. Stick, Baldwinville.

To Fort Leavenworth, Kan., for temporary duty making neurologic and psychopathic examinations of the Seventh Regiment of Engineers, Lieut. Ralph M. Chambers, Westboro.

To Fort Sam Houston, Tex., for duty, Lieut. G. A. MacIver, Boston.

To Fort Sill, Okla., to make examinations in his specialty, Lieut. John J. Stack, Boston.

MICHIGAN

To Alexandria, La., for duty, Capt. J. T. Sample, Saginaw.

To Ann Arbor, Mich., State Psychopathic Hospital, for a six weeks' course of training, Lieut. R. S. Morrish, Flint.

To Battle Creek, Mich., for duty, Lieuts. A. F. Jennings, and H. O. McMahon, Detroit.

To Fort Riley, for a course of instruction, Lieut. David Littlejohn, Bridgman.

To Fort Sill, Okla., for duty, Capt. Carey P. McCord, Detroit.

To proceed to his home and report by telegraph to the A. G. of Army, Capt. F. S. Love, West Branch.

MISSISSIPPI

To Little Rock, Ark., for duty, Lieut. R. T. O'Neil, Vicksburg.

To Syracuse, N. Y., for regimental duty, Capt. B. J. Marshall, Agricultural College; J. T. Barbee, Ripley; Lieuts. V. N. Nichols, Carson; T. J. Bush, Clarksdale; V. H. Bean, Smithville, and Z. C. Hagan, Union.

MISSOURI

To Camp Custer, Battle Creek, Mich., as chief of the surgical service, Major W. J. Frick, Kansas City.

To Camp Meade, Annapolis Junction, Md., as assistant to chief of the medical service in the care of cardiovascular cases, Lieut. A. E. Strauss, St. Louis.

To Des Moines, Ia., for duty, Lieut. D. E. Singleton, Clarence.

To Fort Benjamin Harrison, for duty, Lieut. J. C. Edwards, O'Fallon.

To Fort Riley, for duty, Lieut. Samuel R. Johnson, St. Charles.

To Linda Vista, Calif., for duty, Lieut. C. L. Woolsey, Chillicothe.

To Mount Clemens, Mich., Flying School, for duty, Lieut. F. E. Woodruff, St. Louis.

To Washington, D. C., for duty, Major J. F. Binnie, Kansas City; for duty in connection with the brain section of surgery of the head, Major G. Seelig, St. Louis.

NEBRASKA

To Baltimore, Md., Phipps Clinic for a six weeks' course, Lieut. P. A. Royal, Lincoln.

NEVADA

To Fort Leavenworth, Kan., and report in person to the commanding officer of that post for duty with the Seventh Engineers as assistant to the surgeon and by letter to the commanding general Central Department, Lieut. Delos A. Turner, Goldfield.

NEW HAMPSHIRE

To Atlanta, Ga., for duty, Lieut. H. W. Cleasby, Lancaster.

NEW JERSEY

To Camp Sheridan, Montgomery, Ala., for duty as roentgenologist, Lieut. J. L. Gariss, Trenton.

To Camp Sherman, Chillicothe, O., Lieut. H. I. Gosline, Trenton.

To Fort Des Moines, Ia., for duty, Lieut. E. A. Draper, Cape May.

To Fort Sill, Okla., for a course of instruction in gas defense, Lieuts. F. B. Gilpin, Cranford; and P. Du B. Bunting, Elizabeth.

To Greenville, S. C., for duty, Lieut. J. F. Wallis, Pleasantville.

To Wrightstown, N. J., for duty, Major H. A. Cotton, Trenton; for duty in charge of division of otolaryngology, section of surgery of the head, Capt. W. P. Eagleton, Newark.

NEW YORK

To Albany Hospital and Medical College, Albany, N. Y., for recruiting Base Hospital No. 33, Capt. J. F. Southwell, Albany.

To Annapolis Junction, for duty, Capt. M. W. Rayner, New York City.

To Anniston, Ala., for duty, Lieut. E. P. Boas, New York City.

To Camp Beauregard, Alexandria, La., for duty, Lieut. M. Maslon, Glens Falls.

To *Camp Dix*, Wrightstown, N. J., for duty, as chief of the surgical service, Capt. H. D. Collins, New York City.

To *Columbia*, S. C., for duty, Capt. R. H. Hutchings, Ogdensburg; Lieut. F. C. Robbins, Hornell.

To *Des Moines*, Ia., for duty, Lieut. Henry M. Larson, New York City.

To *Fort Benjamin Harrison* for duty, Capt. G. P. Coopernail, Bedford.

To *Fort Ethan Allen*, Vt., for duty, Lieuts. G. W. Timmers, Castleton; and C. W. Many, Florida.

To *Fort Leavenworth*, Kan., and report in person to the commanding officer, department laboratory for duty and by letter to the commanding general, Central Dept., Lieut. David M. Kaplan, New York City.

To *Fort Sill*, Okla., Camp Doniphan, for duty, Lieut. L. H. Nahum, New York City.

To *Fort Snelling*, Minn., and report in person to the commanding officer of that post for duty with the Forty-first infantry as assistant to the surgeon and by letter to the commanding general, Central Dept., Lieut. Joseph H. Beattie, Dobbs Ferry.

To *Garden City*, Long Island, N. Y., 42d Division, for duty, Lieut. M. Freiburger, New York City.

To *Greenville*, S. C., for duty, Lieut. F. M. Shockley, Brooklyn.

To *Hattiesburg*, Miss., for duty, Lieut. R. F. Zimmerman, Elmhurst.

To *Little Rock*, Ark., for duty, Capt. G. B. Campbell, Utica; and Lieut. C. L. Sicard, Amsterdam.

To *Petersburg*, Va., for duty Capt. James B. Clark, New York City; and J. M. W. Scott, Schenectady.

To *Rantoul*, Ill., and report in person to the commanding officer, Signal Corps Aviation School, for duty as medical member of the examining board, Aviation Section, Signal Corps, and by letter to the commanding general, Central Dept., Lieut. Conrad Berens, Jr., New York City.

To report by telegraph to the commanding general *Eastern Department*, for assignment to duty, Lieut. John B. Byrne, Jr., Brooklyn.

To report by telegraph to commanding general *Southern Dept.*, for duty, Lieut. L. J. Stahl, Flushing.

To *Syracuse*, N. Y., for regimental duty, Lieuts. S. S. Piper, Elmira; W. E. Boyce, Yonkers.

To *Washington Barracks*, D. C., to make examinations in his specialty, Lieut. Edward L. Hanes, Rochester.

To *Wrightstown*, N. J., for duty, Lieut. L. M. Wilbur, Jasper.

To *Yaphank*, Long Island, N. Y., for duty, Major G. M. Hammond, New York City; and Capt. A. J. Rosanoff, Kings Park.

NORTH CAROLINA

To *Fort Ethan Allen*, Vt., for duty, Capt. W. Allan, Charlotte.

To *Macon*, Ga., for duty, Lieut. A. S. Pendleton, Raleigh.

To *Newport News*, Va., and report in person to the commanding officer, port of embarkation, for duty, Capt. James E. Stokes, Salisbury.

OHIO

To *Battle Creek*, Mich., for duty, Capt. F. D. Ferneau, Toledo.

To *Fort Riley*, for a course of instruction, Lieut. Myron Hanna, Scott.

To *Fort Worth*, Tex., for duty, Lieut. V. R. Small, Columbus.

To *New York*, N. Y., Neurological Institute for a six weeks' course of training, Lieut. W. M. Blaine, Youngstown.

OKLAHOMA

To *Fort Riley*, for a course of instruction, Lieut. Paul R. Siberts, Cooperton.

To *Fort Sam Houston*, Tex., for duty, Lieut. D. A. Gregory, Ardmore.

To report by telegraph to commanding general, *Southern Department*, for duty, Lieut. Burton Fain, Frederick.

OREGON

To *Fort Leavenworth*, Kan., and report in person to the commanding officer of that post for duty with the Seventh Engineers as assistant to the surgeon and by letter to the commanding general Central Dept., Lieut. Philip J. Keizer, North Bend.

PENNSYLVANIA

To *Allentown*, Pa., and report in person to Major Elbert E. Parsons for duty and by letter to the commanding general, Eastern Department, Lieut. Dwight E. Long, Freeburg; for duty with Base Hospital No. 27, Lieuts. H. G. Clarke, Bridgeville, and E. W. Fiske, Pittsburgh.

To *American Lake*, Wash., for duty, Lieut. R. P. Smith, Fort Loudon.

To *Annapolis Junction*, Md., for duty, Lieut. C. A. Patten, Philadelphia.

To *Ann Arbor*, Mich., State Psychopathic Hospital, for a six weeks' course of training, Lieut. E. H. Erney, Philadelphia.

To *Augusta*, Ga., for duty, Lieut. E. A. Stracker, Philadelphia.

To *Belleville*, Ill., and report in person to the commanding officer for duty as medical member of the examining board, Signal Corps Aviation School, and by letter to the commanding general, Central Department, Capt. Walter S. Cornell, Philadelphia.

To *Camp Eldridge Laguna* for duty, Lieut. B. F. Fridge, Jr., Manila.

To *Camp Funston*, Fort Riley, Kan., for duty in the cantonment laboratory, Lieut. Russell Richardson, Newtown.

To *Canal Zone* for duty, Lieut. P. A. Trau, Philadelphia.

To *Deming*, N. M., for duty, Lieut. H. Phillips, Philadelphia.

To *Fort Ethan Allen*, Vt., for duty, Lieut. C. W. Lincoln, Wayne.

To *Fort Monroe*, Va., for duty, Lieut. W. J. Lynch, Philadelphia.

To *Fort Niagara*, N. Y., for duty, Lieut. A. A. Eshner, Philadelphia.

To *Fort Sam Houston*, Texas, for duty, Major J. H. W. Rheim, Philadelphia.

To *Fort Sill*, Okla., for a course of instruction in gas defense, Lieut. C. B. Farr and Jo Leidy, Philadelphia.

To *Fort Snelling*, Minn., and report in person to the commanding officer of that post for duty with the Forty-first Infantry as assistant to the surgeon and by letter to the commanding general, Central Department, Lieut. Cheney M. Stimson, Philadelphia.

To *Garden City*, N. Y., Forty-Second Division, for duty, Lieuts. P. M. Tibbins, Beech Creek; R. L. Stackpole, Butler; F. O. Batteiger, Greenville; W. F. Satchell, Saxton; A. M. O'Brien, Sharon; E. Storer, W. Windfield and F. C. Katherman, Whitney.

To *Petersburg*, Va., for duty in charge of division of otolaryngology, section of surgery of the head, Capt. E. W. Day, Pittsburgh.

To *Pittsburgh*, for enlisting personnel of Red Cross Hospital Unit L., Capt. R. V. Robinson, Pittsburgh.

To report by telegraph to commanding general, *Southern Department*, for duty, Lieut. F. Brady, Philadelphia.

To *Spartanburg*, S. C., for duty, Lieut. S. Leopold, Philadelphia.

To *Sunbury*, Pa., Twenty-Eighth Division, Pa. N. G., for duty with First Engineers, Lieut. B. H. E. W. Lucke, Philadelphia.

To *Syracuse*, N. Y., for regimental duty, Capt. E. E. W. Given, Philadelphia; Lieuts. J. C. Kochczyski, Hazleton; F. W. Knippel, Mercer; C. D. Bradley, Philadelphia, and R. H. Murdock, Wilkes-Barre.

PHILIPPINE ISLANDS

To *Camp McGrath*, Batangas, for duty, Lieut. Thomas C. Walker, Manila.

To *Camp Stotsenberg*, Pampanga, for duty, Lieut. H. W. Kennard, Manila.

RHODE ISLAND

To *Chillicothe*, Ohio, for duty, Lieut. H. P. B. Jordan, Providence.

SOUTH CAROLINA

To *Fort Sill*, Okla., for a course of instruction in gas defense, Lieut. L. Petera, Columbia.

SOUTH DAKOTA

To *Fort Riley*, for a course of instruction, Lieut. Harry C. Parsons, Watertown.

TENNESSEE

To *Fort Des Moines*, Iowa, for duty, Lieut. C. M. Gloster, Brownsville.

To *Fort Oglethorpe*, for training with Hospital Unit P., Major William B. Malone, Memphis.

To *Fort Riley*, for a course of instruction, Lieut. Polk D. Brown, Irving College.

To *Fort Sill*, Okla., for a course of instruction in gas defense, Capt. L. A. Stone, Memphis.

To *Syracuse*, N. Y., for regimental duty, Lieut. T. B. Givan, Nashville.

TEXAS

To *Fort Riley*, for a course of instruction, Lieut. Arthur W. C. Bergfeld, Seguin.

To *Petersburg*, Va., for duty, Lieut. R. L. Davis, Big Springs.

To report by telegraph to commanding general, *Southern Department*, for duty, Capt. R. D. Gist, Amarillo; G. H. Garrett, Del Rio; J. M. O'Farrell, Richmond; J. M. Bannister, Snyder; Lieuts. J. H. Walker, Alvard; J. D. Motheral, Angleton; F. E. Hudson, Anson; C. H. Tindall, Appleby; W. E. Watt, Austin; C. L. Monk, Austwell; O. E. Egbert, Beeville; L. F. Putnam, Blessing; M. L. Fuller, Bradshaw; W. F. Chambers, Bronte; W. C. Weir, Buckholts; A. J. Evans, Caddo; D. M. Speer, Celina; M. M. Risinger, Chalk Mt.; W. A. Warner, Claude; J. M. Tribble, Cuero; J. H. Erwin, Dallas; M. M. Morrison, Denison; E. W. Breihan, Denton; V. V. Clark, Estelline; H. F. Wilkins, Fort Worth; B. F. Smith, Jr., Galveston; J. C. Dobbs, Ganado; D. F. Gray and G. Miller, Gause; W. T. Daws and J. A. Maness, Gonzales; M. L. Stricklin, Gustine; F. W. Carruthers, Hillsboro; W. N. Shaw, Houston; H. L. D. Jenkins, Hughes Springs; G. L. Langworthy, Lakeview; O. P. Goodwin, Lamasco; N. C. Boethel, Leroy; A. Nowlin, Liberty Hall; O. A. Smith, Mansfield; R. L. Hamilton, Matador; H. E. Luehrs, Mathis; R. E. Pridgen, Oakland; I. A. Dix, Otto; J. W. Harrison, Palacios; G. W. Wilhite, Palestine; W. A. Jennings, Park Spring; H. A. White, Raymondville; R. R. Allen, Roby; A. G. Neighbor, Rosenberg; W. M. Johnson, Rosston; R. A. Olive, San Angelo; W. J. Vinsant, San Benito; D. R. Aves, Seabrook; R. W. Horton, Smiley; H. W. Gough and R. L. Kimmins, Temple; J. J. Livingston, Tyler; E. Toomim, Waco; O. P. Sweatt, Waxahachie, and D. L. Sanders, Wills Point.

To report in person to commanding general, *Southern Department*, for duty, Lieut. W. T. Harris, San Antonio.

VIRGINIA

To *Camp Lee*, Petersburg, Va., for duty as chief of the surgical service, Lieut. W. L. Peple, Richmond.

To *Fort Riley*, Kan., for duty, Lieut. H. J. Hayes, Richmond.

To *Fort Sill*, Okla., for a course of instruction in gas defense, Lieut. J. B. Halligan, Petersburg.

To *Sunbury*, Pa., Twenty-Eighth Division, P. N. G., for duty with First Engineers, Lieut. C. M. Thomas, Healing Springs.

To *Syracuse*, N. Y., for regimental duty, Lieuts. B. R. Caldwell, New-castle, and B. B. Dutton, Winchester.

WASHINGTON

To report by telegraph to commanding general, *Southern Department*, for duty, Major R. W. Newton, Fort George Wright.

WEST VIRGINIA

To *Syracuse*, N. Y., for regimental duty, Lieuts. H. W. Daniels, Elkins; R. L. Eltinge, Sterling.

WISCONSIN

To *Alexandria*, La., Base Hospital as a roentgenologist, Lieut. C. H. Nims, Oshkosh.

To *Syracuse*, N. Y., for regimental duty, Lieut. S. J. Lewis, Milwaukee.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Lane Lectures.—The sixteenth course of Lane medical lectures will be delivered by Dr. Simon Flexner, director of laboratories of the Rockefeller Institute for Medical Research, on the evenings of October 8, 9, 10, 11 and 12, at 8:15, in Lane Hall, Stanford University Medical School, San Francisco. The medical profession and students of medicine are cordially invited to attend. The titles of the lectures to be given by Dr. Flexner are as follows:

PHYSICAL BASIS AND PRESENT STATUS OF SPECIFIC SERUM AND DRUG THERAPY

- October 8: "Epidemic Meningitis; Lobar Pneumonia; Bacillary Dysentery and Specificity in Bactericidal Serums."
- October 9: "Gaseous Gangrene; Shiga Bacillary Dysentery, and the Principles of Homoserum Therapy."
- October 10: "Poliomyelitis and the Principles of Homoserum Therapy."
- October 11: "Local Specific Therapy as Illustrated by the Serum Treatment of Epidemic Meningitis, Poliomyelitis and Tetanus."
- October 12: "Chemotherapy of the Spirochetal Infections."

ILLINOIS

Personal.—Dr. Ralph T. Hinton, who was appointed superintendent of the Elgin Hospital for the Insane, assumed his duties, September 6. He succeeded Dr. Henry J. Gahagan.

Chicago

Held for Selling Morphine.—Sylvan Sommers, recently said to have been a lieutenant in Ambulance Company No. 1 of the Illinois National Guard, and claiming to be a physician, has been arrested and turned over to United States authorities on the charge of selling habit-forming drugs. Investigation showed that he is not a physician.

Annual Meeting of Railway Surgeons.—The annual meeting of the "Soo" Surgical Association will be held in Chicago, Oct. 22 and 23, 1917, the first two days of the meeting of the Clinical Congress of Surgeons of North America. The meeting will be clinical in character, and various sessions will be held in hospitals and other institutions in the city.

Shortage of Instructors in Medical College.—Twenty-five instructors from the Medical School of the University of Illinois, Chicago, have entered the medical service of the United States Army. This shortage may compel the shortening of the curriculum. President Edmond J. James of the university anticipates a decrease of 35 per cent. in the attendance at the school this fall.

Personal.—Dr. Sidney I. Kornhauser, assistant professor of zoology in Northwestern University, recently delivered an address on "Sex Determination and the Nature of Secondary Sectional Characteristics" at a meeting of the faculty and students of the Graduate Summer Quarter in Medicine of the University of Illinois. At the same meeting Dr. Ruben M. Strong, associate professor of anatomy, Vanderbilt University, made an address on "Adaptation in Bone Architecture," Dr. Orville H. Brown, Phoenix, Ariz., delivered an address on "Asthma," and Dr. Addison Gulick, assistant professor of physiology in the University of Missouri, made an address on "Overfeeding and the Calorie Problem in Human Metabolism."—Dr. Charles M. McKenna, who has been ill for the past two months following a Roentgen-ray burn, was recently operated on and is now convalescent.

IOWA

Schools Closed.—The schools of Davenport were all closed on September 7 on account of infantile paralysis. Children under 16 years of age have been forbidden to enter motion picture theaters, and attendance at church and Sunday school has been prohibited. One case of infantile paralysis has been reported from Rockingham.

Personal.—Dr. Charles F. Read, superintendent of the Watertown Hospital, has been made superintendent of the Insane Hospital at Dunning, Ill.—Drs. Thomas F. Neil and Thomas J. Riach, interns at the Watertown Hospital, have entered the Hospital Corps of the Army.—Dr. George W. Yavorsky, Belle Plaine, captain in the Medical Reserve Corps, has been ordered to Fort Benjamin Harrison.

MARYLAND

For Prevention of Diphtheria.—In order to prevent the spreading of diphtheria in the schools, Health Commissioner Blake has begun making cultures from all children who have had this disease since July 1. Until now he has discovered three carriers of the disease who will be excluded from the schools until their carrying powers have become negative. The commissioner is also making tests of those who have had scarlet fever, to determine whether traces of the disease are still in their systems.

Personal.—Dr. William Wirt Eichelberger has received a commission as captain in the Medical Reserve Corps, and has been selected by the National Committee on Mental Hygiene to help form a unit of neurologists and psychiatrists in the country. Dr. Eichelberger is a graduate of the University of Maryland.—Dr. Harry F. Shipley, a physician of Granite, and the health officer of the Second District of Baltimore County, was seriously injured recently when his automobile turned turtle with him. Dr. Shipley's collar bone was broken, his nose lacerated, and he was badly bruised about the body. He was unconscious when picked up, but recovered after being taken to the hospital.—Dr. P. Hamilton Lloyd, Ridge, is at Mercy Hospital, where he will undergo an operation for stomach trouble.

Campaign to Fight Tuberculosis.—Preparations for an intensive campaign to prevent the spread of tuberculosis in the American Army and among those rejected by the draft will be the theme of the North Atlantic Sectional Conference of the National Association for the Study and Prevention of Tuberculosis, to be held in Baltimore, October 17 and 18. Final details will also be discussed for carrying on the Red Cross Christmas Seal campaign, from which it is hoped to raise the \$3,000,000 necessary for this war work. How to provide adequate care for the thousands of men who will be rejected from the Army because of tuberculosis or suspected tuberculosis, or who will be discharged because of this disease before the new Army is sent overseas or after it is in France, will form the burden of the conference discussion. This conference is one of six that will be held this fall in various parts of the United States.

MASSACHUSETTS

To Admit Women Pupils.—For the first time in its history, Harvard University Medical School will open its doors to women. This is on account of the heavy draft by the war on the medical profession, and it is thought desirable to encourage women to take up the study of medicine.

Meeting of Health Officers.—The first annual State Convocation and School of Instruction for Massachusetts Health Officials took place, September 4-7. Meetings were held at the Massachusetts Institute of Technology and at the medical schools and hospitals in Boston. The papers presented dealt with subjects of interest to physicians, health officers and nurses. It is intended to have this an annual affair, and to promote greater interest and attendance, perhaps by allowing traveling expenses to attending health officials, as is said to be done in other states. Dr. T. F. Harrington of the state board of health said that in 1916 in Massachusetts there occurred twenty-seven cases of anthrax and four deaths; up to September 1 of this year there had been thirty cases and six deaths. This was due to the fact that owing to the war and the increased demand, hides which formerly went to England from India and Africa now come to this country. The hides in many cases are not properly sterilized (sun dried) and U. S. consuls' reports as to the condition of the hides shipped are lost or delayed. In England where they have a board of anthrax control the total number of anthrax cases reported reached thirty in a year before the war. Anthrax is a disease that occurs in animals. The animal on being slaughtered sheds its blood on its horns, hide, hair, etc. The spores, as is known, are very resistant. The disease occurs from handling these animal products not properly sterilized. In all cases investigate the occupation. For treatment, in one hospital where they practiced excision of the pustule they had a mortality of 100 per cent., all the patients dying from septicemia. At the Massachusetts General Hospital they are using the sustaining treatment, and with better results. One patient at North Adams was treated by some serum of Italian manufacture, with recovery. The first case that occurred in Boston was in a man picked up on the street, who died in six hours. The newspapers reported that he died of arsenic poisoning from handling leather; at the Relief Hospital it was said the man died from concussion of the brain. The necropsy showed that the man had pulmonary

edema (edematous form of anthrax). All cases of anthrax are proved by diagnostic methods and injection of guinea-pigs. Dr. Harrington also spoke of the necessity of reporting births in order to provide certificates for enforcing and regulating the child labor laws, and of the importance in recording all stillbirths to note the occupation of the mother; lead poisoning was to be noted in this connection.

MICHIGAN

Licenses Stolen.—Dr. L. N. Host, Detroit, reports that a number of valuable papers were stolen from his office, including his licenses to practice medicine in Wisconsin and in Michigan. Secretaries of state licensing boards are requested to be on the lookout for these licenses. The Wisconsin license was issued in 1915, the Michigan license in 1916.

NEW YORK

Paralysis Up-State.—Eleven cases of infantile paralysis have been reported recently from Colton, St. Lawrence County. The schools are closed, and children are barred from public gatherings.

Personal.—Dr. Lewis Shalet has resigned as general and medical superintendent of the Montefiore Home Country Sanatorium at Bedford Hills. He will locate at West New York, N. J.—Bernon Prentice and Joseph Swann, both of New York, have been appointed to serve as deputy commissioners to Major Murphy, Red Cross commissioner to Europe.

Examination for Superintendent.—A competitive civil service examination will be held, October 6, in New York state for the position of superintendent of the Iola Tuberculosis Sanatorium in Monroe County. The position pays \$4,000 a year. Applicants must be licensed physicians of New York state, but need not reside in the state. Application blanks may be had from the State Civil Service Commission, Albany.

Distribution of Pasteurized Milk.—The milk stations provided by Nathan Straus in New York City were closed for the season, September 9, after having distributed 2,067,726 bottles and 1,296,021 glasses of pasteurized milk during the previous twelve months. During the twenty-five years Mr. Straus has been interested in this work, 44,940,907 bottles and 25,305,519 glasses of pasteurized milk were distributed from the infant milk depots maintained in the city.

Meeting on Neurologic Surgery.—A meeting at which will be presented a symposium on neurologic surgery will be held in New York Polyclinic Hospital, October 1, at 8:15 p. m., by the Department of Neurologic Surgery. The following subjects will be presented:

- "Diagnostic Value of Lumbar Puncture," Dr. Young C. Lott.
- "Observations Regarding the Anesthesia in Cerebral Surgery," Dr. Charles S. Hunt.
- "The Appearance of the Fundus Oculi in Certain Intracranial Conditions," Dr. James A. Kearney.
- "Presentation of Patients Operated on for Various Intracranial Spinal Peripheral Nerve Lesions," Dr. William Sharpe.
- "Psychopathology," Dr. Edward S. Cowles.
- "The Treatment of Hypoplastic and Mentally Impaired Children," Dr. E. Bosworth McCready.

New York City

Ambulance Donated to Red Cross.—The parishoners of St. George Church, Stuyvesant Square, have given the Red Cross an ambulance which is to be sent to France soon. An effort is being made to arouse the interest of all the Episcopal churches of the city in a fund for the purpose of sending army kitchen trailers to France.

Held for Selling Habit-Forming Drugs.—Daniel J. Hoyt, lieutenant in the United States Army, M. R. C., September 8, was held in \$1,500 bond on the charge of selling habit-forming drugs. The arrest was made following a raid on his private sanatorium. Hoyt was in service at Fort Riley, Kan., and was brought to New York for trial.

Drug Sellers Sentenced.—Federal officials who have been conducting a campaign against the illicit traffic in habit-forming drugs recently secured the conviction of three men, who were sentenced to prison for two years each, and of two boys, who were sent to the Elmira Reformatory for terms of eighteen and thirteen months, respectively.

Change in Management of Sanatorium.—Dr. R. W. Adkins has become medical director of the Orchard Springs Sanatorium at Dayton, succeeding Dr. J. C. George. The sanatorium is now run by an incorporated company. Dr. K. F. Shephard, the former owner, remains as president of the board of directors, and consulting psychiatrist.

Refuse Incorporation to "Golden Cross."—For the second time the petition for the incorporation of the "Golden Cross,"

organized to aid soldiers injured in the American Army and Navy and aeronautical service has been denied. In July, Judge Ordway denied a similar petition on the ground that the proposed sphere of activities is adequately covered by the Red Cross. The petition just recently denied says that the organization does not propose to establish a hospital or furnish medical treatment, but only to provide accommodation for those discharged from medical treatment who need rest and aid during convalescence. It is stated by the proposed founders that they did not intend to conflict with the Red Cross, but merely to cooperate, and give sole attention to the aeronautical branch of the service.

PENNSYLVANIA

Infantile Paralysis During August.—Dr. Samuel Gibson Dixon, state commissioner of health, September 7, announced that there had been 107 cases of infantile paralysis in the state in August, but only one district with a serious condition, that at Newcastle. Lawrence County had thirty cases reported, with twenty-one from Lancaster. Dr. Dixon points out that centers of infection for August have been largely those which escaped easiest in the epidemics of 1910 and 1916. Those in the eastern end of the state have been virtually all in rural districts and scattered, whereas last year the cases were mostly concentrated in cities.

Philadelphia

Red Cross Carnival.—A Red Cross carnival to raise \$1,000 for Base Hospital No. 20, organized at the Jefferson Hospital, was held by the Fifty-Sixth Street Fourth of July Association, September 14.

City Pays for Hospital.—The city cleared off its indebtedness for taking by condemnation the buildings of the Medico-Chirurgical Hospital, by paying to the trustees of the University of Pennsylvania, September 14, \$1,047,372.58.

Municipal Appointments.—Director Wilmer Krusen, September 14, appointed to the position of assistant medical school inspector at \$600 a year each, Drs. Charles Salon Wachs, Benjamin Harrison Shuster, William D. Barry and Jacob Moses Cahan.

Navy Base Hospital on Duty.—Members of Naval Base Hospital No. 3 have been ordered to report to the Navy Yard for duty. Miss Alice M. Garrett, chief nurse, said that she had not received further instruction, but that members of the staff are looking forward to orders to proceed to France. The staff was recruited at the Methodist Hospital. Major Elijah Hillingsworth Siter said that no further base hospitals will be supplied from Philadelphia hospitals.

Personal.—Dr. John Wanamaker III, one of the veterans of the city's police surgeons in point of service, on September 13 sent his resignation to Dr. Hubley Raborg Owen, chief of police surgeons. The resignation is effective, October 15. He was appointed a police surgeon in 1904, and for a time was attached to the old ninth district station. During the past ten years he has been detailed at the city hall cell room. For a time Dr. Wanamaker was acting chief surgeon.

WISCONSIN

Personal.—Dr. Samuel Kline, formerly professor of histology and embryology at Fordham Medical School, has been appointed assistant superintendent at the Waldheim Park Sanatorium, Oconomowoc.

Graduate Medical Instruction at Home.—The State Medical Society of Wisconsin has arranged a course of lectures, clinics and laboratory instructions to be given under the extension division of the University of Wisconsin. The course will extend over three weeks, and is being given in Fond du Lac on Mondays and Tuesdays, in Oskosh on Wednesdays and Tuesdays, and in Appleton on Fridays and Saturdays. The subject of the course is the "Recent Advances in the Diagnosis and Treatment of Diseases of the Heart and Lungs." The fee for the course is \$5. The local hospitals are cooperating.

GENERAL

The Quality of American-Made Synthetics.—The Council on Pharmacy and Chemistry, with the aid of the American Medical Association Chemical Laboratory, announces through the secretary, Prof. W. A. Puckner, that it proposes to make a study of the quality of American-made synthetics. It will examine specimens of important, unofficial synthetic drugs submitted by their manufacturers and later, when these drugs are offered for sale, purchase them on the open market and

report on their purity. The Council also offers to examine specimens of American-made synthetics when submitted by dealers, providing the origin of such specimens is established.

This control of synthetic drugs which, as the result of the war are now made in this country, is believed to be in the interest of American industry, for the protection of the public, and to the satisfaction of physicians. Since the manufacture of some of the synthetic drugs is to some extent experimental in this country, it is due physicians and the public that they be given the protection which will come from the proposed investigation of the market supply. In undertaking this investigation, the Council feels confident that the responsible manufacturer will welcome this check as the best way of establishing complete confidence in his product.

FOREIGN

From Havana.—Dr. T. V. Coronado has been appointed professor of hygiene and legal medicine at the University of Havana, to succeed the late Prof. L. M. Cowley.—Dr. F. M. Capote, president of the Colegio Medico de Cuba, has been appointed secretary of the national public health and hospital service, in place of the late Prof. R. Menocal.

Deaths in the Profession Abroad.—E. Rimini, professor of materia medica at the University of Pavia and author of works on chemistry. He lost his life in a railroad accident.—Manouvriez of Paris, noted for his pioneer work in the protection of miners.—Malgat of Nice.—C. B. Rendle of London, aged 82.—J. B. Fisher, Liverpool, aged 60.—Pasanis of Madrid, whose last work was recently summarized in *THE JOURNAL*, page 763. The Italian casualty lists for the last month bear the names of Lieuts. G. Auletta, C. Bergonzolo, M. Bianchi, P. Cavatorti, A. Rossi, A. Dogliotti, L. Salerno and P. Sartorio. Also Col. C. Carratu and Capt. A. C. Tamponi. The British casualty lists include Capt. J. C. Harris, J. B. Rawlins, H. D. Eccles, H. Y. C. Taylor, A. Traill, C. Weller, R. A. Bostock, H. K. Sewell, aged 32; H. Ackroyd, aged 40; F. R. Armitage, aged 34; Lieut.-Col. F. D. Blandy; Lieut. C. M. Atkinson; Major E. F. B. Wilson, aged 57, from South Africa; Capt. D. Arthur, aged 32, who died while a prisoner in Turkey, and Lieut.-Col. H. A. de LaTour, aged 68, from New Zealand.

PARIS LETTER

PARIS, Aug. 23, 1917.

The War

DRY WOUNDS OF THE ARTERIES

Dr. André Martin reported recently to the Réunion médico-chirurgicale de la IIIe Armée eleven observations of "dry" wounds, so called, comprising the following cases: humeral artery (four cases), radial arteries and veins (one case), ulnar artery (two cases), anterior tibial artery (one case), and posterior tibial artery (one case). After calling attention to the fact that these conditions have been well known since Fiolle of Marseilles published the results of his investigations, he pointed out that these wounds are seen in lesions caused by bursting shells (even shrapnel), and in so-called setons. Clinically there is no symptom that will permit one to establish a diagnosis. Roentgenoscopy and an examination of the visible path of the projectile do not always lead to a correct diagnosis; nor can one base one's judgment entirely on the condition of the pulse below the lesion, as to whether obliterated, diminished or normal. The pain localized in the seat of the vascular wound is a symptom of no value. As to the anatomicopathologic condition, in all the cases in which the vessel was completely severed, a part of the artery had been destroyed by charring; retraction of the proximal end had taken place, with formation of clot, extending upward for a variable distance; there was occasional absence of pulsation, and only a slight clot, or none at all, could be observed at the point of section. The vascular tunics were contused and ecchymotic (histologic examination). The distal end presented a frayed appearance, but there were no clots, except in one instance. To sum up, there were no clots, external hemorrhage or hematoma; that is, such is the typical condition. The effect of the dry vascular wounds is often extended to the nerves and the veins. The surrounding muscle lesions are of the common type, but certain forms of gas gangrene are less likely to develop, owing to the favoring nature of the vascular dry wound. The evolution of these wounds would have been aggravated by a secondary hemorrhage or an arterial hematoma. To be sure, with the exception of four cases of wounds of the humeral artery, it

was only a question of lesions affecting medioere vessels, but these traumatism, since the consequences may be grave, deserve careful attention. When the excision is made, one ought, in fact, to examine and verify the condition of the cluster of blood vessels, even if it is an insignificant looking wound of benign aspect, for there is much truth in the saying that there are no small war wounds.

DISAPPEARANCE OF SMALLPOX FROM PARIS

At the last meeting of the Conseil d'hygiène publique et de salubrité of the département of the Seine, Dr. Roux, director of the Institut Pasteur, read a very interesting report on the administration of vaccine in Paris in 1916. He called attention to the fact that the 800,000 vaccinations performed at the beginning of the war and during the year 1915 on the resident population of Paris have resulted in the disappearance of smallpox. In spite of the extraordinary shifting of the population due to the mobilization, and in spite of the fact that Paris offered a refuge to a considerable number of emigrants from invaded countries, the capital has remained exempt from smallpox. However, all the conditions favorable to the incubation of this disease were realized in the agglomerate mass of emigrants, depressed in spirit and in body, as they were, the greater part of whom had not been recently revaccinated, and many of whom had never been inoculated at all. On several occasions variolar infection has been introduced from outside without its becoming the focus of an epidemic. A prolonged war without smallpox is a remarkable fact. It proves the efficacy of the prophylactic measures that have been taken. The honor for this result belongs to the city of Paris and its vaccine service. The people of the city who have eagerly complied with the repeated appeals that the administration has made by means of posters and of advertisements in the press are also to be commended.

In 1916, a single case of smallpox was discovered in Paris. It was a case imported from Algiers. The patient, an Arabian, who had not been vaccinated in childhood, arrived in Paris during the period of incubation. He was placed in the Claude Bernard Hospital and died there. This Arabian was working in a factory employing 1,000 workmen and was living with his brother. His fellow workmen and his brother were vaccinated immediately after the case was discovered, and no other case developed from it.

Death of Dr. Charles Livon

Dr. Charles Livon, director of the Ecole de médecine at Marseilles, died recently, aged 67. Dr. Livon founded at Marseilles in 1893 the Institut antirabique. Since the beginning of the war he had been director of the auxiliary hospital of the Hôtel Dieu at Marseilles.

Marriages

CAPT. DANIEL MARSH SHEWBROOKS, M. R. C., U. S. Army, to Miss Margaret F. Sheldon, Middlebury, Vt., at Kansas City, September 1.

WILLIAM ROBBINS WHITE, M.D., Providence, R. I., to Miss Margaret L. Wardle of Troy, N. Y., at Ferrisburg, Vt., August 28.

LIEUT. CHARLES HENRY LAWS, M. R. C., U. S. Army, Elkins, W. Va., to Mrs. Lula Slaughter Booker of New York, July 26.

ASST. SURG. ARTHUR CLARK DEAN, U. S. Navy, to Miss Minnie M. Snyder, both of Philadelphia, August 29.

ASST. SURG. THOMAS V. MURTO, U. S. Navy, to Miss Elizabeth Ferguson of Norfolk, Va., August 25.

ROBERT LYLE MOTLEY, M.D., to Miss Celia Mary Calcutt, both of Dyersburg, Tenn., August 29.

MERRITT CARLTON VAUGHAN, M.D., to Miss Ann Elsie Steger, both of Buffalo, recently.

PATRICK JOSEPH HAMILL, M.D., to Miss Mary Kenny, both of Jersey City, N. J., August 27.

VICTOR HUGO LINDLAHR, M.D., Chicago, to Miss Sarah Coker, Atlanta, Ga., August 22.

EARL WARREN KEYES, M.D., to Miss Sarah Sage Hollman, both of Cleveland, August 25.

THEODORE E. INGRAM, M.D., to Miss Mary Summy, both of Marietta, Pa., August 29.

ALONZO BROWNING, M.D., to Miss Hulda Oveson, both of Ogden, Utah, August 22.

Deaths

Henry Nash Read, M.D., Brooklyn, N. Y.; Long Island College Hospital, Brooklyn, 1870; aged 69; a Fellow of the American Medical Association, and a member of the Kings County Medical Society, and the Associated Physicians of Long Island; pediatrician to the Long Island College Hospital and the Sheltering Arms Nursery; consulting pediatrician to the Bar Ridge Hospital; died at his home, September 2.

Edwin Taylor Robinson, M.D., Philadelphia; University of Pennsylvania, Philadelphia, 1900; aged 45; a Fellow of the American Medical Association; at one time resident physician of the Philadelphia Hospital; a member of the Obstetrical Society, Philadelphia; Philadelphia Pediatric Society, and Pathological Society of Philadelphia; died in the Lankenau Hospital following an operation, September 3.

Lewis Atterbury Stimson, M.D., New York; Bellevue Hospital Medical College, New York, 1874; aged 72; a member of the Medical Society of the State of New York, New York Surgical Society and the American College of Surgeons; a veteran of the Civil War; consulting surgeon to the New York, Bellevue, St. John's and Christ hospitals; died suddenly at his summer home in Long Island, September 17.

William F. Prather, M.D., Dayton, Ohio; University of Cincinnati, Cincinnati, 1891; aged 55; formerly a Fellow of the American Medical Association, and a member of the Ohio State Medical Association; treasurer of the county medical society for many years, and for ten years secretary of the Dayton Academy of Medicine; died at his home, September 1, from chronic nephritis.

Philip Wilfred Travis Moxon, M.D., Brooklyn, N. Y.; Harvard University Medical School, Boston, 1901; aged 43; a Fellow of the American Medical Association; assistant physician of the Kingston Avenue Hospital, and assistant pediatrician to the Polhemus Clinic; reported to have committed suicide while demented, September 3.

John Benjamin Roberts, M.D., Atlanta, Ga.; Medical College of the State of South Carolina, Charleston, 1867; aged 76; formerly a member of the Medical Association of the State of Georgia; superintendent of the Masonic Children's Home, Macon, Ga., and physician at the Soldiers' Home, Atlanta, Ga.; died at his home, August 30.

John C. Otis, M.D., Cincinnati, Ohio; Medical College of Ohio, Cincinnati, 1891; aged 60; for thirty-five years a member of the Cincinnati branch of the American Pharmaceutical Association; and for twenty years president of the Cincinnati College of Pharmacy; died, August 24, after an illness of four months.

John McDonald Russell, M.D., Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1895; aged 45; formerly a Fellow of the American Medical Association; a member of the Pennsylvania State Medical Society and the Austin Flint Medical Society; died at his home, August 31.

Wilbur C. Rice, M.D., Zephyrhills, Fla.; University of North Carolina, Chapel Hill, N. C., 1907; formerly a Fellow of the American Medical Association, and a member of the Ohio State Medical Society; drowned while bathing in Zephyr Lake, August 27.

Hubbard North Bradley, M.D., Bay City, Mich.; University of Michigan, Ann Arbor, 1905; aged 42; a Fellow of the American Medical Association; died in the Augustana Hospital, Chicago, August 30, after an operation for an obstruction of the intestines.

David Gordon Allen, M.D., Washington, D. C.; College of Physicians and Surgeons, Columbia University, New York, 1903; aged 38; past assistant surgeon, U. S. Navy; a Fellow of the American Medical Association; died on the *Panther*, September 5.

John Wesley Kurz, M.D., Cook, Minn.; University of Minnesota, Minneapolis, 1909; aged 32; a Fellow of the American Medical Association; a member of the Medical Society of the State of Minnesota; died August 31, from meningitis.

George August Woelffel, M.D., Willits, Calif.; College of Physicians and Surgeons, Keokuk, Iowa, 1897; aged 49; a member of the California State Medical Society; for seventeen years a practitioner of Willits; died in San Francisco, August 21.

Edward Richard Ames, M.D., Knoxville, Iowa; Hahnemann Medical College, Chicago, 1896; aged 47; a Fellow of

the American Medical Association; member of the Iowa State Medical Society; died at his home, September 3.

Solomon H. Peck, M.D., Oneonta, N. Y.; New York University Medical College, New York, 1862; aged 92; for more than forty-five years a practitioner in Ithaca, N. Y.; died at the home of his sister, September 2.

John Henry Wilkins, M.D., Victoria, Texas; Meharry Medical College, Nashville, Tenn., 1880; aged 63; for many years a colored practitioner in Victoria; died at Sherman, Texas, July 21, from arteriosclerosis.

John L. Overholt, M.D., Columbus Junction, Iowa; University of Iowa, Iowa City, 1887; aged 55; a member of the Iowa State Medical Society; was found dead in his office, September 1, from heart disease.

Herbert Harrison Cilley, M.D., Long Beach, Calif.; Rush Medical College, Chicago, 1892; aged 58; formerly a member of the Medical Society of the State of California; died at his home, July 16, from polycythemia.

Delphin Bienvenu, M.D., New Orleans, La.; Tulane University, New Orleans, 1878; aged 81; died at the Charity Hospital, September 2, as the result of injuries received in an automobile accident.

John Raymond Shank, M.D., Flint, Mich.; University of Michigan Homeopathic Medical School, Ann Arbor, 1884; aged 56; formerly a member of the Michigan State Medical Society; died at his home, August 25, from heart disease.

Robert C. Knode, M.D., Gering, Neb.; University of Nebraska, Omaha, 1898; aged 40; a member of the Nebraska State Medical Association; was instantly killed by the overturning of his automobile near Burns, Wyo., August 23.

John James Fitzgerald, M.D., Saginaw, Mich.; Saginaw Valley Medical College, Saginaw, Mich., 1902; aged 50; a Fellow of the American Medical Association; died at his home, August 17, from cerebral hemorrhage.

William Anson Forrester, M.D., Cleveland; Bellevue Hospital Medical College, 1888; aged 52; was struck by a motorcycle at Baldwinsville, N. Y., August 21, and died two hours later from his injuries.

George Edward Craig, Evening Shade, Ark. (license, Arkansas, nongraduate, Aug. 18, 1903); aged 74; a Confederate veteran; died at the home of his daughter in Evening Shade, August 19.

Patrick S. Boland, M.D., Carbondale, Pa.; Illinois Medical College, Chicago, 1909; aged 44; formerly principal of the high school at Carbondale; died at his home, August 30, from heart disease.

Clarence M. Conant, M.D., Baltimore; New York Homeopathic Medical College, New York, 1873; aged 66; a clergyman of the Protestant Episcopal Church; died at his home, August 26.

Thomas Elmer Grubbs, M.D., Los Angeles; University of California, San Francisco, 1910; aged 29; a Fellow of the American Medical Association; died at his home, August 24.

Samuel Wood Hunter, M.D., Philadelphia; University of Pennsylvania, Philadelphia, 1868; aged 73; died in the University of Pennsylvania Hospital, Philadelphia, August 25.

John Fremont Axtell, M.D., Newton, N. H.; University of Vermont, Burlington, 1881; aged 61; a Fellow of the American Medical Association; died at his home, August 10.

Henry Alexander Morrisson, Ladelle, Ark. (license, Arkansas, nongraduate, August, 1903); aged 44; died at Monroe, La., July 11, from the effects of a gunshot wound.

George M. Dayton, M.D., Chattanooga, Tenn.; Eclectic Medical Institution, Cincinnati, 1876; aged 68; died in the Bethesda Hospital, Cincinnati, August 28.

Emerson K. Brundidge, M.D., Hazleton, Pa.; Jefferson Medical College, 1880; aged 74; died in the Home for the Aged, Bala, near Philadelphia, August 25.

William J. Sharbaugh, M.D., Altoona, Pa.; Kentucky School of Medicine, Louisville, 1891; aged 68; died at his home, September 2.

William Henry Reedy, M.D., Bloomington, Ill.; Rush Medical College, 1876; aged 69; died at his home, about August 22.

John Wesley Clerke, M.D., Green Cove Springs, Fla.; University of Toronto, Ont., 1884; aged 72; died at his home, August 12.

Henry Dinkel Heil, M.D., Decatur, Ill.; Rush Medical College, 1887; aged 59; died at his home, August 27, from heart disease.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

IDENTIFYING FAKE NEOSALVARSAN

Last week THE JOURNAL recorded the arrest of two individuals in New York City (Tomasses and Clements) charged with making and selling fake Neosalvarsan. The extent to which this fraud has been carried makes it desirable that physicians should be able to distinguish between the false and the genuine article. The Department of Health of the City of New York has furnished a table, which we publish, giving the distinguishing characteristics of the various lots of fake Neosalvarsan which were discovered by the inspectors of that department. There were, as will be remembered, three different lots, one that was made and sold by Tomasses and two others (Lots A and B) marketed by Clements. The New York health officials suggest that, as one of these fake products was put up in genuine tubes purchased from physicians, it is important that physicians using Neosalvarsan should

make it an invariable practice to destroy the tube after using the product. It may not be out of place to warn physicians of the possibility that swindlers may put on the market fake imitations of Diarsenol and Neodiarsenol and other products identical with or similar to Salvarsan and Neosalvarsan.

NEW YORK AND OREGON PERFORM A NATIONAL SERVICE

Filthy Advertisements Finally Driven from the Pages of the Police Gazette

National laws are more effective and more to be desired than local laws on questions that affect the well-being of the country as a whole. Yet it sometimes happens that the laws passed by a progressive state prove of distinct benefit to the nation. About five years ago THE JOURNAL called attention to the case of North Dakota which enacted a law requiring all package goods to be plainly labeled with the net weight of the contents. The law was a reasonable one and one to which no honest manufacturer should have objected. Nevertheless, one of the largest biscuit manufacturers in the country withdrew its products from the state rather than comply with that law, presumably in the belief that the people of North Dakota would repeal the law, so as to be able again to obtain the biscuits of that particular firm.

IDENTIFYING MARKS OF FAKE AND GENUINE NEOSALVARSAN

TOMASSES' PRODUCT	CLEMENTS' PRODUCT (LOT A)	CLEMENTS' PRODUCT (LOT B)	THE GENUINE
<p><i>Packing:</i> In packages of five tubes, wrapped in waxed paper, sealed with two muddy red seals, the printing on which is somewhat indistinct. Altogether, however, the package is a very close imitation of the genuine.</p> <p><i>Tubes:</i> Made of aluminum, embossing of lion trade-mark on cap is indistinct, but so cleverly done as to require comparison with the original in order to detect. If label of aluminum container is removed the collar for the cap is seen to be much less sharply impressed. Dimensions of tube same as in genuine.</p> <p><i>Contents of Tube:</i> Tube contains an insert circular, wrapped about the ampule. A plug of absorbent cotton is always present, but the file and piece of corrugated paper are missing.</p> <p><i>Label on Tube:</i> The label on the tube is a photographic copy of an old tube of the genuine and therefore bears the legend guaranteed by Farbwerke-Hoechst Company under Food and Drugs Act, June 30, 1906. Serial No. 2783 A. The label is a trifle wider than the original, and therefore usually slightly overlaps the bottom of the tube.</p> <p><i>Serial Number:</i> All the product thus far discovered bears the shipping number "A 25884" apparently in print.</p> <p><i>Insert Circular:</i> Size 8½ by 5½ inches. Printed from reset type, except the display heading, which is photographically reproduced. A number of typographical differences, including the misspelling of the chemical name (5th line below heading) and of the word toxicity (4th line from below, first page) make the detection of this fraudulent circular a simple matter. The underscoring of the text on the first page extends beyond the left of the line of type.</p> <p><i>Ampule:</i> This is evidently the work of an amateur. The upper, drawn-out end is invariably crooked.</p> <p><i>Label on Ampule:</i> Photographically reproduced, this invariably bears the control letters "E B U" in print.</p> <p><i>Contents of Ampule:</i> Color quite unlike the genuine. It is dirty orange, resembling the color of aristol.</p> <p><i>Chemical Analysis:</i> Does not at all respond to tests for the genuine.</p>	<p>In single tubes only.....</p> <p>Tubes made of tin (the cap, however, of aluminum) and soldered instead of being spun in one piece. Exposed part of tube painted with aluminum paint.</p> <p>The tube contains an insert circular, wrapped about the ampule. There is also a plug of cotton, but the file and piece of corrugated paper are missing.</p> <p>Same as that of Tomasses' product.</p> <p>The shipping numbers, apparently made with a rubber stamp, are twice the size of those on the genuine.</p> <p>Size 8½ inches by 5½ inches, i. e., slightly larger than the genuine. The circular, however, is photographically reproduced, so does not contain any distinguishing marks.</p> <p>Closely resembles the genuine ampule.</p> <p>Photographic reproduction bears the control letters "V U H" in print.</p> <p>Color is light grayish-yellow, somewhat like that of precipitated sulphur.</p> <p>Does not at all respond to tests for the genuine.</p>	<p>In single tubes only.....</p> <p>This lot is put in genuine aluminum tubes which were purchased from physicians, and therefore constitute the most dangerous of the three frauds thus far discovered. (See below under "Insert Circular" and "Label.")</p> <p>The tube contains an insert circular, wrapped about the ampule. There is also a plug of cotton, but the file and piece of corrugated paper are missing.</p> <p>Genuine tubes, old style (see above).</p> <p>(See above)</p> <p>Same as in Lot A.....</p> <p>Same as in Lot A.....</p> <p>Same as in Lot A.....</p> <p>Same as in Lot A.....</p> <p>Does not at all respond to tests for the genuine.</p>	<p>In packages of five tubes wrapped in waxed paper, sealed with two bright red seals on which the printing is distinct.</p> <p>The line marking the collar for the cap is sharply defined.</p> <p>The tube contains an insert circular, wrapped about the ampule, a small file, a plug of cotton, and the whole wrapped in a small piece of white corrugated paper.</p> <p>Genuine product. Since early in 1916, no longer bears the printed guarantee under the Food and Drugs Act, for the printing of this on the label is no longer permitted by the Federal Government.</p> <p>The shipping numbers vary, and are done by means of a numbering stamp.</p> <p>Size 8¼ inches by 5¾ inches. Underscoring of text at bottom of first page is exactly as long as the printed lines of type. Toxicity is spelled correctly. The chemical name, 5th line below heading, is spelled with a "y"—dioxy.</p> <p>Genuine ampule always well formed. Upper drawn-out end quite straight.</p> <p>Control letters vary, and are hand stamped.</p> <p>Color is yellow like that of English mustard.</p>

The company made a mistake. A number of independent concerns started up business within the State of North Dakota and sold biscuits under labels that complied with the law. As a result, the biscuit company—that had withdrawn its products after about a six years' absence reentered the state with its products labeled in accordance with the state law. More important still, its products for sale in every state in the Union bore a net-weight label and the people of the whole United States were enabled to know just how much they were getting for their money. For this they had to thank the State of North Dakota. Since that time a federal net-weight law has been enacted.

Now comes another example of the benefit the country receives from the action of enlightened states. Four years ago Oregon passed a law making it a misdemeanor to publish any advertisement of the venereal quack type whether it applied to an individual claiming to treat venereal disease or to drugs or devices for the alleged cure of such diseases. The law, of course, was fought by the quacks, but was upheld by the Oregon Supreme Court. This law made itself felt as far away from the Pacific coast as New York City. In that city there is published a sheet known as the *Police Gazette*, one of the distinguishing features of which was its large number of filthy and nauseating venereal advertisements.

THE NATIONAL POLICE GAZETTE, NEW YORK.

LOST MANHOOD
"Restoring" the manly vigor and power of the man who has lost it. Guaranteed to cure in 30 days. Price \$10.00. **FREE TO Weak Men**

FREE TO Weak Men
"Restoring" the manly vigor and power of the man who has lost it. Guaranteed to cure in 30 days. Price \$10.00. **FREE TO Weak Men**

BROU
CATARRH OF THE BLADDER
DON'T GET MARRIED
MEN
\$10,000 REWARD
J.P.
ADIES \$100 REWARD
DROPS
VIRILITY FOR MEN

For Men: A QUICK, SAFE AND POSITIVE TREATMENT
Describes how to find the One Best Remedy
PRICE 50c
THE BOX OF 50 CAPS
TO CURE OF MONEY BACK.
THE SAFETY REMEDY CO., BOX A, CANTON, MASS.

SANTAL MIDY
24 HOURS
TRY OUR NEW SPECIALTY
REDSULES
FOR DISEASES OF THE URINARY ORGANS
ONE POLAR BOX 50c
ACQUIRE MANLY VIGOR
FAILURE OF "606"
LONG LIFE TO ALL
MEN

KNOX
For Catarrhal conditions and sexual discharges or irritation of mucous membrane. Safe, reliable. Contains no poisons or injurious ingredients. Guaranteed not to cause obstruction of passage. Destroys disease germ. Cures in 5 days.
FIVE DAYS
Don't take chances with obstruction. They're offered for only one reason. For your own good. Guaranteed to cure in 5 days. Take to preserve your health without the "K." \$1 per bottle (includes postage and insurance). No drugs elsewhere.

BLOOD POISON
STERLING'S ROYAL REMEDY
A TALK TO MEN
FREE TONIC FOR STRENGTH
B.M.C. BLOOD SPECIFIC
YOUNG MEN
EVERY MAN
DR. GREY

Greatly reduced reproduction of the venereal advertisements appearing in a single issue of the *Police Gazette* previous to Sept. 1, 1917, when the New York law prohibiting such advertisements went into effect.

After the Oregon law went into effect it was found that the copies of the *Police Gazette* offered for sale in that state had been "denatured" in that the "weak men" advertisements were deleted. In other words, the *Police Gazette* got out two editions, one still reeking with filthy advertisements and the other, which it called its "International Edition," with this particular type of advertisement omitted. The "International Edition" also was the one sold in Canada.

On Sept. 1, 1917, the state of New York put into effect a law very similar to that in Oregon. This hit the *Police Gazette* where it lives and, as a result, this periodical, as now published, while still containing some quack and nostrum advertisements—other than venereal—no longer smells to high heaven. As a matter of interest, we give a list of advertisements that ran more or less regularly before the New York law went into effect:

SANTAL MIDY: "Relieves in 24 hours."
REDSULES: "Sent by mail in plain sealed wrapper."
TURKO GIANT OINTMENT: "Men made strong and vigorous."
J. P.: "Restores lost vitality."
VACUUM MESSAGE: "Acquire manly power—virility."
OLD DR. WELCH: "Free treatment, guaranteed for all the worst forms of blood poison."
DR. T. PIERCE: "Sexoid restores lost powers."
SKEEN'S PAINLESS REMEDIES: "Stricture treatment guaranteed."
PLANTEEN'S C. & C.: "Remedy for Men."

KNOXIT: "Relieves in five days."

DR. ROWE: "Varicocele, stricture and urinary diseases."

R. L. G. VIM-TONIC: "Regain your health and lost manly vigor."

SEX TONIQUE: "Quickly relieve any case of lost manhood."

DR. FRANKLIN ROBERTS: Prescription "Free to Weak Men."

H. G. C.: "Relieves within three days."

SALVAR: "Quick and perfect results without danger and at little cost."

ANTI-GONIC TABLETS: "The best preventives of stricture, cystitis, hydrocele."

MAGNETIC REMEDY CO.: "\$10,000 Reward for any case of Lost Manhood our simple treatment will not restore."

DR. J. HENDERSON: "Stricture and discharges successfully treated."

W. F. YOUNG, P. D. F.: "Varicocele, Hydrocele, etc., promptly relieved with inexpensive home treatment."

STERLING'S ROYAL REMEDY: "Blood Poison. Enables you to treat yourself with positive success."

PABST'S OKAY SPECIFIC: "Is a 'dead shot' for the diseases for which it is prescribed."

DR. MEYERS CO.: "We cure varicocele, stricture, chronic, nervous, blood, skin, kidney and bladder diseases."

B. M. C.: "Is a blood specific."

VI-TONOL CAPSULES: "The strength and vigor builder."

DR. GREY: "Over thirty years a specialist in the diseases of men."

NEW-OLD VACUUM CO.: "Virility for men." "Strengthens, develops and enlarges."

DR. SOUTHWORTH'S REMEDY CO.: "Ladies \$1,000 Reward." "Safely relieves some of the longest, most obstinate, abnormal cases in 3 to 5 days."

INJECTION BROU: "The logical treatment. Direct—Quick—Effective."

BLACK-CAPS: "Discharges, inflammations and irritations permanently relieved in two to five days."

NURO-VITO OINTMENT: "Makes weak men strong and strong men stronger."

NOVA NURA CAPSULES: "Wait until you have cured yourself and regained healthy manhood with Nova Nura Capsules, then marry if you want to enjoy happy married life."

TAYLOR'S A-S: "A positive relief for Blood Poison in any or all its stages."

MI-VO: "Quickly Restores Lost Vim, Vigor and Vitality."

No longer will this putrid mass be scattered broadcast over the country through the agency of the *Police Gazette*. That publication's advertising pages have finally rendered to legislative pressure a tribute to decency which they were apparently unwilling to give voluntarily.

Infant Mortality.—The New York Milk Committee has just completed a survey of the death rate among babies in the larger cities of the United States. They find that the infant death rate has been reduced 11 per cent. since 1910. This reduction has been made among cities of 100,000 population or over. The smaller cities have not done so well. The reduction in cities between 50,000 and 100,000 population is only 2 per cent., while those under 50,000 show an increase of 5 per cent. The statistics of 150 cities, representing one fourth of the population of the United States, were studied, and include records of 670,000 living births and 68,000 deaths under 1 year of age for the year 1916, making an infant mortality rate of 100 baby deaths for each thousand births registered. The general reduction since 1910 is 9 per cent. The lowest infant death rate in the country in 1916 among cities of 100,000 or over was in Portland, Ore., with a record of only 55 baby deaths per thousand births. Fall River, Mass., has the highest rate, 163. In the second group of cities, those having a population of from 50,000 to 100,000, Hoboken, N. J., has the low rate of 77 against San Antonio, Tex., which has the high rate of 246. Among cities having a population of 50,000 and under, Brookline, Mass., leads with the low rate of 32 against Austin, Tex., whose rate was 182. Though there has been a general decrease for all the cities since 1910, the reports for 1916 compared with those of 1915 are not so encouraging. Only 13 of the larger cities showed a decreased death rate for 1916 over that of 1915. New York leads in the decrease for this period, having an infant mortality rate for 1916 of 93 per thousand births. Other cities in the group showing decrease were Philadelphia, 101; New Orleans, 96; Washington, 105; Jersey City, 102; Rochester, 82; St. Paul, 67; Denver, 84; Portland, 55; Oakland, 65; Scranton, 85; Grand Rapids, 115; Spokane, 57, and Albany, 96. The cities which showed an increase included Chicago, St. Louis, Pittsburgh, Detroit, Buffalo, San Francisco, Milwaukee, Cincinnati, Newark, Los Angeles, Minneapolis, Indianapolis, Providence and Louisville.

Correspondence

A SELECTIVE DRAFT OF PHYSICIANS BASED ON CLASSIFICATION

To the Editor:—As soon as the medical profession of the United States appreciates that no stigma is connected with a selective draft of physicians based on a previous careful classification, just so soon will genuine medical preparedness be realized in this country. The volunteer system is dead. Virile men will ever regret its passing, and yet it must be admitted that it was undemocratic and utterly inadequate. We are, as a people, slowly but surely coming to a realization that the right of suffrage is inalienably connected with the duty of national service, and that this service can only be economically and justly directed by the federal government. Only when there exists a willingness on the part of the individual to sink all personal dictates to the will of the federal government can a nation be said to have dedicated itself to a war.

It is said that enough physicians have volunteered to care for the first million increment of our National Army. Will it be possible to obtain similar quotas for the second and third million, by the same methods that have been employed in the past? I emphatically do not think so. Have we obtained through the volunteer system the best qualified men for the important duty of caring for our sick and wounded? Again emphatically no. A fair proportion of the physicians who have volunteered are men who have been attracted to a new life through a failure to succeed in their old. The Medical Reserve Corps today contains too many men over 40 and too few under 30. Many communities throughout the country have been stripped of their physicians, whereas from many other none have gone. Do these facts show that the medical profession is performing the best kind of national service?

The profession has failed so far to realize one basic principle connected with its part in this war. Responsibility for the aggressive prosecution of the war lies more heavily on the medical profession than on any other. The profession, under the direction of the regular officers, is the Medical Corps of the Army. To every regular Medical Corps officer, there are today sixteen reserve corps officers in the service of the United States. And this proportion will ever increase. In order to insure the obtaining of sufficient physicians for the continuation of the war, regardless of its length, it seems to me imperative that a selective draft be instituted. The greatest service that the profession could now do the country would be to self-impose such a draft, based on a competent classification. There certainly can be no stigma attached to placing in the hands of the federal government the power wisely to select those men that it needs for the successful prosecution of the present war.

RICHARD DERBY, Major, M. R. C.,
Camp Upton, Yaphank, L. I., N. Y.

WOMEN PHYSICIANS AND THE WAR

To the Editor:—When THE JOURNAL A. M. A. and the California State Journal of Medicine had published calls to physicians to offer their services to the government by enlisting in the Medical Reserve Corps; when Dr. T. W. Huntington of San Francisco, a member of the Advisory Commission of the Council of National Defense, had in various places addressed mass meetings of physicians, strongly urging them to volunteer, and when a personal letter of the same tenor had been sent to each member from the secretary of county medical societies, several women members of the medical profession in California responded to these appeals, in some cases making use of the application blanks provided in THE JOURNAL, etc. Some papers went to the War Office at Washington, D. C., and some (at least one) to the specified local headquarters.

These elicited the uniform reply, variously worded, that the War Department was not yet authorized to accept women medical officers.

Realizing that women physicians are, as a whole, freer than men from family ties and dependents, and knowing how extensively they have been called on during the war in Europe, sixty-five women physicians of San Francisco and vicinity met, June 22, in the rooms of the San Francisco County Medical Society and adopted the following resolution:

WHEREAS, Women physicians in Great Britain, France, Russia, Serbia, Austria and Germany have performed invaluable services during the present war, services which have been signally recognized by their respective governments; and,

WHEREAS, In the United States there are large numbers of women physicians fitted and equipped to render equally valuable service and to render service as efficient and valuable as can be rendered by men physicians, not only as anesthetists, radiographers and hospital and laboratory directors, but also as surgeons; now, therefore, be it

Resolved, That we urge upon the Secretary of War that the services of women physicians be utilized to the fullest extent by the United States War Department in the present war; that opportunities for medical service be given to medical women equal to the opportunities given to medical men, both as members of the staffs of base hospitals and otherwise; and that the women so serving be given the same rank, title and pay given to men holding equivalent positions.

As an earnest of good faith and a guarantee that there will be women ready to serve when the government is ready to use them, the following petition was signed by about thirty present:

We, the undersigned, offer our services to the War Department as members of the Medical Reserve Corps and will serve wherever sent, providing that opportunities for medical service be given to medical women equal to the opportunities given to medical men, both as members of the staffs of base hospitals and otherwise, and that women so serving be given the same rank, title and pay given to men holding equivalent positions.

Since then the number of signatures has increased to fifty-six from the entire state. In view of the fact that the United States government is desirous of profiting by the experience of the countries that have been at war, it is hoped that as soon as this omission is called to the attention of the profession as a whole and of the War Department, the regulations will be so modified as to make it possible to commission medical women.

ELSIE REED MITCHELL, M.D., San Francisco.

A FIELD EXPERIMENT ON POISON-OAK PREVENTION

To the Editor:—On a hot day, last July, without taking any precautions against my old enemy, poison-oak (*Rhus toxicodendron*), I climbed up a steep trail which was overgrown by tall briars and poison-oak bearing green leaves. The trail had fallen into disuse, and the wild growth obscured the path and at times reached above my head. I had to crowd my way through it, sometimes crawl under it, and constantly brush it aside. Finally, I lay down in the brush at the top of the cliff for about one hour surrounded by the poisonous leaves. Naturally, the poison-oak came into direct contact with my hands, wrists and face. I was well aware of my danger, but had no means to protect myself save that I avoided rubbing my face with my hands.

After an hour I walked a mile to my automobile and then drove 4 miles to the hotel, where I washed my face, hands, arms and neck (but not my hair) with soap and water. I avoided washing off all the soap, desiring to protect myself against the poison that doubtless clung to my clothes. Then I drove for three hours and a half, about 90 miles, before reaching home, where I immediately took a complete soap and hot water bath and made an entire change of clothing.

I am so very susceptible to the poison that I awaited the outcome with much interest. Ordinarily, without precautions, I should have been severely poisoned on the face, neck, ears, hands and legs. In this instance, the only poisoning that occurred was a little itching on the ankles, which had been very dusty and had rubbed much against the brush.

This result is quite in accord with laboratory experiments which I reported in the *Archives of Internal Medicine* in February, 1913. Some hours at least are usually required for the *Rhus* poison to penetrate sufficiently to cause dermatitis. If the poison is washed off before it penetrates, dermatitis is avoided.

The foregoing field experiment proves that *Rhus* dermatitis can be avoided by simple means, namely, by removing the poison within a few hours. Many variations of the method immediately suggest themselves: Soap may be carried along to be used at each stream crossed; liquid soap might be carried in a bottle and applied a few times to exposed skin surfaces. The time necessary for the poison to penetrate can be much lengthened and the toxicity much decreased by covering the skin with a film of cottonseed oil.

It is thus clear that with a little precaution the plants of this poisonous family can be defied. As a detail of preventive measures the following is recommended:

Before exposure, apply cottonseed oil, or soapsuds, to all exposed skin surfaces, and use soap in some form every hour during exposure.

As soon after exposure as possible, take the following precautions:

Take a complete soap and hot water bath, not neglecting the hair.

Change all clothing, including hat and shoes.

Avoid contact with clothing or other articles that have been exposed to the poison, until they have been freed from the poison.

EDWARD VON ADELUNG, M.D., Oakland, Calif.

THE ROLL OF HONOR

To the Editor:—The communication from Dr. Edward von Adelung, THE JOURNAL, Sept. 8, 1917, p. 843, stressing the equal or greater financial sacrifice of the small income practitioner as opposed to the very large income practitioner in responding to the call to the colors is interesting and correctly estimates the situation. However, is a financial sacrifice the great sacrifice made?

The medical man who closes his office, abandons his local practice, and thus automatically stops all local revenue, in many instances with certain unavoidable "overhead" expenses still going on, makes a patriotic sacrifice for his country. This hardship can be measured in dollars and cents.

The very great obstacle to the medical man is this financial uncertainty; here comes about the *impasse* in his mind that accounts for the hesitation in volunteering. Can both ends meet under the proposed régime? The very great sacrifice, however, that he makes cannot be measured in dollars and cents. It consists of his own willingness to leave home and family for an indefinite period; to go to any part of the earth when ordered; to encounter all of the uncertainties of military life and finally to submit entirely to the risks and exigencies of the great war. Here is the real sacrifice voluntarily being made by thousands of our fellows, and that cannot be measured by the dollar mark.

JOHN C. SILLIMAN, M.D., Palo Alto, Calif.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

MENCIÈRE'S IODOFORM-PERUVIAN BALSAM MIXTURE

To the Editor:—Please furnish me the formula for Mencièrè's iodoform-Peruvian balsam mixture.

A. G. WILDE, M.D.,

Captain M. C., U. S. Army, Base Hospital No. 5, Nogales, Ariz.

ANSWER.—The formula differs as to whether it is to be used for a spray in emergencies—as when the wounded are coming in in large numbers and every minute counts—or whether it is to be used as a permanent dressing. For the spray, the mixture is made with 10 gm. each of iodoform, guaiacol, eucalyptol and Peruvian balsam, 100 gm. alcohol and ether to 1,000 c.c. Cheyrou says of this (Abstract 51, THE JOURNAL, April 28, 1917, p. 1294) that after the surgical toilet of the wound, this fluid is sprayed forcibly into all the crevices and cavities of the wound. It takes only a few

seconds; the hands do not come in contact with the wound, and only a small amount of the fluid is used while the powerful disinfectants ward off complications. The dressing does not have to be changed until the man reaches the base hospital.

The formula for the permanent dressing was given in abstracts printed in THE JOURNAL, March 6, 1915, p. 861, Oct. 16, 1915, p. 1407, and Dec. 4, 1915, p. 2040: Solution A, iodoform, 10 gm.; guaiacol, 10 gm.; eucalyptol, 10 gm.; balsam of Peru, 30 gm.; ether, 100 gm., to be used to soak the wicks of gauze or to be injected into the sinuses with a Roux syringe. If hydrogen peroxid is lacking, or if one is prodigal, Solution B may be used for washing the wound before embalmment. Solution B differs from A only in the quantity of ether, which is 1,000 gm. instead of the 100 of Solution A. In case of idiosyncrasy or intolerance after a few days' treatment (which is exceptional), the iodoform is omitted. Directions for use are given in the abstracts.

Delestre has also found the Mencièrè mixture useful in the base hospital for the permanent dressing of wounds (*Progrès médical*, April 21, 1917, p. 133). He applied it in 200 cases of severe wounds, *grands blessés*; first clearing the wound of all crushed tissues and then washing it clean with water containing guaiacol and benzoic acid (he does not give the proportions), then "embalming" the wound with the Mencièrè mixture, raising the edges of the wound with Kocher forceps for four or five minutes to form a well. He said that he had seen this always prevent the development of germs in the wound and admirably arrest beginning infections, even grave ones, while the wound cleaned up and healed over remarkably fast. "In short," he concluded, "I am convinced that the Mencièrè treatment will soon win numerous adherents and realize at the same time economy in time, in personnel and in . . . existences."

POLYCHROME STAIN FOR PROTOZOA AND BLOOD CORPUSCLES

To the Editor:—1. In THE JOURNAL (Aug. 25, 1917, p. 679) I note a formula for blood staining. The working formula is supposed to be given clearly, but it seems to me to be lacking in definiteness. Nothing is said about the amount of alcohol or the amount of glycerin to be added, and it occurs to me that there is some reversal of process in the mixing of solutions and the filtering process.

2. Where is the *Kitasato Journal* to be obtained?

A. M. CRANE, M.D., Marion, Ohio.

ANSWER.—1. The description of the procedure would have been clearer if the following additional paragraph had been cited: "The powder obtained by drying out the mixture is a methylenazureosin, of a dark violet, and weighs about 0.3 or 0.5 gm. It is dissolved in methyl alcohol and neutral glycerin in the proportion of 0.5 part of the methylenazureosin to 150 parts each of methyl alcohol and neutral glycerin. The extremely light powder is ground carefully in a mortar, and the alcohol is added in small amounts. The powder once dissolved in the alcohol is filtered, and then the glycerin is added. The solution thus obtained keeps in a cool dark place for a long time."

We will lend the *Kitasato Archives* on receipt of 6 cents.

"NIKALGIN"

To the Editor:—*Collier's* has a special article this week on "Nikalgin." Have you any information on this subject? It sounds like nostrum stuff.

P. R. MINAHAN, M.D., Fond du Lac, Wis.

ANSWER.—"Nikalgin" is said to be the "invention" of Gordon Edwards, an engineer. Large claims for its anesthetic and antiseptic virtues have been made. While no very definite information seems to be forthcoming regarding the preparation, it has been said to be "composed of quinin, hydrochloric acid and urea." This would indicate that "Nikalgin" may be nothing more wonderful than the well known local anesthetic, quinin and urea hydrochlorid, the *Quinina et Urea Hydrochloridum* of the U. S. Pharmacopeia, or a modification of it.

WHAT IS A MIL?

To the Editor:—What is a mil? It seems to be used as a unit of quantity.

E. C.

ANSWER.—The mil is a contraction for "milliliter," a term that has been proposed as more logical and convenient than "c.c." to express the same amount.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARIZONA: Phoenix, Oct. 2-3. Sec., Dr. John Wix Thomas, 306 Goodrich Bldg., Phoenix.

CALIFORNIA: Los Angeles, Oct. 9-13. Secretary, Dr. Charles B. Pinkham, State Capitol, Sacramento.

COLORADO: Denver, Oct. 2. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

DISTRICT OF COLUMBIA: Washington, Oct. 9-11. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington, D. C.

GEORGIA: Atlanta, Oct. 9-11. Sec., Dr. C. T. Nolan, Marietta, Ga.

IDAHO: Pocatello, Oct. 2. Sec., Dr. Charles A. Dettman, Burke.

ILLINOIS: Chicago, Oct. 9-11. Superintendent of Registration, Mr. F. C. Dodds, Springfield.

IOWA: Des Moines, Oct. 9-11. Sec., Dr. G. H. Sumner, State House, Des Moines.

MICHIGAN: Lansing, Oct. 9-11. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.

MINNESOTA: Minneapolis, Oct. 2-5. Sec., Dr. Thomas S. McDavitt, Lowry Bldg., St. Paul.

MONTANA: Helena, Oct. 2. Sec., Dr. William C. Riddell, Power Bldg., Helena.

NATIONAL BOARD OF MEDICAL EXAMINERS: Chicago, Oct. 10-18. Sec., Dr. J. S. Rodman, 2106 Walnut St., Philadelphia.

NEW JERSEY: Trenton, Oct. 16-17. Sec., Dr. Alexander MacAlister, 438 E. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 8. Sec., Dr. R. K. McClanahan, East Las Vegas.

NEW YORK: Albany, Buffalo, New York City and Syracuse, Oct. 2-5. Chief, Examinations Division, Harlan S. Horner, State Education Bldg., Albany.

OKLAHOMA: Oklahoma City, Oct. 9-10. Sec., Dr. Ralph V. Smith, 502 Daniel Bldg., Tulsa.

PORTO RICO: San Juan, Oct. 2. Sec., Dr. M. Quevedo Baez, San Juan.

RHODE ISLAND: Providence, Oct. 4-5. Sec., Dr. Byron O. Richards, State House, Providence.

UTAH: Salt Lake City, Oct. 1-2. Sec., Dr. G. F. Harding, Templeton Bldg., Salt Lake City.

WYOMING: Laramie, Oct. 10-12. Sec., Dr. H. E. McCollum, Laramie.

Michigan May Examination

B. D. Harison, secretary of the Michigan State Board of Registration in Medicine, reports the written examination held at Detroit, May 29-31, 1917. The examination covered 14 subjects and included 100 questions. An average of 75 per cent. was required to pass, and in no subject was the percentage to be less than 50. Of the 59 candidates examined, 57 passed and 2 failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Atlanta Medical College.....	(1915)	79.1	
Chicago College of Medicine and Surgery	(1916)	86.3	
University and Bellevue Hospital	(1915)	87.5	
Detroit College of Medicine and Surgery	(1916) 80.3; (1917) 78.1; 78.6; 79; 79.8; 80.8; 80.9; 81; 81.6; 81.9; 82; 82.1; 82.4; 82.4; 82.6; 82.7; 82.8; 83.4; 83.7; 83.8; 83.9; 84.5; 84.9; 85.1; 85.2; 85.3; 85.3; 85.7; 85.8; 86; 86.1; 86.1; 86.2; 86.3; 86.4; 86.8; 86.9; 87; 87.2; 87.3; 87.5; 87.6; 88.2; 88.2; 88.9; 89.5; 89.6; 91.2.		
Johns Hopkins University	(1917)	84.4	
Rush Medical College	(1917)	87.4	
University of Arkansas	(1909)	80.2	
University of Michigan Medical School	(1916)	84.9	
University of Toronto	(1917)	82.4	
Western University Faculty of Medicine	(1912)	89.2	
	FAILED		
Detroit College of Medicine and Surgery	(1917)	76, 78.5	

Michigan June Examination

Dr. B. D. Harison, secretary of the Michigan State Board of Registration in Medicine, reports the written examination held at Ann Arbor, June, 1917. The examination covered 14 subjects and included 100 questions. The average percentage required to pass was 75 and not less than 50 per cent. must have been obtained in each subject. Of the 54 candidates examined, 53 passed and one failed. Forty-five candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Hahnemann Medical College	(1917)	91.8	
University of Illinois (1916) 89.9; (1917) 83.6.			
University of Michigan, Homeopathic Medical School (1917) 80.3, 89.9			
University of Michigan (1917) 80.4; 81.5; 83; 83.2; 83.3; 83.4; 84.2; 84.2; 84.3; 84.4; 84.8; 85; 85.3; 85.3; 85.4; 85.4; 85.5; 85.5; 85.6; 85.6; 85.7; 85.8; 85.9; 85.9; 86; 86.2; 86.2; 86.3; 86.4; 86.5; 86.7; 86.8; 87.1; 87.2; 87.5; 87.6; 87.9; 87.9; 88.3; 88.8; 89; 89.1; 89.2; 91.3; 92.8.			

University of Oklahoma	(1916)	81.2
University of Pennsylvania	(1916)	91.1
Womens Medical College Pennsylvania	(1915)	91.6

	FAILED	
University of Michigan	(1917)	79.4

College	Year Grad.	Reciprocity with
American Medical Missionary College	(1907)	Illinois
Atlanta Medical College	(1916)	Georgia
Baltimore Medical College	(1911)	Maryland
Baltimore University	(1899)	W. Virginia
Baylor University	(1913)	Texas
Beaumont Hospital Medical College	(1900)	Missouri
Bellevue Hospital	(1876)	Penna.
Chicago College of Med. and Surg. ..	(1913)	Illinois (1915)
College of Physicians and Surgeons	(1914)	Maryland
Detroit College of Medicine and Surgery.....	(1917)	Ohio
Eclectic Medical College	(1915)	Ohio
Hahnemann Medical College	(1906)	Illinois (1915)
Howard University	(1904)	Georgia
Illinois Medical College	(1903)	Indiana
Iowa College of Physicians and Surgeons.....	(1897)	Iowa
Johns Hopkins Medical School	(1907)	Maryland
Louisville Medical College	(1894)	Oklahoma
Marquette University	(1916)	Wisconsin
Medical College of Ohio	(1884)	Indiana (1886)
Northwestern University	(1915)	Illinois
Rush Medical College	(1915)	Illinois (1916)
St. Louis College of Physicians and Surgeons	(1890)	Missouri
St. Louis University, School of Medicine	(1916)	Missouri
Starling Ohio Medical College	(1913)	Ohio
Syrian Protestant College	(1886)	Missouri
Tufts College, Medical School	(1903)	Wisconsin
University of Illinois (1905) Illinois (1914) Illinois (1914)	(1915) Illinois (1916)	Illinois Illinois
University of Michigan	(1908)	Georgia
University of Michigan Homeopathic Medical School. (1888)		Ohio
Univ. of Louisville (1911) Missouri (1913) Indiana (1916)		Kentucky
University of Nashville	(1899)	Kansas
University of Tennessee	(1886)	Kansas
Washington University	(1908)	Missouri (1911)
Vanderbilt University	(1916)	Tennessee

Book Notices

THE ROENTGEN DIAGNOSIS OF DISEASES OF THE ALIMENTARY CANAL. By Russell D. Carman, M.D., Head of Section on Roentgenology, Division of Medicine, Mayo Clinic, and Albert Miller, M.D., First Assistant in Section on Roentgenology, Division of Medicine, Mayo Clinic. Cloth. Price, \$6 net. Pp. 558, with 504 illustrations. Philadelphia: W. B. Saunders Company, 1917.

The authors have selected and arranged in a systematic manner the facts of Roentgen diagnosis which they believe to be worth while, and especially those which they have verified by experience with a large amount of material. Extensive descriptions of apparatus are omitted, but detailed protocols are given of the findings in a considerable number of cases. The authors give freely of their experience, and even record their mistakes because of the lessons they may teach. The unusually large number of cases examined by the authors, their well known ability, and the close cooperation between the various departments of the clinic with which they are connected naturally give their statements weight which they would not have otherwise. For instance: "In the detection of cancer of the stomach, the Roentgen rays take precedence over all other methods. . . . In the Mayo Clinic, 95 per cent. of gastric cancers have given distinct roentgenologic signs of their presence, a percentage not approached by any other process of examination." This surely is a strong statement, but the evidence presented seems to warrant it. The authors insist that the roentgenologist should be acquainted with the principal clinical facts, and that these should at least grossly correspond to his own findings. On the basis of their own statistics, it is stated that nine tenths of the ulcers of the stomach give distinct roentgenologic indications of gastric disease, and in an overwhelming majority of these the Roentgen signs are either pathognomonic or strongly presumptive of ulcer. Because of the many difficulties by which roentgenography of gallstones is beset, the authors have had little success, notwithstanding the fact that abundant material has been at their disposal. The difficulty has not been to find shadows, for

these were often present, but to find shadows that seemed definite and characteristic. Likewise, in lesions of the gall-bladder without discoverable stones, the Roentgen ray can only exceptionally furnish decisive evidence. Duodenal ulcer they believe can always be diagnosed by the Roentgen ray. More than 2,300 cases have been proved by operation, and a great number have been diagnosed but no operation performed. With regard to the possibility of diagnosing chronic appendicitis, the authors make the following rather significant statement: "On the whole, the value of the Roentgen signs of appendicitis appears to depend not only on the intensity of the examiner's endeavor, but also, to some extent, on the degree of his enthusiasm."

The conclusions are based on facts observed in many cases; they will be interesting reading for the general practitioner. The book is a plea for careful, thorough, conscientious roentgenography that will do much to establish Roentgen diagnosis as worth while.

ADVANCED FIRST-AID INSTRUCTIONS FOR MINERS. A Report on Standardization. By a Committee of Surgeons: G. H. Halberstadt, A. F. Knoefel, W. A. Lynott, W. S. Rountree and M. J. Shields. Department of the Interior, Bureau of Mines. Paper. Price, 20 cents. Pp. 154, with 65 illustrations. Washington: Government Printing Office, 1917.

This pamphlet is the result of an evolution coinciding with the progress of first aid teaching among the employees of the mines of the country. At first this was the work of individual physicians in the anthracite region of Pennsylvania, in Alabama and in Indiana, then had the cooperation and assistance of the Red Cross, and finally was taken over as a function of the Bureau of Mines of the Department of the Interior. The pamphlet was prepared by a committee of surgeons, including those first interested in the subject, and gives the essence of their practical experience in the principles of first aid work that may be placed in lay hands. Organization, equipment, a bit of anatomy and physiology, methods of meeting emergencies, applying first aid dressings and apparatus, handling the injured, what to do and what to avoid, are all clearly and concisely set forth. The usefulness of the pamphlet may be said to extend beyond its originally intended function.

GLAUCOMA: A HANDBOOK FOR THE GENERAL PRACTITIONER. By Robert Henry Elliot, M.D., B.S., Sc.D. Cloth. Price, \$1.50 net. Pp. 60, with 12 illustrations. New York: Paul B. Hoeber, 1917.

The author states that he has in manuscript form a much more comprehensive volume on this subject, but the war makes its publication impossible at this time. This monograph, which will serve as an epitome of the larger book, is especially adapted for the general practitioner, because it touches only on the important practical phases of glaucoma and the most approved methods of dealing with this disease. The various theories and questions still in dispute, the scientific investigations into its etiology, etc., are to be discussed fully in the other publication. The general practitioner will find in this monograph a safe guide in the diagnosis, and descriptions of accepted operations as well as the general treatment of glaucoma.

Hamstringing the Child Labor Laws.—"Already in Connecticut, Minnesota, New Hampshire and Vermont no time has been lost in repealing or suspending the operation of the child labor laws. Everywhere the case is the same. There is a clamor to cut the school hours and the school months. The farmer declares he cannot get along without child labor. The truck gardener echoes the call. The makers of munitions say they need children in their plants. The canners assert that without children they cannot put up the great amount of food products the country needs. The vast percentage of these claims are false. They are not made in good faith. They are founded in greed. They are inspired by a desire for cheap labor. They are marked by an utter callousness to the fate of the instruments they seek to employ and misuse." This note, taken from the Columbus (Ohio) *Citizen*, is an indication of the difficulty of enforcing public health and social legislation which interferes to any extent with manufacturing or other industries.

Social Medicine, Medical Economics and Miscellany

Medicopharmaceutic Ethics

At a conference held in Melbourne between representatives of the Victoria Branch of the British Medical Association and representatives of the Pharmaceutical Society of Australasia, the Pharmacy Board and Pharmaceutical Defense Ltd., the following rules of practice, among others, were adopted. The rules are so common-sense that they are worthy of consideration in this country.

1. *Prescriptions—Doubtful Interpretations.*—In cases where there is some doubt regarding the interpretation of any prescription, it shall be the duty of the pharmacist dispensing the same to communicate with the prescriber if possible. It is preferable that such communication should be in writing. In cases where it is necessary to telephone to the prescriber, care should be taken to see that the conversation is as private as possible.

2. *Correction by Prescriber.*—The prescriber in such a case will recognize that the pharmacist is simply performing what is an important part of his professional duty, and will at once cooperate with him in the interests of his patient. He will correct or confirm the prescription. If a correction is necessary, he may request the pharmacist to retain the prescription, and will forward to him the corrected one. As far as possible, verbal corrections should be confirmed in writing.

3. *The Attitude of Prescriber and Dispenser* should be one of mutual respect and cooperation.

4. *Unusual Characteristics.*—In cases where a prescription contains (a) an incompatibility, (b) an unusually large dose, (c) a dangerous dose, or possesses some other characteristic of an unusual nature, the prescriber shall indicate that such peculiarity is intended, and is not inadvertent, by underlining that particular part of the prescription, and initialing the same in the margin.

5. *Where Prescriber Cannot Be Consulted.*—Where a pharmacist is doubtful of the interpretation of a prescription, and it is not possible to consult the prescriber, he shall, after careful consideration, modify the prescription in accordance with what he believes to be the intention of the prescriber. He should, if possible, subsequently communicate with the prescriber by letter, and inform him of what he has done. Care should be taken to see that such discretion, when exercised, does not interfere with the therapeutic value of the medicine.

6. *Modifications to Be Noted.*—Where a pharmacist finds it necessary to modify a prescription, under paragraph 5, he should make a marginal note on the prescription indicating the course he has adopted in dispensing the prescription. The marginal note should be as brief as possible.

7. *Prescribing by Telephone.*—When prescriptions are dictated by telephone, the following rule should be observed: The prescriber should first write out the prescription, and then read it through the telephone to the dispenser. He should request the dispenser to read to him the prescription as taken down, and should, as soon as possible, forward the original prescription to the pharmacist either by post or by the patient.

8. *Criticism Deprecated.*—It is undesirable that a prescriber should adversely criticize a pharmacist unless he is guilty of some offense in his calling. The pharmacist on his part should refrain from discussing with the patient the prescriber or the merits of his prescription. Matters relating to professional fees or the prices charged for medicines should not be discussed with patients.

9. *Unsigned Prescriptions.*—When a prescription is received with the "usual signature," the pharmacist should ascertain from the patient the name of the prescriber, and, if possible, submit the prescription for his signature before dispensing it so as to relieve the prescriber as well as himself from the risk of penalty. The use of a rubber stamp in lieu of the prescriber's written signature should be avoided.

10. *Repetition of Prescriptions.*—When it is desired that a prescription should not be repeated, the prescriber should write on the prescription, "Not to Be Repeated," or "To Be Repeated twice only," or any specified number of times. In cases where such directions are given, the pharmacist who

dispenses the prescription should indorse the prescription as follows: Supplied (here insert date and pharmacist's signature).

11. "*Spoonfuls*" to Be Abandoned.—With the object of securing greater accuracy in dosage, the use of the words "teaspoon," "dessertspoon," and "tablespoon" in the directions on a prescription should be discouraged. Prescribers should write the dosage in drams or ounces, and patients should be advised to measure the doses in a measure-glass.

Medicolegal

Power of Lumber Company to Contract for Services of Physician

(*Jackson Lumber Company vs. Trammell (Ala.)*, 74 So. R. 469)

The Supreme Court of Alabama says that plaintiff Trammell sought to recover for services rendered, as a physician, to the employees of the defendant company, under a contract for a fixed salary. The defendant, as one of the defenses interposed, pleaded that it was a corporation, and was not authorized by its charter so to contract for the services of a physician. The defendant was engaged in the operation of a sawmill. The court judicially knows, as it is a matter of common knowledge, that in such an enterprise much machinery is used, that the employment of laborers is essential to its operation, and that accidents are likely to occur. Without laborers the corporation would be powerless to carry out the purposes of its creation. It is therefore necessarily interested in the welfare of its employees. Much depends on their health and their contentment in the service, and to conserve their physical comfort tends to their efficiency, and the greater their efficiency the greater the profits to the defendant company. It could hardly be denied that a private corporation engaged in the manufacture of lumber could, if it saw fit, erect houses for the use of its employees and surround them with such sanitary conditions as would tend to promote their general and physical welfare, even though its charter might contain no such provisions. These are matters which relate to what might be termed the "internal management" of the corporation, with which, in the absence of fraud or unfair dealing, the courts as a rule do not interfere. The employment of a physician to look after the health of the employees is but in line with the suggestions above made, and concerns one of those questions of internal management which the court thinks may be fairly incidental to the objects of the corporation's creation. By contracting for such medical attention the corporation is not engaging in any business other than that expressly authorized in its charter, but merely adopts this as one of the means of executing its express powers (and as to such means the corporation must be held to have a right of reasonable choice), which the court thinks can be said in this instance to have had a very natural and reasonable tendency to aid in the accomplishment of the purpose for which it was created. But, on a rehearing, the court reverses a judgment obtained by the plaintiff, and remands the cause for a new trial, because of improper argument by counsel for the plaintiff, in directly or indirectly calling the attention of the jury to the fact that the plaintiff was a poor man, while the defendant was a big corporation, a judgment against which could not hurt it.

Validity of Ordinance Restricting Location of Private Hospitals

(*Lawrence vs. Nissen et al. (N. C.)*, 91 S. E. R. 1036)

The Supreme Court of North Carolina holds valid an ordinance which states that the construction, operation or maintenance of a hospital, or place or institution of like character where sick or diseased persons are treated or surgical operations performed, for pay, within the corporate limits of the city of Winston-Salem, and within 100 feet of a building or house used or occupied as a residence, is

declared to be a nuisance, or injury to adjacent property, and to the general public, and is prohibited. The court says that the enactment of such an ordinance is plainly within the powers conferred by the legislature when the aldermen are vested with power, not only to grant building permits, but also to prohibit the construction of buildings or structures that may be a nuisance or injurious to adjacent property. Having the authority to enact the ordinance, the reasonableness of it is not a matter for the court. Neither is it necessary that the court should find that conditions actually exist that require the enactment of the ordinance. It is sufficient if a state of facts could exist which would justify it. The ordinance is preventive in character and intended to protect the comfort, health and safety of the citizens. A hospital may not be a nuisance per se, or in and of itself, but it may become such because of its location, or by reason of the manner in which it is conducted. The objection was made to the ordinance that it was unduly discriminative, in that it applied only to hospitals established for profit, and not for charity; but the court is not impressed with the force of the objection. The discriminations which are open to objection are those wherein persons engaged in the same business are subjected to different restrictions, or are held entitled to different privileges under the same conditions. It is only then that the discrimination can be said to impair that equal right which all can claim in the enforcement of the laws. The establishment and conduct of hospitals for pay is now a recognized and established business. It is rare to find a city or town of any size without such institutions. These hospitals are generally established, owned and conducted by members of the medical profession for their own convenience and profit. No one is engaged in the business of establishing and conducting hospitals for charity. There are public hospitals in large cities with charity wards as well as pay wards in them, established and conducted by the municipal government or by trustees of some endowment fund donated by philanthropy; but the establishment of charitable hospitals is in no sense a recognized business. For this reason it is probable that the board of aldermen did not consider it necessary or important to embrace charity hospitals within the ordinance, deeming the creation of one by some local philanthropist a remote possibility, which could be attended to in the future if application for a building permit should be made.

Construction of Statute with Reference to Prescribing Intoxicating Liquors

(*State vs. Morton (S. D.)*, 162 N. W. R. 155)

The Supreme Court of South Dakota reverses a judgment of conviction of the defendant, a practicing physician, who was charged with furnishing to a named person a prescription for intoxicating liquor to be used as a beverage, and not for medicinal purposes. The prescription was for one-half pint of brandy, and the defendant testified that his directions were to take an ordinary wine glass of it three times a day ten or fifteen minutes before eating. The court says that it is of the view that the evidence was wholly insufficient to show the prescription was issued for intoxicating liquors to be used as a beverage in violation of Chapter 123, Laws of 1905. Under that statute a physician may sell or give a prescription for intoxicating liquors in cases of actual sickness, and when the person to whom the prescription is given is a patient of the physician and is afflicted with some disease, and his condition is such that, in the opinion of the physician, the taking by such patient of intoxicating liquors would be beneficial to him. The court is of the view that Section 1 of Chapter 123 was intended to apply when some one other than the patient himself makes application to the physician for the prescription. In this case the physician must ascertain whether or not the person by whom the liquor is to be used is actually sick; and the sick person by whom the liquor is to be used might not be present before the physician issuing the prescription, and might not be under the care of a physician at all, or might be the patient of some other physician. The court is also of the view that Section 2 of Chapter 123

has application in cases like the one at bar wherein the purchaser of the prescription is the patient of the physician who issues the prescription, and has sought the professional aid, skill and advice of such physician. The court concedes that a physician without any reasonable cause therefor could not arbitrarily say that a person was afflicted with a disease and, in his opinion, needed an alcoholic stimulant; but that was not this case. The undisputed evidence in this case showed that the person to whom the prescription was given personally applied to the defendant, in his capacity as a physician, for aid and advice in relation to his physical condition; that such person had failing appetite, general depression and weakness, felt tired from overwork and lack of nourishment, was not in a normal condition of body, was subnormal and was ailing. The court is of the view that a person in that physical condition was sick and afflicted with a disease, within the meaning of this statute, and in such a condition as would reasonably warrant a physician in exercising his judgment or opinion as to whether or not such patient needed an alcoholic stimulant. When a person in such a physical condition applies to a physician for medical aid and advice, the court is of the view that such a person is a patient within the meaning of the statute. How does a physician ordinarily ascertain whether or not a patient is sick and afflicted with some disease and in a condition that would authorize a prescription for alcoholic liquor? By what the patient tells him taken in connection with the physician's personal observation of the physical appearance and examination of the patient. The essence of this class of cases is whether or not under all the evidence adduced on the trial the physician acted in good faith in giving the prescription. In this case, as in all other criminal actions, the burden of proof was on the state to show by evidence, beyond all reasonable doubt, that the defendant violated the provisions of the statute.

Physician Not Guardian for Patient

(*Ulbrand vs. Bennett et al. (Ore.)*, 163 Pac. R. 445)

The Supreme Court of Oregon, in reversing a judgment rendered against the named defendant and a physician for money belonging to the plaintiff, but in the hands of the defendant, which was used to settle a claim of the physician against the plaintiff for services and to pay a hospital bill, etc., says it is undoubtedly the rule that any transaction between a physician and a patient inuring to the advantage of the former will be carefully scrutinized, and stricter control over it will be exercised than in cases in which no such confidential relation exists between the parties. The precept, however, does not go so far as to constitute a medical man a guardian for his patient, and it is not enough to say that he merely had knowledge of the action of a third party against whom the patient seeks relief without showing also that the physician participated in such action.

Society Proceedings

COMING MEETINGS

- * Amer. Acad. of Ophthal. and Oto-Laryng., Pittsburgh, Oct. 29-30.
- Am. Assn. for Study and Prev. of Inf. Mort., Richmond, Va., Oct. 15-17.
- American Association of Railway Surgeons, Chicago, Oct. 17-19.
- American Roentgen Ray Society, New York, Sept. 20-22.
- Colorado State Medical Society, Colorado Springs, Sept. 25-27.
- Delaware State Medical Society, Middletown, Oct. 8-9.
- Indiana State Medical Association, Evansville, Sept. 26-28.
- Kentucky State Medical Association, Louisville, Oct. 16-18.
- Medical Association of the Southwest, Kansas City, Oct. 15-17.
- Minnesota State Medical Association, St. Paul, Oct. 10-12.
- Mississippi Valley Medical Association, Toledo, O., Oct. 9-11.
- Nevada State Medical Association, Reno, Oct. 18-19.
- New Mexico Medical Society, Las Cruces, Oct. 4-6.
- Pennsylvania State Medical Society, Pittsburgh, Sept. 24-27.
- Southern Medical Association, Memphis, November 12-15.
- Vermont State Medical Society, Barre, Oct. 11-12.
- Virginia State Medical Society, Roanoke, Oct. 23-26.
- West Virginia State Medical Association, Fairmont, Oct. 2-4.
- Wisconsin State Medical Society, Milwaukee, Oct. 3-5.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

September, XIV, No. 3

- 1 *Presence of *Bacillus Abortus Bovinus* in Certified Milk. E. C. Fleischner and K. F. Meyer, San Francisco.—p. 157.
- 2 *Phenolsulphonephthalein Elimination in Infants and Young Children. J. C. Gittings and A. G. Mitchell, Philadelphia.—p. 474.
- 3 *Use of Pancreatic Vitamin in Cases of Marasmus. W. H. Eddy and J. C. Roper, New York.—p. 189.
- 4 *Variations in Infants of Total Blood Solids and Concentration of Sodium Chlorid in Plasma. A. M. Courtney and H. L. Fales, New York.—p. 202.
- 5 *Rumination in First Year of Life. C. G. Grulee, Chicago.—p. 210.
- 6 Gliosarcoma in Infant of Seven Weeks, Resembling Hydrocephalus. L. E. Holt, New York.—p. 219.
- 7 *Effect of Cod Liver Oil on Growth in Case of "Intestinal Infantileism." L. E. Holt, A. M. Courtney and H. L. Fales, New York.—p. 222.

1. *Bacillus Abortus Bovinus* in Certified Milk.—The following question was the basis of the investigation made by Fleischner and Meyer. Can one, by semi-annual tuberculin tests, discover reactors so early in the course of their disease as not to throw out tubercle bacilli in the milk and in this way disseminating bovine tuberculosis? To determine this fact, samples of certified milk were injected into guinea-pigs in an effort to produce tuberculous lesions, if tubercle bacilli were present. Samples of certified milk were collected over a period of several months from the regular distributors so that the product as it was ordinarily consumed should be investigated. The investigation showed that while *B. abortus* is, for practical purposes, always present in the certified milk produced in the San Francisco Bay regions, tubercle bacilli are not present in this same milk in sufficient number to give tuberculosis to guinea-pigs. Hence there is no necessity for pasteurizing certified milk on account of any danger that it may possess as a disseminator of bovine tuberculosis to infants. If the *B. abortus* is present in certified milk to the extent evident from these experiments, it is difficult to consider it pathogenic for infants, without, so far as is known, ever having produced recognizable lesions on postmortem examination.

2. Phenolsulphonephthalein Elimination in Children.—Phenolsulphonephthalein elimination was studied by Gittings and Mitchell in seventy-five patients with definite renal disease. The ages of the patients varied from 3 weeks to 10 years. They found no noteworthy difference in the phenolsulphonephthalein elimination of patients with albumin and casts in the urine—apart from the true nephritic groups—and of those whose urinary findings were negative. In the groups of acute infections, miscellaneous diseases and pyelitis no marked diminution in the amount of phenolsulphonephthalein elimination was noted, except in two of the three patients suffering from tuberculous meningitis. One of these died on the same day that the test was made, and the low phenolsulphonephthalein elimination (15 per cent. in two hours) was of no clinical significance. The second patient gave less than 5 per cent. of phenolsulphonephthalein in two hours, but lived for seven days. The presence of large amounts of albumin and an excessive number of leukocytes in the urine suggests the possibility of tuberculous lesions in the kidneys, which would account for their poor function. Neither of these cases is included in any of the summaries. The cases of nephritis showed a distinct diminution in phenolsulphonephthalein percentages. Presumably all of them belonged to the type of parenchymatous nephritis. None died under observation except a patient with cardiorenal disease, whose death was cardiac and not uremic.

3. Use of Pancreatic Vitamin in Cases of Marasmus.—From the combined results of clinical and experimental observation, the authors conclude that a diet of condensed milk and cereal is markedly deficient in natural vitamins. The addition of pancreatic vitamins to such a diet influences growth. The use of pancreatic vitamin seems to promise definite hope of

success as an agent for stimulating the growth of marasmic children. The dosage and the conditions under which the effect is produced are under investigation.

4. Blood Solids and Concentration of Sodium Chlorid in Plasma of Infants.—Courtney and Fales found that, in general, all infants not in normal condition had low blood chlorid, frequently very much lower than normal, but, except in edema, or under some unusual condition of blood concentration, the percentage of the total solids in the blood of infants tended to remain constant.

5. Rumination in Infants.—In the six cases reported by Grulee, certain phenomena have seemed to be suspiciously common: first, ulcer of the duodenum; second, pylorospasm. Grulee is of the opinion that the condition can be explained on the basis of a hyperexcitability of the involuntary muscles, as suggested by Hess. Treatment to be successful should probably be based on attention to the psychic condition of the child.

7. Effect of Cod Liver Oil on Growth in Case of Intestinal Infantilism.—In the case cited by Holt and his associates there were but slight evidences of old rickets and none whatever of any active rickets. The cod liver oil was administered with the hope that it might influence salt retention. At the same time, by increasing the diet, especially the amount of milk, an attempt was made to increase the salt intake. The results in this case showed conclusively how essential to proper growth is the assimilation of the salts ingested. The authors believe that the cod liver oil was by far the most important factor in the result, the next being the milk.

American Journal of Medical Sciences, Philadelphia

September, CLIV, No. 3

- 8 *Case of Adamantinoma Showing Epithelial Pearls. S. Graves, Louisville, Ky.—p. 313.
- 9 *Pathologic and Clinical Aspects of Thrombo-Angiitis Obliterans. L. Buerger, New York.—p. 319.
- 10 *Treatment of Peripheral Gangrene Due to Thrombo-Angiitis Obliterans, with Reference to Femoral Vein Ligation and Sodium Citrate Injections. N. Ginsburg, Philadelphia.—p. 328.
- 11 Newer Concepts of Neuroses; Estimate of Their Clinical Value. S. I. Schwab, St. Louis.—p. 338.
- 12 *Primary Malignant Neoplasm of Lung. M. Packard, New York.—p. 351.
- 13 *Individual Quantitative Dosage of Tuberculin Determined by Cutaneous Reaction; Its Employment in Treatment of Surgical Tuberculosis. P. R. Sieber, Pittsburgh.—p. 365.
- 14 Relation of Recent Epidemic of Respiratory Diseases in Denver to Pulmonary Tuberculosis. J. J. Waring, Denver.—p. 371.
- 15 Analysis of Thirty Cases of Pulmonary Tuberculosis Treated by Induction of Artificial Pneumothorax. P. H. Ringer, Asheville, N. C.—p. 380.
- 16 Causes of Recurrent Symptoms After Operation for Gastric and Duodenal Ulcer. A. O. Wilensky, New York.—p. 387.
- 17 *Study of Significance of Heredity and Infection in Diabetes Mellitus. J. R. Williams, Rochester, N. Y.—p. 396.
- 18 Study of Thermic Fever, with Special Reference to Blood and Urine Chemical Findings. R. B. H. Gradwohl and E. Schisler, St. Louis.—p. 407.
- 19 *Classification of Chronic High Blood Pressure Cases. L. M. Warfield, Milwaukee, Wis.—p. 414.
- 20 Study of Cases of Ascites in Wards of Canton Hospital, China. W. W. Cadbury, Canton, China.—p. 425.

8. Adamantinoma Showing Epithelial Pearls.—This report is submitted by Graves because it is that of an adamantinoma developing purely from adamantoblasts, shows epithelial pearls, and occurred in a 16-year-old negro boy. The specimen was removed from the superior maxilla. The tumor had been first noticed about one year before as a swelling of the gum, had grown gradually and been painless.

9. Thrombo-Angiitis Obliterans.—The lesions in thrombo-angiitis obliterans in chronologic order are summarized by Buerger: (1) an acute inflammatory lesion with occlusive thrombosis, the formation of miliary giant cell foci; (2) the stage of organization or healing, with the disappearance of the miliary giant cell foci, the organization and canalization of the clot, the disappearance of the inflammatory products; (3) the development of fibrotic tissue in the adventitia that binds together the artery, vein and nerves.

10. Treatment of Gangrene in Thrombo-Angiitis Obliterans.—Femoral vein ligation has been performed by Ginsburg in

four cases of gangrene in thrombo-angiitis obliterans. Independently, or in conjunction with this operation, the employment of intravenous injections of a saline solution, either 2 per cent. sodium citrate or Ringer's solution, has been carried out. Ginsburg found the operation to be of doubtful value since only one of the four patients showed any improvement following its performance. This patient has unquestionably improved to the point of security of the limb in which the venous current was obstructed. Involvement of the other leg is now taking place and the value attaching to the procedure may be still greater in the future, since it may preserve one of his extremities. The operation is a hazardous one and may cost the life of the patient, as occurred in one of the author's cases. If ligation is done the ligation should always be placed below the entrance of the long saphenous vein into the femoral vein, thereby preserving some collateral venous circulation in the affected limb. Following this operation there is developed a large posterior femoral vein passing from the popliteal space as a tributary to the sciatic or inferior gluteal vein. In one of Ginsburg's cases ligation had no effect whatever in retarding the progress of the disease, and even failed to produce venous stasis in the affected extremity. It was a convincing example of how greatly impaired was the arterial distribution to the peripheral parts in the affected limb, and proved that the problem cannot be attacked except by dealing with the arterial element in this disturbed circulation. Ginsburg believes that the poor arterial circulation present is much better than the results attained by any of the proposed surgical measures to increase the circulation in the involved extremity.

12. Primary Malignant Neoplasm of Lung.—Packard's series of primary cancer consists of seven cases. Four of these have been verified by necropsy. Another was confirmed by operation. Five of them occurred in the male sex, and in six the initial lesion was on the right side. The ages varied from 38 to 65 years. Pain and cough were the first symptoms in six, while weakness and exhaustion constituted the prime reason that caused the other patient to seek medical advice. Dyspnea was a very early symptom in all, and although at first it was only marked in some, after physical exertion it invariably became worse, so that later in the disease it actually amounted to orthopnea. Expectoration was variable. Hemorrhage was very common, and occurred in more or less quantities in five of the cases. Tumor cells were never found, although a careful and systematic search was instituted in all instances. Cachexia was a late symptom in all but one case. Fever was present in three cases, reaching as high as 105 in one person. This was accompanied by night sweats and chills, so that tuberculosis and abscess of the lung were very seriously considered. Leukocytosis was present in every instance, varying from 10,000 to 20,000 per cubic millimeter. There was nothing to be noted about the differential blood count, with the exception of eosinophilia in one of the cases in which the diagnosis of sarcoma was sustained.

13. Dosage of Tuberculin in Surgical Tuberculosis.—Of the forty cases reported by Sieber nineteen had glandular disease, all with the cervical group affected, one case showing evidence of involvement of the axillary group as well. Of the joints, in six cases the hip was involved, in three the knee, in one the ankle, and in two the wrist. In four cases the vertebrae were affected. The metatarsal bones and the phalanges of the hand were each diseased in two cases. The lesion was located once in the greater tuberosity of the humerus; sixteen cases were open and twenty-four were closed. Nineteen patients sought treatment because of cervical adenitis, seven of them having sinuses. Of the nineteen cases, twelve were discharged as well, six were improved, and one unimproved when last seen. Of the six improved cases, two failed to return after receiving six injections, one left the city after receiving two injections, and the remaining three are still under treatment. There were six cases of tuberculous arthritis of the hip; one patient has been discharged as well and is now at work; three were improved and two unimproved. In three cases the lesions were situated in the knee. One was discharged with moderate limitation

of motion. The remaining two improved and were lost sight of. In Pott's disease the results have not been as satisfactory; however, in all but one of these cases the disease was well advanced, with the presence of large abscesses. Throughout the series Sieber found that the results varied in inverse ratio to advancement of the disease. Those cases in which abscesses or secondary infections were present showed slower improvement and less satisfactory ultimate results. The best results were obtained when tuberculin treatment was instituted early. Of the forty patients treated, nineteen have been discharged well, sixteen improved, and five have been lost sight of, with the condition unimproved.

17. Heredity and Infection in Diabetes Mellitus.—The importance of both arteriosclerosis and infection in diabetes are emphasized by Williams who believes that there is a liability that arteriosclerosis and diabetes are transmissible from parent to offspring. Infection, both acute and chronic, may precipitate a metabolic collapse or sufficiently lower the function of food metabolism in an individual with either general or local arteriosclerosis as to produce the clinical phenomena which is called diabetes. Individuals with a family history of arteriosclerosis, diabetes and obesity should be safeguarded against all latent and concealed or focal infections. Special attention should be directed to the head, so that dead teeth, apical abscesses, incompletely filled root canals, inflamed gums, infected and diseased tonsils, sinus and middle-ear disease should not exist. Such individuals should be safeguarded in every way against those conditions which induce or hasten the arteriosclerotic process.

19. Chronic High Blood Pressure Cases.—Warfield advises that in a blood pressure reading the whole record should be taken, systolic, diastolic, pulse pressure and pulse rate. The pressure picture is the term suggested for the figures representing the component parts of the blood pressure reading. The diastolic and pulse pressure give more information than the systolic pressure. Warfield divides high pressure cases into three groups called (a) chronic interstitial nephritis, (b) hereditary or cerebral type, (c) arteriosclerotic or cardiac type. Causes of death are usually anemia in Group A, cerebral hemorrhage in Group B, and cardiac decompensation in Group C. The term "cardiorenal disease" he would reserve for the cases of Group A, which suffer from cardiac decompensation; the term hypertensive cardiovascular disease for cases of Group B. Myocardial insufficiency covers most of the cases in Group C.

Journal of Abnormal Psychology, Boston

June, XII, No. 2

- 21 Sketch for Study of New England Character. J. J. Putnam, Boston.—p. 73.
- 22 Psychopathic Aphonia, Stammering and Catalepsy. B. Sidis, Portsmouth, N. H.—p. 100.
- 23 Graphic Representation of Personality and Psychosis. H. D. Singer, Kankakee, Ill.—p. 114.
- 24 Distinctive Features in Psychologic Test Measurements Made on Dementia Praecox and Chronic Alcoholic Patients. S. L. Pressey, Boston.—p. 130.

Journal of Infectious Diseases, Chicago

September, XXI, No. 3

- 25 *Titration of Diphtheria Toxin in Unilaterally Nephrectomized Guinea-Pigs. H. R. Wahl, Cleveland.—p. 227.
- 26 *Comparative Study of Different Antigens and of Different Temperatures of Incubation in Wassermann Test. J. W. Smith, Jr., and W. J. MacNeal, New York.—p. 233.
- 27 Thermal Coagulation Point of Blood and Serum. G. F. Leonard, New Brunswick, N. J.—p. 249.
- 28 *Comparison Between Subcutaneous and Intracutaneous Methods of Testing Virulence of Diphtheria Bacilli. M. A. Smeeton, New York.—p. 254.
- 29 Experiments in Filtration of Antihog-Cholera Serum. B. H. Edgington, A. Broerman and E. W. Porter, Reynoldsburg, Ohio.—p. 258.
- 30 *Schick Test, with Especial Reference to Negro. L. T. Wright, Washington, D. C.—p. 265.
- 31 *Effect of Tethelin on Experimental Tuberculosis. H. J. Corper, Chicago.—p. 269.
- 32 *Precipitin Production in Allergic Rabbits. L. Hektoen, Chicago.—p. 279.
- 33 Modification of McCrady Method of Numerical Interpretation of Fermentation Tube Results. A. Wolman and H. L. Weaver.—p. 287.

- 34 *Immune Reactions in Rabbits Injected with Micrococci from Acute Poliomyelitis. G. Mathers and K. Howell, Chicago.—p. 292.
- 35 *Etiologic Agent and Localizing Factor of Abscesses in Myositis Purulenta Tropica. E. L. Waiker, San Francisco.—p. 298.
- 36 *Streptobacillus from Urine. H. L. Celler and W. Thalheimer, New York.—p. 303.
- 37 Growth of Streptococci in Blood Carbohydrate Medium. D. J. Davis, Chicago.—p. 308.
- 38 Subcutaneous Abscesses in Rabbits. Carrier State and Its Relation to Rabbit Septicemia. D. J. Davis, Chicago.—p. 314.
- 39 Inhibitory Action of Lactic Acid on Certain Bacteria and Fungi. E. L. Macdonald, Chicago.—p. 322.

25. Titrations of Diphtheria Toxins.—The object of Wahl's study was to determine the effect of decreased kidney substance, produced by nephrectomy, on the fatal dose of diphtheria toxin. The results showed a marked diminution in resistance of the nephrectomized animals as compared with normal pigs. When, however, the operative factor with its coincident traumatism and shock was minimized by the use of controls of splenectomized pigs or pigs in which a piece of omentum had been removed, the difference in the resistance was not so great, though still distinctly in favor of the control animal.

26. Comparative Studies of Wassermann Tests.—Smith and MacNeal summarize their results as follows: 1. The use of the cholesterinized antigen, with the first incubation, at 8 C., for four hours, constitutes a more sensitive test for syphilis than does any of the other methods examined. 2. The cholesterinized antigen, both at 37 C. and at 8 C., is apt to yield nonspecific complement fixation. Therefore, in a diagnostic reaction, fixation with the cholesterinized antigen alone is, at best, of only doubtful significance. 3. The simple extract antigen, with the first incubation at 8 C., is more sensitive than the cholesterinized antigen at 37 C., and in this series it did not give any false positive reactions, according to the available evidence. 4. The acetone insoluble preparation, made according to the method of Noguchi, is less sensitive, either at 37 C., or at 8 C., than is the cholesterin-reinforced antigen at either temperature, and is also less sensitive than the simple extract at 8 C. It is more sensitive than the simple extract at 37 C. and, in this series, has, according to the available evidence, given no false positive reactions.

28. Virulence of Diphtheria Bacilli.—From the number of cultures tested by Smeeton the intracutaneous appears to give more accurate results than the subcutaneous method and has a further advantage of being more economical in time and animals. A possible disadvantage lies in the fact that if one toxin pig dies, four or six tests must be repeated.

30. Schick Test in Negro.—In practically all cases examined by Wright the pigment was darker in color than the skin. The reaction is equally as clearcut in negroes as it is in whites. This study of 210 cases indicates that adult negroes possess about the same degree of immunity to diphtheria as do white adults. Lichenification occurs in all positive cases regardless of the color of the skin and promises to be of value in differentiating positive from negative reactions in those rare cases in which an increase of pigmentation is impossible.

31. Tethelin in Experimental Tuberculosis.—Tethelin, the active principle of the anterior lobe of the pituitary, administered subcutaneously in 25 mg. doses on alternate days for eighteen days before and during early infection to tuberculous guinea-pigs, infected with virulent human tubercle bacilli, had no appreciable effect on the progress of the tuberculosis or on the duration of life of these animals. Tethelin administered subcutaneously in 25 mg. doses daily to guinea-pigs sensitized to tuberculosis by dead and living (avirulent) human tubercle bacilli had no appreciable effect on the development, recession, or rupture of intracutaneous tubercles produced by dead human tubercle bacilli nor on deep puncture wounds of the skin in these animals.

32. Precipitin Production in Allergic Rabbits.—It was noted by Hektoen that in rabbits previously injected with foreign blood or serum the subsequent injection of a different blood or serum may reawaken the production of precipitins for the antigens first injected, and the serum of such rabbits may

be unsuitable for practical precipitin tests because of the wide range of its action. Similar manifestations of an increased reactivity may be obtained in dogs as regards lysin and agglutinin for goat and rat corpuscles, respectively, as well as in rabbits and human beings with respect to typhoid agglutinins, and the increase of typhoid agglutinins in infectious conditions in persons previously inoculated or infected with typhoid bacilli may not signify typhoid.

34. Immune Reactions with Poliomyelitic Cocci.—In the blood of rabbits injected with various strains of poliomyelitis cocci, specific agglutinins, opsonins and complement fixing bodies could be demonstrated by Mathers and Howell. The complement fixing bodies were demonstrable in high dilutions and were specific for the poliomyelitis group in most instances. Occasionally, however, some fixation occurred with pneumococcus and hemolytic streptococcus antigens, but this was rare. Conversely, the pneumococcus immune serum and the hemolytic streptococcus immune serum gave some fixation with the poliomyelitic antigens; in the instance of the pneumococcus antigen the reaction seemed apparently nonspecific. The opsonins were demonstrable in high dilutions and were specific—the serum being without opsonic effect on hemolytic streptococci, green-producing streptococci and pneumococci. The agglutinins were demonstrable in low dilutions only. Spontaneous agglutination of the cocci interferes with agglutination tests. These results suggest that serologic tests, especially opsonin determination, may prove of value in the diagnosis of acute poliomyelitis, in case the coccus is found to be associated closely with the disease.

35. Etiology of Myositis Purulenta Tropica.—Walker holds that myositis purulenta tropica is a peculiar form of pyemia. The causal agent in its production is most certainly the pyogenic cocci usually found, and probably always present at some time, in the abscesses. The localizing factor which determines the peculiar situation of the pyemic foci is probably filarial, but the evidence on this point is not conclusive.

36. Streptobacillus from Urine.—A hitherto undescribed gram-positive streptobacillus has repeatedly been isolated by Celler and Thalhimier from the urine of cases suffering from bladder symptoms. It is of low virulence and large doses injected intravenously into rabbits do not kill the animals. The organism does not usually remain in the circulating blood longer than twenty-four hours. After intravenous injection, the streptobacillus can be recovered from the bladder urine sometimes as early as twenty-four hours, and regularly after forty-eight to seventy-two hours. It has also been recovered from the urine secured by ureteral catheterization several days after intravenous injection, but has not been recovered with the same regularity from the kidneys of these animals. This organism seems, therefore, to possess peculiar biologic properties which enable it to maintain itself in the urinary bladder, and probably in the ureter and renal pelvis as well, for an indefinite period.

resembling in form and dimensions the *B. coli*. The size of the bacillus varies from coccus-like forms to large rods, depending on the kind and age of the media in which it is grown. As a rule, its length is about three times its width. The organism grows singly and also in the diplo form. Thread formation has been infrequently observed. It does not form spores. Depending on the media and the conditions of growth the bacillus may show active motility, sluggish motility, or even marked Brownian movement. The organism takes all stains readily. With Loeffler's methylene blue the ends of the bacillus stain a dark blue, while the inner portion resembles a vacuole. It is gram-negative and not acid-fast. Smears made from the organs of an animal killed by the bacillus, when stained according to the Welch method, show the organisms to have capsule-like bodies around them. These, however, could never be verified as capsules. Morphologic and biochemical reactions, and agglutination tests prove that the bacillus belongs to the colon group. That it is not a true colon bacillus is shown by its formation of a soluble thermostabile poison. Poisoning cannot be induced in animals either by feeding the poisonous cheese or by feeding with cultures of the isolated organism. Mice, guinea-pigs, rabbits, cats, rats and dogs are susceptible, in the order named, to the bacillus. The bacillus does not form tyrotoxin. Five-tenths per cent. lactose broth, neutral to phenolphthalein, is the medium most suitable for the production of the poison. The soluble thermostabile poison produced by the bacillus is a toxin-like body, of unknown chemical constitution. Immunity to the organism can be acquired by vaccine and immune serum injections. It can also be obtained by injections of the sterile, cell free filtrate from lactose broth cultures. A lesser but yet marked protection can be acquired by injections of alkaline ether extracts of whey from milk cultures.

42. Typhoid Treated by Injection of Sensitized Vaccine Sediment.—Gay records his experience in the treatment of ninety-eight authenticated cases of typhoid over a period of two and one-half years by the intravenous injection of a polyvalent sensitized typhoid vaccine sediment (Gay-Claypole vaccine). The mortality in these cases was 6.6 per cent. and the complications few. Relapses were distinctly reduced in those cases in which the intravenous injections were followed by a series of three subcutaneous inoculations after the temperature had reached normal.

Journal of Nervous and Mental Disease, Lancaster, Pa.

August, XLVI, No. 2

- 49 Opportunities in Neurology. F. Tilney, New York.—p. 81.
50 *Some New Fields in Neurology and Psychiatry. T. W. Salmon, New York.—p. 90.
51 Analysis of Fourteen Cases of Senile Dementia Showing Neither Atrophic nor Arteriosclerotic Cerebral Changes at Necropsy. L. B. Alford, St. Louis.—p. 100.

50. New Fields in Neurology and Psychiatry.—It is pointed out by Salmon that psychiatry has a most important part to play in the great movements for social betterment which we see being undertaken with such high hopes and with such wide popular interest and support. In some of these movements—mental hygiene, provision for the feeble-minded, eugenics, the control of inebriety and the better management of abnormal children—the part of the psychiatrist must be that of leadership not only in research but in the formulation and to a certain extent in the execution of policies. No other science provides so direct an approach to the problems which must be solved before these movements can succeed. In problems such as those of the treatment of criminals and the prevention of crime, prostitution and dependency, the part of the psychiatrist is to lead in research and to contribute information and guidance whenever it appears that mental factors exercise important influences. It is above all things essential that the psychiatrist should not have the phases of these problems on which he is to work arbitrarily assigned to him by others. He must obtain a view of the whole problem and must make for himself the decision as to which factors are those which can best be understood by psychiatric study or managed by the methods of dealing with conduct disorders which psychiatry has developed in its long experience with mental diseases and other abnormal states.

Journal of Laboratory and Clinical Medicine, St. Louis

August, II, No. 11

- 40 Principles Involved in Economic Readjustment of Diets. J. J. R. Macleod, Cleveland.—p. 743.
41 *Cheese Poisoning: Toxicogenic Bacillus Isolated from Cheese. W. Levin, Ann Arbor, Mich.—p. 761.
42 *Experience in Treatment of Typhoid by Intravenous Injection of Sensitized Typhoid Vaccine Sediment. F. P. Gay, Berkeley, Calif.—p. 785.
43 Relation of Physical Chemistry to Irrigation of Wounds. J. F. McClendon, Minneapolis.—p. 803.
44 Antidotes in Mercuric Chlorid Poisoning. Value of Phosphite and Hypophosphite Combinations. B. Fantus and E. G. Hyatt, Chicago.—p. 813.
45 Apparatus for Studying Effect of Drugs on Isolated Guinea-Pig Uterus. C. R. Eckler, Indianapolis.—p. 819.
46 Use of Indicators to Determine H-Ion Concentration; Apparatus for Teaching. L. Rosenberg, Dallas, Texas.—p. 825.
47 Mass Urinalysis. M. Warren, New York.—p. 826.
48 Guinea-Pigs for Profit. M. A. Kroeber, Mount Vernon, N. Y.—p. 831.

41. Cheese Poisoning.—Six persons were poisoned by eating American cheese. A piece of the cheese was studied bacteriologically by Levin and he describes the organism found in the cultures. It is a facultative anaerobic bacillus,

Journal-Lancet, Minneapolis*September 1, XXXVII, No. 17*

- 52 Hospital Standardization. J. G. Bowman, Chicago.—p. 559.
- 53 Ocular Tuberculosis. General Discussion. F. E. Burch, St. Paul.—p. 561.
- 54 Medical Journals from Standpoint of Contributor. M. H. Mellish, Rochester.—p. 568.
- 55 Tonsillar Infections and Their Diagnosis. S. Oftedal, Fargo, N. D.—p. 570.
- 56 Therapeutic Use of Protein Milk: Report of Cases. C. A. Scherer, Fargo, N. D.—p. 574.
- 57 Comparison of German and American Classifications of Alimentary Disturbances. M. Seham, Minneapolis.—p. 577.

Laryngoscope, St. Louis*August, XXVII, No. 8*

- 58 Hay Fever and Hyperesthetic Rhinitis. W. Scheppegrell, New Orleans.—p. 597.
- 59 Histopathology of Internal Ear in Typhoid, Purpura Hemorrhagica and Epidemic Cerebrospinal Meningitis. F. Tanaka, Okayama, Japan.—p. 608.
- 60 Case of Cyst in Larynx. W. B. Chamberlin, Cleveland.—p. 622.
- 61 Case of Epidural Abscess with Paralytic Symptoms Simulating Brain Abscess and Meningitis. Operation and Recovery. J. C. Calhoun, London.—p. 624.
- 62 Acute Otitis Media of Diphtheritic Origin. W. C. Bane, Denver.—p. 626.
- 63 Chancre of Pharyngeal Tonsil. H. C. Haden, Galveston, Texas.—p. 629.
- 64 Sarcoma of Soft Palate. B. G. Voorhees, Elmira, N. Y.—p. 632.
- 65 Unestablished Incision for Resection of Nasal Septum or an All Skin Incision. C. E. Purcell, Paducah, Ky.—p. 634.
- 66 Stammering; Responsibility. E. Tompkins, Pasadena, Calif.—p. 637.
- 67 Unusual Infection from Ethmoiditis. J. A. Thompson, Cincinnati.—p. 643.

Medical Record, New York*September 1, XCII, No. 9*

- 68 Merits of Medical and of Surgical Treatment Respectively in Peptic Ulcer. J. N. Hall, Denver.—p. 353.
- 69 Hypothesis Regarding Physiochemical Nature of Cancer. E. P. Robinson, New York.—p. 356.
- 70 Therapeutics of Uranium Nitrate. R. W. Wilcox, New York.—p. 361.
- 71 Tonsils and Rheumatism. A. Bardes, New York.—p. 364.
- 72 Consolidated Nursing Service. C. Barker, New York.—p. 366.
- 73 Relation of Capillary Caliber to Normal and Pathologic Sensation and Function. W. V. Gage, Worland, Wyo.—p. 367.

Military Surgeon, Washington, D. C.*September, XLI, No. 3*

- 74 Epidemiologic Study of Outbreak of Measles at Camp Wilson, San Antonio, Texas. E. L. Munson.—p. 257.
- 75 War Surgery. T. H. Goodwin.—p. 279.
- 76 Observations by Junior Surgeon of John B. Murphy Hospital Unit, Serving with British Expeditionary Force, France. R. B. Acker.—p. 295.
- 77 Bone Graft Surgery; Its Application to Fracture Caused by Modern Projectiles. E. B. Downer.—p. 316.
- 78 More Important Surgical Cases Treated at Base Hospital No. 2, Fort Bliss, Texas, Between March, 1916, and March, 1917. W. L. Keller.—p. 325.

Missouri State Medical Association Journal, St. Louis*September, XIV, No. 9*

- 79 *Intestinal Obstruction; Review of Experimental Observations with Practical Suggestions. J. N. Jackson, Kansas City.—p. 377.
- 80 Anterior Poliomyelitis: Statistical Study; Summary of Recent Work; Orthopedic Treatment. A. O'Reilly, St. Louis.—p. 382.
- 81 Adult Thymus and Its Two Types of Dysfunction. G. H. Hoxie, Kansas City.—p. 389.
- 82 Importance of Nonsurgical Work of Army Medical Officer. D. Morton, St. Joseph.—p. 393.
- 83 Infectious Diseases of Lower Bowel. W. H. Stauffer, St. Louis.—p. 395.
- 84 Typhoid Perforation: Report of Case on the One Hundred and Sixteenth Day, with Recovery. E. Schisler, St. Louis.—p. 398.
- 85 Significance of Angiosclerosis of Retinal Blood Vessels. H. Moulton, Fort Smith, Ark.—p. 401.

79. **Intestinal Obstruction.**—The correctness of the views held by eminent surgeons is emphasized by Jackson. It is evident that surgical relief of obstruction is the only final salvation for life, and should be instituted early before the patient has already absorbed a lethal dose of poison. Delay is only excusable at all in doubtful diagnosis. It is really not excusable then for practically all acute abdominal crises which may in any way simulate obstruction are themselves likewise surgical conditions. The only excuse for the responsible physician is the refusal of patient to accept his advice. The lost body fluid should be replaced by proctoclysis and

hypodermoclysis, both before and after operation. Thus fluids are replaced, toxins diluted, elimination increased and acidosis neutralized. Jackson favors the direct surgical drainage of the high intestinal area, advocated by McKenna. The principle is, a quick enterostomy high in the jejunum as the sole primary operation. Six to eight weeks later, with the patient in good condition, the obstructed and damaged area is successfully resected.

New Orleans Medical and Surgical Journal*September, LXX, No. 3*

- 86 Hematuria; Its Clinical Significance. H. W. E. Walther, New Orleans.—p. 207.
- 87 Gunshot Wounds of Extremities. J. C. Willis and A. B. Nelson, Shreveport.—p. 212.
- 88 Treatment of Blackwater Fever. T. E. Wright, Monroe.—p. 222.
- 89 Use of Nonspecific Protein in Ophthalmology. T. J. Dimitry, New Orleans.—p. 231.
- 90 Treatment of Vomiting of Pregnancy with Ovarian Extract and Corpus Luteum. P. J. Carter, New Orleans.—p. 234.
- 91 Compound Fractures; Plea for Early Permanent Fixation. W. M. Perkins, New Orleans.—p. 245.
- 92 Cardiopneumonia. A. E. Fossier, New Orleans.—p. 254.
- 93 Oral Prophylaxis at School Age. H. W. Guthrie, New Orleans.—p. 262.
- 94 Vaccine Treatment of Whooping Cough. C. J. Bloom, New Orleans.—p. 275.

Ohio State Medical Journal, Columbus*September, XIII, No. 9*

- 95 Why Births and Deaths Should Be Registered. J. E. Monger, Columbus.—p. 589.
- 96 Report of Case of Right Strangulated Inguinal Hernia with Pieces of Wood in Strangulated Loop of Ileum. F. C. Laramore, Mount Vernon.—p. 591.
- 97 Anomalies in Behavior of Uterine Musculature. A. J. Skeel, Cleveland.—p. 592.
- 98 *Treatment of Bichlorid of Mercury Poisoning. H. B. Weiss, Cincinnati.—p. 595.
- 99 Modern Treatment of Syphilis. J. L. Murray, Toledo.—p. 598.

98. **Treatment of Bichlorid of Mercury Poisoning.**—Weiss has used the principle of colloidal swelling described by Fischer, as the basis for his treatment. He gives alkali, hypertonic salts by mouth, by rectum and intravenously, and he has used a pleasant alkaline drink, modified from the old English potus imperialis which consists of cream of tartar, 4 gm.; sodium citrate, 2 gm., and sugar, 2 gm., with lemon or orange juice to taste, to 8 ounces of water. This drink is best made by placing the cream of tartar and sodium citrate into the lemonade just before using. In conjunction with this Weiss uses the intravenous injection of Fischer's solution. The treatment commences by washing the stomach with the whites of three eggs and one quart of milk, followed by water until the stomach is emptied. Before the stomach tube is removed 3 ounces of magnesium sulphate with 6 ounces of water is introduced and allowed to remain in the stomach. The patient is then given a soap-suds enema. If the patient did not vomit shortly after taking the poison and did not reach medical aid for at least three hours later, an intravenous injection of Fischer's solution is given at once. Usually over 1,000 c.c. are introduced into the system. Weiss has given as high as 2,000 c.c. of the solution without any disturbance to the patient. Then the patient is given eight glasses of "imperial drink" a day and large quantities of water by mouth. He is allowed a liberal diet, almost anything except an excess of protein foods. The analysis of the urine is used as a control of the treatment. The patient should void large quantities of urine as he is taking large amounts of fluid. Endeavor to keep the urine alkaline. Weiss has had complications only in one patient; he developed a severe necrosis of the mucous membrane of both sides of the cheek, and later in the course of the disease he had severe intestinal hemorrhages, in all probability from the colitis produced by the mercury excreted through the bowel.

Ophthalmic Record, Chicago*September, XXVI, No. 9*

- 100 Case of Recurrent Neuro-Epithelioma. G. O. Ring, Philadelphia.—p. 437.
- 101 A Book on "Eiesight" by Walter Bayley (1529-1592). L. H. Taylor, Wilkes-Barre.—p. 445.
- 102 Factors to be Considered in Intracapsular Cataract Operation. A. S. Green and L. D. Green, San Francisco.—p. 455.
- 103 Steel in Eye without Symptoms. F. Allport, Chicago.—p. 458.

- 104 Case of Recurrent Paralysis of Right Abducens Lasting Twenty-One Years. M. J. Leavitt, Brooklyn.—p. 460.
105 Frequency of Occlusion of Inner End of Canaliculus in Old Trachoma. H. Gifford, Omaha.—p. 462.

Ophthalmology, Seattle

July, XIII, No. 4

- 106 Eye Strain. M. Corry, Delhi, India.—p. 557.
107 Cataract Operation as Done by Spanish and Latin American Surgeons. J. S. Fernandez, Havana, Cuba.—p. 576.
108 New Operation for Cataract. L. D. Green, San Francisco.—p. 579.
109 Etiology and Treatment of Glaucoma. H. G. Thomas, Oakland, Calif.—p. 582.
110 Pathology of Glaucoma. C. Zimmermann, Milwaukee, Wis.—p. 588.
111 State Legislation Concerning Blind. F. Allport, Chicago.—p. 597.

Rhode Island Medical Journal, Providence

September, I, No. 9

- 112 Acute Abdomen; Report of Cases. C. O. Cooke, Providence.—p. 187.
113 Adult Rectal Prolapse; Two Cases and Contrast. R. W. Jackson, Fall River, Mass.—p. 191.
114 Diastolic Blood Pressure. O. A. Faust, Providence.—p. 195.

South Carolina Medical Association Journal, Greenville

August, XIII, No. 8

- 115 Hospital Standardization. J. G. Bowman, Chicago.—p. 631.
116 Medical Aspects of Social Hygiene Movement. R. S. Yarros, Chicago.—p. 637.

Wisconsin Medical Journal, Milwaukee

August, XVI, No. 3

- 117 Etiology of Primary Glaucoma. P. H. Dernehl, Milwaukee.—p. 79.
118 Relation of Acidosis to Edema in Pneumonia. A. B. Schwartz, Milwaukee.—p. 83.
119 Duodenal Ulcer in Infants; Report of Four Cases. W. H. Bartran, Green Bay.—p. 85.
120 Clinical Examination in Cases of Focal Infection. E. G. Nadeau, Green Bay.—p. 89.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

August 18, II, No. 2955

- 1 Part Played by British Medical Women in War. M. H. F. Ivens.—p. 203.
2 *Alleged Perils of Uric Acid. J. B. Berkart.—p. 208.
3 Acetozone as General Surgical Antiseptic. G. Gore-Gillon and R. T. Hewlett.—p. 209.
4 *Bacteriologic Examination of Blood in Cases of Irritable Heart. G. Briscoe and L. Dimond.—p. 210.
5 Two Cases of Traumatic Rupture of Spleen. J. L. Stretton.—p. 211.
6 Case of Spontaneous Rupture of Spleen; Splenectomy; Recovery. W. Rankin.—p. 211.
7 Early Treatment of Compound Fracture of Femur Caused by Gunshot Wound. R. C. Dun.—p. 212.

2. **Alleged Perils of Uric Acid.**—Berkart claims that the clinical data affords no proof whatever of any pathogenic property of uric acid; nor do the results of experimental inquiries. There is consequently no indication for an exhibition of a uric acid solvent, because that substance is readily soluble in the tissue juices and is not the cause of the symptoms observed. Not only is the use of the pretended remedies to cure the various functional derangements and organic lesions which are wrongly attributed to uric acid recommended on a baseless hypothesis, but it is mischievous also, because it allures the unwary sufferer by specious advertisements of its effectiveness to have recourse to it and continue with it until its failure is evident. Thus valuable time is lost before he submits himself to rational treatment while there is still a reasonable prospect of satisfactorily coping with his disease.

4. **Examination of Blood in Cases of Irritable Heart.**—In order to prove or disprove the correctness of the statement that organisms had been found in the blood of patients complaining of the symptoms associated with the condition known as "irritable heart," Briscoe and Dimond made ninety-six observations on forty-three cases. In no instance was any organism grown, except in the few cases which became con-

taminated by organisms from the air when the flask method was used. Using the methods of cultivation in general vogue the authors failed to demonstrate the presence of bacteremia in cases of "irritable heart," and conclude therefore that bacteremia does not play a demonstrable part in the pathology of this disease.

Glasgow Medical Journal

August, LXXXVIII, No. 2

- 8 Value of Artificial Pneumothorax in Treatment of Pulmonary Tuberculosis. J. Crocket.—p. 65.
9 British Hospital Work in Serbia.—p. 77.

Indian Medical Gazette, Calcutta

July, LII, No. 7

- 10 New Calcutta Eye Hospital. F. P. Maynard.—p. 225.
11 King Edward VII Memorial Pasteur Institute, Shillong. R. Knowles.—p. 226.
12 Malaria. H. Willis.—p. 230.
13 Frontier Sores and Their Treatment by Antimony Injections. L. B. Scott.—p. 231.
14 Treatment of Cutaneous Leishmaniasis with Intravenous Injections of Tartar Emetic. J. A. Sinton.—p. 239.
15 Experience in Tartar Emetic Treatment of Kala-Azar Including Its Use in Young Children. L. Rogers.—p. 241.

Journal of Laryngology, Rhinology and Otology, London

August, XXXII, No. 8

- 16 Bony Tumor of Nasopharynx Simulated by Malposition of Cervical Vertebrae; Reposition; Great Amelioration. E. F. Cyriax.—p. 241.

Lancet, London

August 11, II, No. 4902

- 17 *Gunshot Wounds of Knee Joint. J. Campbell and H. F. Woolfenden.—p. 185.
18 *Irrigation and Suction Drainage for Treatment of Certain War Wounds. G. C. Sneyd.—p. 194.
19 *Thermalgia (Causalgia). J. S. B. Stopford.—p. 195.
20 Bayonet Wound of Buttock; Lung Punctured; Surgical Emphysema. J. D. Hayward.—p. 199.
21 Cervical Laminectomies. R. B. Blair.—p. 200.
22 Cultural Experiments with Meningococcus. H. W. Crowe.—p. 201.
23 "Ropy" Bread. J. M. Beattie and F. C. Lewis.—p. 211.

August 18, No. 4903

- 24 Meat Inspection. W. J. Howarth.—p. 225.
25 *Immediate Effect of Cigaret Smoking on Healthy Men and on Cases of "Soldier's Heart." J. Parkinson and H. Koefod.—p. 232.
26 Horseshoe Kidney by Union of Upper Poles. Diagnosed Prior to Operation. D. Newman.—p. 236.
27 Case of Claustrophobia. W. H. R. Rivers.—p. 237.
28 Perforations of Stomach and Duodenum. J. Taylor.—p. 241.
29 Problem of Tuberculosis. H. H. Thomson.—p. 251.

17. **Gunshot Wounds of Knee Joint.**—The lines along which all treatment of gunshot wounds of the knee joint is directed by Campbell and Woolfenden in septic cases are: 1. The lowering of intra-articular tension by evacuation of the exudate, thereby preventing the tracking of infection along the fascial planes. 2. The rapid overcoming of infection and the removal of infective material as soon as it is formed, thereby diminishing suppuration. 3. The promotion of the formation of adhesions, thereby limiting the area of infection and diminishing the area of the surface for toxic absorption. 4. The removal of pressure from the articular cartilage, thereby diminishing the chances of its becoming eroded. Excluding one patient whose leg was amputated for gangrene due to concomitant laceration of the popliteal vessels, and two that died, the one suffering on admission from septicemia and the other from intense and fatal anemia as the result of blood lost at the time of injury, the authors have had fifty-nine recoveries out of sixty cases, and only one amputation. The treatment in severe cases is based on three fundamentals: 1. Absolute rest and fixation. 2. The strictest asepsis. 3. The use of Carrel's method of wound treatment. With this method of treatment efficiently carried out infection is most effectually counteracted; organisms and the pabulum suitable for their growth are washed outward, even from the deepest parts of the wound; ingress of sepsis from without is prevented—to the authors' minds a most important consideration in the treatment of knee joint cases; pus only forms in small quantity; adhesions of the synovial membranes form with great readiness; the patient need only be dressed once in twenty-four or forty-eight hours.

18. **Irrigation and Suction Drainage for War Wounds.**—In wounds of a cavernous type where a large retentive septic space is present and where counterdrainage is anatomically impossible Sneyd has adopted the use of a suction apparatus to surmount the difficulty of drainage, at the same time using Carrel's tubes for irrigation. The suction apparatus is on the principle of the Sprengel pump, as advocated by Cathcart some years ago in bladder cases.

19. **Thermalgia (Causalgia).**—Since the name causalgia is liable to be misleading, Stopford suggests the substitution of the more obvious name thermalgia. This most distressing condition was described first by S. Weir Mitchell as occurring in the American Civil War. Thermalgia, as generally described, is an extreme type of many median and sciatic injuries, and to determine the etiology it is necessary to investigate all cases in which pain is the predominant and constant symptom. The clinical symptom which is constant and characteristic in all these cases is the "bursting," "throbbing," or "burning" pain in the hand or foot. The affected part is generally swollen or doughy and the temperature of the skin higher than on the normal side. Often the appearance of the hand or foot suggests the presence of deep suppuration in the palm or sole. The pain is usually persistent, intractable, and in its severest form sufficient to render the patient emotional or even to drive him to suicidal tendencies. It is made worse by heat, movement, excitement, or the dependent position, and as a result any treatment for the paralyzed muscles is impossible as long as the pain persists. The one agent which renders any relief at all from the pain, is cold, and this fails if there is a marked loss of sensibility. The associated symptoms are by no means constant and depend considerably on the number of fibers divided. In most cases they are characterized by manifestations of nerve irritation as glossy skin, hyperidrosis, hyperemia, and bone and joint changes. As a result of the arthritic changes and the inability to treat the paralyzed muscles, most distressing and unsightly deformities occur in the later stages of neglected cases.

The severe pain is the urgent symptom, but in treating this it is important to remember the pathologic condition which gives rise to it—partial division with increasing perineural and intraneural sclerosis. Since usually only a few fibers are severed the aim must be not only to relieve the pain but also to conserve the undivided fibers, and, so far as possible, diminish the sclerosis. Only operative measures can achieve this satisfactorily, and to obtain the best results they must be adopted at the earliest opportunity; in fact, as soon as the risk of sepsis can be eliminated. The essential factors in successful operative treatment appear to be: first, careful separation of all adhesions around the nerve and absolute clearing of all perineural fibrosis. Second, complete hemostasis to reduce the resultant scar as much as possible. Third, protection of the nerve at the site of injury to prevent recurrent adhesions. Fat seems to serve this purpose best, since it minimizes the risk of the formation of a thick fibrous sheath around the nerve, which so commonly follows the use of other tissues or extraneous materials. Failing to procure fat, it is best to suture the injured muscles so that no raw surfaces are exposed and only undamaged portions are in contact with the nerve.

25. **Effect of Cigaret Smoking.**—The immediate effect of cigarette smoking on the circulatory system and on the breathlessness of exertion was observed in thirty smokers, of whom twenty were cases of "soldier's heart" and ten were healthy soldiers. Each patient smoked either four or five cigarettes during a period of forty minutes. Demonstrable effect was recorded in seventeen of the twenty patients; the three unaffected were noninhalers. Nine of the ten controls, all inhalers, were influenced in the same fashion, though not to the same degree. The average pulse rate among the patients during smoking was nine beats higher than before smoking; in the healthy controls it was six higher. Initial slowing of the heart was never observed, nor any irregularity referable to smoking. The rate of respiration in the patients was unaffected; in the controls it was slightly reduced. The average systolic blood pressure was raised by 5 to 10 mm. Hg, and

the diastolic by 5 mm., both in patients and controls. These effects appeared within five minutes; with the first cigarette they almost reached the maximum, and this was maintained throughout the smoking period.

A simple exertion test was performed before smoking and repeated on its cessation. In the patients the pulse rate maintained a higher level throughout the test after smoking, and half of them were more breathless both subjectively and objectively. In two patients precordial pain was induced by smoking, apart from exertion. But in the controls the pulse rate curve during exertion was much the same after smoking as before, and breathlessness was induced in two only. These observations show that, in health, the smoking of a single cigarette by an habitual smoker usually raises the pulse rate and blood pressure perceptibly; and these effects are a little more pronounced in cases of "soldier's heart." Moreover, the smoking of a few cigarettes can render healthy men more breathless on exertion, and manifestly does so in a large proportion of these patients. Excessive cigarette smoking is not the essential cause in most cases of "soldier's heart"; but, in the authors' opinion, it is an important contributory factor in the breathlessness and precordial pain of many of them.

Medical Journal of Australia, Sydney

July 28, 11, No. 4

- 30 *Thirty-Three Cases of Appendicitis in Children. W. A. Wood.—p. 65.
- 31 Experiences in Three Hundred Cases of Parturition Treated by Scopolamin-Morphin Injection. E. B. Heffernan.—p. 68.
- 32 Cremation. W. G. Armstrong.—p. 70.
- 33 Carcinoma of Appendix. H. F. Praagst.—p. 72.
- 34 Enlargement of Suprarenal Glands in Fatal Case of Diabetes. W. F. Litchfield and E. M. Little.—p. 73.

30. **Appendicitis in Children.**—In the thirty-three cases of appendicitis reported by Wood there were eleven with concretions; three of these were recurrent cases and the rest were first attacks. In two cases a pencil of hard feces filled the lumen throughout its length. In others there was a hard nucleus with plastic feces adherent to it. Three cases of general peritonitis had concretions, and out of eight abscess cases seven had concretions. In six out of the eleven cases of concretions there was an acute onset, with vomiting and severe abdominal pain, which was at McBurney's point from the beginning. These were all operated on within forty-eight hours; but in three perforation had already occurred. In one case the appendix had become adherent to the cecum, which had been penetrated by the perforation and the concretion had fallen through, leaving its bed behind in the appendix. In the cases of concretion with a longer history, one patient had had a tenderness over McBurney's point for three months, and another had had dyspeptic symptoms and tenderness on deep pressure at McBurney's point and over the gallbladder for eighteen months. In the latter nothing abnormal was detected on direct palpation. In two cases there was a gangrenous appendix and perforation within forty-eight hours, with a temperature of 37.8 C. In another case general peritonitis following perforation developed within thirty-six hours, with a similar type of temperature.

In twenty cases out of the thirty there was vomiting or nausea. In three abscess cases there was no vomiting. In eleven cases there had been previous attacks. Of these, two appendixes were filled with plastic feces, two with hardened feces like a pencil, three had concretions, two were constricted by fibrous contraction, one contained free blood and was constricted by swollen mucous membrane, and one contained twenty-five thread worms, with swollen and ecchymosed mucous membrane. In two of these recurrent cases with local pains and tenderness, but no vomiting or constipation, there was complete blocking. Tenderness at McBurney's point affords the most useful sign of all for diagnostic purposes. In the early stages the leukocyte count has been of service in suggesting the presence of pus. Wood examined all the appendixes removed, and found a profuse colon bacillus growth in nearly all of the acute cases, whether they had proceeded to the pus stage or not. In the interval cases, thread worm cases, and in the normal appendixes removed in the postmortem room, there was only a scanty colon bacillus growth. When pus had formed inside the appendix, there

was often no mucous lining, but only a smooth, fibrous surface, from which it was impossible to get a smear. Most of the children's appendixes show a delta-shaped entrance to the cecum, which is closed by a valve of mucous membrane.

Archives des Maladies du Cœur, etc., Paris

July, X, No. 7, pp. 305-352

- 35 *Retrograde Ventricular Extrasystoles and Postextrasystolic Ventricular Automatism. (De la conductibilité cardiaque inversée.) M. Petzetakis.—p. 305.

- 36 The Anatomic Studies of Leonardo da Vinci. Chauvet.—p. 327.

35. Retrograde Conductibility of the Heart.—Petzetakis discusses whether an impulse may not be carried from the ventricle back to the auricle. Some deny the possibility of this, but he reports the details of two cases in which with total bradycardia there were unmistakable retrograde ventricular extrasystoles. One patient was a farmer-soldier of 23 with trigeminal rhythm. The tracings show how compression of the eyeball abolished the extrasystoles and slowed the rhythm, while amyl nitrite accelerated it. The other patient was a barber, and the tracings show the constancy of the auricular flutter following each extrasystole from the ventricular automatism. In the first case the extrasystoles appeared only when the man was much fatigued. In the other, the bradycardia followed an attack of dysentery, and the extrasystoles cut into the bradycardia. Neither of the men had any organic disease of the heart, and these extrasystoles were evidently of toxic or reflex origin. It is sometimes possible to arrest extrasystoles by deep breathing, confirming their nervous nature. They have also been brought on experimentally by stimulation of the cardiac nerves. Petzetakis has even induced extrasystoles by stimulation of the sciatic nerve, and has witnessed them develop from the influence of the uterus. Last December he reported that he had succeeded in inducing retrograde ventricular extrasystoles in dogs with bradycardia. The data presented thus demonstrate that cardiac conductibility is reversible, but, he adds, it is nothing new that an irreversible phenomenon may be composed of elements individually reversible.

Bulletin de l'Académie de Médecine, Paris

July 31, LXXVIII, No. 30, pp. 89-106

- 37 Cereals to Take the Place of Wheat. E. Maurel.—p. 89.
38 Pyopneumothorax as Consequence of Poisoning from Asphyxiating Gases. L. Lyon-Caen and Kuss.—p. 96.
39 Graduated Farm Labor in Systematic Treatment of Stiff Joints and Muscular Contracture after War Wounds. H. Guilleminot.—p. 97.
40 *Receiving Cap for Telephone and Wireless Telegraph Operators. H. Bauvallet.—p. 101.
41 *Tests for Apparent Death. A. Terson.—p. 103.

40. Receiving Cap for Telephone and Wireless Telegraph Operators.—Bauvallet's model cap is held in place by pressure from front to rear, like the head mirror of the nose and throat men, and there is no strong pressure from side to side. Each receiver has a soft circular pad which fits gently over the ear but closes it hermetically. There is also a soft pad to protect the brow. The wires can be arranged below the chin to form a band which aids in holding the cap in place. The ear pads are removable, to permit sterilization and individual use. A number of other innovations are described, Bauvallet having tested on himself the caps at present in use and having become convinced that from the medical standpoint there was great room for improvement.

41. Signs of Apparent Death.—Terson expatiates on the important information to be derived from the eye in regard to the manner of death and whether there is still a spark of life in the body. He says that the assumption that the pupils do not show any reaction after death is a mistake. There is no or very slight reaction to light, but the action of mydriatics and miotics and the action of electricity is almost always still pronounced although variable as to intensity and duration. In some cadavers these reactions can be elicited up to five or six hours after death; in others they are scarcely perceptible. With eserine he was able to induce violent contraction of the pupil, lasting for twenty minutes, in the cadaver of an elderly man who had been dead for four

hours, while similar tests the same day in a young man who had been dead for only two hours elicited a scarcely perceptible response. The pupil is the last of all to die, and while it may be immovable in certain living persons, it may persist movable for some time under different reagents in certain cadavers. Hence examination of the pupil is not decisive. On the other hand, the circulation reactions are absolutely dependable. Injection of fluorescein does not always induce in the human eye as lively a change of tint as in animals. Its effect should be studied elsewhere as well as in the eye. Application of the actual cautery, or of copper sulphate, and instillation or injection of salt solution under the conjunctiva do not induce any irritation on the warm cadaver two hours after death. More instructive still is a test with pulverized dionin. This, he recalls, is the proprietary name given by the Germans to the codethylin or ethyl morphin discovered by Grimaux in 1882. It dissolves rapidly in glycerin, and when applied to the eye in a 33 per cent. solution in glycerin it induces smarting, a purplish red congestion and chemotic swelling of the conjunctiva of the eyeball, and all this without any actual injury or accident at the time or later. Terson urges that this simple reaction should be applied at the slightest doubt whether the death is real or only apparent. In the numerous conditions which so deceptively simulate death, the ocular criteria should never be neglected. Their confirming evidence dissipates the last doubt, and even applied alone their testimony may prove convincing.

Journal de Radiologie et d'Electrologie, Paris

May-June, II, No. 9, pp. 545-592

- 42 Radiographic Aspect of Gangrenous Lesions, Especially Gas Gangrene. G. Lardennois and Pech.—p. 545.
43 Radiologic Equipment for the Army. Aubourg and Barret.—p. 548.
44 Operating under Screen Control. (Les méthodes radio-chirurgicales.) R. Ledoux-Lebard.—p. 552.
45 *Radiotherapy for War Wounds. Réchou.—p. 557.
46 Necessity for Having Only Physicians as Chiefs of Radiologic Services. M. Béchère.—p. 564.
47 *Let the Radiologist Select his Methods for his Diagnosis. Barret and Aubourg.—p. 567.
48 The Role and the Results of Roentgenology in the Diagnosis of Pulmonary Tuberculosis in Soldiers. Delherm and L. Kindberg.—p. 572.

45. Radiotherapy of War Wounds.—Réchou expatiates on the efficacy of the Roentgen rays in modifying the fibrous connective tissue which forms around nerves after a war wound, facilitating the absorption of the newly formed exogenous sclerosis, as Hesnard calls it. This connective tissue proliferating around the nerve binds it to adjacent organs and mischief follows. The rays seem to disintegrate this newly formed tissue while the nerve tissue does not seem to be influenced by the rays in doses just sufficient to accomplish this. He has found most effectual a monthly large dose, 10 or 12 H units, under an aluminum filter, with cross fire application when possible. He reports the details of seven cases in which the neuroma, contracture of the biceps and of the fingers and the reaction of degeneration and atrophy of the muscles all subsided in two or three months or were materially improved. In a group of five other cases the cicatrix after a war wound was adherent and interfered with functioning. The use of the limb was regained more or less completely after a few exposures. Cheloid and painful cicatrix were also favorably modified. Neuritis and even ankylosis may show marked improvement. In the discussion that followed, Beaujard reported over 66 per cent. cured and over 23 improved in ninety-three cases of crippling or painful wounds and all but 20 per cent. cured or improved in fifteen cases of troublesome neuromas, while all were cured of the ten patients with typical causalgia. All but 21.5 per cent. were cured or improved in fourteen cases of cicatricial compression of a nerve and in both of the two cases in which the spinal cord was thus compressed. Laquerrière emphasizes the fine results obtained in a number of cases of infiltration and inflammation of tendon sheaths, also as an adjuvant in old hydrarthrosis. The speakers emphasized that their remarks applied exclusively to war conditions, and that the rays were most effectual with young cicatricial tissue.

47. **Radioscopy and Radiology.**—Barret and Aubourg comment on the advisability of leaving to the radiologist the choice of the method of examination. His task is the radio-diagnosis, and how best to obtain this should be left to him. Radioscopy is the preferable technic for it in most cases and the prevailing abuse of radiography is extravagant. Among the cases cited to demonstrate the correctness of these statements is one of a scrap of shell in the forearm. A radiogram had been taken from the front and side, the fingers extended, but the surgeon at four separate operations was unable to find the scrap. Examination with the screen showed that when the fingers were flexed the scrap moved up 34 mm. Under the influence of the anesthetic the fingers became flexed.

Paris Médical

August 4, VII, No. 31, pp. 93-128

- 49 *Atropin and Amyl Nitrite Test in Bradycardia. O. Josué and F. Belloir.—p. 93.
- 50 *Heart Murmurs. C. Laubry.—p. 99.
- 51 Anemia in Primary Malaria. G. Paisseau and H. Lemaire.—p. 103.
- 52 *The Systolic Blood Pressure in Arm and Leg with Aortic Insufficiency. J. Heitz.—p. 112.
- 53 *The Abdominocardiac and Oculocardiac Reflexes. L. Pron.—p. 122.
- 54 Rapid, Extemporaneous Technic for Transfusion of Blood. G. Rosenthal.—p. 125.

49. **Atropin and Amyl Nitrite Tests with Bradycardia.**—Josué and Belloir state that as these drugs temporarily arrest the cardio-inhibiting action of the pneumogastric, they throw light on the clinical physiology of the heart action in case of abnormally slow functioning. The action of amyl nitrite is quicker, more constant and stronger than that of atropin. A positive response, namely, acceleration of the pulse, does not imply that the bradycardia is the result of excitation of the pneumogastric but only that the vagus still retains its normal tonic action on the myocardium. In fact, both atropin and amyl nitrite act on the normal heart. This point is very important. However, the cases of bradycardia giving a clearly positive reaction are as a rule total bradycardias determined by the excitation of the vagus; only exceptionally are they the result of dissociation between the auricles and ventricle from the same cause. The tonic action of the vagus may be still retained even when the bradycardia is the result of toxic myocardiac trouble. In this case the test may prove positive even although the myocardium is responsible for the bradycardia. The cases of bradycardia in which the tests are negative are those for which the myocardium is responsible. As a rule the bradycardia in such cases is from heart block. Negative responses occur likewise in bradycardia from toxic influences acting on the myocardium, as for example under digitalis. In the cases of bradycardia with complete dissociation between the auricle and ventricle, these drug tests sometimes determine a slightly faster action of the ventricles, indicating the persistence of the connection of the pneumogastric with the ventricles. When there is no nervous or muscular connection and the ventricles contract with an invariable idioventricular rhythm, there is absolutely no response to these drug tests. In conclusion they warn that the information supplied by atropin and amyl nitrite with bradycardia is interesting but not absolutely conclusive, certain points being still open to discussion.

50. **Heart Murmurs.**—Laubry's remarks are addressed to the practitioner, not the specialist. He reiterates that the special moment during the heart cycle at which the murmur appears, and its duration, are the main points for estimation of its clinical significance. The important thing is to locate the murmur in time rather than in space; its seat is of less moment. Vaquez declares that the heart should never be examined first with the stethoscope; this should be reserved till later to determine the exact point where the murmur sounds loudest. The first phase should be determined not by the pulse but by the tactile sensation of the apex beat which accompanies the sound. When a diastolic murmur commences with the second phase or immediately afterward, finishes immediately before the first phase, and fills the whole of the long pause, it is always organic; it occurs only with aortic insufficiency. With mitral insufficiency, the sound is a

rumbling, not a murmur. When the murmur occupies the entire systole, commencing with the first phase and stopping with the second, it is always a sign of valvular disease, but if there is even a brief space free from it at the middle or end of the short pause, then the murmur can be recognized as not only inorganic but it can be located outside of the heart, in the precardiac sheet of the lung. If the free interval is at the beginning of the short pause, then it may be organic, notwithstanding the integrity of the first sound. A murmur of inorganic origin may be encountered with tachycardia, in which case exact localization in time is out of the question. The site of the murmur is of little importance with a diastolic murmur but is important with the systolic. In the region of the base and of the middle of the heart, at about the third interspace and the fourth rib, every dubious murmur not decidedly filling the entire pause may be regarded as inorganic, as also every murmur at the base not followed by a diastolic murmur. In the apex region, if there is any doubt, prolonged repose, influence of change of position or of pressure on the eyeball may modify conditions so that the murmur may be better understood. Of course the above applies only to dubious murmurs. With actual organic disease there is no chance for doubt. The practitioner should practice to locate the murmur at its special point in the time cycle. When certain of this, he can fit the knowledge thus gained into the whole train of symptoms and the history of the case, and all may become clear. The murmur symptom should be analyzed first of all.

52. **The Systolic Blood Pressure in Arm and Leg with Aortic Incompetency.**—Heitz reviews the literature and his findings in fifty-one subjects, the tabulated data filling six pages. The systolic pressure seems to be higher in the tibial arteries as a rule with aortic incompetency or aortic lesion of any kind, but the diastolic is not modified. The patients were reclining at the time.

53. **The Abdominocardiac Reflex.**—Pron tabulates the details of fifty cases in which he recorded the difference between the pulse rate as the subject stood erect or reclined. The sliding down of the viscera, the intestines and the stomach in particular, as the subject stands, drags on the gastric ramifications of the pneumogastric, and by reflex action accelerates the pulse. This abdominocardiac reflex thus signifies abdominal ptosis, complete or partial, but its effect is magnified by any existing nervous irritability. The practical conclusion of his research is that the pulse should be counted always with the subject reclining; if he is standing the pulse may be pathologic even when the cardiovascular system is intact. Another practical point is that persons inclined to ptosis should wear a supporting band to ward off such traction on the gastric nerve ramifications. The supporting band must always be below the stomach, to push it up. Sometimes a little pad of flannel or cotton, fastened to the belt or worn just above the belt may answer the purpose. Study of the abdominocardiac reflex also emphasizes the importance for dyspeptics of reclining after meals to relieve them of the dragging down from the weight of the food. Also that persons inclined to defective digestion should avoid the erect position as much as possible at all times.

Presse Médicale, Paris

July 5, XXV, No. 37, pp. 377-384

- 55 *Spirochete and Mycosis Bronchitis Sometimes Simulating Pulmonary Tuberculosis. A. Castellani.—p. 377.
- 56 Case of Chronic Congenital Edema of Right Arm. L. Rimbaud and H. Roger.—p. 380.
- 57 Extraction of Projectiles under Screen Control. A. Lapointe.—p. 381.

55. **Bronchial Spirochetosis.**—Castellani is professor of tropical diseases at the University of Rome. He here states that in a soldiers' sanatorium in northern Italy he noticed that over 3 per cent. of those sent there with the diagnosis of pulmonary tuberculosis in reality had merely a mycosis or spirochetosis affecting the bronchi. He called attention to this bronchospirochetosis in 1905, and his statements have been confirmed since by others in the Philippines, Soudan, Switzerland and elsewhere, Chalmers and O'Ferral reproducing it in monkeys by intratracheal injection of a patient's

sputum. The chronic form can usually be differentiated from pulmonary tuberculosis only by the microscope. The prognosis is generally favorable in the acute forms, but when it runs into a chronic course it may last indefinitely although with occasional remissions. Arsenic is the main reliance in treatment and lately he has been combining tartar emetic with it. He prescribes the latter as 0.10 or 0.20 gm. tartar emetic, with 50 gm. syrup of tolu, and 100 gm. chloroform water to counteract the emetic action of the tartrate. The patient takes a tablespoonful in water four or six times a day. Castellani describes further the various forms of mycosis affecting the bronchi, tabulating twenty different hyphomycetes he has isolated, all belonging to the monilia type, and others of the oidium and hemispora types. In all these forms of mycosis there may be symptoms merely of a mild bronchitis or they may suggest pulmonary tuberculosis. Iodids are useful in treatment, but they do not ward off the fatal termination in the malignant cases. It has seemed sometimes that the iodids (2 or 4 gm. a day of potassium or sodium iodid) were more effectual if salt was restricted in the diet. Pinoy called attention to this with dermatomycoses. The microscope is the only means of differentiation.

Revue de Chirurgie, Paris

January-February, XXXVI, No. 1-2, pp. 1-240

- 58 *Is the Carrel Technic Applicable in the Base Hospitals? M. Guillot and H. Woimant.—p. 1.
59 *Amebic Liver Abscess Treated with Emetin Alone. P. Brocq and A. Augé.—p. 21.
60 *Inability to Rotate the Forearm after Fracture. F. Masmonteil.—p. 38.
61 *War Wounds of Foot and Ankle. E. Quénu.—p. 89. Continuation.
62 Aneurysm Involving Internal Carotid Artery and Internal Jugular Sinus at the Base of the Skull. M. Patel and M. Lannois.—p. 217.
63 *Oblique Anastomosis of Ureter Stumps. A. L. Soresi (New York).—p. 226.
64 Dry Wounds of Large Vessels. F. Perrenot.—p. 232.

58. **The Carrel Method as Applied in Base Hospitals.**—Guillot and Woimant report from the Rockefeller Institute at Compiègne that their experience with thirty-four wounded men confirms that old wounds respond on the whole like recent wounds to the Carrel method of sterilization and early suture. The only problem is to ensure that the antiseptic laves all the parts of the wound. It is necessary for this to clear out all infected tissues, and these complete operations on infected wounds, especially where there is fracture, are dangerous. The bacteriologic control shows that in an infected fracture case the microbes proliferate enormously after any operation on the focus, running up in a few hours from ten to uncountable numbers. Hence ample disinfection must be applied as a preliminary to the completing operation. By this means conditions are improved so that the focus can be thoroughly cleared out with comparatively little danger, and the wound then be treated as if it were a fresh wound. Each of these four phases, disinfection, operation, sterilization and suture, is done strictly under the guidance of bacteriologic control. The criterion for safety in the final suturing of the wound is one bacterium per three microscopic fields. They close with a recapitulation of the exact details of Carrel's technic and for the preparation of Dakin's fluid.

59. **Amebic Suppuration in the Liver Cured with Emetin Alone.**—Brocq and Augé report three new cases which emphasize anew the remarkable results that can be anticipated from subcutaneous injection of emetin alone, rendering surgical measures unnecessary. One of the men had acute hepatitis, the general condition so grave that no operation could be attempted, and the benefit under the emetin amounted to an actual resurrection. The improvement became evident the third day. Two doses of 0.02 gm. were injected daily for three days, then 0.04 gm. the fourth and fifth days, then 0.02 gm., gradually reducing the dose. The total given was 0.44 gm. in twelve days. The amebic infection was of eight years' standing. In the second case the diagnosis wavered between abscess of the liver and suppurating gallbladder disease, but an exploratory laparotomy revealed the large abscess in the liver. They did not attempt to evacuate it but gave 0.32 gm. emetin in the first twelve days and the

same amount in a second series of injections after a week's suspension. The third case shows that unless the course of emetin is prolonged long enough or repeated often enough the suppuration in the liver is liable to return. It is not enough to cure the liver lesion; the patient must be radically freed from the ameba.

60. **Inability to Rotate the Forearm after Fracture.**—Masmonteil discusses the mechanical principles involved in the limitation or complete suppression of rotation of the forearm after fracture, and how to prevent and cure it.

61. **Wounds of Foot and Ankle.**—In this instalment of Quénu's monograph he discusses treatment of recent and old wounds of foot and ankle, the cases cited in illustration bearing the numbers 173 to 243. By analysis of the mechanism of the unphysiologic functioning after healing, he seeks guidance for treatment of such injuries.

63. **Anastomosis of Ureter Stumps.**—Soresi is serving with the Italian army at present, and he here gives an illustrated description of a simple method of suturing the ureter stumps which leaves no possibility for narrowing the lumen. The primary transverse section is transformed into an ellipsoidal anastomosis, placed slanting. This shortens the ureter by 1 cm. He slits each stump for about 1 mm. longer than the diameter of the stump, and sutures the rear straight edge of each stump together. Then the circular edge of the right stump is sutured to the straight edge of the left stump and the suture is continued right along, joining the front straight edge of the right stump to the circular edge of the left. By this means is obtained a long slanting suture with the ureter bulging roundly at each side. The diameter of the ureter is thus materially enlarged at this point. A roentgenogram of a dog eleven months after an operation of this kind shows the ureter considerably enlarged at the anastomosis with no dilatation above.

Correspondenz-Blatt für Schweizer Aerzte, Basel

July 28, XLVII, No. 30, pp. 961-992

- 65 Operation versus Radiotherapy for Uterine Cancer. A. Labhardt.—p. 961.
66 *The Alleged Titration of Digitalis on Frogs. T. A. Redonnet (Madrid).—p. 974.
August 11, No. 32, pp. 1025-1056
67 *Dosage of Bromids in Epilepsy and Melancholia. E. Bernoulli.—p. 1025.
68 Importance for Man of Bovine Tubercle Bacilli. S. F. von Wolf-ring.—p. 1036.

66. **The Alleged Titration of Digitalis.**—Redonnet writes from the Pharmacologic Institute at Zurich to comment on the difference frequently observed between the action of digitalis preparations in the clinic and that which should be anticipated from the titrated values. Tests on the frog heart gave varying results with preparations of digitalis of different origins and dissolved in different mediums. Different results were obtained at will by varying the vehicle, the concentration and the other ingredients of the preparation. Clinical experience further shows that titration values obtained with the frog heart do not have identical values in man. In short, he declares, frog heart titration is useless and misleading. Quantitative dosage should alone prevail, and the physician should master the dosage for some one preparation and not change about. His own experience is the best teacher, and he will thus overcome the confusion with which the frog method has shrouded the use of digitalis. He reiterates that digitalis is the opium or the quinin of the heart just according to the dosage.

67. **Dosage of the Bromids.**—Bernoulli refers to the increasing use of the bromids in treatment of melancholia and similar conditions, saying that this enlarging of the indications renders careful dosage imperative. This treatment has proved particularly useful in the hands of Ulrich (as mentioned in these columns July 1, 1916, p. 81). He aims to get the patient under the influence of the bromids to an extent equivalent to the first phase of a bromid narcosis, but emphasizes the necessity for exact estimation of the degree of brominization. When there is large intake of salt, the bromid has comparatively little action. By giving the two in certain relative

proportions, a balance is obtained in the body in time, corresponding to the balance between them in the dosage. The promptness with which this balance is attained depends on the five factors, the intake of bromids, of salt, the elimination of each and the salt content of the body. Bernoulli compares it to a tub of cold water into which hot and cold water are running. The heat of the water is determined by the amount of hot water that displaces the cold in the tub, and the degree of brominization by the fraction of the body chlorin which has been molecularly substituted by bromin. This is the relative bromin content of the body and it can be determined by a single analysis of the blood. Individuals differ widely; he found 1.2 gm. chlorin per kilogram body weight in two thin persons and from 1.13 to 1.57 gm. in fourteen rabbits. When this is once established, then further control can be kept up by determining the chlorin content of the urine; the variations in this seem to give dependable information as to variations in the chlorin-bromin balance, although there may be a wide difference between the content in blood and urine. In severe cases of epilepsy, enough bromids must be given to bring the relative bromin content of the blood up to 20 or 25 per cent. or even 30 per cent. In the urine the corresponding relative content would be from 15 to 25 per cent. The diet must be salt-poor, reduced to from 5 to 15 gm. salt per day. It is not necessary to drop salt altogether. The chlorin content of the urine also permits control of the intake. Only when we know the exact amount of chlorid being ingested can we estimate the proper dose of the bromid. He gives a table showing the exact amounts of sodium bromid that should be given with given amounts of salt to realize a 15, 20, 25 or 30 per cent. relative bromin content of the urine. When the patient is getting 5 gm. of sodium chlorid per day, the sodium bromid dose should be respectively, 1.6, 2.2, 3 and 3.8 gm. With 10 gm. sodium chlorid, the figures are 3.1, 4.4, 5.9 and 7.5 gm. With 15 gm. sodium chlorid, 4.7, 6.6, 8.8 and 11.3 gm. If potassium bromid is used instead of sodium bromid, the dose should be increased by 15 per cent. above these figures. A chart marked off in fifteen vertical and twenty horizontal squares shows the dosage with precision, the vertical squares representing the sodium bromid and the horizontal the sodium chlorid. Starting at the left, lower zero corner, straight lines are drawn slanting up to the right. One drawn from zero to the upper right corner represents a 30 per cent. relative bromin content of the urine. A second line from zero to the twelfth vertical square, at the right, represents 25 per cent.; to the ninth right vertical square, 20 per cent., and to a point just above the sixth right vertical square, 15 per cent. Seven case reports are given in detail, with the chart of one. He reiterates that it is the combination of sodium chlorid and sodium bromid that is effectual, neither alone, and only their proper combination.

Gazzetta degli Ospedali e delle Cliniche, Milan

July 1, XXXVIII, No. 52, pp. 737-752

- 69 Fatal Tetragenus Sepsis. C. Rubino.—p. 739.

July 5, No. 53, pp. 753-760

- 70 Surgical Complications of Scarlet Fever. F. Bindi.—p. 755.
71 Reform of Midwife System. E. Villa.—p. 759.

July 12, No. 55, pp. 777-784

- 72 Epidemic of Neuritis with Scurvy in Troops on Active Service. M. E. Ferrari.—p. 778.

July 15, No. 56, pp. 785-800

- 73 *Pain and Other Disturbances from War Wounds of the Arm. (Sinestesalgia.) L. Corridi.—p. 786.

July 19, No. 57, pp. 801-808

- 74 *Eye Complications of Scarlet Fever. Tito di Giuseppe.—p. 803.

73. Nervous Disturbances after War Wounds of the Arm.—In the three cases described there were two sets of symptoms, one evidently due to neuritis from compression and the other to injury of the sympathetic innervation. The median nerve was the main trunk involved. In order to act on both sets of symptoms, two operations were indicated: neurolysis to free the nerve from the compression and Leriche's method of excision of the perivascular sheath of the artery. The symptoms corresponded to Weir Mitchell's causalgia, but Corridi prefers to call it sinestesalgia. The sharp neuralgic pains

appeared soon after the injury while the pains of the causalgia syndrome did not appear until days later and it developed gradually. The neuralgic pains, the motor disturbances and the muscular trophism were all improved at once by the neurolysis, but the causalgia persisted unmodified.

74. The Eye Lesions of Scarlet Fever.—In an extensive epidemic of scarlet fever in the Chieta province in Italy, ten cases were encountered in which there were complications on the part of the eyes. In a population of 30,000, there were 2,000 cases of scarlet fever between September, 1916, and March, 1917, with 200 deaths. The eye complications included four cases of corneal ulcer, two of iritis, and four of panophthalmia, all of which developed during the course of the disease. In one child the corneal ulceration entailed the loss of the aqueous humor and the child died the twelfth day. In another the ulcer developed the fourth day of the disease, which otherwise was mild. Keratoconus was left but there was no otitis or phlegmon. The third child had multiple corneal ulcers develop about the eighth day of the disease, and the child was left blind. There was evidently primary thrombus formation as occurred elsewhere in a number of other cases, obstructing the femoral in one case and compelling amputation, while one young woman developed paralysis in one arm. In the fourth case of corneal ulceration the same mechanism was involved, the circulation in the cornea suffering but the ulcer healed, leaving merely a small leukoma which did not interfere materially with vision. The iritis cases were less severe, pain and photophobia being the symptoms, with mydriasis and some exudation in the eye affected, but the whole subsided in one case under atropin. In the other case the eye was finally enucleated on account of complications. The trouble in these cases was not from interference with the circulation but was probably of toxic origin. Two of the four cases of panophthalmia were in a young mother and her child, both dying. The throat, ears and eyes were all affected, the corneas ulcerating. The other two cases of panophthalmia also proved fatal, one eye having been enucleated without arresting the process. The child succumbed to scarlatinal nephritis, the other to cachexia from multiple abscesses in ears, legs and neck. Both parotids suppurated also. The onset of the ophthalmia was stormy, the eye actually liquefying within a few days. It was noticed in this epidemic that no patient ever recovered that had presented bilateral mydriasis with pericorneal injection. Patients exhibiting this symptom (without signs of meningitis), apparently in good general condition, the pulse, respiration, heart, kidneys, etc., apparently in good order, rapidly succumbed without presenting any other lesions, the heart failing. This mydriasis is probably due to lesions in the sympathetic system, or in the suprarenals first and in the sympathetic secondarily. The toxic action responsible for it must have been very virulent as all such patients died within twenty-four or forty-eight hours after the mydriasis was noted.

Pediatria, Naples

August, XXV, No. 8, pp. 449-512

- 75 *Tartar Emetic in Treatment of Infantile Kala-Azar. A. Longo.—p. 449.

- 76 *Disease of Respiratory Apparatus in Infants Brought to Welfare Station. M. la Ferla.—p. 469.

- 77 Importance of Radioscopy in Infantile Scurvy. (Malattia di Barlow.) U. Provinciali.—p. 481.

75. Tartar Emetic in Leishmaniosis in Children.—Longo says that the most optimistic statistics mention only 10 per cent. recoveries among children with infantile kala-azar, and in his region, Catania, the proportion is only 4 per cent. This renders particularly noticeable his seventeen completely cured children among twenty given a thorough course of intravenous treatment with antimony and potassium tartrate, with no signs of recurrence during the three months or more since. He started the treatment in a total of forty-three cases, and an additional series of twelve are still taking the course. In the cured cases the children have been free from fever for three months at least and the spleen has subsided almost to or behind the costal arch. Even including the others of the forty-three who did not complete the course, the record is

41 per cent. recoveries. During the tentative period of treatment, three of the children showed symptoms of antimony poisoning, but none have been noted during the year since the doses were reduced. In two cases the course had been irregular and interrupted for periods up to eleven months. When the drug was given later during a recurrence, the germs seemed to have been rendered tartrate-fast, by the irregular and interrupted technic. The leishmania seemed to have been mithridatized against the drug, as no effect on it from the drug could be detected unless possibly an aggravating influence. These children were 14 months and over 4 years old and the disease was of one and five months' standing. They were given a total of 1.05 and 1.4 gm. of the drug in twenty-two and thirty-one injections. One girl of 3 threw off the kala-azar completely after two injections in the course of four days, and a total of only 0.08 gm. of the tartrate. A number of the children were withdrawn from treatment on account of the mothers' dread of the intravenous technic. Others died from an intercurrent acute infectious disease. The attempts at rectal and intramuscular injection had to be suspended as proving less effectual than the intravenous method. In conclusion, Longo gives the details of six cases in which he gave the tartar emetic by the mouth. The stomach does not stand the drug well, and only four of his six patients were able to keep up the course. There was no apparent effect from it in one child, who showed no benefit likewise from the drug by intravenous injection. In another the course was interrupted by whooping cough, but the two others were apparently promptly cured by the drug, taking a total of 0.59 and 0.63 gm. The daily dose was about 0.03 or 0.04 gm. and often about a quarter of it was vomited. This recovery of two out of four under oral administration of tartar emetic is promising. These children were 16 months and 3 years old, and the disease was of five and six months' standing.

76. Respiratory Affections in Infants.—La Ferla has been investigating parallel series of infants living at home and living in institutions, in order to determine the comparative prevalence of affections of the respiratory tract among them. The findings show that infants living at home and brought regularly to the welfare stations are less subject to affections of the respiratory organs, and they are less severe when they develop, than in corresponding series of infants in institutions. The dispensary "consultations" babies thrived better and threw off their respiratory trouble more quickly than the babies taken into the hospital. Of the 271 infants in question, only one fifth lost much weight during the respiratory affections. The children brought to the consultations averaged about three affections of the respiratory tract during the year.

Policlinico, Rome

August 5, XXIV, No. 32, pp. 977-1004

- 78 Trench Nephritis. F. Giugni.—p. 977.
79 Nephritis in Troops on Active Service. T. Silvestri.—p. 986.
80 Approximate Dosage of Albumin in the Urine. A. Angiolani.—p. 989.

August 12, No. 33, pp. 1005-1032

- 81 *Inhalation of Ether in Treatment of Mutism, Dysphonia and Tachypnea of Hysteric Origin. E. Trocello.—p. 1005.
82 Fracture of the Greater Trochanter. (Frattura parcellare da strappamento del grande trocantere.) L. G. Gazzotti.—p. 1012.

August, Medical Section No. 8, pp. 309-348

- 83 *Tertiary Syphilis of the Liver. A. Furno.—p. 309.
84 Improved Color Tests for Quinin. D. Ganassini.—p. 344.

81. Ether in Treatment of Hysteric Aphonia and Mutism.—Trocello reports two cases which sustain his plea for a trial of ether in all cases of hysteric mutism, aphonia or dysphonia. Simple inhalation of 20 c.c. of ether in the home cured the complete mutism in the first patient, a woman of 26. It had come on suddenly with a sensation of severe constriction back of the sternum, tachypnea and hiccup, during a period of debility from severe metrorrhagia and emotional stress. The woman had never presented appreciable symptoms of hysteria before. The same violent sensation of retrosternal constriction preceded the aphonia also in the second case, the patient a soldier. The ether treatment failed in this case. Others have called attention to the difference between the

effect in mutism and dysphonia, the former being much more amenable. Trocello thinks there can be no doubt that there is some connection between the retrosternal sensation of violent constriction and the vocal disturbances.

83. Tertiary Manifestations of Syphilis in the Liver.—Furno reports in detail five cases of syphilitic disease of the liver, and compares them with similar cases in the literature. The first presented typical syphilitic diabetes of liver origin. He has been able to find on record only one other case in which the syphilitic diabetes was due exclusively to the liver. The enlarged liver and the pronounced and persisting glycosuria in his case both subsided under treatment for syphilis, the glycosuria promptly disappearing as the liver returned to normal size. There was nothing to indicate disease of the pancreas or a nervous origin for the glycosuria. It disappeared after two injections of calomel in the course of two weeks. In another case the stormy onset was supposed to be liver colic. The temperature rose but then dropped to normal but rose again later. Furno assumes that the colic was responsible for the fever at first and later the specific treatment. In other cases also the temperature rose each time after intravenous injection of salvarsan. The rise in temperature seems to be due to the action of the drug on the specific disease and is not merely a febrile reaction. The temperature and other conditions grew worse under a mild mercurial and iodid course of treatment in three of the cases reported. He regards this as instructive, as showing, first, that the fever is actually the work of the syphilitic process, and, secondly, that the process is not chronic but subacute, and in this way it serves to differentiate syphilitic from other forms of liver disease. Thirdly, it explains the origin of syphilitic fever. In all the five cases, specific treatment was followed by prompt subsidence of the enlarged liver, always accompanied with fever. There was no fever when the liver subsided in size from other causes than specific treatment. In one case in which for two weeks the true diagnosis had not been made, the enlarged liver had materially subsided under repose, dieting and measures to stimulate production of bile, but there was no fever during this period. Most writers assume that the fever is the result of absorption of the necrotic products of the gumma, but the behavior of the fever in these cases indicates rather that the heat-regulating nerve centers are irritated by the toxic products elaborated in syphilitic liver tissue. Carcinoma and sarcoma are generally afebrile when located elsewhere than in the liver. In his cases the pain in the liver region became much more intense under specific treatment, and there was also vomiting at the onset of the liver trouble and on beginning specific treatment. Hiller has reported a case of liver syphilis with vomiting of blood. There was little if any tendency to jaundice in Furno's cases. This is more common with secondary syphilitic disease of the liver. Any confusion with Banti's disease is out of the question if we remember Banti's words that malaria, syphilis and tuberculosis must all be excluded before accepting this diagnosis. The fever following specific treatment also aids in excluding Banti's disease, as mercury iodid treatment in this disease has not been known to induce fever. There was pronounced leukopeny in all of Furno's five cases. In one intense headache and pain back of the sternum and in the liver were the predominant symptoms. One woman of 34 had had diffuse myalgia for six weeks with chills, fever and enlargement of liver and spleen, while another woman of 54 had had pains in the bones for a few months, with intense headache, oppression and pains in the right abdomen radiating to the arm, with some fever. On account of slight albuminuria she had been treated for uric-acidemia but the condition grew constantly worse, with uncontrollable vomiting, abdominal pain and uremic manifestations. Under specific treatment prompt improvement was realized but it proved impossible to get the liver back quite to normal proportions.

Riforma Medica, Naples

July 28, XXXIII, No. 30, pp. 749-768

- 85 Diagnosis of Tuberculosis in Soldiers. E. Maragliano.—p. 749.
86 Malaria in Soldiers. D. Cesa-Bianchi.—p. 752.
87 Simulated or Factitious Talipes. A. Mori.—p. 755. Commenced in No. 29, p. 729.

Brazil-Medico, Rio de Janeiro*July 7, XXXI, No. 27, pp. 225-232*

- 88 Presumptive Diagnosis of Pellagra with Consecutive Polyneuritis in Man of Thirty-Two. C. de Rezende.—p. 225.

Cronica Medica, Lima, Peru*July, XXXIV, No. 649, pp. 221-268*

- 89 The Etiologic Factors of Mental Disease through the History of Peru. H. Valdizan.—p. 221.
90 *The Fibrous Form of Pulmonary Tuberculosis. A. Corvetto.—p. 236.
91 Present Status of Vaccination against Typhoid. C. A. Bambaren.—p. 243.

90. **Dense Fibrous Form of Pulmonary Tuberculosis.**—Corvetto's cases of this type began very slowly and insidiously and hemoptysis was the most constant symptom, coming on at any stage of the disease. It is not formed of pure blood; a hemorrhagic pneumonia is responsible for it, not an ulceration. The diaphragm is higher on the side affected. The general condition may keep good for a long time; one of his patients showed little disturbance for ten years, but the disease progresses inexorably to a fatal termination in time. This can be postponed by hygiene and avoidance of fatigue and other harmful factors. Such patients are usually between 40 and 60, but the young do not escape. The heart becomes compromised comparatively early, and everything that strains the heart must be avoided. A mild, sheltered climate is better than altitude for the older patients. There is little if any fever with this dense fibrous type. Tuberculin has done more harm than good in these cases in his experience, and artificial pneumothorax has little prospect of success. This should be reserved for the rapidly spreading forms of tuberculosis, especially the unilateral. The dense fibrous type usually affects both lungs.

Revista de Medicina y Cirugia, Havana*August, XXII, No. 10, pp. 373-422*

- 92 Celebration of Santos Fernandez' Seventieth Birthday. J. P. Arteaga.—p. 373. Mentioned in THE JOURNAL, August 25, p. 660.

Hospitalstidende, Copenhagen*July 11, LX, No. 28, pp. 669-692*

- 93 Heart Block in Upper Portion of His-Tawara Bundle; Four Cases. V. C. E. Petersen.—p. 669.

July 18, No. 29, pp. 693-716

- 94 *Status Epilepticus in the Pregnant. V. Albeck.—p. 693.
95 *Spontaneous Rupture of the Rectum. E. Henningsen.—p. 702.

94. **Status Epilepticus in the Pregnant.**—Albeck's experience has convinced him that status epilepticus in pregnant or parturient women is not so exceptional as would appear from the records, but it is often mistaken for eclampsia. Differentiation is particularly difficult when the epileptic seizures are accompanied by albuminuria and edema, as in his three cases. The fact that the patient is known to be an epileptic or that the convulsions have recurred at previous pregnancies, speaks for the epileptic nature of the trouble, as eclampsia, he says, so good as never occurs twice in the same individual. The blood pressure may also aid in differentiation; a normal or nearly normal blood pressure is not found in eclampsia. In five cases on record of status epilepticus in pregnant or parturient women all terminated fatally, but Jardine has reported a case at the eighth month and the woman recovered after cesarean section. Albeck systematically interrupted the pregnancy in his three cases, by instrumental dilatation or cesarean section, and all the women recovered. He thinks that a latent or frank tendency to epilepsy is roused by some pregnancy intoxication. He has had 151 cases of what he calls eclampsism among 3,000 pregnant women; in one case it was pronounced in an epileptic woman for a few weeks before delivery but yet status epilepticus did not develop, and a living child was delivered by section at term. This patient had been given potassium bromid regularly from the first symptoms. None of the women thus treated developed status epilepticus, but when it was already installed, he did not venture to allow the pregnancy to continue but interrupted it at once. The outcome in his three cases testifies to the wisdom of this method of treating status epilepticus in a woman suffering from pregnancy intoxication.

95. **Spontaneous Rupture of the Rectum.**—Henningsen's two patients were men of 57 and 59. The first had been harvesting turnips when he felt a sudden sharp pain in the lower abdomen and he went at once to bed. There was some nausea but no vomiting, hiccup, stools or flatus. The abdomen was slightly tender throughout; the percussion findings were practically normal and nothing abnormal was found on exploring the rectum. Cancer was surmised, but as the condition was not alarming the patient was merely kept under surveillance; some flatus was passed and a small bowel movement followed an enema. There was also a little vomiting but not ill smelling. The third day conditions grew rapidly worse and laparotomy revealed a minute perforation in the upper end of the rectum. It was sutured through an incision in the left iliac fossa but the man died the seventh day from diffuse fibrinous peritonitis. Nothing could be found to explain the perforation in this or in the second case. In the latter there had been no trauma, no exertion, and there had been an interval of five hours since the last and entirely natural defecation. Except for gastric ulcer twelve years before, the man had been clinically healthy. Three hours after dinner he felt a sudden and intense pain in the abdomen. The physician could find nothing abnormal in the abdomen or rectum but relieved the pain with morphin. By the next day the abdomen was diffusely tender, rigid and drawn in and the temperature had gone up a little. At the laparotomy no trace of the assumed gastric ulcer could be found and the trouble was traced to a perforation with sharp edges, about 2 cm. long and 1 cm. wide, lengthwise of the middle of the rectum. It was sutured through an incision in the right iliac fossa, but death soon followed. In this case absolutely nothing to explain the rupture was found at the time or at necropsy.

Ugeskrift for Læger, Copenhagen*May 31, LXXIX, No. 22, pp. 855-898*

- 96 *Early Diagnosis of Liver Disease by Functional Tests. J. P. Gregersen.—p. 855. Commenced in No. 21, p. 831.

96. **Clinical Significance of Urobilinuria.**—Gregersen's conclusions as to the great diagnostic importance of urobilinuria are based on research on very nearly 400 persons, including 50 healthy, 42 with nephritis, 35 with gastric ulcer, 28 with diabetes, 31 with neurasthenia, 20 with chronic polyarthritis and other patients bringing the total to thirty-eight different diseases or affections thus tested. The urine was examined three or four times or more in nearly every case, and always more than once. A positive response to the test for urobilinuria was never obtained in the healthy or in those diseases in which the liver is not involved, regardless of the diet. But urobilinuria is the rule in all febrile conditions, the liver evidently suffering in all such. This must always be borne in mind in examining persons who have or have had fever within a few days. Even extensive cancer does not induce urobilinuria unless there is compression or other injury of the biliary apparatus. With chlorosis and secondary anemia there is no urobilinuria, while it is constant with pernicious anemia; probably the great destruction of reds imposes such extra tasks on the liver that it becomes insufficient.

Urobilinuria is the invariable accompaniment of disease of the liver. It is probably the first appreciable symptom of incipient cirrhosis of the liver and the first symptom of beginning obstruction of the outflow of bile, and it is the last to disappear when the stasis of bile has been corrected. When the obstruction to the bile is so complete that no bile gets into the intestines, there can be no urobilinuria; hence the absence of urobilinuria in such conditions testifies to complete obstruction of the bile passage. He adds that the test for urobilinuria is simple and easy by a modification of Schlesinger's technic: Add 2 or 3 drops of tincture of iodine to 10 c.c. urine, and thereafter 10 c.c. of a 1 per cent. suspension of zinc acetate in absolute alcohol. Agitate well and filter. In the presence of urobilin there will be a green fluorescence in the filtrate. This reaction persists for several days even with bacterial decomposition. It does not reveal and does not seem to be modified by albumin, pus, blood, sugar or bile pigment in the urine.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXIX, No. 13

CHICAGO, ILLINOIS

SEPTEMBER 29, 1917

ADEQUATE MEDICAL SERVICE OF THE FUTURE*

OTTO P. GEIER, M.D.

CINCINNATI

In the strikingly evolutionary programs of the twentieth century, no group of individuals is about to have its old-time relationships more radically changed than the group of physicians. Many factors, social and economic, will be responsible. Some of these most evolutionary changes will promptly and voluntarily come from within the profession; others will be forced on the profession. It is evident that we have for all time passed beyond the stage of the absolutely individual and personal relationship of family physician and patient, to one in which the community steps in to safeguard itself against any abuse of this circumscribed relationship, and demands collective action in matters of health for the benefit of all.

SOCIAL AND ECONOMIC PROBLEMS

The concentration of population in cities has developed problems beyond the control of the private physician. In the trail of density of population have come the tenement, sweat-shop, bad housing and living conditions, tuberculosis, alcoholism, venereal disease, poverty, delinquency and crime.* The development of industry with its occupational hazards has created another series of health impairments which the family physician may have the knowledge to alleviate, but the prevention of which is entirely beyond his control. The establishment of the public health department was a partial answer to these new social requirements.

The coming of industrial concentration presented other social disorders. We have witnessed the development of class feeling and the estrangement between labor and capital. Strikes and lockouts were only a consequence. The valued relationship of master and man passed out. They no longer had real personality for each other, no longer worked side by side, they lived further apart, thus making the difference in their scale of living more evident. The gulf between poverty and riches was widened. Unemployment, seasonal employment, the physically unfit, the unemployable, the industrial hobo, the labor turnover, all loomed up as medical and social problems of such huge size as to spell defeat of their solution.

Society is realizing that the problems of industry are largely its problems; that the major portion of the community is engaged in industry and that when

badly administered, it is therefore a menace to the peace, health and happiness of the whole community. When properly administered, it is of inestimable value socially and economically. Whatever industry does, because of its size, is impressive.

Has the medical profession kept pace with society in its realization for the necessity of community thinking, community action? Has the profession recognized that its work is fundamental to the solution of every social problem thus far presented? Are we thinking in terms of the mass, and adjusting our work to the new social needs? Have we fully realized our obligations, our opportunities? Do we actually sense the full meaning of the fact that every social disorder has a medical aspect? Do we really appreciate that most social misfortunes are founded in the neglect of the laws that make for a healthy mental and physical state, and that it is our bounden duty to apply ourselves to these tasks? Do we understand that these social disorders call for a new medical order? To the extent that we do understand, we shall be either producers of social reform or merely its by-products. Ours is the choice.

It was with these thoughts in mind that your officers deviated from the usual style of program for the Section on Preventive Medicine and Public Health, and have endeavored to encourage an extended discussion of the social and economic status of the practice of medicine. In thus drawing your attention away from the discussion of detail of administration, away from the refinements of the application of scientific and hygienic measures, I hope to visualize a broad concept of the potentiality of the socially minded physician in private practice, in public health practice, and especially in industrial practice. I am trusting that the discussion may point the way toward a more adequate practice of medicine, the medicine of tomorrow.

Ours is no effort by legislation to thrust revolutionary methods on the members of our profession. It is rather to set out in bold relief some of the rational and evolutionary processes that are taking place, and may yet take place, within the profession; to measure, if possible, their relative social values, and to deduce from this study the direction in which medicine must go to meet the new social order, to produce adequate medical service. I shall confine this discussion to the consideration of three of these well defined tendencies:

1. Higher standards of private practice by refinement in diagnosis and treatment through group practice.

2. Higher standards of public health practice (emphasizing school dispensaries).

3. The development of industrial medicine—the new specialty.

* Chairman's address, read before the Section on Preventive Medicine and Public Health at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

Scientific attainment will come through the emphasis of the first. The application of this science to the ultimate social good will proceed largely through the latter two. All three together, through years of patient effort, will make for that final goal, adequate medical service.

In contrast to the stated need for years of evolutionary growth, the adequate medical service is being heralded as possible of accomplishment over night, by the mere process of legislative action, changing the method of compensating the physician through a central collecting agency. Some of us are ready to affirm that there is an actual shortage of adequate medical service both quantitatively and qualitatively, and that, therefore, no kind of legislation can make it purchasable by all or for all; that the chief social need is for the development of some organized plan of reform within the profession that will eventually produce and make procurable adequate medical service.

We are deeply indebted to the proponents of social insurance for setting forth the direct relationship between poverty and disease, for emphasizing the economic advantage to society of grappling vigorously with the problem of disease, and for pointing out the shortcomings and the inadequacy of present medical service. The argumentation has crystallized recognition of the immense contribution that scientific preventive medicine should make to the nation's better health. But, in their unfortunate haste to legislate, and in their intolerance of further discussion, they have not taken time to write into their instrument the fundamentals that attack disease and thereby prevent poverty.

It is not my purpose to decry compulsory sickness insurance, but to present a partial program for the socialization of medicine which will be worth while for itself, but which incidentally must finally become the foundation of any rational health insurance plan against which will be found but few opponents.

As the proposed health insurance bill revolutionizes the relationships of the physician, we are by that act immediately threatened with a new future for the practice of medicine. Is it not timely, therefore, that the medical profession should decide what that future shall be?

The subject of adequate medical service is of vital interest to the wage earner, the political economist, the physician, the employer and the public. Ours is an effort through group practice or a symposium discussion to diagnose our social miseries, and then to write a prescription. It is fair to assume that if a program can be devised that will meet the needs of the individual, it can probably be extended advantageously to meet the needs of the community.

What are the individual's social needs?

1. Health, so that he may work effectively and thereby earn a good wage.
2. Employment in an industry free from health and accident hazards.
3. A healthful home accessible to his work.
4. Intelligent medical care in time of illness.
5. Protection to his home and industry.
6. Good schools for his children which safeguard the health.
7. A health department which will protect his family against contagious diseases, and safeguard his food supplies.
8. Healthful recreation for himself and family.

It will be seen at a glance that his success and happiness are predicated on his health and that of his family; that this health is possible only through collective action, and that the family physician appears only when some health agency has failed to prevent disease.

For the reason that most physicians are still individualists and have failed to recognize that health is no longer a personal matter, a discussion of the necessary changes in the practice of medicine is timely.

A conviction has been born out of considerable observation and experience in philanthropic and social work that physicians do not comprehend their direct relation to sociology. The physician should be the leader in community thought in all problems of disease, insanity, crime, delinquency and dependency. To do so, however, he must have a wide angled vision of social disorders.

If disease is so costly, what definite and practical means are now at hand to reduce that loss? How far can we prevent disease? To those who have given only cursory thought to this subject, the annual loss of \$500,000,000 charged to illness seems impressive. But let us consider what the great economic and social wastes are that make for sickness and poverty. Let us see whether these wastes are preventable, and if so, should not society rather give its attention to this worthwhile program which, in accomplishment, will be striking at the roots of the evils which to many appear momentarily to justify the medical and social revolution involved in compulsory sickness insurance?

Tuberculosis, it is said, claims an annual economic loss in this country of nearly \$500,000,000. Bad housing, bad living, alcoholism, venereal disease, and occupational diseases would surely add an equal number of millions. The excessive annual labor turnover, or the quick hiring and firing of help is responsible for another \$500,000,000. Voluntary absence from work due to personal reasons or lack of application causes an annual loss of more than \$500,000,000.

Now these social and economic losses, totaling billions, are all preventable if society is really in earnest about improving its fundamental conditions and those of the medical profession. Remove these drains on the wage earner's health and purse, and he will need none of the proffered aid from the state in the guise of compulsory sickness insurance.

We can form some estimate, for instance, of the cost of alcohol and venereal disease to society, if we take the sum total of the cost of prison administration, maintenance of almshouses, institutions for the insane and feeble-minded, the cost of caring for delinquent and dependent children, the blind, and the cost of the erection of hospitals, and particularly the care of sickness due to the factors of alcohol and venereal disease.

Alcohol is charged with an increased mortality of from 25 to 75 per cent. in its users. The morbidity must follow about the same curve. Will the proposed model health insurance bill reduce alcoholism or venereal disease by one iota? On the other hand, would not some constructive program looking toward the reduction of these enormous burdens on the community be the most logical way of immediately reducing poverty and thereby furnishing a purchasing power for medical service? Considering the long lasting financial drain of tuberculosis, will the mere payment of two thirds of the wages make the slightest dent in the fearful economic loss from the white plague? This disease can be finally controlled only by

early diagnosis. The early diagnosis and cure of tuberculosis can come only through higher standards of medical practice, medical supervision, physical examinations and reexaminations, through better housing conditions and sanitary measures, and through the reduction of alcoholism and venereal disease on which this plague is so largely engrafted.

SOCIAL IMPROVEMENT THROUGH MEDICAL IMPROVEMENT

What plan for social improvement is worth our time, our discussion, our money? If we, as physicians, would be successful in the improvement of the health and happiness of the nation, we must at the outset reorganize both private health practice and public health practice. Both must be placed on a higher plane of efficiency. Next, we must set up adequate public health machinery by reorganizing the federal, state and municipal health work. This work must be entirely removed from political control, so that scientific attainment and spirit may pervade the whole organization, and then we may have the maximum of coordination and cooperation throughout this machinery for the attainment of 100 per cent. efficiency in working for public health. The proposed health insurance bill affects but 30 per cent. of the population (industrial workers). Any plan for health betterment should include 100 per cent. of the population. Good health pays. It should be demanded of the rich as well as the poor. We can well afford to extend our health department facilities so that we may know about the living and health conditions of all of the people.

How can this best be accomplished and by what agencies?

1. We must provide the private practitioner with the opportunity of higher standards of practice.

2. We must raise the standards of public health practice.

3. We should encourage the extension of industrial medicine.

These three factors will produce better health, lessen disease, and increase the number of working days, as well as working capacity, thereby reducing poverty and at the same time increasing the purchasing power for better standards of living, including the purchasing capacity of adequate medical service.

HIGHER STANDARDS OF PRIVATE PRACTICE THROUGH DIAGNOSTIC CLINICS

What share of the \$500,000,000 loss which is charged to illness is due to unnecessary length of illness on account of lack of diagnosis, faulty diagnosis or faulty therapeutics? Loss from illness can be tremendously reduced through the establishment of diagnostic clinics so that 100 per cent. of the people may enjoy the advantage of the most scientific medical and surgical knowledge obtainable. These diagnostic clinical stations would afford to all physicians in their daily work the same facilities as extension courses and postgraduate work. It is difficult to imagine a better method of raising the standards of medical practice.

The group plan of practice, the furnishing of diagnosis, should be made free, or supplied at a minimum cost, so that 100 per cent. of the profession may keep in daily contact with the progress of scientific medicine by taking their patients to consulting clinics. Today in large cities 20 per cent. of the profession only have access to the scientific equipment of hospitals and pub-

lic diagnostic research laboratories, and the 20 per cent. have these advantages at the cost of the 80 per cent. of the public and the 80 per cent. of the profession. By making diagnostic clinics free, or practically so, we shall enormously stimulate accurate diagnosis, systematic treatment, and preventive health work. These diagnostic clinics should be under the control of the health department. Health departments today make Vidal tests, sputum examinations, Wassermann tests, diphtheria cultures, and send their men to confirm diagnoses of contagious diseases. The extension of this work to more complete diagnosis should not be objectionable.

Hospitals should primarily be teaching centers for all the physicians of the community as well as for medical students. Too often public and semipublic hospitals serve the selfish purposes of a fortunate few who, while claiming altruistic motives, deny to the profession at large, and therefore to the public, the educational advantages of hospital and clinical facilities. Specialism is all too rampant, and forbids the general practitioner a place in the sun.

THE SCHOOL DISPENSARY

The tremendous reduction in loss from illness occurring through the operation of industrial dispensaries suggests the extension of this principle to the schools. If full time physicians were placed in charge of all-day dispensaries in schools, making physical examinations of all children, and prescribing for their minor ailments, using the public diagnostic clinics previously referred to for confirmation of diagnoses, a similar reduction would take place in lost time from school as has taken place in lost time from work through the operation of all-day industrial dispensaries. Many universities have already instituted such medical supervision and care of the students. Industrial workers and schoolchildren comprise, perhaps, more than 80 per cent. of our population that would thus be reached by intensive preventive work and treatments in the daily clinics. The school dispensary in reaching out and supervising the child of preschool age, now utterly neglected, will serve a great social purpose.

THE IMPORTANCE TO PUBLIC HEALTH OF THE INDUSTRIAL DISPENSARY

If war has proved anything, it is that military success is dependent on industrial efficiency of the country. The health of the industrial units has loomed up as of paramount importance. We are equally concerned with the health of the individuals in these units in peace times, since they form the major portion of the community.

Perhaps the greatest change that has come in medical practice has been the development of the field of industrial hygiene. It is now taking the whole time of thousands of physicians in the medical supervision and care of employees, and it would seem that the beginning has just been made. No doubt this situation has been stimulated by workmen's compensation acts, but it is equally due to the awakening social consciousness on the part of the manufacturer. He has learned that the health of the worker is a definite asset in his business. Medical care in industry is not a charity. It pays good dividends. With the discussion for social insurance, we may look for a still greater extension of this work, and a more general employment of physicians in industry. The caring for occupational diseases, under workmen's compensation com-

missions, which is sure to come, will further stimulate the interest of industry in industrial sanitation and supervision of employees.

In strong contrast to compulsory sickness insurance, the industrial dispensary plan assures constant watchfulness over the health of the industrial worker, and brings to light economic pressure for the elimination of industrial hazards. At the same time, the wage of the worker is raised because such care increases his capacity for work and therefore still further reduces the necessity for charity in one form or another. It adds a new arm to the health department, and makes possible preventive medicine such as we have never yet dreamed of.

It does not take much imagination, therefore, to foresee the time when practically all of the industrial workers will be under daily supervision through industrial dispensaries. For the first time, then, we can begin to collect accurate data on morbidity. The very limited registration reflects the backward state of scientific preventive medicine. Absence from work is an economic question, and industry is going to know the reason why a man is off from work, and from what illness he is suffering. The employer is going to concern himself to the end that the employee's medical attention is of good quality. He will be interested in his food as well as in his housing problems. As to the claimed loss of nine days per year per man, or \$500,000,000 on account of illness, private initiative, through the industrial dispensary, has shown that this loss can be reduced by one-half without charge on any one but the employer, and this money is gladly spent because it is economically sound to do so.

Now the questions arise, What relationship will this new industrial medicine bear to public health work? Should it not have some kind of supervision from the health department so that its work may be best coordinated? And lastly, Would not industry cooperate in making industrial hygiene compulsory?

This type of socialized medicine will be intensively preventive, and entirely democratic; it will discover disease in its incipency; it will prevent loss from illness instead of merely paying, through compulsory sickness insurance, a certain fraction of that loss; it will attack directly such problems as bad housing, venereal diseases, alcoholism and tuberculosis, and thereby make a fundamental contribution to social welfare. In comparison, the proposed sickness insurance bill is merely palliative, and actually tends to cover over and hide the various "social ulcers."

If we were to socialize medicine to the extent suggested, we would improve that time-honored and most desirable relationship between the family physician and patient. This immediate and definite response to social need would avoid the lowering of standards that is likely to come with the introduction of the panelized physician. Unless compulsory sickness insurance can be so devised as to place chief emphasis on prevention of disease rather than the giving of financial relief, it will actually jeopardize present health work by further reducing the present inadequate budgets. Through the socialization of medicine, the raising of the standards of medical practice, along with the extension of preventive work, illness to the industrial worker and to the rest of the public might well be reduced by one half. It would then follow that the distribution of the loss from nonpreventable diseases could more rationally be undertaken by some insurance plan.

It appears that no social progress in matters of health can be made which is not preceded by progress in the practice of medicine. The medical profession, however, will be limited in its progress unless it recognizes the close interrelationship between social work and medical work. These must be coordinately developed.

Let us now begin within the profession "a clean up and brush up campaign." Let us "put our own house in order." Let us be certain that we have given close attention to the social needs of the community. We may stand erect in the knowledge that we have always given unstintingly of our energy to make the world better for our living. If we are fully awake to our social obligations and opportunities, we need not commit the error of permitting well meaning reformers to mobilize our forces. It is our business to formulate social programs, not ours to accept, unchallenged, programs which place uneconomic burdens on us. Who are better equipped to write a social prescription than the members of the medical profession? Before making any additional sacrifices, we want to be "dead certain" that the other social groups are doing their part, and that the sacrifice is justified. If society at large will do her share in correcting her own evils, the medical profession can be counted on as always to cooperate and to do more than its share.

CONCLUSIONS

1. Private health practice and public health practice must be improved.
2. The knowledge of the prevention of disease, its diagnosis, and cure must be advanced.
3. Higher personal and ethical standards must prevail.
4. This better day will be hastened by a more general adoption of the group practice plan.
5. More men must fit themselves for the distinct specialty of industrial medicine.
6. The supervision of schoolchildren and children of preschool age should be extended through the establishment of school dispensaries.
7. These methods together will constitute an adequate medical service, and be a forward step in the ultimate socialization of medicine.

ABSTRACT OF DISCUSSION

MR. LEE K. FRANKEL, New York: The fundamental error that has been made in the discussion of this subject is due to lack of realization as to what insurance means. Primarily, insurance has no thought of prevention. The advocates of social insurance have said much about the proposed compulsory insurance bill carrying with it prevention of sickness. If we will only realize that, fundamentally, insurance is not prevention, but that it is indemnity for loss, we may get together on a basis for legislation satisfactory to all. Health insurance, basically, is intended to replace wages which individuals lose by illness. This is a comparatively simple matter: it means the preparation of a morbidity table in order to determine the cost. So far as this payment of claims is concerned, insurance involves the medical profession; but it involves it only in so far as the skill of the medical practitioner is required to determine whether the individual who claims benefit is or is not entitled to benefit.

Where the confusion has arisen, not only here, but abroad as well, is in the fact that the medical practitioner has been expected to perform this one primary and important function, but, in addition thereto, to give medical treatment and care.

When you realize that medical men have deliberately

banded themselves together, have gone on so-called strikes, and have refused to give treatment, in absolute opposition to the ethics of the profession, you can realize what social health insurance in Germany has developed. If there is one thing we want to avoid, it is the repetition of that in the United States. The question of medical care, the question of treatment, is a thing apart from the payment of cash benefits. Whether we shall get away from the theory of the individual medical practitioner, with his fee, and have salaried medical practitioners, cannot be determined by the outsider; it must be determined by the profession itself; and until the profession has given careful consideration to this matter, has come to some agreement, we cannot develop any efficient and thorough scheme of sickness insurance in the United States.

DR. JOSEPH GOLDBERGER, Washington, D. C.: In my judgment there is no matter that is likely to be such a powerful incentive for the exercise and practice of preventive medicine as health insurance. As an illustration of the principle involved, I want to cite the parallel phenomenon that we are seeing at the present time in connection with preventive medicine in a field related to health insurance, namely, life insurance.

Now, you all, I think, know the splendid work that the Metropolitan Life Insurance Company, for instance, is doing toward the conservation of health and the prevention of death, simply because it finds that it is a matter of dollars and cents; that it is a matter of economy to prevent death. Now, it seems to me that when we have some system of health insurance, then the prevention of sickness will become a profitable business to the organization insuring against sickness. When it comes to the question of organization and administration, that is a matter about which I have no opinions. The point, however, that I wish to emphasize, and that I think is of fundamental importance, is the one that I have just mentioned: that health insurance makes the conservation of health and the prevention of sickness a matter of dollars and cents, a most potent and driving force.

DR. OTTO P. GEIER, Cincinnati: May I insert a comment on Dr. Goldberger's statement as to the likelihood of economic pressure bringing about preventive work? If he will go to Ohio and study the workmen's compensation law and see the ever-increasing cost per \$100 of insurance in the various industries, and note how relatively indifferent the manufacturer is to that increasing cost, he will take a different view as to the rapidity with which people will respond to preventive work under social insurance because of economic pressure. What actually happened was that industry opposed the workmen's compensation act. Once adopted, the industries accepted the situation and the rate per \$100 of pay roll for each class of industry. When the rate went up 5 cents, 10 cents, 15 cents, 20 cents per \$100, little or no attention was paid to it. Industry had acquired an immunity against any economic reaction. The fact remains that industry is not trying to reduce accident through a desire to reduce the rate. The real reason for industry's interest in reducing accidents is a realization that the man's absence is expensive because of the lowering of production, and because by reducing accidents industry also reduces the expensive labor turnover.

Detecting Adulteration in Tea.—A new method of detecting adulteration in tea has been described by L. Rehfoos in the *Bulletin* of the Botanical Society of Geneva (Switzerland). It involves an examination of the stomata, which are quite different in *Thea sinensis* from those of the leaves used for adulteration. In *Thea* the guard-cells of the stomata possess, on their inner surface, a very strongly marked layer of cutin, which is prolonged into a beak or hook, and which is distinct from the beak which closes the ostiole. Mr. Rehfoos finds these features, with minor variations, in all of numerous kinds of tea examined, and they appear even in the sepals of the tea plant. The only leaf used for adulteration that bears much resemblance to *Thea sinensis* is the leaf of *Camellia* (also a species of *Thea*), but a transverse section of the latter shows that the hooks of the stomata are very slightly developed.—*Scientific American*.

A CRITIQUE OF BANTI'S DISEASE*

ELI MOSCHCOWITZ, M.D.

NEW YORK

INTRODUCTION

The disease described by Banti has received fair attention from writers on clinical medicine, but curiously, very little from pathologic anatomists, and rarely from both. As a consequence, the literature on Banti's disease affords a most disjointed impression, and leaves little material on which to base an estimate of the validity of Banti's disease as a nosologic entity. Indeed, in order to form a clear idea as to what Banti's disease is, it is necessary to turn to the articles written by Banti himself. Then we find that one of two things has happened. Either the observer has not taken sufficient pains to find out Banti's own specifications, or he has frankly committed himself to Banti's views, without the slightest, or only faint-hearted, attempts at criticism. Practically the only criticism of Banti's views has come from pathologists and, significantly enough, the general tone of it is one of guarded skepticism. We therefore meet with the strange phenomenon of a disease being almost wholeheartedly accepted by clinicians, and only negatively, so to speak, by pathologists. As an attempt at reconciliation of these two views various modifications of Banti's conceptions have been proposed, which have resulted only in making "confusion worse confounded," so that nobody, not even Banti himself, as I shall show, knows definitely what Banti's disease connotes.

It seems necessary, therefore, to resurvey our ground and subject the vast data that have been gathered to a comprehensive critique, in the light of both clinical medicine and pathologic anatomy.

REPORT OF CASES

This study was instigated by the report of the following two cases:

CASE 1 (Beth Israel Hospital Pathologic Report 4467).—*History.*—M. W., a man, aged 60, married, admitted July 25, 1913, for one year had complained of general weakness, which slowly increased. For the last half year, he noticed a yellow tint of the skin. He had gone to bed five weeks previously with swelling of the ankles and feet. At times he had slight vertigo. There were urinary, respiratory or digestive symptoms.

Physical Examination.—The patient was emaciated and had edema of the ankles and the eyes. There was evidence of profound anemia, and the skin had a yellow tinge. There were signs of a chronic tuberculosis of both lungs. The left heart was dilated, with a rough systolic murmur in the pulmonic region. The liver was palpable 3 inches below the costal margin. The spleen extended from the seventh intercostal space to the level of the umbilicus; its edge was irregular; it was soft in the upper and hard in the lower portion. The abdomen contained fluid. The blood count on admission revealed 2,850,000 erythrocytes. These were progressively reduced until two days before death, when they were 1,200,000. The leukocytes were 7,000 on admission, and varied around this number throughout the patient's illness. The hemoglobin was 35 per cent. at the outset; a day or two before death it was 10 to 14 per cent. There was evidence of anisocytosis and poikilocytosis, and occasional microblasts were present. The temperature varied between 98 and 100 F. The pulse was not rapid. A test meal revealed blood in

*From the Pathological Laboratory of the Beth Israel Hospital.

*Read before the Section on Pathology and Physiology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

the gastric contents. The clinical diagnosis was Banti's disease. The patient died, Dec. 8, 1913.

Anatomic Diagnosis.—Necropsy revealed emphysema and healed tuberculosis of both lungs, chronic pleurisy with adhesions, hypertrophy and dilatation of left ventricle, atheroma of aorta, thrombotic fibrous angioma of liver, chronic diffuse nephritis and splenomegaly. The spleen measured 24 by 20 by 15 cm. and weighed 1,165 gm. (liquor formaldehydi). It was densely adherent to the costal wall, and the capsule was thick, dense and resembled *Zuckerguss* (sugar-icing) in appearance. In the upper part of the convex surface was a shallow depression in which the capsule was unusually thick. Section through this area revealed a thin plaque of lime. The pulp was firm and elastic. It was a deep reddish-purple, and the surface was smooth. The pulp did not scrape. Connective tissue trabeculae, both large and small, were enormously increased. The larger trabeculae were especially prominent and sprang forward from the cut section. Malpighian corpuscles were not visible.

The liver presented a slightly nutmeg-like appearance. There was no cirrhosis.

Microscopic examination revealed chronic congestion and chronic tuberculosis of the lungs; brown pigmentation of the heart muscle; slight chronic congestion of the liver (no cirrhosis); slight interstitial pancreatitis, and marked chronic diffuse nephritis.

The capsule of the spleen was much thickened, and in places showed areas of hyaline degeneration. The predominant lesion was a profound fibrosis. The new connective tissue was either pure fibrous and surrounded the splenic veins, or was more cellular and then appeared as masses or strands throughout the organ. The pulp was deeply engorged with red blood cells. The pulp cells showed a marked diminution in cellular content. The cells consisted mostly of lymphocytes; many cells were of the plasma type; there were a few large cells of the endothelial type and a few large multinucleated cells. The splenic veins were normal in size. Their lining epithelium was not swollen. The trabeculae were enormous in size. Their blood vessels showed thickening. The malpighian bodies were few in number and very small. A small number showed fibrosis proceeding eccentrically from the central artery. There was no blood pigment. The splenic veins in the pedicle showed enormous thickening of the intima, forming veritable projections into the lumen. The walls showed a profound increase in connective tissue with hyaline degeneration. There were extensive lime deposits in the walls of the veins. The arteries showed slight thickening. Sections of spleen and vessels stained by Levaditi's method showed no spirochetes. The lymphatic glands were normal.

CASE 2 (Beth Israel Hospital Pathologic Report 7288).—*History.*—R. K., a woman, married, aged 47, Russian, housewife, admitted, July 15, 1916, never had had children, but had had twelve miscarriages. Her illness dated back twelve years, when she was sick for some months with an attack similar to the present. She had hemorrhages from the mouth and bowels, with swelling of the abdomen and feet. Ten weeks previously she had had a hemorrhage from the mouth and bowels. She also noticed at that time swelling of the abdomen and feet; her appetite was poor; she had occasional nausea but no vomiting; she had precordial pain with palpitation and occasional fainting spells, occasional headaches, and much weakness, and had lost considerably in weight.

Physical Examination.—The patient was pale and emaciated. The spleen extended nearly to the umbilicus; it was hard, rough, irregular and lobulated in outline. There was much fluid in the abdomen. The other organs were negative. The red blood count was 3,460,000; leukocytes, 14,200; hemoglobin, 50 per cent. The differential count gave: polymorphonuclears, 85 per cent.; lymphocytes, 12 per cent.; eosinophils, 3 per cent. The feces were tarry and give a reaction for blood. The temperature and the pulse were normal. The Wassermann reaction was negative.

The abdomen was tapped twice, and each time from 9,000 to 10,000 c.c. of clear fluid were withdrawn.

The clinical diagnosis was Banti's disease. The patient died, Aug. 18, 1916.

Anatomic Diagnosis.—Necropsy revealed brown atrophy of the heart muscle; slight atheroma of mitral and aortic valves; healed tuberculosis of the bronchial lymph nodes; chronic perihepatitis; slight chronic congestion of the liver, but no cirrhosis; chronic diffuse nephritis; chronic peritonitis, and splenomegaly with multiple healed infarcts containing lime and bone.

The spleen measured 25 by 15 by 7.5 cm., and weighed 3,840 gm. The surface was irregular and lobulated, with numerous deep depressions to which, as a rule, the omentum was densely adherent. At its upper part a portion of the spleen about the size of a baseball had been almost completely cut off from the remainder of the organ by a deep fissure. There were numerous other deep depressions due to the scars of healed infarcts. Most of these scars contained lime, and some of them bone. The deep fissure described above contained an unusually large plaque of bone. The capsule was distended, and averaged about 4 mm. in thickness. On section, the parenchyma was brownish red; the pulp soft and elastic; it did not scrape or spring forward from the cut section. The trabeculae were much increased, both in size and in number. The malpighian bodies were not visible. The splenic veins and artery at the hilum were much thickened and calcareous.

Microscopic Examination.—There was brown degeneration, chronic congestion and slight fatty infiltration of the heart muscle. The liver showed no cirrhosis. There was a moderate grade of chronic parenchymatous nephritis. The other organs showed nothing of significance.

The capsule of the spleen showed thickening and hyaline degeneration. The predominant aspect was that of a profound fibrosis. The organ appeared like a huge angioma, the splenic veins being round or spindle-shaped and were surrounded by dense masses of splenic pulp which had undergone almost complete fibrous change. Much of this new fibrous tissue was hyaline in character. The pulp contained comparatively few cells. These were mostly of the lymphoid and plasma type, with a few large endothelial cells. The endothelium of the splenic veins was not swollen. The malpighian bodies were almost completely absent; here and there was a small group of irregularly arranged lymphoid cells which represented the remains of the malpighian bodies. The trabeculae were enormously increased in size, and their containing vessel showed thickening of the walls with hyaline degeneration. The infarcts showed an almost complete transformation into hyaline connective tissue; nearly all contained lime and some contained bone. There was no blood pigment in the spleen.

The splenic vessels at the hilum showed a connective tissue infiltration so profound that little muscular tissue was left in the walls, and the normal structure was almost completely obliterated. This new connective tissue also showed hyaline degeneration. There was much deposition of lime in the outer coats of the vessels. Sections of spleen and vessels stained by the Levaditi method showed no spirochetes. The lymphatic glands were normal.

COMMENT

Reviewing the clinical features of these two cases we find the following:

The first case was that of a man, aged 60, who had been suffering for one year from a rather profound anemia which progressively increased. During his stay in the hospital, there had been a pronounced splenomegaly, a moderate ascites, and, as the necropsy revealed, a healed tuberculosis of both lungs. In addition the patient had presented a blood condition corresponding to that of a secondary anemia. Despite the short history and an absence of a relative lymphocytosis, the diagnosis of "Banti's disease," had seemed the only one possible and had accordingly been made.

The second case was that of a woman, aged 46, who had been ill for twelve years, and had given a history of hemorrhages from the mouth and bowels. Very significant had been the history of twelve miscarriages. There had been splenomegaly, a secondary anemia, and an enormous ascites which required tapping. The Wassermann reaction had been negative. In this case all the evidence, both clinical and physical, had seemed typical of Banti's disease.

Reviewing the pathologic findings in these two cases we find many things in common: (1) an enormous splenomegaly, each spleen weighing well over 1,000 gm.; (2) a diffuse fibrosis with persistence of the splenic veins and a consequent diminution in cellular content of splenic pulp; (3) a much thickened and partly adherent capsule; (4) a notable diminution in size and number of malpighian follicles, a change in many instances due to progressive fibrosis proceeding from the central artery; (5) a pronounced endophlebitis of the veins in the hilum of the spleen, where there are, in addition, calcareous plaques; (6) thickening and hyaline degeneration of many of the vessels in the trabeculae; (7) absence of general glandular enlargements; and (8) the liver free from cirrhosis.

DEFINITION OF TERMS "SPLENIC ANEMIA" AND "BANTI'S DISEASE"

In accordance with these clinical and pathologic data, what generic pathologic diagnosis is justified? In other words, do the pathologic findings bear out the clinical diagnosis?

In order to answer this question, a brief discussion of certain forms of the nonleukemic splenomegalies is necessary.

In 1866, Gretsels¹ defined a syndrome which Griessinger termed "splenic anemia." The essential features of this disease are (1) primary cryptogenetic splenomegaly; (2) secondary anemia, and (3) chronicity.

In 1894, Banti² believed that he isolated a syndrome and pathologic complex from this broad clinical entity. According to Banti this disease has clinically three stages: (1) a period lasting from three to five, but occasionally even twelve years, characterized by a splenomegaly of practically constant size, and an anemia; (2) a short second period characterized by swelling of the liver with diminution of the quantity of urine, and (3) a final period which lasts one or two years, and is characterized by a small liver and ascites. The symptoms in this stage, according to Banti, are identical with those of an ordinary atrophic cirrhosis. The disease invariably ends in death from hemorrhage, or autointoxication from the cirrhosis. The disease is without known etiology. The most common causes of splenomegaly, such as alcohol, malaria and syphilis, play no rôle whatever.

In addition to the symptoms enumerated above, Banti's disease is characterized by hemorrhages from the mouth and the bowel, an icteric skin hue (but no true icterus), and a secondary anemia distinguished by a subnormal leukocyte count with a relative lymphocytosis.

Pathologically, Banti³ now maintains what he did not assume in his earlier papers, namely, that the disease has a distinct pathology. These manifestations are the following: 1. In the spleen there is a fibrosis of the reticulum, with narrowing of the splenic veins and a thickening of the capsule and of the coarser and

finer trabeculae. 2. The main characteristic of the lesion is a fibrosis of many of the malpighian follicles beginning around the central artery of the follicle and proceeding outward. The artery often shows hyaline degeneration. These changes he termed "fibroadenie," because, despite the increase in connective tissue content, the histologic structure of the spleen still retained its glandular appearance. According to Banti, the connective tissue is not of inflammatory origin, because he has never seen anything resembling fibroblastic granulation tissue in these spleens. There is no blood destruction as evidenced by the absence of blood pigments. 3. A cirrhosis of the liver is present differing in no way from that of the Laennec type. 4. In many cases there is an endophlebitis and often a calcification of the splenic veins, extending sometimes to the junction with the portal vein, and even within the portal vein itself. 5. The characteristic red marrow of a secondary anemia is found. 6. Freedom from general glandular enlargement is noted.

In explaining the pathogenesis of the disease, Banti believed that there is a primary splenomegaly due very probably to an infectious agent. The enlargement of the organ produced in turn another toxin which caused a secondary cirrhosis of the liver and the changes in the splenic veins. The anemia is the result partly of the toxemia and partly of the hemorrhages.

Banti's reasons for believing that the splenomegaly is primary are the following: (1) the large size of the spleen at a time when the anemia is not marked; (2) the microscopic lesion seeming to show that the "fibroadenie" antedates the cirrhosis of the liver; (3) the spleen in Banti's disease showing no evidence of *stauung*, a feature characteristic of the spleen in hepatic cirrhosis, and (4) the cures obtained by splenectomy.

In analyzing the clinical and pathologic features of the disease called by his name, we find that Banti has hedged his malady about by so many criteria that it is almost unreasonable to expect any single case to conform to every requirement.

These requirements are clinical and pathologic, and may be classified as follows: 1. The disease must be without known etiology. As soon as a definite cause for the malady is established, the case is no longer regarded as a possible "Banti," but is at once thrown out of court. 2. The blood picture must be typical. 3. There must be three stages, two of which are fairly well defined clinically. 4. The signs of anemia and splenomegaly must precede the cirrhosis.

Pathologically the data which make a diagnosis of Banti's disease possible are the following: (1) a splenomegaly of considerable size; (2) a cirrhosis in the liver of the Laennec type; (3) a histologic fibrosis of the spleen arising without the interposition of fibroblasts; (4) a progressive eccentric fibrosis of the malpighian follicles, and (5) a usual but not constant endophlebitis of the splenic vein.

Banti admits that there is nothing pathognomonic in the pathologic findings. It seems, therefore, that the diagnosis of Banti's disease must be made by a combination of both clinical and pathologic data. In other words, no matter how clear the clinical diagnosis of Banti's disease may be, unless the pathologic findings are those premised by Banti, the disease is not Banti's disease. On the other hand, even if the characteristic pathologic findings are present, unless the history of the case is typical, the diagnosis of Banti's disease must not be made.

1. Gretsels: Berl. klin. Wehnschr., 1866, 111, 212.

2. Banti: Sperimentale, 1894, 48, 407.

3. Banti: Folia haemat., 1, 1910, 11, 1.

As a consequence of this dual interpretation, the confusion in regard to the status of Banti's disease as either a clinical or pathologic entity is truly amazing.

Banti has found a few adherents, but by far a greater number of opponents. I have already stated that, as far as I can judge from a study of the literature, his adherents are usually the clinicians, while the pathologists are nearly all his opponents. In this critique of the opposing views, I shall try: (1) to submit the argument pro and con that Banti's disease is a distinct entity; (2) to discuss the relation of this disease to allied morbid states; (3) to discuss certain curious features relating to the pathology of this disease, and (4) to suggest certain problems arising from this study.

ARGUMENTS FOR AND AGAINST BANTI'S DISEASE AS A DISTINCT ENTITY

At the outset we shall admit that the clinical picture described by Banti is sometimes seen. Every clinician with any experience will vouch for this fact. In other words, there are unquestionably patients who, for no obvious cause, show symptoms of long-standing anemia with splenomegaly, and these patients after a lapse of years develop ascites and die. It is also admitted that at necropsy the lesions described by Banti are found.

On the other hand, the literature teems with variations from this general type. These will be discussed seriatim.

1. As to the etiology of Banti's disease, a large number of clinically typical cases have been reported due to syphilis (Marchand,⁴ Chiari,⁵ Schmidt⁶ and Krull⁷). In Schmidt's case, in fact, the disease was cured by salvarsan.

Kartulis⁸ reports ten cases of clinically typical Banti's disease, in which plasmodia were found in the spleen. Skubetsky⁹ reports a typical Banti's disease (splenomegaly, anemia, ascites and leukopenia) due to tuberculosis of various serous cavities.

Furthermore, there is a host of accurately described and clinically typical cases of Banti's disease in which the symptoms and findings simulated those of a Laennec cirrhosis so closely that the authors believe these two diseases to be identical. I shall discuss this part of the subject more extensively farther on.

Neuberg¹⁰ summarizes his own views by saying that there are many case reports of clinical Banti's disease without known etiology, but with other pathologic findings than those described by Banti; while on the other hand there is an equally large number of case reports in which the characteristic lesions are described, but which have a definitely determined etiology.

2. Is the blood picture characteristic of Banti's disease? I have found the characteristic blood picture in various conditions in which the diagnosis of Banti's disease did not enter. The blood picture appears to be nothing more than the changes associated with any secondary anemia. Hedenius¹¹ concurs in this view. Banti in his most recent publication admits that the

blood picture "is not pathognomonic but only helpful to the diagnosis."

3. Are the stages of the disease described by Banti invariable and is the cirrhosis always secondary to the splenomegaly? In other words, is a cirrhosis of the liver always absent in the first stage of Banti's disease and is it always present in the last stage? If, then, a patient dies with all the symptoms of Banti's disease and at necropsy no cirrhosis is found, must we diagnose Banti's disease in the first stage, or is the case not Banti's disease at all? And if the case is not Banti's disease, in what category may it be placed? The formulation of Banti's disease as occurring in stages has probably caused more of the hopeless confusion in regard to the interpretation of the disease than any other factor.

Numerous cases of clinically typical Banti's disease have been described in which at necropsy no cirrhosis was found. My two reports are cases in point. On the other hand, there is a host of reported cases with the characteristic pathologic changes, but with symptoms so typical of those which Banti described that they were regarded by their observers as cases of true cirrhosis of the liver.

Banti himself is not clear on this point. He admits that patients with clinical Banti's disease may show at necropsy no cirrhosis of the liver. In attempting to place these cases in their proper sphere he suggests a number of possibilities: (a) that they represent first stages of Banti's disease, and that in these cases the splenotoxin expended itself in merely creating a fatal anemia and not a cirrhosis of the liver; (b) that the lesion may be due to another toxic agent; (c) that after all there may be two nosologic entities: a splenomegaly with cirrhosis and a splenomegaly with anemia. Finally, he adds to the confusion by describing the pathologic findings in the first stage of what he himself regarded as genuine cases of Banti's disease. In such cases, he finds no cirrhosis. But the question arises, in view of the foregoing dicta set forth by Banti, How does he know that these cases were in the first stage? For, as I understand him, the diagnosis of Banti's disease is not justified unless cirrhosis is found postmortem.

We thus see from these three points of view, the most important among the clinical phases, that Banti's disease has most indeterminate outlines.

Let me now offer a critique from the pathologic-anatomic aspect.

4. What evidence is there for Banti's contention that a splenotoxin is a secondary cirrhosis of the liver? These are purely hypothetical assumptions, and are based on the fact that clinically the splenomegaly seemed to antedate the onset of the hepatic cirrhosis. The only scientific evidence that such a toxin is developed by the spleen in Banti's disease is the report of Umber,¹² who found in metabolism studies in one case that there was a protein destruction which disappeared after splenectomy. This observation has never been confirmed. Furthermore, the only experiment showing that a splenotoxin may cause changes in the liver is that of Mallory,¹³ who, after causing extensive trauma to the spleen, found focal necrosis in the liver. This observation has been cited by various observers as upholding Banti's contention; but, according to my view, the arguments are only too specious. In the first place, dead tissue is not a toxin;

4. Marchand: München. med. Wchnschr., 51, 463.

5. Chiari: Strassb. med. Ztg., 1910, 7, 66.

6. Schmidt: München. med. Wchnschr., 1911, 58, 625.

7. Krull: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1915, 8, No. 4.

8. Kartulis: Zentralbl. f. Bakteriöl. u. Parasitenk., 1912, 64, Part 1, Orig. 1.

9. Skubetsky: Wien. klin. Wchnschr., 1912, 62, 1087.

10. Neuberg: Ztschr. f. klin. Med., 1911-1912, 74, 92.

11. Hedenius: Ztschr. f. klin. Med., 63, 306.

12. Umber: Ztschr. f. klin. Med., 1905, 55, 289.

13. Mallory: Jour. Med. Research, 6, 264.

and secondly, focal necrosis in the liver is not, nor does it ever bring about a cirrhosis.

Even from the hypothetic standpoint, the pathogenesis as described by Banti is difficult to conceive of. We must remember that Banti wishes us to believe that an extensive fibrosis of the spleen is the result of an unknown toxin, and that, furthermore, this fibrous spleen elaborates another toxin which acts directly on the liver. In the first place, the transference of a sclerosing toxin from one organ to another, has, as far as I can determine, no analogue in pathologic anatomy. If a sclerosing toxin is elaborated within the human body, it affects two or more organs simultaneously. Moreover, it is difficult to comprehend how an organ so extensively fibrous as a spleen in Banti's disease can elaborate a toxin that will in turn have sclerosing properties.

5. Are the histologic characters of the spleen described by Banti pathognomonic? Even Banti admits that these lesions are not pathognomonic of Banti's disease. Fibrosis of the spleen is, of course, found in a host of other conditions; in cirrhosis of the liver, for instance. Even what Banti regards as the most characteristic histologic detail, the eccentric fibrosis of the malpighian follicles, is not pathognomonic of his disease. My cases reveal this lesion, although in the strictest interpretation they are not cases of Banti's disease. The same holds true for the other associated lesions described by Banti.

All in all, it is well agreed by everybody, even by Banti himself, that a pathologic diagnosis of Banti's disease is impossible on the basis of the pathologic findings alone (Simmonds,¹⁴ Neuberg, Marchand, Wentworth,¹⁵ Kaufmann,¹⁶ Hedenius, Borissowa,¹⁷ Schewandin¹⁸ and Naunyn¹⁹).

6. What evidence is there that the fibrosis of the spleen is a primary sclerosis and is not of inflammatory origin? Banti maintains that the process is a primary sclerosis because he does not see fibroblasts in the spleens of Banti's disease. This argument, to my mind, is weak. In the first place, cells resembling fibroblasts are seen in such spleens. Chiari, indeed, who in some particulars leans to Banti's views, asserts without hesitation that the fibrosis in Banti's disease is identical with the splenic fibrosis of any other origin. In the second place, the distinction between a fibrosis that arises from a so-called "primary sclerosis" and one of "inflammatory origin" is entirely an academic one, and is not countenanced by authorities in pathologic anatomy.

7. What is the evidence in favor of splenectomy as a cure for Banti's disease? In all his publications Banti has been advancing the beneficial results of splenectomy as one of the prime arguments in favor of the primary splenic origin of his disease. This statement, like many others that Banti has made, is much quoted in the literature of this subject.

I feel, however, after analysis of the reported cures, that this statement cannot be accepted without much hesitancy. A study of the reported cases shows either that (1) no proof is offered that the disease described conformed to Banti's specifications, or (2) the "cures" are reported altogether too soon after the operation.

1. Harris and Herzog,²⁰ who summarized all the

reported cures up to 1901, describe unquestionable cases of Gaucher's disease in the number. Wentworth, who also is skeptical of reported cures of Banti's disease by splenectomy, reports a so-called "cure" that proved to be a syphilis of the liver. Marchand reports a similar instance. Naegeli-Nef²¹ and Hedenius also believe that many of these reported cures are of maladies other than Banti's disease.

2. The second consideration that arouses scepticism is the fact that the cures are reported too soon after the operation. This is the criticism applicable to the majority of reported "cures." When we consider that even in the third stage a patient may live as long as five years, a cure reported within this time is not of profound significance. In one of the cases that I report, the patient lived for twelve years after the onset of the symptoms.

The most recent summary of splenectomies for Banti's disease that I have been able to find is that of Armstrong,²² published in 1906. Of the thirty-two reports, only four were made five years after operation. In Banti's latest paper, he collects thirty-six instances with twenty recoveries. He says that two patients operated on in the "first stage" in 1895 and 1904, respectively, and two patients operated on during the "second stage" in 1896 and 1903, respectively, are well. He also makes the cryptic statement that patients operated on in the third stage afford good results. These few cases are all that I can find that in any way sustain splenectomy as a therapeutic measure for Banti's disease. The whole question of splenectomy as a cure for Banti's disease is paralleled, I believe, by our experience with splenectomy as a cure for pernicious anemia. With the first reports, its value seemed to be established; but as soon as sufficient time had elapsed to permit the observation of end-results, it was found that these patients with pernicious anemia succumbed despite the splenectomy, and that the splenectomy produced only a temporary improvement.

RELATION OF BANTI'S DISEASE TO ALLIED MORBID STATES

1. *Cirrhosis of the Liver.*—Banti's disease very closely resembles cirrhosis of the liver, both clinically and pathologically. Indeed, the view that the two conditions are identical is held by many, perhaps even by the majority of Banti's critics (Simmonds, Albu,²³ Gilbert and Lereboullet,²⁴ Krull, Naegeli-Nef, Naunyn and Wentworth).

Obviously the first argument that would occur to one in order to refute this identity is the different sequence of clinical events. In Banti's disease, a primary splenomegaly is followed by signs of cirrhosis, while in typical Laennec cirrhosis, the reverse is the rule. Nevertheless, I have seen cases of Laennec cirrhosis, and Krull, Naunyn, Wentworth and Marchand report similar experiences, in which splenomegaly is so profound as to mask the symptoms arising from the lesion within the liver.

Pathologically, also, the spleen of a Laennec cirrhosis and that of Banti's disease are in many respects alike. Both are distinguished by splenomegaly, fibrosis and atrophy of the malpighian follicles. In cirrhosis, it is true, the fibrosis is not so profound, and there

14. Simmonds: München. med. Wchnschr., 53, 772.

15. Wentworth: Boston Med. and Surg. Jour., 145, 375.

16. Kaufmann: Lehrb. der spez. path. Anat., Ed. 6, 1911.

17. Borissowa: Virchows Arch. f. path. Anat., 172, 108.

18. Schewandin: Zentralbl. f. Path., 21, 668.

19. Naunyn: Verhandl. d. deutsch. path. Gesellsch., 8.

20. Harris and Herzog: Ann. Surg., 1901, 34, 111.

21. Naegeli-Nef: Cor.-Bl. f. schweiz. Aerzte, 1904, 24, 280.

22. Armstrong: Brit. Med. Jour., 1906, 2, 1273.

23. Albu: Deutsch. med. Wchnschr., 1904, 31, 707.

24. Gilbert and Lereboullet: Rev. de méd., 1904, 24, 893.

is greater evidence of *Stauung* and hyperplasia of the pulp.

In view, therefore, of the criteria which Banti adduced, a differentiation between Banti's disease and cirrhosis of the liver appears easy. However, when we consider the indefinite outlines, both clinical and pathologic, of Banti's disease, and on the other hand, the very close clinical and pathologic similarity of cirrhosis of the liver and Banti's disease, we can readily understand why so many authors regard the two maladies as identical. A precise differentiation will always be difficult when we must deal, as regards one factor at least, with a purely clinical entity.

2. *Relation of Banti's Disease to Splenic Anemia.*—This relation is a question that has puzzled nearly every one interested in this subject. Nor is it hard to understand the reason, when we consider that the term "splenic anemia" was ascribed by Griessinger to a purely clinical condition. It is thus a term of wide connotation and can be safely applied to any condition in which a splenomegaly of unusual size is associated with an anemia of whatever grade or type.

Since Griessinger's original communication, a number of fairly distinct forms of splenomegaly associated with anemia have been split from this broad group; for instance, the splenomegalies of the Gaucher type, which has a sharply defined pathologic and histologic picture; also the peculiar anemia occurring in children, known as von Jaksch anemia,²⁵ which has a sharply defined blood picture of its own. And now comes Banti, who also parcels off a portion of this "medical Poland" as his own. And what have we left? According to Banti, only such cases as are fatal and at necropsy show no cirrhosis. Even these cases Banti does not permit to slip out of his hand so easily, because he still feels that they may be cases of Banti's disease in the first stage. If this is admitted, then splenic anemia as an entity disappears completely. On the other hand, Naunyn is willing to call only such cases Banti's disease as are distinguished by splenomegaly without cirrhosis; that is, cases that were formerly termed "splenic anemia"; and Senator²⁶ says that a Banti disease is only a second stage of a splenic anemia; that is, a combination of splenic anemia and cirrhosis of the liver. The pronouncements of Senator and especially Naunyn are unfair, because Banti should be left to define his disease as he thinks best. If all of Banti's claims are then recognized, we shall arrive at what I regard as the most significant conclusion arising from this study, namely, that Banti's disease and splenic anemia are one and the same thing.

3. *Relation of Banti's Disease to Pseudoleukemia.*—At one time, according to Wentworth, Banti believed that the disease called by his name was the splenic form of pseudoleukemia. But in his most recent paper (1910) Banti does not even mention this name, in connection with his disease. This is justified in view of the entirely different histologic characters of the spleen in pseudoleukemia and in Banti's disease.

TO THE PATHOLOGY OF BANTI'S DISEASE

Banti describes a pronounced endophlebitis and often calcification of the portal vein and its tributaries. He believed that this lesion was the result of the action of the splenotoxin on the intima. This lesion

has been described many times in connection with this malady, notably by Dock and Warthin,²⁷ Levastini and Bloch²⁸ and Bonné.²⁹ My two cases present this lesion in a profound degree. Furthermore, other observers, Cauchois,³⁰ Edens,³¹ Nonne, MacCallum,³² Devé,³³ and Oettinger and Fiessinger,³⁴ report extensive thrombosis in the splenic and portal veins, arising either from an endophlebitis or without known cause, and associated with splenomegaly. The question arises whether Banti is right in his interpretation, or whether the splenic disease may occur as a consequence of the lesion in the vein. Warthin³⁵ raised this question and instituted experiments consisting in ligation of the splenic veins in dogs. He found that this operation resulted in no increase in the size of the spleen, but rather in an atrophy. Others believe that the splenomegaly is the result of the thrombosis. Cauchois, especially, devotes a lengthy thesis to prove the latter hypothesis, and attempts to make a separate group of cases presenting the Banti syndrome associated with pylothrombosis. His arguments are by no means convincing. This question can therefore safely be left open. The difficulty arises from the fact that sufficient data are not yet available to show whether an endophlebitis with or without calcification occurs unassociated with splenomegaly. In other words, this vein lesion may eventually prove to be entirely an incidental one, and not either a cause or an effect.

On the other hand, it is easily conceivable, indeed, very probable, that the endophlebitis of the splenic vein may cause an ascites in cases that present no cirrhosis of the liver. This may account for the many cases of clinical Banti's disease in which no cirrhosis is found post mortem. This is what probably occurred in my two cases.

SIMULATION OF BANTI'S DISEASE BY PERSISTENCE OF THE UMBILICAL VEIN

These cases are to my mind of much significance as pointing to a possible clue to the origin of many forms of splenomegaly, inclusive of that associated with the name of Banti. Four such cases have been described in comparatively recent times by Cruveilhier,³⁶ Baumgarten,³⁷ Masura³⁸ and Benque.³⁹ The clinical picture in all was that of Banti's disease. In addition there was hypoplasia of the liver, which these observers agreed was probably a result of the persistence of the umbilical vein. At necropsy, this vein was found enormously dilated, and communicated in some cases with the deep hypogastric or the deep epigastric vein. The excessive amount of blood which this vein carried into the portal sinus overtaxed its capacity and caused a stasis in the splenic vein. In this manner, the authors accounted for the enormous splenomegaly.

These cases seem to me to indicate the possibility that the splenomegaly of some cases of Banti's disease may be of primary vascular origin after all.

25. Some question has recently been raised as to the validity of this form of anemia as a distinct type. Some observers hold that it is only a form of secondary anemia with a profound blood reaction, owing to the heightened susceptibility of the bone marrow in children.

26. Senator: Berl. klin. Wchnschr., 1901, **38**, 1145.

27. Dock and Warthin: Tr. Assn. Am. Phys., **18**, 522.

28. Levastini and Bloch: Bull. Soc. anat. de Paris, **79**, 352.

29. Bonné: Inaug. Diss., Göttingen, 1884.

30. Cauchois: Paris thèses, 1908.

31. Edens: Mitt. a. d. Grenzgeb. d. Med. u. Chir., **18**, 59.

32. MacCallum: Pathological Anatomy, 1916.

33. Devé: Normandie med., March 1, 1908.

34. Oettinger and Fiessinger, Rev. med., 1907.

35. Warthin: Proc. Soc. Exper. Biol. and Med., **4**, 127.

36. Cruveilhier: Anat. pathol. du corps humain, **16**, 6.

37. Baumgarten: Arb. a. d. Gebiete der path. Anat. u. Bakter., 1908, **7**.

38. Masura: Med. Klin., 1911, **8**, 103.

39. Benque: Wien. klin. Wchnschr., **25**, 1240.

THE AUTHOR'S CONCEPTION OF BANTI'S DISEASE

I would deem this communication futile were its theme one of destructive criticism only. My critique, thus far, transports one, as far as the subject of primary splenomegaly with anemia is concerned, practically to the period antedating Banti's publications; not entirely, however. We give credit to Banti for stimulating investigation of an obscure malady, for elucidating much of the pathology of the condition, and for elaborating the clinical phenomena. What substitute, then, can be offered for Banti's conception, and where can the disease that he describes be correctly placed in nosology?

My study and reflection lead me to the following views:

1. All the evidence thus far submitted gives us no right to believe that splenic anemia and Banti's disease are not identical.

2. There is no reason for differentiating Banti's disease from other splenomegalies associated with anemia on the ground that in Banti's disease no etiology can be determined. A nosologic distinction based on whether a disease has a known or unknown etiology has no *raison d'être* in clinical medicine. Rather, I believe, we should regard Banti's disease as merely a nosologic and clinical entity which may be due to both known and unknown causes. The known causes are syphilis, alcohol, malaria, trypanosomiasis, persistence of umbilical vein, etc. In all these maladies, a splenomegaly, an indurative splenitis, with eventual atrophy of the malpighian follicles, and an anemia are the predominant features.

It may be argued that in the splenomegalies associated with alcohol, malaria, syphilis, etc., the causes of the disease and some of the clinical phenomena differ from those which Banti described. In reply, I answer: 1. Banti's disease has no typical course and diagnostic symptoms; indeed, if the specifications which Banti predicated are strictly adhered to as criteria for making a diagnosis, we would find that Banti's disease is extraordinarily rare. 2. A clinical diagnosis of Banti's disease has been made by most able clinicians in cases that eventually prove to be cirrhosis of the liver, malaria, syphilitic splenomegaly, etc. I have cited such instances in this communication. Again, it may be argued that the pathology of Banti's disease is quite different from that of the splenomegalies of known origin. But, as I have already pointed out, the pathology of Banti's disease is by no means a specific one. The fact that many observers hold that Banti's disease and cirrhosis of the liver are identical shows that this contention is not unjustified. 3. I believe that Banti's explanation of the cirrhosis of the liver as secondary to the splenotoxin is wrong. The reasons for this belief I have already discussed. Furthermore, I do not believe that patients who show at necropsy no cirrhosis of the liver should, as some hold, be regarded as affected with a different malady, or that such cases should be regarded, as does Banti, as instances of Banti's disease in the first stage.

I believe it is more logical and would simplify matters considerably to regard these variations as phenomena of one and the same disease; that a fibrogenetic toxin, probably of intestinal origin, attacks the organs draining the portal area, causing primarily a fibrosis of the spleen; and, if the toxin is sufficiently intense or the patient lives a sufficiently long time,

causing a cirrhosis of the liver as well. I believe that the common association of sclerotic vascular changes in the mesenteric vessels in Banti's disease are most readily explainable on the same grounds.

Finally, in view of the fact that Banti has failed to make out a case for the disease called by his name and has not shown it to be a distinct entity, the term "Banti complex" should be substituted for the term "Banti's disease" in clinical medicine.

41 West Eighty-Third Street.

THE FRAMINGHAM HEALTH AND TUBERCULOSIS DEMON- STRATION *

D. B. ARMSTRONG, M.D., M.A., M.S.

Assistant Secretary, National Association for the Study and Prevention of Tuberculosis; Executive Officer, Framingham Community Health and Tuberculosis Demonstration

FRAMINGHAM, MASS.

As announced in the papers and elsewhere, the Framingham Community Health and Tuberculosis Demonstration is being conducted under the supervision of a committee organized by the National Association for the Study and Prevention of Tuberculosis. On this committee¹ are represented the National Tuberculosis Association, the Massachusetts State Department of Health, the United States Public Health Service, private antituberculosis organizations in Massachusetts, Connecticut, New York and Pennsylvania, and the Metropolitan Life Insurance Company, the donors of the \$100,000 to be devoted to the work.

The selection of Framingham was made after several months' study of numerous communities of similar size in various parts of the United States, but particularly in Massachusetts and New York State. Framingham recommended itself to the committee because it possessed certain average qualities, being an industrial community, with mixed industries, varied racial groups, a good local health organization, backed up by an excellent state department of health, a normal amount of disease, particularly tuberculosis, well trained physicians and good hospitals, and sufficient promise of cooperation from medical, industrial, commercial and social organizations to give reasonable assurances of success.

Is it possible to discover and to place under adequate medical, nursing and relief supervision all of the cases of tuberculosis, incipient and advanced, in a normal industrial community?

Is it possible to ascertain, with some degree of definiteness, the responsible social and economic factors in disease causation, including all types of morbidity, not only tuberculosis?

What is the most efficient utilization of the existing means available for the discovery and treatment of disease? What percentage of theoretically preventable disease is practically preventable with the use of known but unused, or at least uncoordinated, instruments? What is the best possible adjustment of social

* Read before the Section on Preventive Medicine and Public Health at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. The committee in charge of the work is as follows: Dr. Edward R. Baldwin, chairman; Dr. Charles J. Hatfield, secretary, and Dr. Lee K. Frankel, Mr. Homer Folks, Dr. Arthur K. Stone, Dr. Eugene R. Kelley, Dr. Steven J. Maher, Dr. William Charles White, Mr. Henry S. Dennison, Dr. Victor Safford, Dr. F. C. Smith, and Dr. Charles L. Minor.

forces, existing or to be created, with the objects of the prevention of unnecessary disease and death?

Such, in brief, are the fairly ambitious questions which Framingham is attempting to solve. If the community is the logical social unit for disease prevention and control, and if the time is right for the application of a complete program for disease prevention and health creation, there is every reason to hope that, in some degree at least, answers to the foregoing questions may be demonstrated. Obviously, the problem is not only one of tuberculosis and not only a health problem. Fundamentally it is a problem of social and economic organization.

As indicated above, the objects of the investigation are to demonstrate what may be possible with united community action in the problem of prevention and control of tuberculosis. Inevitably, the experiment, if it goes forward as planned, will broaden out into a general health demonstration concerning itself with the various disease-prevention problems, as they affect the several age groups, and utilizing in its effort at control all potential agencies — social, industrial, educational, medical, etc.

Briefly stated, the essentials of the demonstration, as viewed by the committee, are as follows:

1. The sympathetic cooperation of all individuals and organizations, public and private, in Framingham.

2. The execution of the program on an educational, persuasive and democratic basis, social machinery being devised to carry the various elements in the community organization along with the work as it progresses.

3. The utilization of expert advisory service whenever feasible. This principle applies, of course, to general sanitary, medical, nursing, educational, school or industrial problems.

In order to present before this audience the important phases of the program within the time allowed for this discussion, special attention must be paid to the medical and health aspects of the plan, and consequently only the briefest mention can be made of other significant steps.

It will be realized by any one who has given thought to the problems of preventive medicine that the phase of a complete community program present certain theoretically clear and distinct aspects. There is, in the first place, the preparation of the community for active participation in and full understanding of the work as it is carried out. Along with this go certain activities that may be considered diagnostic in character; that is to say, there must be first a carefully designed effort to make a diagnosis of the community's vital health needs.

These diagnostic activities are further subdivided, and fall under two heads: (1) those which are concerned with the physical conditions under which the people work and live, namely, the environment; and (2) those which apply particularly to the individuals themselves.

The final step is that of community treatment, involving the application of the diagnostic findings and the following out of the therapeutic indications on a community scale. For the sake of clarity as well as brevity, I will take up in a somewhat artificial chronological order the phases of the Framingham program as they have been developed or are foreshadowed in the health demonstration.

Time will allow for little more than an itemization of these steps. Their presentation in this order is, as

stated above, entirely artificial, in view of the fact that numerous activities in all phases of the work have to be initiated and urged forward simultaneously.

A. PREPARATORY STEPS

As stated previously, it is felt by the committee in charge of this work that the whole project, if it is to be of permanent value, must be carried out on a democratic educational basis. For that reason, a great deal of attention has been given to certain fundamental preliminary measures, such as the following:

1. The acquainting of the people of Framingham with the motives, methods and practical objects of the demonstration. Special literature has been distributed, almost daily articles have been supplied to the press, and numerous meetings have been addressed on all sorts of occasions, etc.

2. An intimate and elastic local committee organization. This has involved the selection of a local executive committee (of thirteen members), a local advisory council, with numerous subcommittees, a committee on infant welfare, a committee on industry, etc. In addition, and most important, plans are being made for the early organization of small informal neighborhood committees, selected on a block basis, representative of the leading personalities in the community, to serve as a direct channel of interchange between the health demonstration office and the homes of the people.

3. The encouragement of the town to meet its own obligations, and to place the nonexperimental phases of the work on a basis of permanence. This work has already resulted in the handing over to the Community Health Station of two old school buildings for possible use in the treatment of tuberculous patients, or the so-called pretuberculous children, the laying of definite plans on the part of the local hospital to meet the outpatient clinical needs of the community, the establishment of permanent, full-time medical and nursing service for the schoolchildren, the establishment of supervising nursing service by the board of health, the establishment of full-time medical and nursing service for at least half of the industrial population, provision of a full-time secretary with plans for nursing and relief service under the auspices of a local civic league, etc.

4. The organization of a local medical club. The importance of this organization cannot be overestimated, serving as it does as a channel for reaching collectively the medical men in the community. It is an instrument by which their understanding of the program may be facilitated, and the universal adoption of certain diagnostic and treatment standards encouraged.

5. The determination of tuberculosis standards. This preliminary work has been carried out by a committee of specialists from Boston and elsewhere. There have been worked out, for presentation to and use by the local medical men in Framingham, standards for the diagnosis of incipient tuberculous disease, for the diagnosis of tuberculosis among children, for the classification of recognized tuberculosis, for treatment of tuberculosis in its several stages, etc.

B. COMMUNITY DIAGNOSTIC STEPS

As stated previously, the measures aimed at the evaluation of the community's needs fall under two groups.

The first concerns *the environment*. A study of the community's disease hazards has now been completed

in Framingham. This study has touched in the main the following realms of human contact:

1. An analysis of the community's statistical background. This has involved a study of death, birth and sickness statistics for the past ten years, a careful determination for different geographic and racial sections in the community of infant mortality rates, a check-up on birth registration, an effort to correct the tuberculosis death rate during the past year, etc.

2. A study of rural sanitation. One of the reasons Framingham was selected was that it presented in part of the community a distinct rural problem. The rural study covered, therefore, the hazards of rural life, involving an analysis of stable, privy, food, drinking water, housing, and other factors.

3. A study of milk production and handling, a study of food sanitation in all kinds of food shops, etc.

4. A study of general sanitary conditions in the community at large, including a privy and well census, a survey of fly and mosquito breeding conditions, and other allied problems.

5. A very careful survey of hygienic conditions in the schools, including the problems of general sanitation, cleanliness facilities, illumination, ventilation, heating, seating, etc.

6. A thorough analysis of hazards in industry, including ventilation, illumination, dust, fumes, machine guarding and facilities for cleanliness.

All of these sanitary studies have been carried out under the direction of Mr. Franz Schneider, Jr., the sanitarian for the Russell Sage Foundation, and in this work he has had the cooperation and assistance of many agencies, including the Massachusetts State Department of Health, the Massachusetts State Board of Labor and Industries, the Museum of Safety, the New York State Commission on Ventilation, and the United States Public Health Service, all of which agencies have assigned men and instruments from time to time to assist in the completion of the survey program.

The second great division of the community diagnostic problem concerns *the people* themselves. Mention has been made previously of the measures taken to ascertain the hazards of life and work in Framingham. This work has been supplemented by several distinct efforts to ascertain what actual conditions prevail among the people of Framingham, including not only factors of medical and hygienic importance, but certain indirect, yet fundamental factors, social and economic in character. A brief mention of the chief measures follows:

1. A study of infant and child life in Framingham, including particularly the preschool group. In this work we have had the cooperation of the *Delinicator* magazine in its infant welfare campaign. This has made possible the visiting of every home in Framingham in which a birth was recorded during the last year, with the enumeration of certain essential prenatal, obstetric and postnatal facts. This work, coupled with an aggressive baby week campaign, has resulted in the establishment of infant clinics, on a permanent basis, involving the cooperation of the local physicians, assisted by expert consultants in difficult cases of infant morbidity.

2. A tuberculin survey of children from 1 to 7 years of age.

3. A study of physical conditions among the school-children, as a part of the community's plan for full-

time medical and nursing supervision of the school population.

4. A survey of social and economic conditions in Framingham, bringing out facts regarding home hygiene, income and rent, etc. This work was done in cooperation with the Massachusetts Committee on Safety, and was in reality a part of a patriotic census of resources, taken by 200 volunteer enumerators. For the most part, these enumerators were selected from their own districts, and form the nucleus for future community social organization, making possible a perpetual check on changing economic and social conditions.

5. A health or sickness canvass of rural as well as urban parts of Framingham. This work was done by nurses secured from the local hospital, as well as from cooperating Boston organizations, such as the Boston District Nursing Association. In part, also, several large insurance companies represented in Framingham, such as the Metropolitan, the John Hancock and the Prudential, aided materially in the collection of data regarding recognized and admitted illness.

Fortunately, this sickness census included those families which were later given thorough medical examinations, thereby making possible for the first time a direct comparison between sickness census findings and genuine medical examination results. In this sickness census work about 2,000 families, representing all types and conditions of people in Framingham, were covered.

6. A medical examination campaign. In this work, the most important and radical step taken thus far, about 1,000 families were first visited by nurses and insurance agents, in order to take a sickness census, and to make arrangements for medical examinations. Histories were then taken of those individuals willing to be examined, subsequent to which the people themselves, men, women and children, were given a thorough medical examination in the homes. This work involved the employment of seventy-two physicians from out of town, specially trained in tuberculosis work. It also took the full time of twenty-five nurses and eighteen laboratory workers to cover the field in one week's time.

In all, 2,400 histories were taken, 2,000 people examined, and 1,400 urinalyses made. The people examined were reasonably well distributed as to age, sex, nationality, economic condition and geographic distribution, the results being therefore representative not only of Framingham as a whole, but of any other typical American industrial community.

The final analysis of the results of this medical work is still under way, and for that reason it would be impossible, even if time permitted, to discuss the results more fully at this time. It is believed, however, that an unexpectedly large amount of suspicious and positive tuberculosis has been discovered, involving a follow-up nursing and medical program of major importance.

The committee is convinced also that the results of the work, on the general medical as well as on the tuberculosis side, will serve as a very effective instrument for the promotion of routine thorough medical examinations of supposedly healthy people.

Fortunately, the medical examinations have now become more or less endemic in Framingham, and are being carried out not only by community health station

representatives, but also by local physicians. The local men are calling in expert consultants when needed, are using standard history and examination record forms, and are charging a standard price for health examinations on an individual or, preferably, on a family basis.

C. COMMUNITY TREATMENT

The foregoing measures indicate for the most part the progress to date of the Framingham Community Health and Tuberculosis Demonstration. It remains now briefly to point out what seem to the committee to be the follow-up steps, the community treatment measures, as indicated by the preliminary findings.

Obviously, there is still much to be done on the diagnostic side. A careful analysis of results thus far will indicate further measures of significance, if we are to derive from this demonstration an exact knowledge of the factors that are of importance in the production and perpetuation of tuberculosis in a normal American community.

Medical findings must be correlated with social and economic conditions. Light must be thrown, if possible, on the relative importance of infection on the one hand, and hereditary resistance on the other. Only an intensive scrutiny of the progress of the work as carried out along accepted, routine lines will indicate probable loopholes in the community's defense against disease, and probable additional measures for filling the gaps hitherto undemonstrated.

The major treatment activities immediately contemplated are as follows:

1. The correction of environmental conditions. The Community Health Station feels assured of the cooperation of local official and private agencies in the application of the findings of the sanitary study, in schools, factories, etc., or in the community at large.

2. Education and publicity. The Community Health Station will make every effort to popularize those findings which require public support for their effective application. A program of education is under construction which will reach all interests in the community, which will use not only special occasions, but also routine educational channels, such as the schools, the churches, the clubs and the factories. This work ought to lay the basis for future hygienic practices in the homes, schools, factories and workshops. It ought also to result in bringing under continuous and competent medical supervision the major part of the entire population as a result of the popularization of the medical examination finding, etc.

3. The continued encouragement of the community to meet its own obligations. This applies not only to the public requirements, such as school medical inspection, public health nursing, etc., as mentioned in an earlier part of the paper, but also such measures as medical factory inspection, improvement in dairy conditions, etc.

4. The use of the local medical organization to bring about a higher degree of efficiency and standardization in local medical diagnosis and therapeutics. An expert consultation system is being worked out. With the cooperation of the public health service, the physicians are being asked to report all types of morbidity. Standard methods for diagnosis and treatment for tuberculous cases are being advocated. Lectures and clinics bearing particularly on the detection of incipient disease are being planned under the auspices

of the local medical club and the Extension Department of the Harvard Medical School, etc.

5. The coordination of nursing activities. The nursing agencies in the community, including the District Nursing Association, the local hospital training school nurses, the Civic League relief and infant welfare nurse, the school nurse, the factory nurses, and the board of health, public health and tuberculosis nurse, are also being coordinated into a nursing unit, with adequate expert supervision, emphasizing the principle of generalized rather than specialized nursing. In this work, the board of health nurse will act as the central agent, supervising the work of the other agencies on a basis of mutual understanding and cooperation.

6. Provision for outpatient medical service. The local hospital has plans for setting aside a part of its equipment sufficient to provide outpatient medical, minor surgical, infant welfare, nose and throat, eye refraction, and dental services. This work will be developed in cooperation with the local medical club, assisted by expert consultation service when necessary, and will be placed so far as possible on a self-supporting, pay, medical compensation basis. It will provide medical and health center facilities, not only for the community at large, but also for the diagnostic end of the medical services in schools and factories in the community.

7. The careful follow-up of the results of the medical examination and infant consultation campaigns, arranging for treatment by the local physicians. This follow-up work will involve certain problems not directly related to the special tuberculosis interests of the community. The groups of citizens' reports as a result of the medical examination work will be as follows:

- (a) Normal individuals.

- (b) Individuals with slight affections, to be referred by correspondence to their physicians for treatment.

- (c) Individuals with nontuberculous, serious affections, to be referred by correspondence and by visiting nurses to their physicians for treatment.

- (d) Venereal cases to be handled confidentially with the local physicians.

- (e) Glandular cases in children, possibly tuberculous, to be reached by special nursing and educational follow up.

- (f) Tuberculosis cases, positive or suspicious, on which the follow-up energies of the Community Health Station will be specially concentrated. This will involve nursing visits, subsequent reexaminations, treatment by local physicians, or through other channels on an expert consultation basis, final classification as to diagnosis, and continuous follow-up educational activity.

8. The use of all available treatment facilities for tuberculosis cases. This in brief involves the utilization of at least the following channels:

- (a) Home treatment, with the aid of the local physicians, in the great majority of cases. In Framingham it will probably be possible to find the diseased individuals in the early stages of the infection, when moderate modifications in diet, personal hygiene, work, etc., will constitute adequate measures against the development of the disease. In these cases, of course, special educational and perhaps medical mea-

asures will have to be taken to prevent the spread of infection, particularly to infants and children.

(b) The establishment of summer camps or perhaps a preventorium for delicate children, with or without suspicious glandular development, previously known to have been exposed to the disease. For this purpose it may be possible to utilize one of the old school buildings in Framingham, held over by the town administration for this use.

(c) The establishment of at least a temporary and possibly a permanent local institution or clearing house for advanced cases among males and females, adults and children. This will be useful for patients on state institution waiting lists, for patients who do not desire to leave the community, or for patients whose presence at home will involve the hazardous exposure of other members of the family. Such an institution can be organized in Framingham as a distant ward of the local hospital, thereby saving considerable overhead expense in nursing and other charges.

(d) The local hospital has placed at the disposal of the Community Health Station a sun room for the treatment of surgical cases of the disease.

(e) Wherever possible, established treatment facilities for advanced cases, or for incipient cases likely to be improved by out of town treatment, will be used. This includes the four Massachusetts state institutions, several neighboring private hospitals, a large county hospital now under construction, etc.

9. Continued hygienic education. This, of course, is an ever present need in any community, and will be carried out continuously through all regular and special channels, reaching school, factory and other groups. This public health educational work will for the most part be under the permanent supervision of an established local organization, namely, the Civic League. An effort will be made to bring under this organization all private agencies interested in health or preventive medical work, thereby coordinating and centralizing efforts along these lines.

10. The coordination and permanence of local health and relief activities. As stated in the beginning, one of the essentials of the program is to have perpetuated on a permanent basis those activities which are demonstrated to be of continuous value to the community.

There exist in Framingham two agencies for this work: (1) the board of health, which, with the assistance of the other official branches of the town government, is being encouraged to meet the normal community needs along public lines, and (2) the local Civic League, which organization is equipping itself to carry on health educational work, to promote domestic science and home economic education in cooperation with the local public and normal schools, to coordinate and carry out on a satisfactory basis whatever relief work is necessary in the community, and in general to systematize and place on a permanent basis of efficiency those health, educational and charitable activities not recognized by the town itself as official obligations. This coordination of public and private agencies will make a permanent social organization that ought to continue to meet the community's needs along all these lines, subsequent to the experimental stages of the health demonstration. The Civic League will also give attention to recreation facilities.

SUMMARY

The methods and objects of the Framingham Community Health and Tuberculosis Demonstration are so

directed as to discover disease, especially tuberculosis, in its incipency, with the help of the local physicians, through the special examinations that have been and that are being carried on, and through the special work among infants, in schools, in factories, and elsewhere.

Adequate treatment facilities, especially for tuberculosis, will be provided as outlined above, whenever possible, on a basis of permanence, and in such a way as to require the local community to meet its own logical and natural obligations.

Finally, it is hoped that general sanitation, health education, and continuous medical supervision will act as effective instruments in the prevention of unnecessary disease and defect.

Thus far the health demonstration has demonstrated that with sympathetic cooperation from local and outside agencies, the basis for community social control over disease-producing factors can be laid. It is the hope of the committee that further developments of the work will demonstrate that on a community basis disease may be prevented and health created, thereby laying a permanent physical foundation for future social, economic and spiritual evolution.

ABSTRACT OF DISCUSSION

DR. S. ADOLPHUS KNOPF, New York: When one desires to improve the health, vigor and morale of the community, with a view particularly to preventing the development and spread of tuberculosis, one should begin at the beginning; that is to say, with prenatal as well as postnatal care of the infant. Thus, if the mother is a working woman, she should not be allowed to work until the day before her confinement, but should be given prepuerperal care of at least two to three weeks, with instruction how to care for herself and child after birth. Breast feeding should be insisted on whenever possible. Military statistics in foreign countries prove that the breast fed candidates make better recruits than the ones who were artificially fed when babies. Unfortunately, poor working mothers are often deprived of the privilege of nursing their little ones as they should be nursed, because the few moments which can be utilized when the baby is brought to the factory do not suffice to give the child the necessary quantity of food. By and by the baby is fed artificially at home.

It seems to me in a community experiment this underfeeding of infants, particularly among the working classes, should be prevented. This neglect is, of course, equally sinful, if not more so, in the well-to-do classes who find it more convenient to have their children artificially fed. In our kindergartens the little ones often catch colds which ultimately develop into tuberculosis. In the report submitted to us by Dr. Armstrong I did not see any mention made of school luncheons. The underfed schoolchild cannot do as good work as the well fed child.

I am sorry to say that I did not see anything mentioned in the report as to the efforts made to keep the atmosphere as clear as possible. Can the doctor tell me whether they use hard coal or soft coal in Framingham.

DR. D. B. ARMSTRONG, Framingham, Mass.: They probably use some of both.

DR. MAURICE FISHBERG, New York: It is interesting to see that at last, on a small scale, an experiment is being made to determine the real value of the methods we have been applying for twenty or thirty years and how far they have been effective in eradicating tuberculosis. Although we are now spending over \$20,000,000 annually on the prophylaxis of tuberculosis, we have no exact data on which to base any method which will surely be effective. One physician tells us that everything seems all right excepting that in the inquiry the number of infants that are artificially fed should be ascertained. There is no doubt that breast feeding prevents many diseases of infancy; but 99 per cent. of my hos-

pital patients have been breast fed, yet now they are tuberculous. We are also told that no success can be expected at Framingham unless the use of soft coal is prohibited. To be sure, smoke is a nuisance, but it does not cause tuberculosis. In Pittsburgh the tuberculosis mortality is very low and coal miners are almost immune to this disease. The work at Framingham will therefore have to be along different lines.

Too much cannot be expected in an experiment of three to five years. Tuberculous disease is not synchronous with infection, excepting during infancy. Infants, when exposed, are infected, become sick and die within a comparatively short time. But adults become sick with tuberculosis as a result of infection dating back to childhood. The adult population of Framingham has undoubtedly been infected with the tubercle bacillus long ago, and whether they will become sick with the disease depends no more on infection, but on other factors. As to what reactivates the dormant processes in the lungs remains to be determined, and the committee at Framingham has an opportunity to give us the information we are now lacking. But prophylaxis of infection should only be attempted in the case of infants.

The question of diagnosis in New York has not yet been solved. The municipal sanatorium is said to have 40 to 60 per cent. of sputum-negative cases. Now, wherever careful investigations have been made it was found that hardly over 10 per cent. of sputum-negative cases, presenting suspicious symptoms and signs of tuberculosis, are really suffering from this disease and in need of prolonged treatment. Over 10 per cent. of patients in hospitals for advanced consumptives have been found nontuberculous at necropsies. I hope that the work at Framingham will be done more by clinicians than by social workers, so that the number of non-tuberculous persons treated as sick with tuberculosis will be reduced to a minimum.

I should like to warn you against judging the value of the experiment on the data supplied by the mortality rates. The tuberculosis mortality rates have been declining for over fifty years in all civilized countries; in New York, Philadelphia and Boston, for over one hundred years; while our prophylactic measures have been applied only since the last fifteen or twenty years. To be significant, the drop in the mortality rates will have to be more pronounced, the curve will have to be more steep, than it has been during the past twenty years.

DR. HAVEN EMERSON, New York: I have not the figures at hand as to the percentage of patients sent to the municipal sanatorium at Otisville who are positive sputum cases. The patients are mostly positive bacillus carriers, removed from homes where there are children in the household; and the others are patients who are sick enough to need sanatorium care on their own account, and are really acutely sick patients, whom any physician would wish to have put under bed care: so much so is this the case that we have found it necessary to insist on having an infirmary in which these patients can be cared for, as if in an acute hospital. What Dr. Fishberg says may have been true of the way in which the sanatorium was operated at first, when the conception of it was as a hospital for the treatment of incipient tuberculosis. The sanatorium now is operated with the idea of its being primarily to play a part in the sanitary control of the disease.

Dr. Fishberg's figures may have been based on the previous operation of the sanatorium, but I think that does not give a true impression of the character of the patients we are now admitting.

Improvement in Retarded Children.—It is a well known fact that children who are retarded and far below the average intelligence at an early period may as they grow older catch up a year or two in mental growth. The fact that a child grades below the average by formal tests is not an infallible sign that he will never develop beyond the mental attainments of a child. An analogy is found in the retarded physical development of certain children.—Treadway, *Public Health Report*, Nov. 24, 1916.

CEREBRAL SPASTIC PARALYSIS DUE TO HEMORRHAGE

A FURTHER REPORT OF THE FIRST SIXTY-FIVE CASES OF CRANIAL DECOMPRESSION FOR SELECTED CASES *

WILLIAM SHARPE, M.D.

AND

BENJAMIN P. FARRELL, M.D.

NEW YORK

The patients were carefully selected, and only those with signs of persistent intracranial pressure were chosen, this constituting less than 25 per cent. of those examined. Ophthalmoscopic examination revealed dilated retinal veins and blurring of the optic disks; in the later cases, these findings of increased pressure have been confirmed by the measurement of the cerebrospinal fluid at lumbar puncture by the use of the spinal mercurial manometer. In all of the cases there was a history of prolonged and difficult labor, most of them being instrumental deliveries. A negative Wassermann test of both blood and spinal fluid was obtained in every case except one. No selection was made as to age, spasticity or mental deficiency. Microcephalic children, cases of agenesis (so-called Little's disease), and those due to meningo-encephalitis were naturally excluded as nonoperable, there being no increased intracranial pressure.

The pathologic condition, as found at operation and and post mortem, was noted, a written permission for necropsy having been obtained in each case. A definite fibrous cystic formation was invariably present. This lesion was supracortical in all but four cases, the others being subcortical or cortical. The cysts were punctured and their outer walls removed; fibrous formation was removed except in cases in which its removal would have caused damage to the underlying tissue; in these cases it was left alone.

After-treatment consisted in the correction of deformities by tendon lengthenings, stretching of muscles, tendon transplants, etc., massage, and careful muscle education with special attention toward establishing an improved coordination.

Of the sixty-five patients, nine died after operation, and eight have died in the past two years, making a total of seventeen deaths. We have been unable to obtain any record of four; nineteen show practically no change; twenty-five show improvement more or less marked; the youngest patient was 2½ years of age, and the oldest 17 years.

When epilepsy is a complicating factor, the prognosis is invariably bad; the immediate results were gratifying in that the convulsive seizures were less frequent, but this improvement lasted only for a few months. The younger the child, generally speaking, the more marked has been the improvement. The older the child, the less marked the improvement. In the adult cases there has been practically no improvement. Supracortical lesions are the only favorable cases; in this type damage to the nerve cells is due to pressure alone from the overlying lesion. In the cortical or subcortical lesions, there is, naturally, a definite destruction of brain tissue, and only in those

* The preliminary report of this work appeared in *THE JOURNAL*, Feb. 6, 1915, p. 482.

* Read before the Section on Orthopedic Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

cells along the edges of the cyst that are suffering from pressure can any improvement be expected.

CONCLUSION

We want to make an appeal for better preventive means in avoiding this most distressing affliction. First of all, we need more care on the part of the obstetrician; careful pelvic measurements should be made as early as possible; prolonged labor should be avoided whenever possible; practitioners should realize that cesarean section is less dangerous to mother and child than is the use of the high forceps; every child should be as carefully inspected during the first few weeks of life for symptoms and signs of intracranial hemorrhage as for deformities. When these symptoms and signs are present, a cranial decompression operation should be performed as early as possible in those selected cases in which the fluid or clotted blood can be removed before any (or but little) permanent damage to the brain tissue has taken place. In this manner we believe that children suffering from this form of spastic paralysis can be reduced in number, and that the most severe cases can be avoided or improved. The essential points to be emphasized are the early diagnosis and early treatment of these selected cases.

ABSTRACT OF DISCUSSION

DR. FRED J. FASSETT, Seattle: We have, in previous times, seen promises given for the relief of such deplorable conditions, and have had good reports from the treatment up to a certain point, and there the matter has apparently dropped. I think that when it has been shown that a remedy that seemed promising at first has later become less promising, there is a tendency to drop the subject on the part of those who have introduced it, thus leaving the rest of us in the air, so to speak, as to the ultimate results. We are asked often what the final outcome was in such cases, and are compelled to answer that we do not know. We in the West have sometimes seen patients who have traveled thousands of miles to be treated in some new way, only to find out that had the later results been published, the trip would have been unnecessary. I wish, therefore, to commend the frankness with which these gentlemen have reported to us this definite conclusion of their work.

DR. WILLIAM SHARPE, New York: Dr. Farrell and I have endeavored in this report to be as conservative and as critical in regard to the results in these first sixty-five cases as one could possibly be. The point we wish to emphasize is that most of these patients over 3 years of age are derelicts, and no marked improvement can be expected in many of them. These extreme cases can be somewhat improved, but the improvement, as you see, in many of them is slight. Indeed, in only twenty-five out of our first sixty-five cases, which were of the most extreme type of the condition, can we say that the operation was justified by the results obtained.

We wish also to emphasize the fact that the cases should be diagnosed early—as soon as possible after birth—by means of careful ophthalmoscopic examinations, a measurement of the pressure of the cerebrospinal fluid at lumbar puncture by means of the spinal mercurial manometer, blood and spinal fluid Wassermann tests, etc. By selecting these patients carefully and operating only on the ones with increased intracranial pressure can we expect to obtain definite results. I have now operated on nine of these infants on the day after birth, with excellent results. Only about one out of every five patients examined has shown signs of increased intracranial pressure, and naturally only these selected patients were operated on.

I wish also to emphasize the importance of getting permission for necropsy in this work. Of the 282 children I have now operated on out of almost 1,400 children examined,

we have had permission for necropsy in every case before the operation, and of the twenty-eight children who died we found the intracranial hemorrhage in all but one of them. In the early cases we can get excellent results; but in the wrecks or derelicts of several years' duration, very little can be expected in the way of a marked improvement.

THE IMPORTANCE OF THE LIGAMENTS OF THE ANKLE IN CORRECTION OF CONGENITAL CLUBFOOT*

ISADORE ZADEK, M.D.

AND

E. L. BARNETT, M.D.

NEW YORK

It is generally conceded that the best time to begin treatment in cases of congenital clubfoot is within a few weeks after birth.

The usual procedure is to correct the varus by means of manual force, gradually overcoming the deformity and maintaining by means of plaster of Paris the correction obtained each time. When the



Fig. 1.—After achillotomy; patient aged 5½ years; foot pushed up as far as possible; no change.

varus has been overcome completely, and the foot is overcorrected and in eversion, the equinus is attacked. A similar method is followed here, using plaster of Paris, braces, or adhesive tape, to maintain the amount of correction obtained. This suffices in a large percentage of cases to effect an anatomic restoration of the affected structures of the foot. However, this leaves a large percentage still uncorrected.

It is with the element of equinus that we have been chiefly concerned. Observation of a considerable number of so-called cured congenital clubfeet treated by manipulation shows the varus practically overcome, while the child stands and walks without being able to put his heel squarely on the ground.

A properly cured case of congenital clubfoot treated by one of the usual methods in vogue, employing only manual force, shows at the end of treatment a considerable degree of dorsal flexion of the foot. When the foot goes into dorsal flexion it goes as a whole, so that the plantar surface is in one plane.

* From the clinic of the Hospital for the Ruptured and Crippled.

* Read before the Orthopedic Section of the New York Academy of Medicine, May 18, 1917.

In many cases results are not so fortunate. In these unsuccessful cases the foot can be pushed up almost to a right angle with the sole in one plane, but when further correction is attempted we get a sole with a generally rounded contour. This means that the malposition of the os calcis and astragalus has not been rectified. In these cases we have made our correction in the front half of the foot at the mediotarsal and subastragaloid joints, and we have broken up the normal relations of the bones of the foot, producing an "apparently overcorrected-noncorrected equinus." The inevitable result is that this overcorrected part of the foot later drops to a position relatively normal as regards the posterior half of the foot. We then have a so-called "relapsed clubfoot," which term is a misnomer.

At this stage, one finds dorsal flexion of the foot restricted, and the resistant structures show no elasticity and hence no give under steady pressure of extreme force. The obstacle shows so little tendency to yield that one might readily conclude that it was bony.



Fig. 2.—Following achillotomy; same patient; posterior ligaments of ankle were cut subcutaneously; now foot can be pushed into dorsal flexion, and os calcis tilts up to normal degree.

If a roentgenogram of a normal child's foot is taken when in plantar flexion, at a right angle, and in dorsal flexion, it is found that the os calcis and the astragalus increase their upward inclination with this motion in the foot. In the type of clubfoot which we are considering, the os calcis is tilted downward or at right angles to the tibia, and one cannot with extreme force alter this position. The Roentgen ray reveals all of the bones poorly developed. The astragalus shows a more shallow groove for the neck than the normal of the same age.

We frequently hear of subcutaneous section of the astragaloscaphoid ligament, or if one prefers the open method, one may cut the whole internal lateral ligament according to the technic of Ober. Yet in these cases the operator is frequently satisfied with tenotomy of the Achilles tendon as a means of correcting the equinus deformity. This procedure in these cases is ineffectual, and yet we find an achillotomy repeated two, three or more times.

We have followed by means of the Roentgen ray the relative effect of section of the Achilles tendon and the posterior ligaments of the ankle joint, as regards the freedom of dorsal flexion of the foot immediately afterward and the positions assumed by the os calcis (Figs. 1 and 2).

We were unaware of the ease with which the posterior ligaments of the ankle can be cut subcutaneously, and our first case was done under the fluoroscope.

The technic which we have employed has been to use a tenotomy knife with a long shank and small blade with a cutting edge only on one side. The knife is inserted on the inner side of the ankle just at the inner edge of the Achilles tendon, and on a level with the tip of the internal malleolus. The back of the blade is turned inward. After penetrating from a quarter to half an inch, depending on the age of the patient, the blade is turned so as to lift the vessels, nerves, and other structures up on its back, and the blade is pushed deeper. Maintaining this position, the blade is swept outward from the internal malleolus while pushing up on the foot. There is an audible and palpable grating while the sawing motion is in progress. After all the resistant structures have been cut, the tenotome is withdrawn and the foot is pushed up. There is a give and sometimes an audible cracking. Now one finds the os calcis tilted up. We have thus far treated in the manner described twelve clubfeet. We would caution against using this procedure soon after manual correction has been attempted, as the foot broken and weakened at the mediotarsal joint will give at this point, and thus will not allow sufficient leverage to obtain the desired dorsal flexion of the foot as a whole.

CONCLUSIONS

1. One of us, from observation of several hundred cases of congenital clubfoot treated by the usual methods, has noted that practically none of the severe cases shows dorsal flexion to a right angle without breaking the mediotarsal joint. In view of this observation of failure to procure sufficient dorsal flexion to insure stable locomotion, this operation has been devised.

2. From a study of these cases by the Roentgen-ray, we conclude that the only reliable test for the correction of the equinus if there is a rounded sole is a roentgenogram. Many cases which have shown apparent overcorrection, when studied by the Roentgen ray show a break at the mediotarsal joint, with the malposition of the os calcis not rectified. These are the cases which later, never having had the equinus overcorrected, gradually become worse and constitute the early "relapsed clubfeet."

The Fundamentals of Military Efficiency.—Military efficiency in an individual, then, rests upon certain considerations, chief among which are health, strength and activity. To secure and keep these qualities it is essential for every man to form such habits as experience has shown to be necessary. These habits are: personal cleanliness; regulation of diet; avoidance of excesses (particularly in eating, drinking, and sexual matters); wearing suitable clothing; keeping the bodily processes at work (kidneys, bowels, skin); taking sufficient exercise, preferably in the open air; devoting a proper part of each day to rest of body and mind, with recreation for the latter; maintaining the surroundings in which one lives, in a cleanly state.—Keefer, *Military Hygiene*.

A CASE OF EPIDERMOPHYTON
INFECTION OF THE
SCALP*RICHARD S. WEISS, M.D.
ST. LOUIS

The recent work of Ormsby and Mitchell¹ has revived interest in the ringworm infections of the skin.

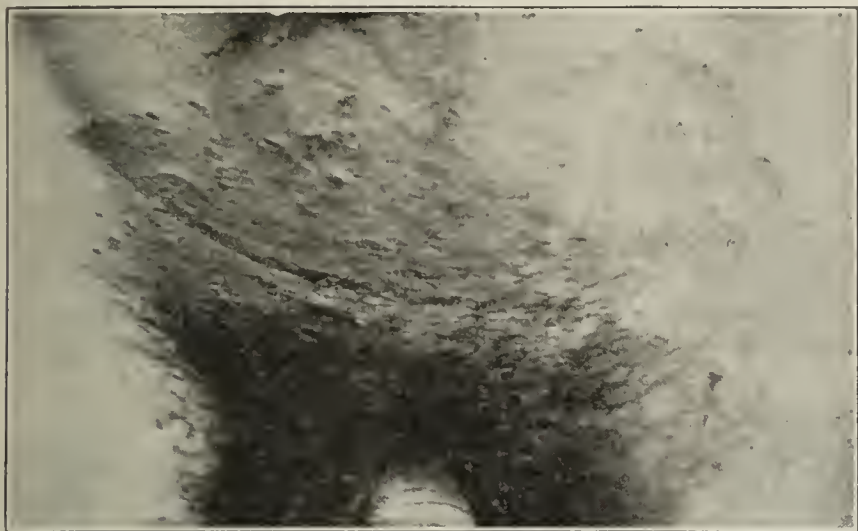


Fig. 1.—Pubic region, showing typical "eczema marginatum."

These observers call our attention to the fact that many cases of dermatitis are caused by these parasites and by one in particular, the *Epidermophyton inguinale* (Sabouraud).

A patient has recently come under observation who shows practically all distributions of epidermophyton



Fig. 2.—The lesion at the side of the left knee.

infection, and in addition shows a new distribution, a large patch of the disease on the scalp. A careful survey of the literature which is available reveals no similar distribution, and I therefore put the case on record.

* From the Department of Dermatology, Washington University Medical School.

1. Ormsby, O. S., and Mitchell, J. H.: Ringworm of Hands and Feet, THE JOURNAL A. M. A., Sept. 2, 1916, p. 711.

REPORT OF CASE

R. K., a man, aged 27, entered the Washington University Dispensary Skin Clinic, Feb. 23, 1917, complaining of "eczema." His family history and past history have no bearing on the case. He denied having had gonorrhea or syphilis. With the exception of a slight enlargement of the thyroid, the physical examination was negative.

The present illness began in November, 1915, as a few little blisters on the bottom of the right foot. It spread slowly upward between the toes and around the nails. Itching was rather severe, and there was weeping and crusting. About five months later, other patches appeared about the genitals and on the arms. These patches did not itch, but they spread rapidly. Recently patches have appeared around the left knee and on the legs. The eruption as a whole has been gradually spreading, and the itching has been getting worse. The hands were involved about a month after the disease began, blisters appearing between the fingers. These would break and a crust would form. These lesions healed spontaneously in about a month. A patch on the back of the scalp was first noticed in March, 1917.



Fig. 3.—The maceration under and between the toes.

The Skin Lesions.—Distributed in various regions, the patient presents patches of characteristic dermatitis.

In the pubic, genitocrural, perineal and anal regions a typical "eczema marginatum" is found. It is of unusually extensive distribution (Fig. 1). The primary lesions are tiny vesicles and scaly papules in a typical ring arrangement, spreading at the border and clearing in the center.

On the middle third, posterior surface of the right arm, a similar patch presents itself. It has the same characteristics and is about 5 inches in diameter.

On the middle third, inner surface of the left thigh, is a similar patch, about 4 inches in diameter.

Covering the internal and part of the posterior surface of the left knee another large patch is found. It is about 8 inches in its longest diameter (Fig. 2).

The right foot is also involved (Fig. 3). Beginning at the tarsometatarsal articulations and extending upward on the plantar and inner surfaces of the toes is a vesicular dermatitis with much scaling and maceration. The maceration is an especial feature between and behind the toes. Here the

lesion presents undermined borders and deep maceration, and is typically characteristic of the disease in this location.

The back of the scalp is markedly involved (Fig. 4). The lesion takes the form of a segment of a circle, and is about 6 inches long. The advancing border consists of a ridge of scaly papules. There are no vesicles to be seen. The color is dull red somewhat masked by the hair. There is no alopecia.

The Organism.—Scrapings were made from the edge of most of the lesions, including the scalp, and fungi corresponding in type to the *Epidermophyton inguinale* were demonstrated in potassium hydroxid preparations.

Cultures were made from the edge of the scalp lesion on Sabouraud's medium and on glucose agar. Only *Staphylococcus aureus* grew in the Sabouraud tubes. On the glucose agar, *Staphylococcus aureus* appeared in a few days. About ten days later, small yellowish colonies of fungi made their appearance and slowly grew until in about three weeks they were about one-half inch in diameter (Figs. 5 and 6). The color was a dirty white with a slight tinge of yellow. A week or so later the colonies were covered with fluffy, white tufts. Subcultures were made on glucose agar. The organism

described shows a lesion on the back of the scalp apparently autoinoculated from the extensive lesions elsewhere on the body. This location is not a flexure (except perhaps in very stout persons, and this patient is slender), so that it is apparent that at times inoculation may occur in places where there is no excess of heat and moisture.

Wall Building.

TREATED AND UNTREATED OSTEOCHONDRITIS JUVENILIS OF THE HIP*

WALLACE BLANCHARD, M.D.

Fellow of the American College of Surgeons

CHICAGO

Perthes' disease, or osteochondritis juvenilis of the hip, results in far more extensive bone atrophy than has been supposed. The bone atrophy and rarefaction



Fig. 4.—The lesion on the scalp.

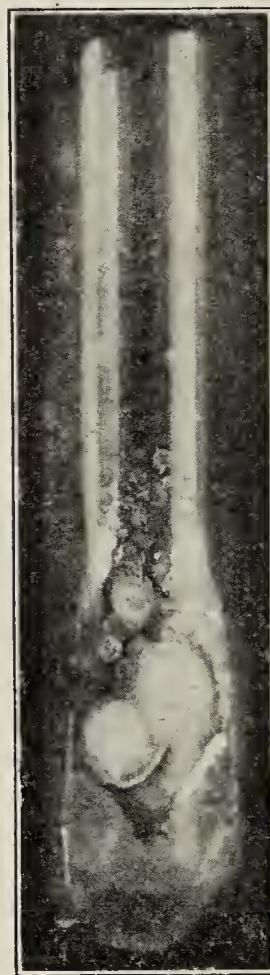


Fig. 5.—Culture of *Epidermophyton inguinale* from the scalp.

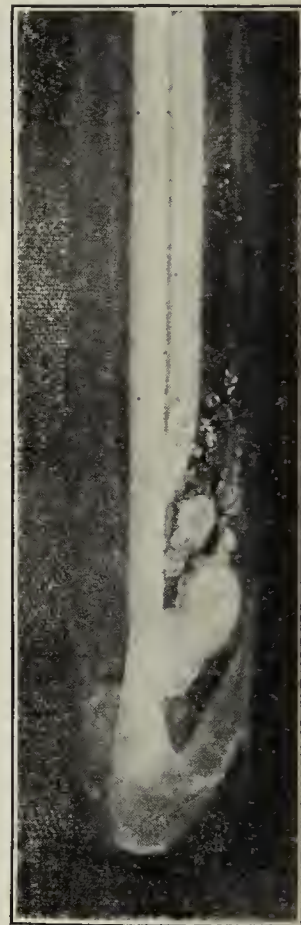


Fig. 6.—Culture of *Epidermophyton inguinale* from the scalp.

reproduced true to type, but the cultures were also contaminated with staphylococcus.

Smears made from the cultures at about the third week showed the same organism observed in the scales from the lesions.

Hairs from the scalp lesion were examined in potassium hydroxid, but no organisms could be found.

Treatment.—The lesions were at first treated with Whitfield's ointment² with but little improvement. The patient was then given 3 per cent. pyrogallol for the scalp, pubic, crural, perineal and anal regions, and 3 per cent. chrysarobin for the remaining lesions. By May 22, 1917, the lesions had all disappeared.

COMMENT

Sabouraud³ states that "it [the *Epidermophyton inguinale*] does not attack the hair; it requires the bottom of a flexure for its inoculation." The case

2. Seven per cent. salicylic acid and 14 per cent. benzoic acid in white petrolatum (Whitfield: Brit. Jour. Dermat., 1911, 23, 375).

3. Sabouraud: Brit. Jour. Dermat., 1911, 23, 385.

are so extensive that they have changed our previous conception of the pathology of the disease.

Up to the present time, the only joint and bone changes recognized in Perthes' disease have been a partial or total destruction of the head of the femur with a stumping of the neck, together with a thinning of the femoral shaft. Most authors have agreed with the unsustained suggestion, made by Freiberg¹ at the last session of this Association, that the disease is caused by tonsillitis or some other local infection. Experiments have been made on animals by Allison² to determine what influence a slight injury or displace-

* Read before the Section on Orthopedic Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Freiberg, A. H.: The Evolution of Osteochondritis Deformans Coxae Juvenilis, THE JOURNAL A. M. A., Aug. 25, 1916, p. 658.

2. Allison, Nathaniel: Am. Jour. Orthop. Surg., October, 1915.

ment to the epiphysis might have on the hip, and his results were negative.

Since I desired to make a comparative study of diseased and normal hips, I had roentgenograms taken of cases of Perthes' disease, to include all of the pelvis as well as both the femoral shafts on single large plates. In these comprehensive pictures, I soon discovered decreased bone density and some atrophy of the pelvis on the diseased side in the acute cases.

The bone atrophy and lessened density are of about the same degree in the ilium, ischium and pubic bone as in the shaft of the femur. The atrophy of the ischium and pubic bone usually reduces the obturator foramen to one-half the size of the opposite foramen, as is well shown in Figure 4. On examining roentgenograms of both legs in one picture, it soon became apparent that all the bones of the leg suffered moderate atrophic changes. Decreased density is also seen in all the surrounding muscles and other soft parts.

The shrinking of the head of the femur leaves a vacant space in the acetabulum which shows principally adaptive changes.

Atrophy of bones and muscles is one of the first symptoms, and is as equally constant in the functionally used diseased leg as in the unused diseased leg. The atrophy becomes less as the distance increases from the hip.

Early and continued mechanical treatment that protects the head of the femur from weight-bearing, jar and concussion will usually preserve the head in its rounded shape; but observation of a number of treated and untreated cases shows that the best available mechanical treatment has little or no effect in either preventing or causing atrophy of the bones and muscles of the leg of the diseased side.

I have not been able to locate a tonsillar or other source of infection in a single case.

The moderate but extensive atrophy and decreased density of bone and adjacent tissues precludes the possibility of the disease being due to a circumscribed joint infection or an epiphyseal injury. The disease is undoubtedly trophic in character and is probably caused by an extensively disturbed blood circulation that impairs nutrition from a median pelvic line to the foot.

It is unfortunate that this rather recently discovered disease of the hip joint has been differentiated from tuberculous hip disease, with which it has been so long confused, if the treatment is to be neglected because it runs a milder course and with much less resulting deformity.

Patients who have had Perthes' disease which has been diagnosed as tuberculous hip disease, and who have promptly received the best mechanical and general treatment usually accorded to tuberculous hips, have invariably made the best possible recoveries.

The neglected and untreated cases of Perthes' disease after one or two years show the heads of the femurs to be nearly destroyed, with the necks stunted, and in coxa vara or coxa valga positions. Abduction is partly lost, and movements of the hips in other directions are slightly limited. The legs are from 1 to 3 cm. short, and the patients walk with a limp.

The friction and concussion of weight-bearing on softened bone cause the erosion of the head and the stunting of the neck of the femur. The disease is self-limited. The extensive bone atrophy, together with the obliteration of the head of the femur, runs its

course in about one year, and this is followed by a longer period of bone hardening and rebuilding. One proof of this limited course is that if the head of the femur is protected from the outset of the disease by adequate mechanical treatment so that it retains its rounded shape for two years, it again becomes hard, firm and self-protecting.

Roentgenograms show a decreased density of bone in the first year of the disease, and during the second and third years the deepened shadows indicate that the diseased bones have become harder and more dense than normal bones. This hardening resembles the eburnation of soft bones after rickets, in which they frequently become as hard and firm in a child of 5 years as in a man of 25.



Fig. 1 (Case 1).—Atrophy and greatly reduced density of the pelvic bones, femur and muscles of the diseased side in acute Perthes' disease in a boy, aged 5 years.

There is perhaps no destructive joint lesion that is quite as amenable to treatment as Perthes' disease. The promptness with which the head of the femur rebuilds under mechanical protection is quite surprising.

If an adequate protective mechanical treatment is commenced even late in the course of the disease, when the head of the femur has been destroyed, and the treatment is then continued for a year or two, the head of the femur will regenerate to nearly its full rounded shape, in the same manner that the head of the femur rebuilds for several years after the reduction of a congenital hip dislocation, with the result that the ultimate shortening will be lessened fully a half. The limp is relieved in proportion to the regeneration of the head of the femur.

This rebuilding is a further proof that Perthes' disease is not an infective epiphysitis, since after the head of the femur has been destroyed by an epiphysitis, it does not regenerate.



Fig. 2 (Case 2).—Reduction of the head of the femur to a small pyramid of bone in E. M., a girl, aged 8, who had had Perthes' disease for one year; the leg is 2 cm. short; the patient walks with a limp.

Roentgenograms of untreated cases of Perthes' disease, taken from seven to eight years after the disease has run its course leaving only remnants of a head or a stunted neck, show that unaided Nature has been partly successful in rebuilding the head to its normal shape.

In Perthes' disease, lengthening of the leg rarely happens, but I have one case to report.

A. H., a boy, aged 6 years, has had pain in his hip, and walked for one year with the left leg abducted. The roentgenogram (Fig. 5) shows the usual atrophic changes. The abduction leverage on the softened neck and shaft of the



Fig. 3 (Case 2).—Regenerated head of the femur in E. M. at the age of 15 years; the patient had mechanical treatment during the second year of the disease, and walks without a limp.

femur during the one year of acute disease has straightened the normal outcurve of the shaft and elevated the neck about 35 degrees, causing a 4 cm. lengthening of the left leg. The abduction protected the head of the femur, which shows only atrophic changes. The hardening stage is somewhat

advanced, and nothing but an osteotomy at the neck can restore the normal relations. The boy walks with a limp to the right.

In marked contrast to the depression seen in tuberculous hip disease, patients with Perthes' disease usually retain the irrepressible spirits of healthy childhood.

In going over thirty years of hospital and private histories of tuberculous hip disease, I have been able to cull out over forty cases of undoubted Perthes' disease in which the patients were treated as having tuberculous hips and discharged cured with results too suspiciously good to have been obtained in tuberculous cases. In a number of these cases, the roentgenograms confirm the late diagnosis of Perthes' disease. It is a consolation to know that even if the diagnosis was incorrect the patient received the best possible treatment.

The condition is not likely to be confused with any other than tuberculous hip disease. The patient is usually from 4 to 10 years of age, walks with a slight limp, and complains of occasional pain. There is



Fig. 4 (Case 3).—Head of the femur, in which only two small buttons are left, in an untreated case of Perthes' disease in a girl, aged 8 years; the leg is 2.5 cm. short, and the patient walks with a limp.

always some atrophy of the thigh and less of the leg. Abduction is limited, but movements in all other directions are free. These symptoms closely resemble the symptoms of an insidiously advancing tuberculosis of the hip joint, but the roentgenogram will usually decide. If it is too early for pathologic conditions to show decisively in the roentgenogram, one should be taken a month or several months later, but the mechanical treatment should be begun immediately, since in either condition the treatment will be the same, and the treatment cannot be commenced too early. With the hip joint well protected, constant exercise in the open air and a liberal raw food diet seem to be of greatest service in the treatment of Perthes' disease.

Every orthopedic surgeon is familiar with the plaster-of-Paris spica and with a variety of hip splints that afford good protection to the head of the femur, and I present the accompanying pictures of patients with Perthes' disease, the one in a plaster-of-Paris spica and the other in my strap iron hip splint with high shoe and crutches, only to emphasize the necessity of very complete protection to the hip joint in order to get the best possible ultimate results.

CONCLUSIONS

1. Osteochondritis deformans juvenilis seems to be a nutritional disease of the bones and muscles of the hip and leg.



Fig. 5 (Case 4).—Lengthening of the leg in Perthes' disease, a rare resulting deformity, in a boy, aged 6.

2. The femoral head that continues in functional use during the acute stage of the disease becomes obliterated wholly or in part by the attrition of weight-bearing on softened bone.

3. The head of the femur that is mechanically protected throughout the acute stage of the disease suffers only the same atrophic changes as the adjacent bones.

4. In convalescence, the destroyed head redevelops rapidly under mechanical protection, and redevelops more slowly and less perfectly without protection.

5. The disease progresses with one year of bone and muscle atrophy and lessened density followed by several years of increasing density and redevelopment.

6. The bone hardening resembles the eburnation after rickets.

7. From the foregoing facts it may be inferred that this disease of growing bone is nutritional character, and is due to a blood circulation that is disturbed from a median pelvic line to the foot, and that the head and neck of the femur are only incidentally affected.

8. The question of etiology remains of chief interest.

15 East Washington Street.

ABSTRACT OF DISCUSSION

DR. JOHN JOSEPH NUTT, New York: Although the author of the paper said that the etiologic factors are of the most interest, it seems to me that it is of more practical interest

to decide on the best method of treatment. A great many advocate treating these patients not at all; some advocate treating them slightly; and some advocate treating them much more thoroughly. If we treat them too slightly and neglect them, I think we will have worse results than by making mistakes in diagnosis and treating them as tuberculous hips.

One point that I have never thought of before is that as the head becomes flattened and lessened, the line formed by the lower edge of the shadow of the neck does not quite fall in line with the line showing the upper border of the obturator foramen.

DR. PERCY W. ROBERTS, New York: I merely wish to ask Dr. Blanchard what, in his experience, have been the acute symptoms; or, perhaps, to put it differently, in what proportion of cases has he seen such symptoms as pain and spasm?

DR. FREDERICK J. GAENSLER, Milwaukee, Wis.: I want to emphasize what I consider a very important point made by Dr. Blanchard. The tendency has been to let these patients go on about as they pleased, feeling that ultimate recovery, with but slight deformity, would result. I think he has sounded an important note of warning in advising against this, and I endorse his recommendation of judicious supportive treatment.

I wonder whether Dr. Blanchard did not make a mistake in referring to Dr. Freiberg as having written a paper on the infectious origin of osteochondritis. I think it was Dr. Kidner.

I became much interested in this condition when Calvé, in 1912, at Berc-sur-mer, showed me some cases of what we now know as Perthes' disease, which he described as pseudo-coxalgia. When I visited Perthes at Tübingen in the same summer he showed me examples of the same group of cases. I told him at that time that it corresponded exactly to the type of cases that Calvé had shown me. He was much interested, and I let him have the reprint that Calvé had given me. At first he thought the cases were not the same; but later changed his opinion, and regarded them as identical. If we want to add another name to the already hyphenated appellation of the disease, I think the name of Calvé should find a place in it.

DR. SAMUEL C. BALDWIN, Salt Lake City: I did not hear Dr. Blanchard say anything about the symptoms, or whether in his cases he found much pain. Last year, at the clinical meeting of the American Orthopedic Association at Philadelphia, Dr. James K. Young showed roentgenograms of several cases in which there had been a great deal of destruction of the bone. I have had one very interesting case recently, which illustrated what Dr. Blanchard has said about these cases having been treated for tuberculous hip disease, years back, when they were really cases of Perthes' disease.

About fifteen years ago, I had a boy whom I treated for hip disease. Last summer his sister was brought to me with a condition that looked exactly like Perthes' disease of the



Fig. 6 (Case 5).—A girl, aged 5 years, with Perthes' disease, in a plaster-of-Paris spica with high shoe and crutches.

hip, but it was in the second metatarsal bone. When I saw the girl first she was about 16 years old. There was no swelling or tenderness, and she had had practically no pain in the joint. If she walks a great deal and gets very tired the joint will sometimes pain her just a little. The head of the second metatarsal bone looks exactly like the head of the femur in a case of Perthes' disease. About fifteen years



Fig. 7 (Case 6).—A boy, aged 5 years, with Perthes' disease, in a strap iron hip splint with high shoe and crutches.

ago, as I have said, I treated her brother for hip-joint disease and he got well a great deal more rapidly than these patients usually do. He is well now, with very little limp, and I have wondered whether this was a case of hip disease or what we now know as Perthes' disease. His mother told me that he had been at work for a number of years and had a very slight limp. I do not know whether this condition has been described in any other bones than the head of the femur or not, but in the case of the sister I was impressed by the

shortening of the toe, such as we get in the head of the femur in Perthes' disease, and by the lack of other symptoms.

DR. JAMES W. SEVER, Boston: I should like to make a plea for the calling of this condition Legg's disease rather than Perthes' disease or Legg-Perthes' disease.

In the routine treatment of the cases at the Children's Hospital, Boston, use is made of the abduction splint; or what we used to employ is the old Taylor splint, and what we use now is the abduction splint, just as we do in tuberculosis of the hip. The patients are guarded to prevent walking on the affected limb, which is kept abducted and on a certain amount of traction. A plaster-of-Paris spica is not used, and the patients go on crutches. They do not get much deformity in the neck of the femur. They do, however, get some flattening and overgrowth of the edges of the epiphysis; and they recover with some limp, but very little deformity.

DR. EMIL S. GEIST, Minneapolis: Regarding the condition of toe deformity, we saw yesterday, at the clinic of Dr. Hibbs, a roentgenogram of that case. The condition has recently been well described by Dr. Freiberg. It bears a relation to osteochondritis of the hip, in that these toe cases are usually the result of injury, and the question arises whether there is a similarity between these two conditions in that regard.

DR. WALLACE BLANCHARD, Chicago: Many cases of Perthes' disease run a very mild course and remain unrecognized for several years.

I think that there was no mistake in my quotation from Dr. Freiberg. I got the information from the Transactions of the Section on Orthopedic Surgery of the American Medical Association, 1916.

The obturator foramen frequently becomes one-half the normal size at the end of the first year of the disease. It usually becomes gradually smaller until it ultimately diminishes to one-third the size of the opposite foramen.

One gentleman asked whether these patients come to us early. They seldom come early, and many times not until the second or third year of the disease.

Dr. A. T. Legg announced a paper before the American Orthopedic Association at Pittsburgh, in June, but failed to appear. In the announcement, he said that he was going to give the histories and descriptions of seventy-five cases of regenerated and flattened heads of femurs, and that twenty-five of these had been regenerations of the head after the reduction of congenital dislocation of the hip. The others he could not account for; and it occurs to me that most of these, and perhaps all, are rebuilt heads after unrecognized Perthes' disease.

CEREBROSPINAL FLUID PRESSURE*

A. L. SKOOG, M.D.

KANSAS CITY, MO.

While there is included herewith the report of a case with data and pathologic material adding strong support to the theory that cerebrospinal fluid is a secretion from the choroid plexus cells, I trust that it may serve a purpose in another direction, namely, that it may encourage more frequent observations of spinal fluid pressure, and especially the utilization of a manometer for accurate registration of subarachnoid tension. We are accustomed to see present day case reports and hospital charts with a lumbar puncture record giving the cell count, and Wassermann, colloidal gold and globulin tests; but seldom do we see a recorded figure for the spinal fluid pressure. There are a number of pathologic states involving the central nervous system in which a spinal fluid pressure reading is of as much importance as (in some of more importance than) a cell count or Wassermann test.

Before launching into the more practical facts, there are several historical, anatomic and physiologic considerations to be reviewed.

Relative to pressure and the circulation of the cerebrospinal fluid, it is essential to know through what organ the fluid makes its appearance; and by what route the exit is made. The choroid plexus was known to Herophilus, Galen, Vesalius and others.¹ While this gland attracted medical men of the early

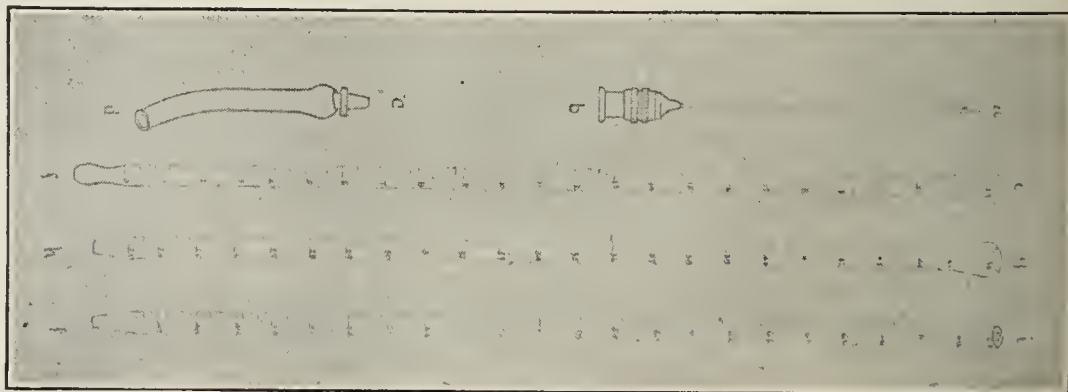


Fig. 1.—Rachiocentesis apparatus.

Christian era, its function was appreciated only quite recently. Even now, with a considerable amount of valuable experimental data at our command, there remains some hesitancy in accepting the conclusion that the gland exists essentially for the purpose of secreting the cerebrospinal fluid. The work of

* Read before the Section on Nervous and Mental Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Schläffer: Ueber den Bau und die Function der Epithelzellen des Plexus Choroideus, Beitr. z. path. Anat. u. z. allg. Path. (Ziegler's), Festschrift für Prof. Julius Arnold, 1905, p. 101.

Magendie,² Luschka,³ Falkenheim and Naunyn,⁴ Sicard,⁵ Meek,⁶ Mestrezat,⁷ Cathelin⁸ and others ought, however, to leave no doubt on the question. Cushing⁹ accepts as true that the choroid plexus is the chief source of supply, but states that "this has not been conclusively proved." The ependyma cells probably add a small quantity of liquid.

How and where does this secretion leave the subarachnoid space? The responses to this question are less satisfactory than are those respecting its formation. The once much discussed pacchionian theory is not tenable. It has been held that the fluid escapes along the cranial and spinal nerve roots and blood vessels, all of which have projections from the leptomeninges. Weed¹⁰ states that fluid escapes by way of the villi in the subarachnoid space and thence into the lymph and venous channels.

The cerebrospinal fluid differs from all other human secretions. It is conclusively not a transudate. It is not lymph. The secretion resembles rather closely the fluids found within the eyeball and the internal auditory organs.

Is there a circulation? There does not seem to be any clearly systematic and continuous flow of the spinal fluid from one area of the ventricle or subarachnoid space to another. However, ample proof is at hand to show that there are movements. Sicard and Cestan¹¹ injected India ink into the subarachnoid space in the atlanto-occipital region, and found a rather rapid distribution of the carbon particles in the cul-de-sacs, the subarachnoid areas and around the nerve roots. Dogs and fresh cadavers were used for these experiments. Later others have demonstrated a circulation of the fluid with movements directed caudad and cephalad. I am inclined to look on these movements, which constitute the circulation, as coming from transmitted energy having its source in the cardiac and respiratory acts. Oscillations from both can be seen at every normal spinal puncture. Luschka

demonstrated a lining of cilia on the projecting surface of the ependyma cells. Others have described a similar structure. These cilia may be a factor in the circulation.

Quincke,¹² in 1872, while working in a physiologic laboratory, reported some experimental cerebrospinal fluid work on animals with reference to pressure. Nineteen years later Quincke¹³ published reports on the first lumbar punctures performed in pathologic human cases, which included thirty adults and twelve children. A description of his manometer appears. This consists of a needle with its mandarin, rubber connector, a glass tube and a measuring stick with millimeter graduations. For some years following Quincke's reports there was a slow addition to our experimental knowledge and a comparatively small number of lumbar punctures performed for diagnostic and therapeutic purposes. During the past ten years, a rapid increment in the number of lumbar punctures performed has been noted, and a greatly increased fund of academic and clinical data has been furnished us along physical, chemical and biologic lines.

A number of manometers have been presented to the profession, mostly for water readings. The few mercury apparatus are not as practical. The water readings may be converted into mercury by dividing with 13.6. The two-way and three-way needles are convenient, but they rust and early give trouble.

I use an apparatus¹⁴ of my own design (Fig. 1). It is simple, easily sterilized and readily kept free from rust. It consists of two needles of different size and strength, a short rubber connector and glass manometer tubes. The stylet should

be withdrawn from the needle before puncturing. First one connects the first glass manometer tube into the connector (*c* and *d*). Then, the flow being established, the connector is immediately applied (*c* into *b*). If the pressure is abnormally high, the other glass tubes which have ground ends may be used to make a longer vertical column. They have millimeter graduations. The outer end of the needle (*b*) is ground so that a syringe of Luer type can be adapted. The rapidity of flow can be controlled by the stylet. When the flow comes from the needle in a stream or dropping rapidly, it should be checked partially with the stylet. When fluid is drained off too rapidly, there is more danger of postoperative headaches or disagreeable head symp-



Fig. 2.—High power magnification of an area of choroid plexus gland in case reported, showing normal and pathologic choroid cells.

2. Magendie: *Mémoire sur un liquide qui se trouve dans le crâne et la colonne vertébrale de l'homme et des animaux mammifères*, *Mémoire 2*, Jour. de physiol. exper., January, 1827, 7.

3. Luschka: *Die Adergeflechte des menschlichen Gehirns*, Berlin, 1855.

4. Falkenheim and Naunyn: *Ueber Hirndruck*, Arch. f. exper. Path. u. Pharmacol., 1887, 22, 261.

5. Sicard: *Le liquide céphalo-rachidien*, Paris, 1902.

6. Meek: *A Study of the Choroid Plexus*, Jour. Comp. Neurol. and Psychol., 1907, 17, 286.

7. Mestrezat: *Le liquide céphalo-rachidien*, Paris, 1912, p. 76.

8. Cathelin: *La circulation du liquide céphalo-rachidien*, Paris, 1912.

9. Cushing: *Studies on the Cerebrospinal Fluid*, Jour. Med. Research, 1914, 31, 1.

10. Weed: *Studies on the Cerebrospinal Fluid*, Jour. Med. Research, 1914, 31, 21.

11. Sicard and Cestan: *Bull. et mém. Soc. méd. d. hôp. de Paris*, 1904, 6, 715.

12. Quincke: *Zur Physiologie der Cerebrospinalflüssigkeit*, Arch. f. Anat. u. Physiol., 1872.

13. Quincke: *Die Lumbalpunktion des Hydrocephalus*, Berl. klin. Wehnschr., 1891, 9, No. 38.

14. Obtained from the Physicians' Supply Co., Kansas City, Mo.

toms, which often continue for some days. In intracranial lesions with greatly increased pressures, especially tumors located in the posterior fossa, too sudden withdrawal of the spinal fluid might produce alarming symptoms. The literature contains reports of a few deaths resulting from lumbar punctures performed on patients having a tumor in the posterior cranial fossa.

It might be contended that a manometer for accurately measuring the spinal fluid pressure is not necessary for practical purposes. I cannot agree to such a contention if careful spinal fluid work is to be considered. Recorded figures for pressure have much diagnostic value for a number of organic diseases within the cranial and spinal cavities. The number of drops per minute, or stream volume, can furnish only a very crude estimate of the pressure. Often, too, such a method leads to gross error. A cauda equina root in the lumbosacral cistern, or arachnoid tissue, might almost stop the flow; but if a manometer be applied, a pressure of several hundred millimeters will be found. The medulla may be pressed down into the foramen magnum, allowing only a small number of drops per minute, while if the manometer is used a high pressure reading might be obtained. When the spinal fluid is removed simply for therapeutic reasons, it is important to take a reading from time to time during the puncture.

The normal spinal fluid pressure as measured by a manometer at the lumbar region is subject to variations. The reason for some of these variations has not been explained satisfactorily.

I find that the normal pressure in the normal person taken in the sitting posture with head bent forward ranges from 90 to 150 mm. of water. In searching the literature we find a wide range of differences for the normal pressure. There is evidence in some reports that pathologic cases were used to find so-called normal pressures. As far as possible, especially if one is not doing frequent lumbar punctures, the patient should be placed always in about the same posture.

Whether the head is bent forward or held erect occasionally influences the reading a few millimeters. Cardiac and respiratory oscillations are always observed, the latter being greater than the first and ranging from 10 to 20 mm. Coughing and physical strains may produce a sharp increase in the pressure.

Why do we have this subarachnoid pressure, and whence is the energy derived? Hydrostatic pressure accounts for possibly a small portion. The blood vessels and transmitted heart muscle energy cannot

account directly for it; at least only slightly. High blood pressure does not cause an increased cerebrospinal fluid pressure. The elasticity of the leptomeningeal tissues seems to account for a portion. Closely associated with this is capillarity. The choroid plexus gland, or its secretion, is responsible for the largest percentage of the pressure. In most of the places the subarachnoid cavity has walls comparatively closely coapted. Pfaundler¹⁵ names the following four component factors in normal cerebrospinal pressure: (1) compression pressure, contained within the fluid itself; (2) hydrostatic pressure; (3) pressure transmitted from the blood, and (4) elastic pressure, deriving its energy from the elastic subarachnoid walls. The last seems to be the most important. The portion described by Pfaundler as compression pressure should not be considered separately. It is a result of the other three.

I have performed lumbar punctures a number of times with a view to obtaining the relative pressures in the sitting and reclining postures. Both normal and pathologic material has been used. After the pressure has been read in the sitting posture, the patient is placed in a reclining position, leaving the head on a level with the point of entrance of the needle, which has remained in the canal during the change of posture. In the majority of cases the pressure remained about the same both for the normal and pathologic cases. In one case of chronic serous meningitis, the pressure at the start was 270 mm. of water in a sitting posture.

The registration was 190 after the patient was placed in a reclining position. The pressure returned promptly to 270 when the patient was restored to the initial sitting posture.

A great number of pathologic states involving the brain, spinal cord, and their membranes will produce alterations of tension of the subarachnoid fluid. States with increased pressure exceed tremendously those with decreased pressure.

In my experience, brain tumor cases have furnished the highest pressures, often registering from 620 to 700 mm. and more. There have been reported pressures reaching 1,000 mm., but these are rarely encountered. Much caution should be exercised in lowering the pressure when high figures are registered.

Tuberculous meningitis gives an exceptionally high pressure, but does not reach that of the tumors. All forms of syphilis of the central nervous system, including tabes and general paresis, furnish high pressures

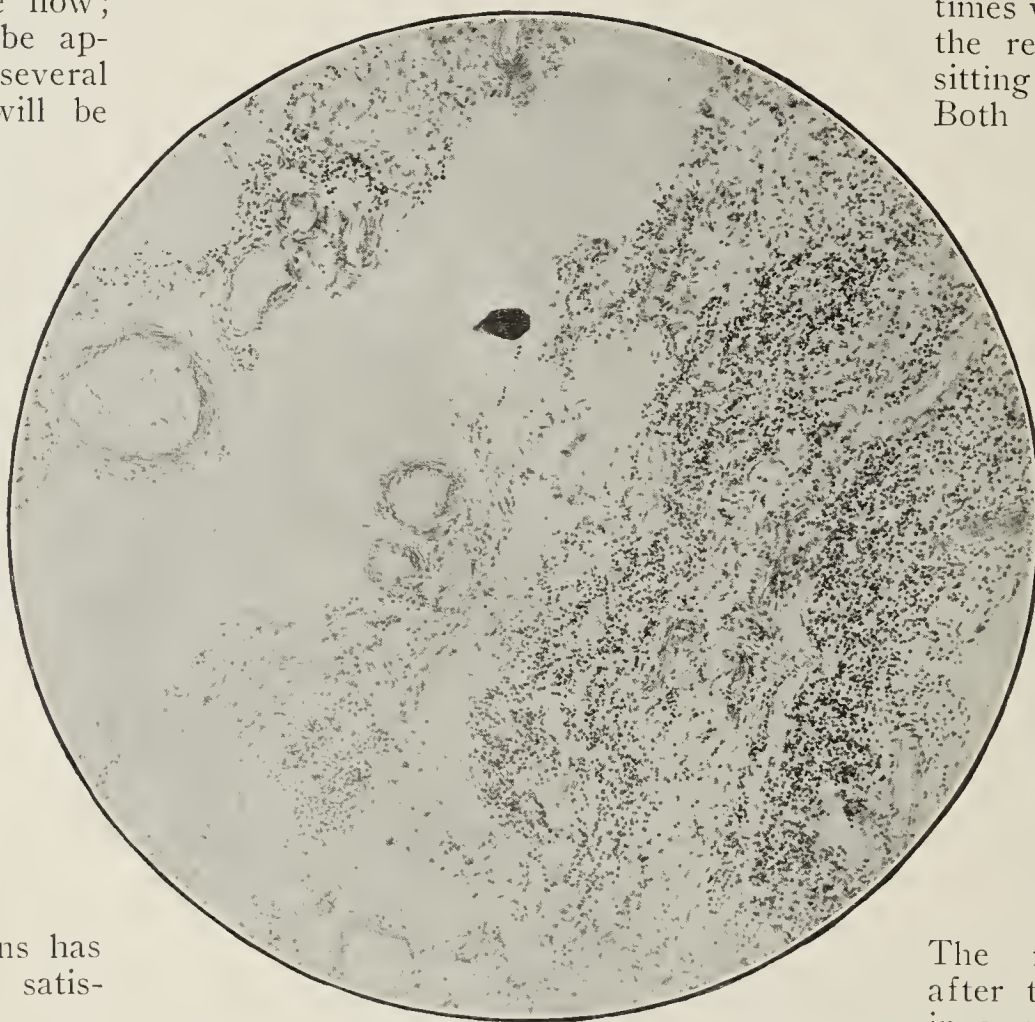


Fig. 3.—Low power magnification of an area of choroid plexus gland in case reported. The villi and choroid cells have been destroyed completely. Some vascular infiltration is seen. Massive round cell infiltrations are much in evidence.

15. Pfaundler: Ueber Lumbalpunktionen an Kindern, *Jahrb. f. Kinderh.*, 1899, 49, 264.

ranging from 250 to 400 mm. Paresis and secondary or tertiary meningitis supply the higher figures.

Hydrocephalus, if the intracranial pressure has not prevented an outflow, causes a greatly increased spinal fluid tension. In a number of the chronic degenerative neural diseases there are moderately increased pressures.

All the acute meningitis cases will show a sharp rise in the spinal fluid pressure. Acute poliomyelitis, rabies, tetanus, several intoxications and alcoholic delirium furnish somewhat increased pressures, usually about 200 to 300 mm.

Head traumas and particularly brain hemorrhages will provoke a considerable increase in the spinal pressure.

The most frequent causes for real, pathologically low pressures are inflammations of the spinal cord preventing patency of the subarachnoid space and the flow of fluid to the lumbosacral cistern. A spinal cord neoplasm or cyst may cause a similar condition. When a tumor of sufficient size is pressing on the cord, the manometer may show only a few millimeters' pressure (about 20 to 40 mm.). After the removal of from 1 to 5 c.c. of the spinal fluid by lumbar puncture, this low pressure promptly drops to nil.

The following is an abstract of a case report with low pressure:

A man, aged 57, concerning whose family and personal history no data were obtainable, but who was admittedly an alcoholic, complained of weakness, headache and a general decline. There was much mental torpor. The pupils were sluggish to light and irregular. All deep reflexes were mildly increased.

A necropsy held twelve hours after death revealed changes of a specific nature throughout the cardiovascular system. The dura was much adherent to the leptomeninges. The pia-arachnoid was denser than normal and had numerous whitish plaques scattered about.

The brain was rather wet. The choroid plexus could be traced through all the ventricles, but everywhere was more or less excessively adherent. The villi could not be separated, as can be done in the normal brain. The choroid cells were, to a great extent, completely destroyed. In some large areas not a single cell was visible. Among the villi best preserved there could always be found some cells degenerated, or even destroyed. In case all the cells had been destroyed, there remained stubs of villi, and more or less agglutinated masses. These masses contained dense connective or cicatricial tissue.

Specific infiltrations with large masses of round cells were nicely illustrated. These gummatous masses were irregularly distributed, but were most numerous and largest in the areas in which the destructive process was more complete.

The arteries, especially the smaller arterioles, frequently had thickened walls. Often the walls were considerably thicker in one area of the vessel than in another.

Rachiocentesis is customarily performed at the third or fourth lumbar spaces, hence the term "lumbar puncture." However, there are a few instances in which it can be performed to greater advantage in one of the dorsal or cervical spaces. As an illustration, in a case of tetanus I have successfully injected anti-toxin into the subarachnoid space between the upper dorsal vertebrae. The lumbar region was so arched and rigid that no needle could enter its spaces. Also when a transverse cord lesion exists I have employed dorsal and cervical punctures in order to demonstrate the difference in pressure in the lumbar region and in the region above, which contained a tumor, cyst or other possible compressing material. The fluid collected from above and below certain lesions has often

physical and chemical differences of much diagnostic significance.

SUMMARY

The abstracted case report contained herewith demonstrates that impaired function or destruction of the choroid plexus gives a diminished quantity of cerebrospinal fluid and a lowered pressure, as shown by rachiocentesis. This supports the contention that at least the bulk of the cerebrospinal fluid is secreted by the choroid plexus cells.

There exists a definite spinal fluid pressure which has certain variations according to various observations. A minimum figure can be placed at 90 and a maximum at 150 mm. (water manometer). When pathologic states exist, high pressures greatly preponderate. It is more difficult to be assured of the reality of a low pressure, but its presence has much diagnostic weight.

Accurate registration of the subarachnoid fluid tension within the entire craniospinal cavity should be more generally recorded, for comparative pressures have a great deal of diagnostic value in many neurologic diseases.

ABSTRACT OF DISCUSSION

DR. WILLIAM M. LESZYNSKY, New York: I should like to introduce a word of caution in regard to the possible breaking of the needle in lumbar puncture, which has occurred in many instances. The ordinary steel needle should not be used. Lately a needle has been made according to my suggestion, called a nickeloid needle, which is noncorrosive and can be bent at a right angle, so that under ordinary usage breakage is practically impossible.

DR. A. L. SKOOG, Kansas City, Mo.: I broke one needle in puncturing the skin. When I started doing lumbar punctures I experimented on cadavers. I broke one needle on the cadaver. It was an iridium-platinum needle, and I have never used one since. All the needles which I use are tested at intervals. It is wise to be careful with the needles. It is important to know the pressure of the cerebrospinal fluid, and one cannot always tell this by the rapidity of the dropping. If there is a greatly increased pressure patients are more likely to have severe headaches. I would give a word of warning about suddenly reducing a very high pressure of the cerebrospinal fluid to normal; for instance, in the case of tumor in the posterior fossa. One must be very careful. A number of deaths have resulted from sudden reduction of tension in tumors of the cerebellum and that region.

Common Colds.—The phrase "common colds," like "charity," covers a multitude of sanitary sins, and curiously enough the name has been applied to a group of affections which, far from depending absolutely on cold, are frequently the direct result of living in close, overheated surroundings having a lower relative humidity than the driest desert known to man. The word "colds" means an acute infection of the lining membranes of the nose, tonsils, throat, and larger bronchial tubes. The process may be even more extensive and amount to a general infection of the entire body. All of the breathing apparatus, excepting the smaller terminal portions in the lungs, may be involved, and as a matter of fact the disease may, and often does, spread to these, thus producing pneumonia. In this connection it may be pointed out that pneumonia kills more people in the United States than any other disease excepting tuberculosis and heart disease. Many pneumonians begin as a common cold. Colds do not produce tuberculosis, yet unfortunately what is considered as a cold may be in reality the first symptoms of the white plague. In every case, however, colds are dependent on the growth and activity of living germs which are received from other persons.—Rucker, *Pub. Health Rep.*

MORPHOLOGIC APPEARANCE OF CANCER CLINICALLY CURED BY RADIUM AND ROENTGEN RAY*

ISAAC LEVIN, M.D.

Clinical Professor of Cancer Research, New York University and
Bellevue Hospital Medical College; Chief of the Department
of Cancer Research, Montefiore Hospital and Home

AND

BARNET JOSEPH, M.D.

Adjunct to the Department of Cancer Research, Montefiore
Hospital and Home

NEW YORK

The reports on the result of surgical treatment of cancer cases as well as the more recent reports on radium and Roentgen-ray therapy of the disease abound in expressions "radical cure," "clinical cure" and "improvement." It is appropriate, therefore, to preface the analysis of the cases presented for this study by a correct definition of these terms.

A surgical statement that a cancer case is radically cured implies that the patient is alive and free from the disease from three to five years after the operation. The probable ultimate result of a radical operation may be inferred among others from the following study of a French surgeon, Heurtaux. During a period of thirty years he operated in 341 cases of carcinoma of the breast; 284 cases could be traced for long periods of time, and of these patients, 43.3 per cent. remained well four years after the operation and should consequently be considered radically cured. Four years later, or eight years after the operation, only 16.9 per cent. remained well and free from a recurrence. Ten years after the operation only 12.32

A recurrence of cancer, no matter how late after an operation, indicates that some tumor tissue was left behind somewhere in the organism at the operation. A radical operation for a malignant tumor means a complete eradication of all tumor tissue from the organism. An analysis of Heurtaux's writings, and

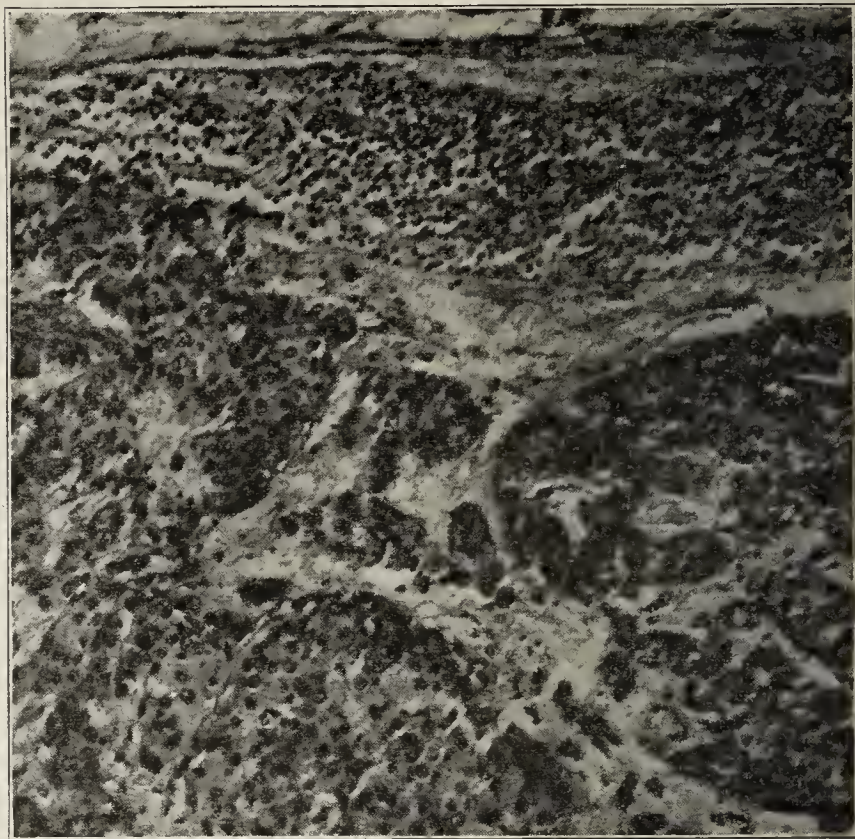


Fig. 2 (Case 1).—Metastatic carcinoma of a lymph gland.

many other similar publications, thus shows that in by far the greatest majority of cases of cancer the best surgical methods of treatment do not completely eradicate the disease and consequently do not induce a radical cure of the disease. Most frequently, then, surgery only postpones a recurrence and thus prolongs life. It is quite legitimate, nevertheless, to consider such a result a clinical cure, since the patient remains clinically well for a longer or shorter period of time, and the presence in the organism of the remnants of the malignant tumor cannot be detected by any means at our disposal. Furthermore, a clinical cure takes place even when the malignant tumor does not entirely disappear, but loses the characteristics of its malignancy, ceases to grow and invade the surrounding tissue, behaves clinically like a benign tumor and retains these characteristics for a sufficient length of time. To recapitulate: A clinical cure of cancer means a gross destruction or diminution of the size of the primary tumor with disappearance of symptoms and a well being continued for a sufficiently long time to preclude the possibility of a spontaneous remission of the disease.

An "improvement," "palliation" or "palliative improvement" must be considered the alleviation of distressing symptoms without any inhibition of the development and growth of the malignant tumor. A tracheotomy for the relief of dyspnea in carcinoma of the larynx, gastrostomy for relief of obstruction in carcinoma of the cardia, gastro-enterostomy in carcinoma of the pylorus, and colostomy in carcinoma of the colon produce such a palliative improvement, which may be followed by increase of weight and strength and temporary well being of the patient. The action of radium and Roentgen rays in arresting hemorrhage, foul discharge and relieving pain in far

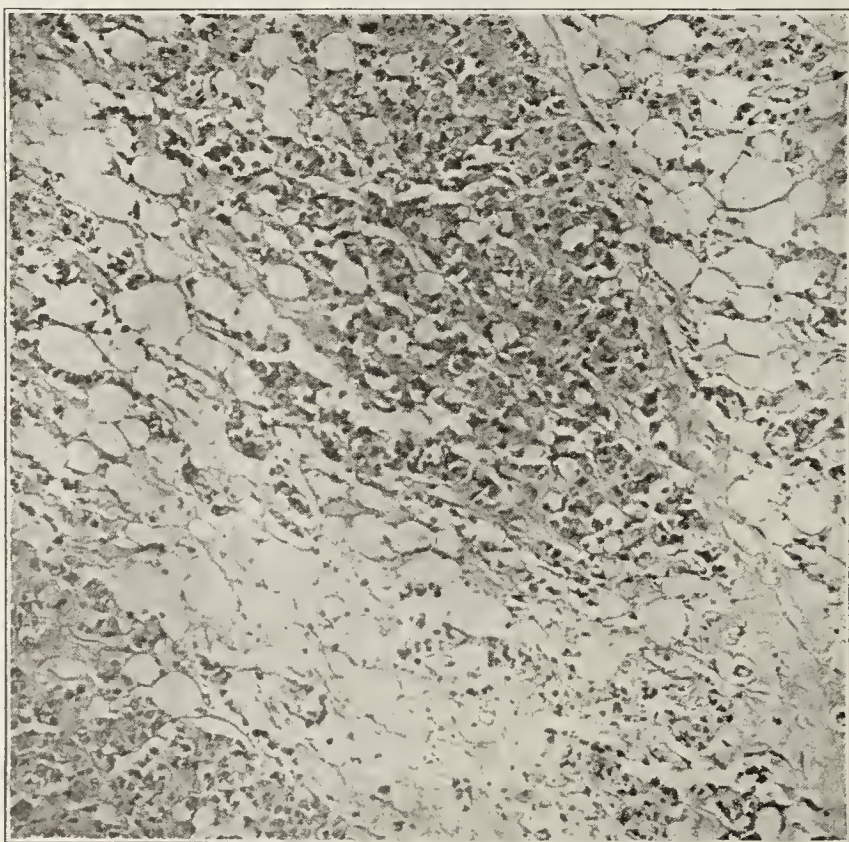


Fig. 1 (Case 1).—Scirrhous carcinoma of the breast.

per cent. remained well, fifteen years after the operation 8.1 per cent., and twenty years after the operation only 2.46 per cent. remained free from a recurrence.

* From the Department of Cancer Research of the Montefiore Hospital and Home.

* Read before the Section on Pathology and Physiology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

advanced inoperable cancer cases also induces thereby a palliative improvement.

One of us¹ recently reported on several cases of inoperable carcinoma and sarcoma which remained clinically cured for a number of years by the aid of radium and Roentgen-ray therapy. The number of similar cases reported by other investigators is so great, and the therapeutic action of these radiations is so frequently satisfactory under correct and uniform conditions, that the specific action of the rays on malignant tumors does not require any further discussion. The fact that in the vast majority of cases of malignant tumors which undergo the radium and Roentgen-ray treatment a palliation or a clinical cure and not a radical cure is obtained does not detract anything from the value of the method.

The clinical effect of the radium and Roentgen rays on malignant tumors is accompanied in the great majority of cases by distinct morphologic changes in the tumor tissue. As a general rule, it may be stated that tissues consisting of less differentiated, younger cells, cells in a state of active proliferation, are most deeply influenced by the rays, and that consequently there is selective action of the rays on the actively proliferating tumor cells, as compared with the normal organ cells. The first morphologic changes which occur in carcinoma or sarcoma tissue under influence of radium and the Roentgen rays are observed in the tumor cells themselves, and are manifested by the vacuolation of the protoplasm, pyknosis of nuclei, karyolysis, and ultimately complete necrosis of the cell. These cellular changes are accompanied by a round cell infiltration which replaces the destroyed cancer cells. Subsequently this round cell infiltration is changed into dense sclerotic connective tissue poor

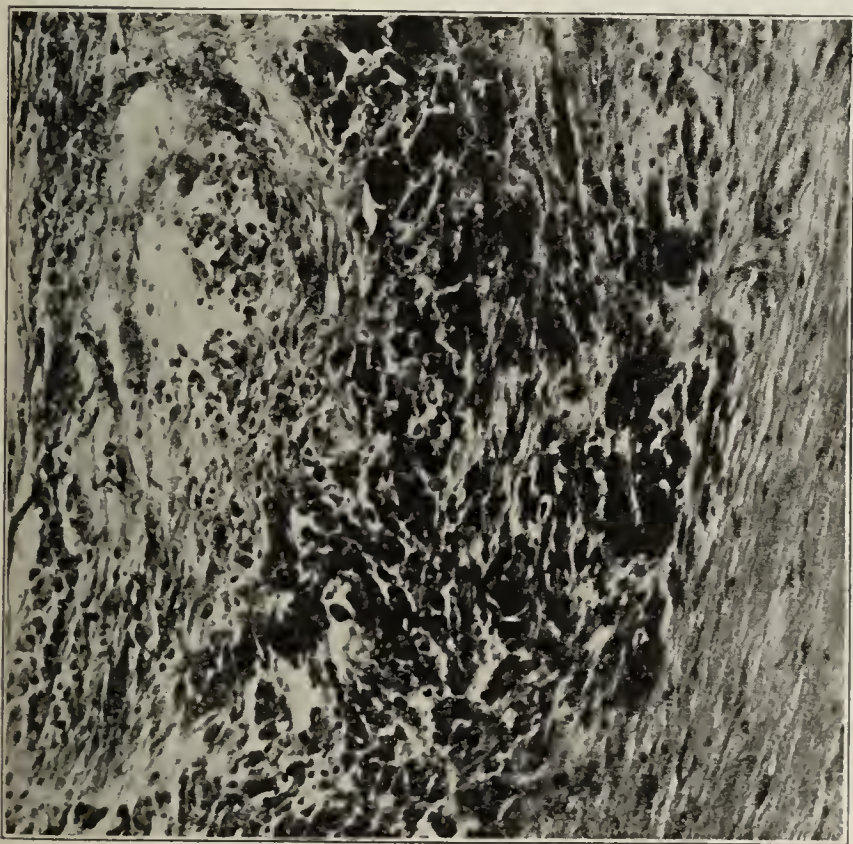


Fig. 3 (Case 2).—Melanotic cancer, primary tumor, before treatment.

in blood vessels. This connective tissue formation may become very extensive, surround islands of cancer cells, and assist in the destruction of the latter. Indeed, this new connective tissue formation is the most generally observed morphologic change in the tumor. Some observers even maintain that this con-

nective tissue formation is the only direct effect of radiation, while the destruction of the tumor cells is secondary and is due to lack of nutrition. However, this opinion is not borne out by facts. The first morphologic change noted is always the destruction of the tumor cells, and the connective tissue appears only

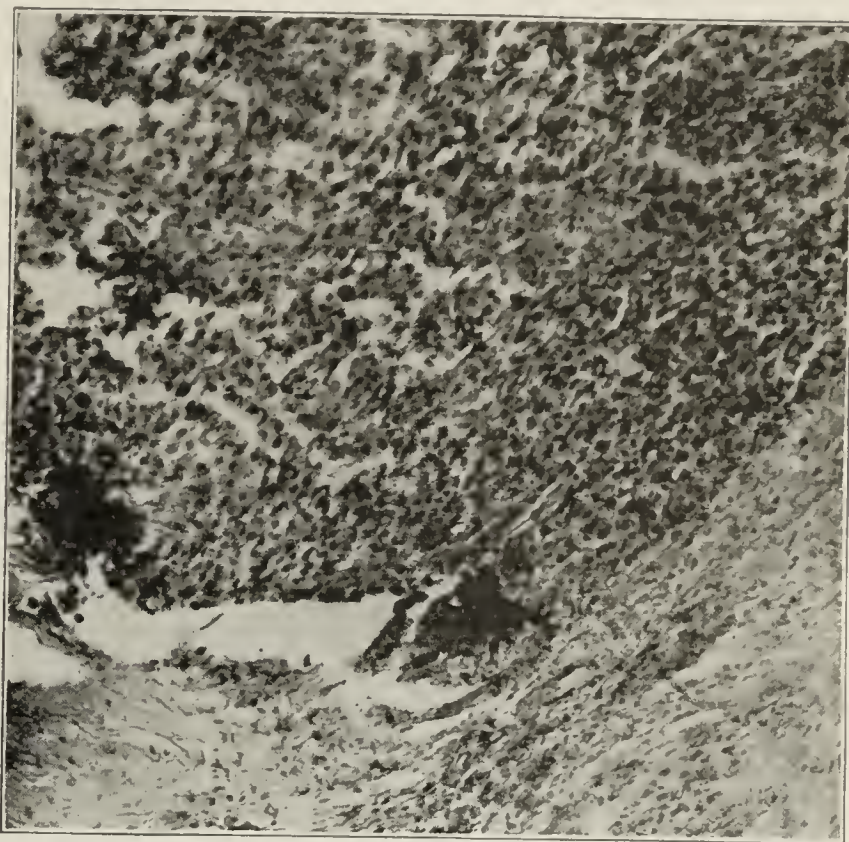


Fig. 4 (Case 2).—Melanotic cancer of the lymph gland twenty months after the beginning of the treatment.

subsequently. Moreover, in certain conditions—for instance, rodent ulcer of the skin—the epithelioma cells disappear and the ulcerated area is covered with skin epithelium without any formation of connective tissue. The assumption, on the other hand, that the formation of connective tissue is secondary to the accumulation of dead tumor cells and is analogous to formation of connective tissue around foreign bodies and particles of dead matter is also hardly tenable. Were this connective tissue formed only by the stimulus of the dead tumor cells, then the radiations would dissolve it subsequently as easily as it dissolves a keloid, for instance. However, this does not take place, and the amount of the peculiar sclerotic connective tissue usually increases with subsequent radiations.

A case of carcinoma of the sigmoid with metastatic dissemination in the peritoneum previously reported by one of us¹ demonstrates the importance and extent of this connective tissue formation. An exploratory laparotomy was done on the patient which revealed a carcinoma of the sigmoid and a peritoneal dissemination with minute metastatic nodules. The case was declared to be inoperable and the tumor was not removed. The patient was treated with massive doses of Roentgen rays for six months; subsequently the patient died from an acute intestinal obstruction. At the necropsy there were found in the peritoneal cavity several loops of the small intestine adherent by old adhesions to the posterior surface of the tumor mass in the sigmoid. The peritoneum was studded with numerous white plaques, varying in size from 1 to 5 mm. in diameter. Microscopic examination of a section taken through two loops of the small intestine that were firmly bound together by adhesions showed that the latter consisted of a thick layer of connective

1. Levin, Isaac: Surg., Gynec. and Obst., 1915, 21, 374.

tissue containing occasional nests of tumor cells. The peritoneal nodules were composed of dense connective tissue, with occasional minute groups of tumor cells. The amount of connective tissue in these peritoneal nodules of carcinoma was entirely out of proportion to the number of carcinoma cells present. On the other hand, the peritoneal endothelium of the sections of the wall of the small intestine adjacent to the plaques was normal and showed no connective tissue formation.

The source of the new connective tissue formed under the influence of the radium and Roentgen rays must be looked for either in the stroma of the tumor or in the round cell infiltration that closely follows the destruction of the tumor cells by the radiations. It may be stated then that while the destruction of the tumor cells is the primary phase and the formation of new sclerotic connective tissue a secondary, it is at least as important a phase in the morphologic changes which

emphysema. In August, 1915, a hard mass the size of a hen's egg was discovered in the outer margin of the right breast. The skin was adherent to the tumor, and there were enlarged glands in the right axilla. A clinical diagnosis was made of carcinoma of the breast with the involvement of the axillary glands. The general condition of the patient precluded any operative interference, and she was treated by local application of radium to the breast and axillary glands and Roentgen-rays through the chest wall. The breast tumor and the gland at first diminished somewhat in size and then remained stationary. Seventeen months later the patient died from her pulmonary condition. A complete necropsy was performed by Dr. B. S. Kline. A minute search was made for possible metastases, but none were found anywhere in the organism. The microscopic examination of the tumor of the breast showed a scirrhus carcinoma, and the lymphatic glands of the axilla were filled with solid carcinoma. Figures 1 and 2 show that morphologically both the primary tumor and the metastases in the lymph glands appeared quite malignant and did not show any changes characteristic of radiotherapy. Nevertheless, nearly a year and a half after the condition was discovered, no dissemination or distant metastases were found anywhere in the organism.

As a rule, a patient with carcinoma of the breast with the involvement of the axillary glands, if left untreated, dies in less than a year and a half from a general dissemination of the carcinoma. It is thus quite evident that in the case reported here radium and Roentgen-ray therapy inhibited the further growth and dissemination of the carcinoma tissue and transformed it, as it were, into a biologically and clinically benign type of a tumor, though it did not change its morphologic appearance.

CASE 2.—Mrs. B. K., aged 40, developed a pedunculated tumor the size of a small orange on the skin of the right supraclavicular region. The tumor was removed in March, 1915, with the pedicle. There was left after the operation an ulcerated area 1 cm. in diameter that did not heal. The microscopic examination (Fig. 3) of the tumor showed it to be a

melanotic cancer. The case was then referred to one of us for radium and Roentgen-ray treatment. On examination there was observed the ulceration described above and an enlarged supraclavicular lymph gland about three-fourths inch long. Under the influence of the ray therapy, the ulcer healed and the gland at first diminished somewhat in size and then remained stationary. At present, two and one-half years after the beginning of the treatment, the patient is clinically perfectly well, and no metastatic tumors have developed anywhere. Melanotic cancer is an exceedingly malignant condition, and the average life of the patient is not more than two years. Coley and Hoguet,² who made an exhaustive study on the subject, state that the melanotic cancer in the cervical glands is especially malignant, causing death in a short time. In October, 1916, twenty months after the beginning of the treatment, the supraclavicular gland was excised for diagnostic purposes. The microscopic examination (Fig. 4) of the gland showed a morphologic picture identical with the one found in the primary tumor before the initiation of the treatment. Nevertheless, as stated above, at present, eight months after the second operation and two years and three months after the

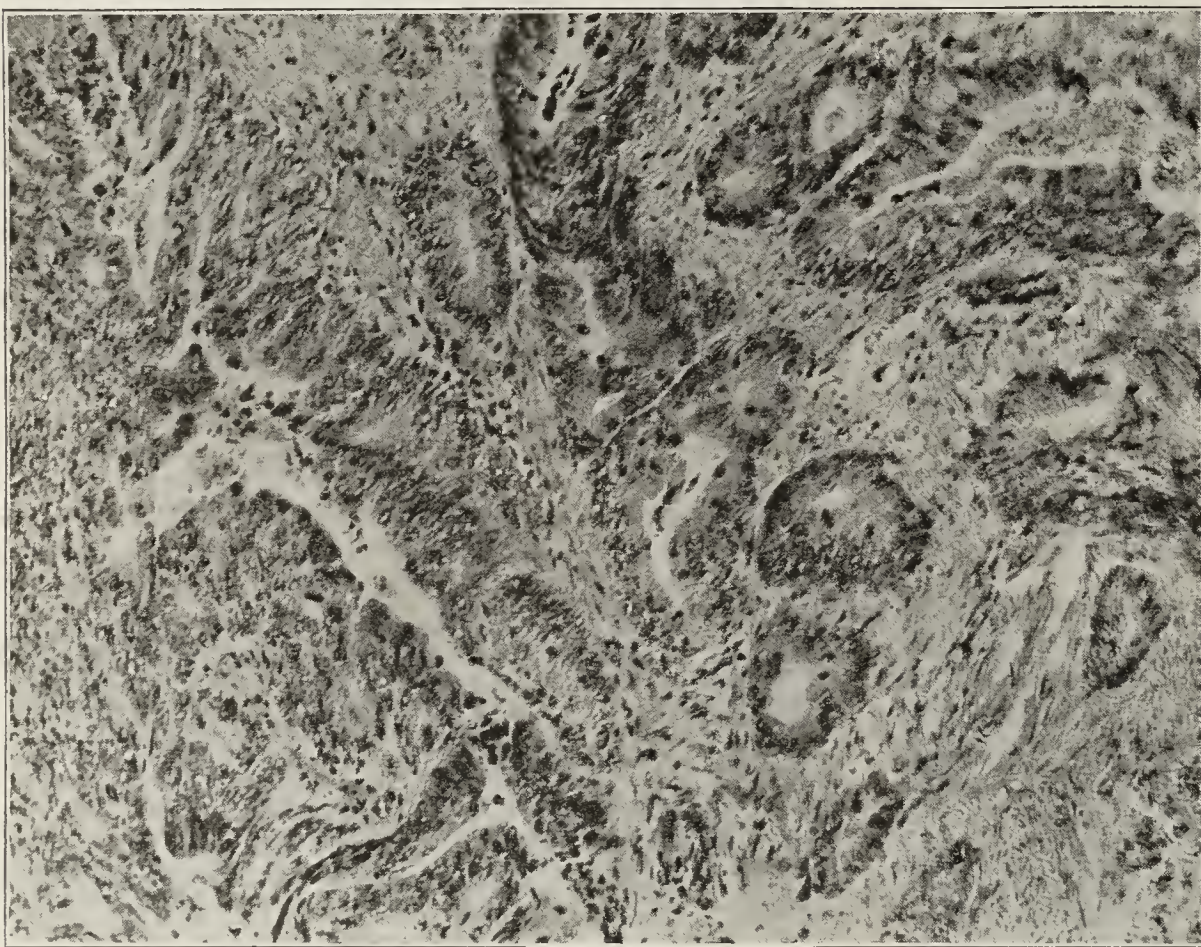


Fig. 5 (Case 3).—Adenocarcinoma of the colon, recurrent, before treatment.

take place in malignant tumors under the influence of radium and Roentgen rays. Furthermore, the microscopic study of this case of carcinoma of the sigmoid indicates the possibility that the proliferating capacity and the consequent clinical malignancy of a tumor may be inhibited under the influence of the radiations without the presence of any apparent morphologic changes in the tumor tissue. The deeper portions of the sigmoid tumor, as well as a certain number of the peritoneal plaques, showed morphologically unchanged carcinoma cells. Nevertheless, in over six months not a single one of the minute nodules found at the operation developed into a discrete secondary tumor, and the primary sigmoid tumor did not increase in size during the time.

The following series of cases, observed recently by us, present a similar condition of clinical cure without any apparent morphologic changes in the tumor tissue:

CASE 1.—Mrs. W. Y., aged 40, was admitted to the Montefiore Hospital in 1906 suffering from bronchial asthma and

2. Coley, W. B., and Hoguet, J. P.: *Ann. Surg.*, 1916, **64**, 206.

first, the patient is perfectly well and did not develop any secondary tumors anywhere. Here again the radiotherapy inhibited the proliferating power of the cancer cells and arrested the growth of the tumor without having produced any apparent morphologic change.

CASE 3.—Mr. B. G., aged 51, was operated on in December, 1915, for adenocarcinoma of the ascending colon. The tumor was radically removed and a right colostomy performed. In February, 1916, the patient was admitted to Montefiore Hospital. On admission, no recurrence of the carcinoma was found anywhere. In July, 1916, an attempt was made to close the colostomy wound by the aid of clamps, but the operation was discontinued since a recurrence was discovered at the intestinal bridge of the colostomy opening. There was felt a hard tumor mass about a cubic inch in size. The outer surface of the tumor consisted of an ulcerated area about three-fourths inch in diameter. A small piece was excised for examination, and showed microscopically an adenocarcinoma (Fig. 5). For the last ten months the patient has been undergoing Roentgen-ray treatment. He is clinically well, the tumor did not increase in size, the ulceration appears to be partly healed, and no secondary tumors or metastases developed anywhere. Recurrences in intestinal carcinoma are generally malignant, and disseminate all over the peritoneum and kill the patient very rapidly. Recently another piece was excised for examination, and the result of the microscopic study of this later specimen (Fig. 6) is very instructive. There is no direct evidence of any extensive degeneration of the cancer cells or excessive formation of new sclerotic connective tissue characteristic of radiated malignant tumors. But, unlike Cases 1 and 2, the two specimens of this case removed before and after treatment do show a certain morphologic difference. While the specimen taken before treatment shows a perfectly characteristic picture of adenocarcinoma in every field, the specimen obtained after treatment is not so characteristic, and a great many of the tubules resemble more a benign adenoma than an adenocarcinoma. These findings are somewhat difficult to explain. It is possible that the superficial, more malignant part of the tumor was destroyed under the influence of the rays. The partial healing of the ulcerated surface coincides with this assumption. The deeper portions were then inhibited by the Roentgen ray in their further malignant transformation. In any event, a clinical inhibition is quite evident in this case as well.

We have been unable to find in the literature any description of similar cases in which a clinical arrest of disease was accompanied by a complete absence of morphologic changes. Morson,³ in his description of the various changes which occur in malignant tumors on exposure to the gamma rays of radium, states that there may take place a loss of the reproductive function of the cancer cell, but he does not illustrate this condition in any of his cases. On the other hand, there is a good deal of experimental evidence that elucidates the clinical and morphologic phenomena described in this presentation. Von Wassermann⁴ reported in 1914 the results of his experiments on the action of radium on small pieces of mouse carcinoma in vitro. He has shown that the cells remain alive, but the pieces do not grow when they are subsequently inoculated in a healthy mouse. He concludes that the rays act directly on the cancer cells. However, they do not kill the cells, but impair the genuceptors or the proliferating apparatus, and as a result inhibit the formation of new cells. The actual death of the cancer cell and disappearance of the tumor is produced either through the aging of the remaining cells or through the cytolytic powers of the organism. Therefore, the rays act selectively on tissues, the cells of which are rich in genuceptors and proliferate rapidly. This hypothesis of von Wassermann fits in very well also with the frequently observed clinical fact

that a malignant tumor may continue to diminish in size weeks after the ray treatment was discontinued. In a recent publication on the effects of radium on tissue growth in vitro, Prime⁵ reports very similar results. He observed that radium injures the nucleus of the cells growing in animal plasma, so that it prevents further formation of mitosis. On the other hand, it does not injure the life and functions of the cell. For instance, the outwandering of the cells from the main mass of the tumor in the culture due to ameboid motion continues with the same rapidity as in the nonradiated control cultures. The beating of a piece of a heart muscle placed in the plasma culture continues for the same length of time in the radiated as in control cultures. Identical results were obtained

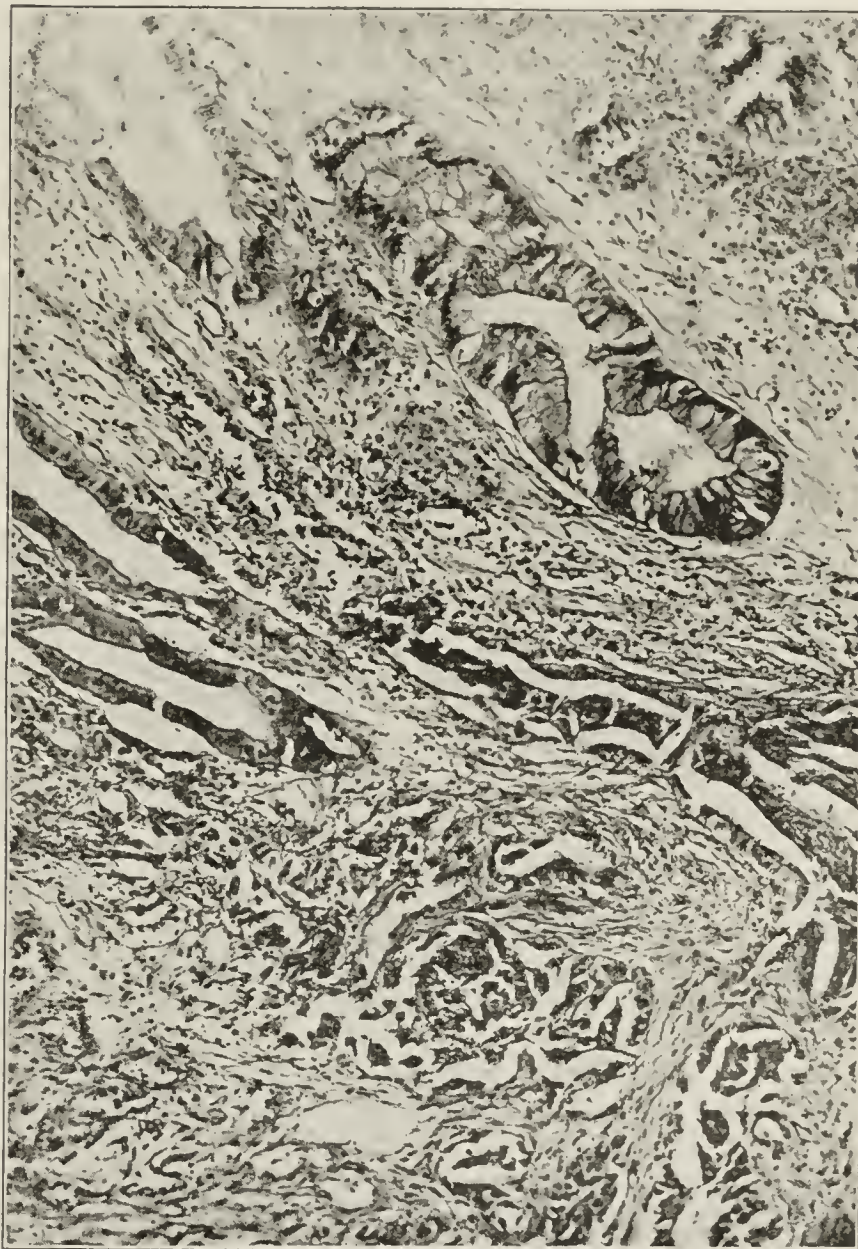


Fig. 6 (Case 3).—Adenocarcinoma of the colon after treatment.

by Halberstädter,⁶ who studied the action of the radium rays on trypanosomes in vitro. The effect of the rays consisted in the inhibition of the infectivity of the parasites; that is, they lost their power to proliferate when introduced into a new host after having been radiated in vitro. On the other hand, the motility of the trypanosomes is not impaired by the action of the radium.

Thus the clinical investigations reported in this presentation as well as experimental studies show that the radium and Roentgen rays may impair deeply the proliferating power and consequently the clinical malignancy of cancer cells without producing any change in the morphologic appearance of the tumor. Indeed, it is quite probable that the first effect of the

3. Morson, A. C.: Brit. Jour. Surg., 1915, 2, 354.

4. Von Wassermann, A.: Deutsch. med. Wchnschr., 1914, 40, 524.

5. Prime, Frederick: Jour. Cancer Research, 1917, 2, 107.

6. Halberstädter, L.: Berl. klin. Wchnschr., 1914, 51, 252.

rays on every malignant tumor consists in the inhibition of the proliferating power, in the *sterilization*, as it were, of the cancer cells. The degeneration and destruction of the cancer cells and the formation of the sclerotic connective tissue takes place subsequently, under the influence of the rays. Moreover, this cell degeneration and cell death may not be due directly to the action of the rays, but takes place in the natural course of the life cycle of the cancer cell. This cycle consists of youth, or period of development; maturity, or period of function; and the senility, or period of degeneration, which gradually leads to death. In parenchymatous organs, like the liver and the kidney, the first period is usually completed during embryonic life or at very early age. The second period continues through the whole life of the organism, and the third period is attained at the old age of the organism or near its death. The life of an individual cancer cell, on the other hand, is very short. It changes rapidly from an embryonic into an adult and then immediately into an aged, degenerated cell, and this process takes place continually irrespective of any extrinsic aid. But in a malignant tumor the majority of the cancer cells are quickly rejuvenated before they reach senility through the fact that each cancer cell changes into two young daughter cells. When the rays arrest this proliferation, then the cancer cells without any further outside aid mature and degenerate. It is interesting to note in this connection that the life of the epithelium of the skin or testicle is nearly as short as the one of the malignant tumors, and the rays act on these organs as specifically as they do on malignant tumors.

The importance of this observation is twofold. In the first place, the morphologic appearance of radiated tumor tissue is not an absolute criterion of the therapeutic effect produced by the action of the rays on the tumor. Positive finding of the changes described above as characteristic of the action of the rays is an indication of a therapeutic result. Negative findings, on the other hand, do not preclude the possibility that the tumor was influenced by the rays. Radiated and nonradiated carcinoma tissues may have the same microscopic appearance, and still the former tissue is sterilized and may have lost to a great extent its power of proliferation and consequently its clinical malignancy. In fact, the same holds true for various malignant tumors without any relationship to radiotherapy. An epithelioma may present the same microscopic picture whether it belongs to a comparatively benign, slowly growing ulcer of the face or to a highly malignant epithelioma of the lip. The second point of great practical importance to be derived from this investigation is that the radium and Roentgen rays are capable in a certain number of cases of sterilizing or inhibiting the malignancy of a tumor without destroying it. It is imperative, therefore, to subject every malignant tumor to treatment by the rays, before the performance of the radical or partial operation. The same holds true of postoperative treatment. The rays may sterilize and inhibit the proliferation of the remaining cancer cells, even if they do not destroy them outright.

119 West Seventy-First Street.—2051 Fifth Avenue.

ABSTRACT OF DISCUSSION

DR. HENRY SCHMITZ, Chicago: We must accept the dictum that the radiosensitivity of cells depends on various factors. The action of radium is direct and indirect. The direct action

causes degeneration of the cells whereby mitosis ceases. The indirect action is a systemic one which, as yet, we cannot explain.

Tumors arise not by the avidity of the tumor cells, but by a decrease of the avidity of the normal body cells. If the resistance of the host declines until it reaches a point where the carcinoma cells overpower the normal cells, then growth of the tumor follows. The question is whether it is not the systemic influence of the rays, that is, the indirect action, which brings about the cessation of growth of the tumors. The direct action of the rays on the carcinoma cells varies and depends on various factors—in the first place, on the specific character of the cells—the less differentiated the cell is the more radiosensitive will it be. It also depends on the age of the bearer of the cells. We know that the rays act very much more readily and intensely in the young than on adults. Cancers also are more malignant at this period. This behavior results from the fact that the cells of the young are more profusely nucleated; the blood supply is more abundant. In the aged, however, the nuclei become fewer and the blood vessels contract by a process of arteriosclerosis, as occurs during senility or decline of life. The carcinoma cannot grow as rapidly. The tumor also will react less powerfully to the rays. The radiosensitivity of cancer also depends on the structure of the growth. A carcinoma which is very rich in connective tissue is less easily influenced by the rays than one which consists principally of cells.

The indirect or systemic action of the radium rays may result from the splitting up of the cancer cells whereby a cell protein is liberated. This in turn is followed by a leukopenia. In patients in whom we observe a favorable reaction, this negative phase is followed by a leukocytosis and lymphocytosis. Could this fact not be construed as representing an increase in the protective powers of the host and thus explain the observation of Dr. Levin that a cessation of the growth of the tumor occurred, though apparently typical carcinoma cells were found in subsequent examinations?

DR. ALFRED WOELFEL, Chicago: In another section, in which a paper on the effect of radium was discussed, the statement was made that the effect on the pathogenesis depended on the malignancy being in a state of active mitosis, as I understood it; that no effect was to be expected from radium rays unless the cells were in a state of active mitosis or unless use was made of the caustic rays. Dr. Levin, however, explains the irradiation effect as consisting of an interruption of the proliferating power of the cells. I would like Dr. Levin to explain that a little more fully. I gather from his paper that he means that the action of the rays on the pathogenesis is not limited to the time in which the cells are in an actual state of mitosis.

DR. JAMES EWING, New York: I have often observed the condition which Dr. Levin presented and which others also have observed. I do not think, however, that any of us have wanted to commit ourselves to the view that the physical treatment of cancer can rest with the production of this state of suspended animation in cancer tissue. In practically all Roentgen-ray and radium clinics there are patients who are doing fairly well, but who still have obvious signs of the disease and whose tissue shows that the tumor cells are still in an excellent state of nutrition, and sometimes with a mitotic process going on. The disease is still there but the patient is doing very well. Yet their condition is very unsatisfactory, both to the surgeon and to the Roentgen-ray therapist.

The tendency is to do something more for these people and to attempt to destroy these cells, and the result in most instances is unfortunate. I am inclined to think that in the treatment of inoperable cases of advanced carcinoma by physical agents we shall have to come to the conclusion that all that can be expected is to bring the tumor to the state of suspended activity described by Dr. Levin; and if we can add to the duration of life by 10 per cent. of the present expectation, we shall have accomplished a great deal. It may be that physical therapy will have to leave to other methods the final solution of this problem.

As for the direct and indirect effects of physical agents, that is a matter in which there is a difference of opinion. Until we know a good deal more about the indirect effect of the rays, we had better trust to the direct effects.

DR. ISAAC LEVIN, New York: I need not reply to Dr. Schmitz's question, since Dr. Ewing has answered it. There is no direct proof of the existence of a secondary immunizing effect of the rays on the organism, and for the present we must accept only the direct action of the rays on the malignant tumor. The pathologic and clinical evidences of malignancy do not always coincide. A pathologist cannot decide from the microscopic appearance whether the specimen is derived from an ulcer rodens or an epithelioma of the lip. Clinically, on the other hand, the former is a comparatively benign condition, while epithelioma of the lip belongs to the most malignant types of cancer. The same is true of the case of melanotic cancer described in the paper; the condition surely lost its clinical malignancy since the treatment was initiated. Still the two specimens taken before and after treatment show an identical microscopic picture.

The comparative number of mitotic figures found in a microscopic specimen is also no direct indication of clinical malignancy. There are round cell sarcomas which show under the microscope a great many mitotic figures but which are clinically comparatively benign.

The first action of the rays on the cancer cells consists most probably in the inhibition of their proliferating power without any degeneration and actual destruction of the cell. The latter follows subsequently. It is true at the same time that when this stunning, as it were, of the cancer cell is not followed by its destruction, then it may ultimately recover, and a recurrence of the tumor will take place. The same process probably takes place when the tumor recurs twenty years after a radical operation.

OILED GAUZE AND THE ABSORBING POWER OF COTTON SPONGES*

TORALD SOLLMANN, M.D.
CLEVELAND

"Nonadhering surgical gauze" was introduced by H. E. Fisher.¹ It was prepared by saturating the gauze with a soft paraffin mixture made by the addition of petrolatum, lanolin or stearic acid to paraffin. Fisher asserts especially that the blocking of the fibers prevents matting with secretions and debris; that it prevents adherence of the gauze, and that the granulations of tissue repair are not injured when the dressing is removed.

While working on paraffin bandages, I became interested in the permeability of such bandages as influenced by various waxes and oily preparations. A series of gauzes of loose and close mesh were prepared by impregnating them with paraffins of different hardness, ranging from hard paraffin to liquid petrolatum.

As the result of experiments I find that "oiled gauze," that is, gauze that is impregnated with liquid petrolatum, holds out considerable promise of usefulness. Cotton sponges wrapped in this oiled gauze absorb viscid fluids very much better than when wrapped in plain gauze; the gauze is soft and pliable; it is easily prepared, and it can be sterilized by heat after impregnation.

In the course of the investigation a loose mesh cheesecloth and a close mesh muslin were compared;

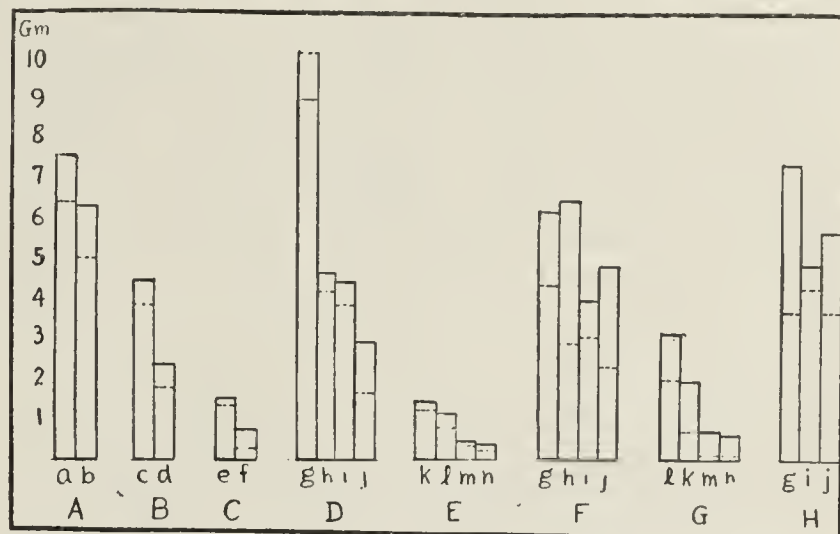
it was found that the former permits much better absorption. I also used a series of mixtures of paraffins² for impregnating the gauzes, but found that liquid petrolatum alone is superior. This oiled gauze is prepared by dipping the cloth into the liquid petrolatum and expressing out the excess.

The technic of making the absorption tests was as follows:

Sponges were prepared by wrapping 1 gm. of absorbent cotton in a piece of the gauze, 12 cm. square. Egg white and egg yolk were used to simulate wound discharges. The egg white or egg yolk was placed in a flat bottom pan, in a layer perhaps 2 to 3 mm. thick; and in this were placed the sponges, which had previously been weighed. The sponges were reweighed at intervals. The results are shown in detail in the chart.

The results of the experiments may be thus summarized:

1. Sponges made of compressed cotton³ absorb better than those made of loose cotton.
2. Sponges made with the cotton layers parallel to the surface absorb much better than those made with the layers vertical to the surface.



Absorption of fluid by sponges: The dotted line shows the grams of fluid absorbed in one hour, and the solid line that absorbed in twenty-four hours. A to E represent the absorption of undiluted egg white; F and G that of undiluted egg yolk, and H that of beaten egg. A, comparison of (a) compressed and (c) plain cotton, wrapped in cheesecloth; B, comparison of cotton applied (c) horizontally and (d) vertically; C, comparison of (e) cotton in muslin and (f) charcoal in muslin; the cotton, as in all these experiments, weighed 1 gm.; the charcoal pad contained 4 gm. of granular charcoal; D to H, comparison of treated and untreated gauze; (g) Stanolind cheesecloth; (h) 50 per cent. Stanolind cheesecloth; (i) plain cheesecloth; (j) Fisher cheesecloth; (k) plain muslin; (l) Stanolind muslin; (m) 50 per cent. Stanolind muslin; (n) Fisher muslin.

3. The sponges wrapped in loose mesh fabric absorb somewhat better than those wrapped in close mesh fabric.

4. Sponges filled with cotton absorb much better than those filled with powdered charcoal.

5. Sponges covered with gauze impregnated with liquid petrolatum absorb very much better than sponges covered with plain gauze.

6. Sponges covered with gauze impregnated with 50 per cent. liquid petrolatum are intermediate.

7. Sponges covered with gauze impregnated with Fisher's mixture do not absorb as well even as those covered with plain gauze.

8. The influence of oils, etc., on absorption is practically the same for loose mesh as close mesh gauze; and for egg albumin and egg yolk.

* From the Pharmacologic Laboratory of the Western Reserve University, School of Medicine.

* Partly supported by a grant from the Committee on Therapeutic Research of the Council on Pharmacy and Chemistry of the American Medical Association.

1. Fisher, H. E.: Nonadhering Surgical Gauze, *THE JOURNAL A. M. A.*, March 25, 1916, p. 939.

2. The following paraffins and oils were employed: hard paraffin (Parowax brand); 20 per cent. white petrolatum: paraffin (Parowax), 80 parts, white petrolatum, 20 parts (Fisher's formula); 1 per cent. naval pitch: preceding mixture with 1 per cent. naval pitch added; 50 per cent. liquid petrolatum: equal parts of paraffin (Parowax) and liquid petrolatum; liquid petrolatum (Stanolind liquid paraffin).

3. The finished sponge was compressed in an old style letter press.

The favorable influence of the oiled gauze is explained by the protection that the oil furnishes against swelling of the thread and obstruction of the mesh.

I have not yet had the opportunity of investigating whether it is as little adhesive as the Fisher preparations; but it is certainly more favorable to absorption, and I would therefore suggest its use for dressing moist wounds.

ECLAMPSIA AND LUMBAR PUNCTURE

J. W. SNYDER, M.D.

MICHIGAN CITY, IND.

At 1 a. m., April 23, 1917, I was called seven miles from town to see Mrs. W., aged 25, with her first child. Pains had begun at 4 p. m. the preceding afternoon, and at 11:30 she had a convulsion. By the time I reached her she had had four convulsions, and a fifth quickly followed. In the intervals she was delirious, tossing about the bed. Restraint was necessary to keep her on the bed at all. On hasty examination I found the cervix dilated and the head in left occipito-anterior presentation on the perineum; but the patient seemed to be unable to deliver the child, mainly because she made no intelligent effort to aid the labor pains. Being alone, except for the assistance of an excited husband and a grandmother who could not speak English, I gave the patient ether and made a forceps delivery. When the patient recovered I gave her $\frac{1}{2}$ grain of morphin, and as the convulsions were returning I ordered her removal to the city hospital, to which she was admitted at 4:30 a. m. On catheterization, 4 ounces of urine were obtained which tested over one-half albumin by volume, and also gave a decided reaction for diacetic acid. One thousand c.c. of physiologic sodium chlorid solution were given under the breast, followed in two hours by 1,000 c.c. of sterile water. Sodium bicarbonate and glucose solution were given by bowel. One-fourth grain of morphin and $\frac{1}{200}$ grain of scopolamin were administered by hypodermic injection and repeated in two hours. Two minims of croton oil were given on the tongue.

Four hours after admission, the temperature was 102, the pulse 108 and the respirations 34. Six convulsions had occurred in the four hours' time. In the next two hours there were four convulsions more severe than those that had occurred before. The temperature went up to 105.2 by axilla, the pulse was 130, and the respirations were 36. One three-hundredth grain of scopolamin and $\frac{1}{6}$ grain of morphin were given, and in the next hour three more convulsions occurred. At 11 o'clock the temperature was 106 by axilla, the respirations 34 and the pulse 140, very weak and irregular. The breathing was shallow and irregular, with considerable edema at the base of the lungs. The face was congested and cyanotic. As a last resort I did a spinal tap, not expecting any good, as I thought the patient would be dead inside of an hour. The spinal fluid did not seem to be under much increase of pressure, flowing slowly in drops and being perfectly clear. About 2 drams were removed and no more because I could see no reason to expect benefit from it. Before I left the room the appearance of the patient had changed. The face began to lose much of the congested appearance, and the respirations became more regular and deeper. Within one hour the temperature had fallen to 105, the respirations were 34, and the pulse was 112. No more convulsions occurred. At 2 p. m. the temperature was 103, the pulse 108, and the respirations 30, and 26 ounces of urine were removed by catheter.

From that time on the patient made a steady recovery. The temperature reached normal on the third day, and the patient recovered consciousness on the evening of that day. She had no recollection of labor or anything following. Sodium bicarbonate and glucose solution was continued by bowel for several days, and the bowels were thoroughly evacuated. The patient left the hospital, May 5, in good condition except for some necrosis at the point of giving hypodermoclysis.

This case may be only an accident, but I believe that in similar cases the procedure merits repetition. It is, of course, not a measure to remedy the toxemia, but only a means to control the convulsions. I have found a report by W. T. Wilson¹ regarding this procedure in two cases of eclampsia with beneficial results. Recently Musser and Hufford² reported a series in which lumbar puncture controlled the delirium of pneumonia. I believe the procedure is used also with advantage in the delirium of alcoholism and to control convulsions in meningitis.

THE TREATMENT OF EPIDEMIC POLIOMYELITIS WITH IMMUNE HORSE SERUM*

PRELIMINARY REPORT

E. C. ROSENOW, M.D.

ROCHESTER, MINN.

In a previous report,¹ it has been shown that the serum of a horse, which had been immunized with streptococci isolated from the central nervous system of monkeys paralyzed with virus, had the power to neutralize virus in vitro, and to prevent poliomyelitis in monkeys following intracerebral inoculation of active virus. Moreover, this serum appeared to have a curative effect in the experimental disease in monkeys after the symptoms had begun.

Opportunity to test the effect of this serum in patients presented itself during the present epidemic of anterior poliomyelitis at Davenport, Iowa, and surrounding community. The routine procedure consists of making a spinal puncture for diagnostic tests and for relief of abnormal intraspinal pressure, and of injecting the serum. From 5 to 30 c.c. of spinal fluid are allowed to escape, depending on the age of the patient and the amount of pressure. The fluid is made to flow slowly because it is believed that rapid withdrawal might be harmful. The cell count and Noguchi's globulin test are made at the bedside, and if positive, the injection of serum is given at once. The serum is activated with complement by adding one part of fresh guinea-pig serum to nine parts of the immune serum and incubating at 37 degrees for one hour. It is then diluted with equal parts of 0.85 per cent. salt solution. The diluted serum is injected slowly into a suitable superficial vein not later than thirty-six hours after activation. Approximately 2 c.c. of the mixture are injected per minute of time. The dose is varied according to the age of the patient and severity of the symptoms. Babies from about 1 to 2 years of age are given from 3 to 7 c.c. of serum at each injection, that is, 6 to 14 c.c. of the mixture; children from 2 to 5 years of age from 7 to 10 c.c., and older individuals from 10 to 20 c.c. The injections are repeated in from eight to twenty-four hours if necessary.

Every patient in whom the diagnosis is definite, and the disease still active, is given injections of serum irrespective of the severity of symptoms. Altogether forty-four patients have been treated. Of these nine died, a mortality of 20 per cent. Of the nine fatal

1. Wilson, W. T.: Lumbar Puncture for the Relief of Convulsions in Puerperal Eclampsia, *THE JOURNAL A. M. A.*, Sept. 2, 1916, p. 742.

2. Musser, J. H., Jr., and Hufford, H. K. B.: Lumbar Puncture for the Relief of Delirium in Lobar Pneumonia, *THE JOURNAL A. M. A.*, April 28, 1917, p. 1231.

* From the Mayo Foundation.

1. Rosenow, E. C.: The Production of an Antipoliomyelitis Serum in Horses, *THE JOURNAL A. M. A.*, July 28, 1917, p. 261.

cases, six were moribund, or in a dying condition from respiratory failure at the time the serum was given, and hence should not be included as treated cases. Of the thirty-eight patients in whom there was sufficient time for the serum to act, three died, a mortality of 8 per cent. One of these was a baby 11 months old, semi-comatose with spasms eight days after onset of the illness when the serum was first given. One, a boy 2 years old with cyanosis, marked tremors, high fever, severe gastro-enteritis and beginning respiratory paralysis on the second day at the time of the first injection; and one, a girl 11 years old, with high fever and paralysis of the face on the third day when the first dose of serum was given. Of these thirty-eight treated cases, twenty-two showed definite paralysis when the treatment was begun, and sixteen were in the preparalytic stage. Excepting the three fatal cases in the former group, paralysis appeared to be arrested in all but one, a boy 5 years of age, in whom a moderate paralysis developed in the left leg, the first injection of serum being given on the second day of the disease. All of the sixteen cases treated before paralysis had begun recovered without paralysis.

These results are in sharp contrast to the twenty-three untreated cases which occurred during this epidemic of which nine patients died, a mortality of 35 per cent.

The apparent good effects from the injection of serum are often striking. The headache, nervousness, restlessness and tremor often disappear promptly. The temperature and pulse rate are lowered. A beginning paralysis often disappears in an astonishingly short time. A rapidly progressing paralysis is often arrested and improvement is unusually rapid. The postparalytic pains do not appear or are comparatively mild. It is believed that the unactivated serum would do good, and that intraspinal injections might be given with benefit, but since the activated serum and intravenous injections have given the best results in monkeys, and are yielding such splendid results in patients, I have not felt justified in changing the method. Intravenous injections in this epidemic appear especially desirable because the gastro-intestinal symptoms are so pronounced.

It is, of course, realized that many more patients must be treated before conclusions can be drawn as to the exact value of this treatment. Of its harmlessness and apparent good effects, there can scarcely be any question. There is on hand enough serum to treat approximately 800 patients. Suitable quantities will be sent gratis on request to physicians or laboratories for reports of cases in localities where poliomyelitis now exists in epidemic form.

I wish here to express my very great appreciation for the courtesies extended me in the use of the Pathological Laboratory at Mercy Hospital, and of the splendid cooperation of the physicians making it possible to treat the disease in the early stages.

The Panama Canal in Switzerland.—At the meeting of the Zurich Medical Society, March 10, a lantern slide lecture on the Panama Canal was delivered by Lieutenant Lutz, who described the conquest of yellow fever and malaria, and the practical results at Panama. It is mentioned merely as an example of the internationalism of science, enthusiastic credit being paid to the Americans and to Finlay of Cuba, with comment on the inevitable failure of the French, at that stage of science, the Swiss audience, and the speaker an interned German officer.

SIMPLIFIED METHOD FOR THE PREPARATION OF CARREL-DAKIN SOLUTION

FREDERIC ROSENGARTEN

PHILADELPHIA

The preparation of neutral solution of chlorinated soda by the process described by Carrel and Dakin requires more or less chemical skill and equipment. With the proposed process nearly any one can prepare the solution without the use of chemical apparatus and within ten or fifteen minutes.

The materials and process for preparing the solution are:

1. Chlorinated soda solution, which should contain from 2.8 to 2.9 per cent. of available chlorin.

2. An approximately 5 per cent. aqueous solution of sodium bicarbonate.

3. Phenolphthalein powder.

Dilute 1 volume of the chlorinated soda solution with 5 volumes of water, add 25 c.c. of the sodium bicarbonate solution for every liter of chlorinated soda, and mix well. Now remove about 20 c.c. of the solution, add to it a small pinch of phenolphthalein, and shake gently for two minutes. If no red color appears, the solution is ready for use. Should a red color develop, add from 10 to 20 c.c. more of sodium bicarbonate to the solution, mix well, and test for free alkali with phenolphthalein as described above. Repeat the addition of sodium bicarbonate if necessary, until 20 c.c. of the solution show no red color when tested with phenolphthalein in the manner described above. A slight excess of sodium bicarbonate will probably not affect the quality of the solution.

The objection to the use of ordinary chlorinated soda solution for the treatment of wounds is that the solution almost invariably contains caustic alkali, which causes an irritation of the tissues. To overcome this, Carrel and Dakin use also sodium bicarbonate in the preparation of their solution, the sodium bicarbonate serving to neutralize any hydroxid present in the chlorinated lime. The same principle is applied in the proposed process, the only difference being that the sodium bicarbonate is added to the already prepared chlorinated soda solution. It is, however, this very difference that makes the preparation of the solution very easy because chlorinated soda solution of from 2.8 to 2.9 per cent. available chlorin is readily obtainable and keeps well when properly preserved; all that is necessary is to dilute the solution and neutralize it with sodium bicarbonate.

Since the solution prepared by the proposed process is *free of caustic alkali* and contains the same amount of available chlorin as that prepared by the Carrel-Dakin process, it is reasonable to expect that it will have the same therapeutic value.

Neither of the solutions will keep for a long time, but if we can judge from one comparative experiment carried out with each solution, the one prepared by the proposed process retains its value for a longer time than the solution prepared by the Dakin process. Thus while the latter solution containing, when prepared, 0.47 per cent. of available chlorin, showed only 0.41 per cent. at the expiration of two weeks, a solution prepared by the proposed process and also originally containing 0.47 per cent. of available chlorin still tested 0.44 per cent. after three weeks.

916 Parrish Street.

Military Medicine and Surgery

DICHLORAMIN-T IN THE TREATMENT OF THE WOUNDS OF WAR

JOSHUA E. SWEET, A.M., M.D.

Captain, Medical Reserve Corps, United States Army;
Surgeon, Base Hospital No. 10

FRANCE

It seems to be agreed that the chlorin compounds which have been derived from the old Labarraque's solution have given, in general, the best results in the treatment of the wounds of the present war.¹ I do not mean that equally good results have not been obtained by certain workers with hypertonic salt solution, or that equally good results have not been obtained by the proper utilization of the fundamental surgical principle of drainage, without the use of any antiseptic or lymphagogue whatever.

These chlorin-containing solutions, variously known as eusol,² Dakin's solution and Daufresne's solution, have suffered from two serious faults. They are not particularly stable, and must be prepared with care. Further, these solutions contain so little antiseptic value that they must be frequently renewed in the wound.

The latter fault has been overcome by the methods which have been devised for frequent renewal of the antiseptic solution, as often as may be necessary, without disturbing the entire wound dressing. The best known of these methods is the Carrel tube. It should be emphasized that the Carrel tube is not a surgical method in itself; it is not the essence of wound treatment; a few Carrel tubes placed in a wound will not heal the wound; the tubes must be used to convey the antiseptic frequently to the recesses of the wound. I mention this because it has seemed as though some surgeon had not quite grasped the point.

It is further quite certain that the use of the Carrel tube has led many surgeons far away from the surgical principle of free, dependent drainage, a principle established by centuries of surgical experience. Therefore we constantly find wounds constructed by the surgeon in direct opposition to the laws of gravity and surgery, wounds which do not heal kindly even when "puddled," but which would have healed of themselves if they had been given wide dependent drainage.

These facts were perfectly clear to Dakin's mind and led him to seek for a more effective chlorin compound, a compound which should contain enough available chlorin to suffice for a period of at least twenty-four hours, and which should be nontoxic and non-irritating. The first result of this study was chlormin-T

(toluene-para-sulphon-sodium-chloramin) and later dichloramin-T (toluene-para-sulphon-dichloramin).³

Dr. Dakin asked Dr. Walter E. Lee, of the Pennsylvania Hospital of Philadelphia, and me to test the surgical value of the new preparation. Our solutions were first prepared by Dr. Byron M. Hendrix of the Department of Physiological Chemistry of the University of Pennsylvania, following Dr. Dakin's instructions, and later, by the Henry Phipps Institute of Philadelphia, through the courtesy of Dr. Paul A. Lewis of the institute. Our preliminary results have been reported,⁴ but it has been my good fortune, with the United States Army Base Hospital No. 10, to test the effect of the new preparation on war wounds in a British general hospital in France. Our results with these wounds bear out our first report in every particular and further emphasize certain features of the method.

There are more things to be considered in the treatment of war wounds than the direct effect of the treatment on the wounds themselves, that is, if two methods give equally good results in wound healing, but the one method is less painful, and effects a marked saving of time, labor and material, then the second method far surpasses the first.

It seems almost useless to me to discuss at any great length the results in regard to the wounds themselves, because probably equally good results can be obtained by the proper use of any method, so far as final wound healing is concerned; and further, surgeons are so constituted that they do not believe any other surgeon's results, anyway, until they have tested his methods for themselves — doubtless a most praiseworthy attitude of mind in a profession in which new suggestions for old and tried methods are rather numerous.

We have treated some eighty patients with Dakin's dichloramin-T; some have been old cases with foreign bodies lying in the bone, and suppuration did not stop until the foreign body was removed. Fresh cases in which the casualty clearing station has left us enough integument to permit it have been treated with dichloramin once and immediately closed and have healed by secondary intention. Sixteen cases, old and fresh, were cultured after treatment with dichloramin-T for varying periods, of which eleven gave no growth whatever; of the five in which a growth appeared, four were old cases of deep bone involvement; the only growth was the *Staphylococcus aureus* in four cases and in one case the pyocyanus.

The wounds fill rapidly with granulation tissue of healthy color which exhibits no tendency to exuberant growth and no tendency to become water soaked and indolent; the skin edges grow in very rapidly.

These results are no different from those which can be obtained by other methods, and no one would believe them if they were any better. Let me say, therefore, that the surgeons of the unit are agreed that the wounds treated by dichloramin-T are in every way as satisfactory as they have ever seen under any method; and two of our surgeons have had previous experience in France, while all are surgeons of long experience in civil practice.

1. Makins, G. H.: Brit. Med. Jour., 1917, 1, 789. Dakin, H. D.: Ibid., 1917, 1, 833.

2. "Eusol" is a contraction of "Edinburgh University Solution." This is the acid hypochlorite solution advocated by Lorrain Smith. Quoting Useful Drugs, Edition 2, page 44: "The acid solution (Lorrain Smith's) may be prepared by shaking 12.5 gm. of chlorinated lime and 12.5 gm. powdered boric acid with 1 liter of water, allowing the mixture to stand for some hours, and filtering. The neutral solution (Carrel-Dakin's) is made by dissolving 14 gm. of anhydrous sodium carbonate in 1 liter of water, adding 20 gm. of chlorinated lime, shaking the mixture, after half an hour siphoning off the supernatant fluid from the precipitated calcium carbonate, filtering and neutralizing by adding boric acid (usually 2.5 to 4 gm.) until a drop of the solution does not redden a few drops of phenolphthalein solution. The alkaline preparation of hypochlorites is represented by the solution of chlorinated soda U. S. P. described below. Unless strongly alkaline, solutions of hypochlorites decompose rapidly."

3. For a description of the method of preparation of the dichloramin-T and the chlorinated oils, see Dunham, E. K., and Dakin, H. D.: Brit. Med. Jour., 1917, 1, 865. Dakin, H. D.; Lee, W. E.; Sweet, J. E.; Hendrix, B. M., and Le Conte, R. G.: A Report of the Use of Dichloramin-T (Toluene-Parasulphondichloramin) in the Treatment of Infected Wounds, THE JOURNAL A. M. A., July 7, 1917, p. 27.

4. Dakin et al., Footnote 3.

The results along other lines are capable of more definite demonstration, and it is on these that I would lay the most emphasis.

This new dichloramin solution is made by dissolving the crystals of dichloramin-T in chlorinated eucalyptol and then diluting this solution by the addition of chlorinated paraffin oil. It is best applied by an oil spray, an ordinary hard rubber or all glass atomizer being the most practical method. Metal atomizers are not suitable, since the metal is attacked by the chlorin.

This oily solution presents the first great advantage—the dressings do not stick to the wound, and the entire act of dressing is relatively painless.

The gauze does not have to be separated from the granulations by soaking with some liquid or other. It is therefore not even necessary in the average wound to place a waterproof protective covering over the bed linen while dressing, and the necessity of moving the part or the patient is obviated. The old dressing is simply lifted off, and the wound sprayed; the force of the spray will dislodge sloughs, and the wound is covered with a fresh dressing.

It is perfectly evident that a very important saving of time results from this simplicity of dressing. One surgeon has repeatedly dressed thirty wounds in ninety minutes, an average of three minutes to each dressing. These figures and the figures to be given later refer to the acute wards, in which the patients are all bed patients.

The solution contains enough available antiseptic so that one dressing every twenty-four hours is ample for large, deep wounds, and one dressing every forty-eight or seventy-two hours is enough for the simple or more superficial wounds. Since the solution contains so much available chlorin and does not have to be renewed every few hours, the use of the Carrel tube is entirely done away with. The oily solution of dichloramin-T creeps into all the wound crevices and corners, and it can be readily introduced into sinuses by means of a cotton swab dipped into the solution.

TABLE 1.—COMPARATIVE USE OF MATERIAL, JULY 5, 1917

Wards	Gauze, 6-yd. Rolls	Cotton, 1-yd. Rolls	Treatment	No. of Patients
1	12	2.5	Eusol	23
2	10	4	Eusol	22
3	3.5	2.5	Dichloramin-T	23
4	6	2.5	Eusol	25

The amount of this new solution needed for wound dressing should be emphasized. At first thought it would seem that a solution containing oil of eucalyptus and liquid petrolatum would be far too expensive for general use in comparison with eusol. Forty-two wounds were dressed by one surgeon with 35 c.c.; another surgeon dressed 154 wounds with 115 c.c. These figures apply to the acute wards, and include many compound fractures and extensive buttock and thigh wounds. The fact that so little fluid has to be used and that therefore only the wound discharge has to be cared for results in a tremendous saving of gauze and cotton. In Table 1 are given the results of a comparison of the amounts of gauze and cotton used during different periods in the four acute surgical wards of the hospital. Each ward is in charge of surgeons of equal skill and all trained in the same hospital; the nurses are also all graduates of the same hospital training school; in other words, the comparison is not between workers trained in different schools of surgical technic.

Table 2 gives the amount of gauze and cotton used in seven days in three of the acute surgical wards. Ward 2 changed during this period from the use of eusol to the use of dichloramin-T; the figures from this ward are therefore not available. The number of patients was the same in the three wards and the proportion of relatively slight and extensive wounds in each ward was the same.

This saving of material is of importance in several ways. It effects not only a saving of labor from the cotton field to the hospital, a saving of transport, but also an important saving in the hospital itself; the time taken by the nurses in the preparation and sterilization of material can be utilized for the care of the patients, and to this can be added the saving in time, labor and material by doing away entirely with the need for the Carrel tubes.

TABLE 2.—COMPARATIVE USE OF MATERIALS, JULY 4, TO JULY 10, 1917, INCLUSIVE

Ward	Gauze, 6-yd. Rolls	Cotton, 1-yd. Rolls	Treatment
1	72	38.5	Eusol
3	33	7	Dichloramin-T
4	45	18	Eusol

The need for so little solution in wound dressing and the fact that the dressing need be sufficient only to care for the wound discharge means that the bed linen is not wet, with a consequent saving in the moving of the wounded and an increase in their comfort and well being.

The dichloramin-T solution, like all the other chlorin compounds, is a very active lymphagogue in fresh wounds, and the amount of wound excretion may be considerable. The lymphagogic effect may be directly watched in suitable wounds. As granulation tissue develops, the lymph discharge greatly decreases until the wound becomes comparatively dry. The dichloramin-T also possesses to a marked degree the characteristic power of the chlorin solutions in aiding the digestion and removal of necrotic, sloughing tissues. The new solution seems more effective in cleaning up sloughing tissue than the older chlorin compounds. While the majority of our cases come from the casualty clearing station in excellent, clean condition, a sufficient number have reached us with necrotic tissue in the wound amply to satisfy us of the rapidity with which the dead tissue is freed under the dichloramin-T. The tendency to secondary hemorrhage is certainly not increased. We have had but one secondary hemorrhage in the series, which includes a number of deep buttock wounds, and cases of exposed great arteries of the arm and leg.

The solution is not irritating to the skin or mucous membrane, except possibly in the rare individual who possesses an idiosyncrasy to the eucalyptus oil. Such individuals have been reported in dermatologic literature. Among the patients treated here we have encountered only one dermatitis; but since the dermatitis did not develop until after two weeks' use of the solution and was accompanied by high temperature, it is not clear whether it should be ascribed to the oil or to the well known action of wound excretion.

The constituents of the solution are stable, although the final combination is not indefinitely stable, nor can it be exposed to strong light. It is easily prepared from the constituents. The dichloramin-T which I have was put up in packages of 10 gm. each; the content of one package is dissolved in 75 c.c. of chlorinated eucalyptol and diluted with equal parts of chlorinated paraffin oil as needed, making,

therefore, approximately a 6.5 per cent. solution of dichloramin-T.

The first application of the solution to a fresh wound produces a smarting or burning sensation, which passes away in a very few minutes; in some individuals this seems quite severe, but I have yet to see the patient who does not prefer this slight smarting to the real pain of removing a wet dressing which has dried around the edge of the wound. After the second or third application the smarting sensation on applying the solution seems to have disappeared.

Since the time to treat an infection is before the infection starts, it is hoped that the dichloramin-T solution can be given an early trial at the field ambulance and casualty clearing stations.

CONCLUSIONS

Dakin's dichloramin-T in solution in eucalyptol and paraffin oil is therefore of great advantage in wound treatment, even if the final results in wound healing were no better, because:

1. It saves the pain of wound dressing.
2. It effects an appreciable saving of dressing material.
3. The amount of solution is of small bulk.
4. The number of wounds which a surgeon can dress in a given time is far greater than by any other method.
5. The elimination of the Carrel tube simplifies the dressing and the problem of transportation of the wounded.
6. The elimination of the Carrel tube saves the time taken by the nurse for the periodic flushing.

EQUILIBRIUM TESTS FOR AVIATION RECRUITS

CHARLES P. SMALL, M.D.
CHICAGO

Because of the unusual conditions confronted by the aviator, the physical examination of candidates for this branch of the government service is more rigid than for any other branch. Among the most important tests are those for determining the sense of equilibrium. The Bárány rotating chair, or the Jones modification of the chair is used (Fig. 1).

THE BÁRÁNY CHAIR

The essential factors in the construction of the chair are a foot-rest to allow the person examined to be revolved freely with his feet resting on the foot-rest, a few inches above the floor; a head-rest to hold the head firmly at the desired angle; a stop catch by which the examiner by pressing with his foot can instantly bring the rotating chair to a stop; and a long arm extending upward behind the chair at a slight angle, by means of which the examiner is able to rotate the chair easily. Before making the tests it is well to have the applicant's ears examined to see that there is no impacted wax in the external auditory canals, also to ascertain the condition of the eustachian tubes, that is, whether or not they are patulous. Applicants are advised to eat a very light luncheon before having this examination, as nausea and vomiting occasionally follow the test.

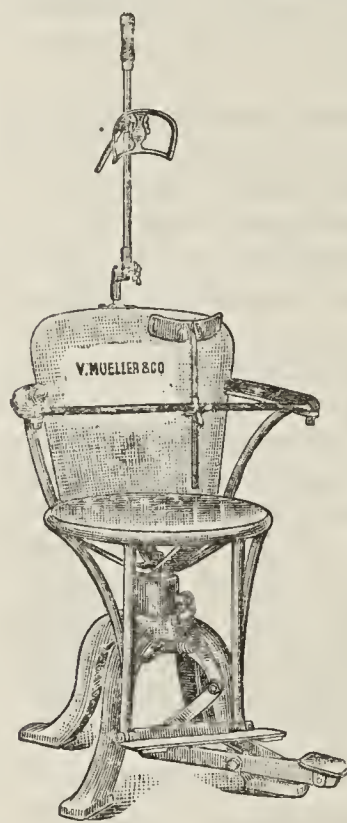
METHOD OF EXAMINATION

The examiner is provided with a stop-watch. The applicant sits with eyes closed and his feet on the

foot-rest; his head is against the head-rest tilted at an angle of about 30 degrees. The chair is rotated ten complete revolutions toward the right in exactly 20 seconds. The chair is then brought to a sudden stop and the applicant is told to open his eyes and look straight in front of him at some distant object. If his horizontal canals are functioning normally, there will be a lateral nystagmus, to the left, continuing for about 25 seconds, although a variation of 10 seconds below or beyond this time is allowable. The process is then repeated, turning the chair this time to the left, which will produce a nystagmus to the right.

THE POINTING TEST

The "pointing test" is next made, as follows: The examiner stands directly in front of the chair, and the applicant sitting erect with his eyes blindfolded is told to extend his right arm directly in front of him and with his forefinger touching the finger of the examiner held at that point. The applicant is now told to raise his arm above his head and quickly bring it down again to exactly the same spot, that is, to touch the examiner's finger when he brings his arm down. He is then made to do the same thing with his left arm.



The Bárány chair

The applicant now assumes an easy position with his arms resting on the arms of the chair; the chair is rotated rapidly to the right, ten times in 10 seconds. The instant the chair is brought to a stop, the examiner again holds his finger in contact with the applicant's right forefinger directly in front of him, and the applicant is again told to raise his arm and quickly bring it down to touch the examiner's finger. In the normal condition the applicant will not touch the finger, but will "past point" several inches to the right of it. On repeating the movement he will again point to the right and usually even on the third attempt. Any further repetitions of the movement should show a restoration of the normal equilibrium, and the finger drop in the right direction. The test is then repeated, rotating the chair this time to the left, when the finger should "past point" to the left in the same way. The "falling test" is now made, to ascertain the condition of the vertical canals. The applicant bends his body forward at an angle of 90 degrees, his eyes still blindfolded, and his head resting on his fists held on his knees. The chair is rotated rapidly toward the right, ten times in 10 seconds. The instant it is brought to a stop the applicant is told to sit straight up. If normal he will fall toward the right side. Assuming the same bent position again, he is rotated toward the left in the same way, and on attempting to sit up straight, he will fall to the left side. The rotation method is now used exclusively in examining the sense of equilibrium, having superseded the caloric method as being more rapid, easier in application and more exact in determining the integrity of the entire vestibular function.

25 East Washington Street.

PROMPT REMOVAL OF FOREIGN
BODIES IN GUNSHOT
WOUNDS

ARGUMENTS IN FAVOR

KELLOGG SPEED, M.D.

Major, Medical Reserve Corps, United States Army

FRANCE

Coming back into the field of military surgery after an absence of several months, during which interval the lessons of experience have matured, I feel compelled to make an academic statement concerning early removal of foreign bodies in many gunshot wounds. In the service of the British expeditionary forces during 1916 I had the opportunity of caring for thousands of wounded men. This year, returning to the same field in the service of our own United States, and having earned the right, in part, to make general observations, the advantage of early foreign body removal strikes me most forcibly.

With the advancement of the stress of war, the increase of its countless thousands of wounded men and the refinement of efficiency and cruelty of gunfire, the services rendered by the medical corps have progressed favorably. By that I mean not so much the efficiency of individual medical officers, nor the far-seeing arrangements of general officers governing corps movements, as I do the application of simpler methods, the multiplication of excellently equipped casualty clearing stations near the line and the more active immediate treatment by qualified surgeons.

In the first eighteen months of the war, although stupendous efforts at organization of the various medical corps were put forth, and although the results were correspondingly satisfactory, the general outcome fell short of the idealism of surgical work. It was of necessity so. Medical men had to become accustomed to the work in hand, weigh it in the light of their previous experience, and observe results after many months and months of waiting. That period passed with a lower mortality and a happier general result than any other great war has shown. New infections were encountered and studied, and their untoward results checked. Tetanus was quite firmly controlled in spite of its all-pervading possibilities in trench war.

If methods have improved, if such dreaded infections as gas gangrene are known, if tetanus can be controlled, may we not look to even better results by considering the larger problems of the medical service? Laying aside sanitation, sick men and medical disease, and dealing with wounded men and their recovery, what have we to consider? First, there is the method of gathering up the wounded, and their transportation to comfort and medical aid; secondly, the nearness of high surgical aid and its character, and lastly, the transportation to bases and home lands of the seriously wounded, and return to the firing line as soon as possible of the largest percentage of men for continued service.

When one comes to observe the expanded system of care, comfort and transportation of the wounded from the battlefield, one cannot fail to feel a deep and respectful admiration for its thoroughness. At present it is about the last word on the subject. The expansion of close lying casualty clearing stations, both in number and in capacity, with the personnel better qualified to perform rapid, clean, conservative

war surgery, leads me to the points I wish to elaborate, under the second and last heading mentioned.

With the equipment now at hand, it seems best to remove nearly all foreign bodies remaining in the tissues after gunshot as soon as conservatively possible. No discussion is entered into here about subsequent treatment, methods of irrigation, drainage tubes, bismuth iodoform petrolatum paste,¹ or types of dressings. Why should this prompt method be advocated and what are its limits?

It is commonly known that some foreign bodies, especially small ones, will remain in well vascularized, tissues, become encapsulated and cause no harm. That is a fact. On the other hand, take a half million instances of gunshot wounds. Without being able to give any reliable statistics, one may believe that a large proportion of them go on to suppuration, to indications for removal of the foreign body for that reason alone, or for pain or functional interference.

Suppuration, drainage, convalescence, late secondary operations after return to service, with all the handling and expense incident thereto, are a drag on resources. Could not an appreciable portion of this outlay be curtailed by prompt removal of foreign bodies? Because wounded men are rapidly conveyed to casualty clearing stations, there foreign bodies should be removed — with restrictions — so that the wounded may then, within a few hours for the most part, be on the first step to recovery. If suppuration follows, its course is shorter — the foreign body is out. There is far less likelihood of serious gas or other infection. More lives are saved. Time, dressings, the number of the medical corps assistants, transportation expense and home hospitals are curtailed, and a larger proportion of wounded men can be retained near the active field forces and sent back without home travel. One need only enumerate various complications which might be partly obviated. Long draining, secondary sinuses from tissues — foreign bodies lying within — secondary hemorrhages, and finally the psychologic effect on men who carry in their bodies these retained pieces of metal are avoided.

Let me cite some of the incidents of a day's work:

The first man had been shot sixteen months before, a small piece of shell entering the anterior aspect of the thigh. The foreign body had been located by means of the Roentgen ray, and was known to be present; but because it lay deeply near the femur and was small, causing no suppuration, removal was never attempted. The patient had worried so much about this that he finally had to be sent down to the base, complaining of great pain in the foot and the leg. I removed the body, cleanly encapsulated just in front of the femur. Great satisfaction and relief of all symptoms followed.

A second man was shot through the deltoid region. He had no marked symptoms, no bone, blood vessel or nerve injury, and was immediately sent on to the base with a dressing. In twenty-four hours a gas infection developed, and in spite of amputation, death followed quickly. Possibly extraction and drainage at the time of reception in the casualty clearing station would have saved his life.

Another instance of gunshot penetration of the knee joint may be cited. It had a small wound of entrance. Exploration arthrotomy was performed as soon as the patient was received. The joint was found transversed, was washed out with saline solution, and after removal of the foreign body the synovial membrane was closed snugly. The external wound was trimmed and sutured, and a small drain inserted

1. This is a paste much in vogue at the present time for smearing into wounds, followed by tight closure. It is sometimes referred to in English literature as bismuth iodoform paraffin paste, or B. I. P. P. Hence "bipp" and the verb "bipped."

to the closed capsule. Splint and extension were applied. Recovery followed with a useful knee joint.

Why should not all gunshot wounds be thus treated? Some cannot be, of course. Loss of blood, shock, anatomic inaccessibility, and perhaps a rush of work forbid. The first three named reasons may be adequate—the last not.

In all instances of gunshot injury with retained sizable missiles except those to be classed with complications of loss of blood, shock (anesthetic contraindication) and anatomic inaccessibility, it is suggested, because of the reasons outlined, that prompt removal be adopted.

THE VENEREAL DISEASES

BALANITIS GANGRENOSA

EROSIVE OR GANGRENOUS BALANITIS

(Continued from page 1005)

NOTE.—This is the third of a series of four articles on the management of venereal diseases with special reference to military practice. The first article on "The Diagnosis and Treatment of Syphilis" appeared September 15, p. 907. The second article on "Chancroid" appeared September 22, p. 1004. The articles have been prepared under the direction of the Surgeon-General by the Advisory Committee on Venereal Diseases, Dr. William Allen Pusey, Chicago, chairman; Dr. Francis R. Hagner, Washington, D. C.; Dr. Grover W. Wende, Buffalo, Dr. Sigmund Pollitzer, New York, and Dr. Henry H. Morton, Brooklyn, with Lieut.-Col. F. F. Russell in charge of Infectious Diseases. The series is published with the permission of the Surgeon-General, and will include the following: Treatment of Syphilis; Chancroid; Balanitis Gangrenosa; Acute and Chronic Gonorrhea, with its complications. The complete series will be issued in the form of a manual.—ED.

In connection with chancroid attention is called to this venereal infection, which while rare is important, because of its destructive course, if unrecognized and treated as chancroid.

Balanitis gangrenosa begins as small whitish patches of superficial ulceration which are situated either in the coronary sulcus or on adjacent parts of the glans or prepuce. These excoriations increase in size and produce superficial, small, round ulcers which from coalescence form larger circinate ulcers. These ulcers are covered by a closely adherent necrotic pellicle, and are surrounded by an inflammatory border. The base of the ulcer bleeds readily when the pellicle is detached. The disease invariably occurs under a long prepuce, and when the process becomes well established the prepuce becomes edematous and phimosis usually occurs. There is a free discharge of very offensive thin, yellowish or brownish pus. This superficial form of the disease may get well spontaneously or as the result of treatment, but it is likely to develop into the gangrenous form. An intense edema of the penis develops and a black slough forms in the affected area. If the ulcer is situated on the prepuce, the dark area becomes visible from without. The slough perforates the prepuce and the glans often projects through the opening thus made. If the ulcer is on the glans itself, rapid destruction of it takes place. The whole glans may be destroyed in a few days. Following this, the gangrene spreads to the shaft of the penis, and partial or complete amputation may result. With the gangrenous form the discharge is yellowish or brownish, and is more offensive than in the less severe affection.

In both the erosive and gangrenous forms there is lymphangitis and enlargement of the inguinal glands, but, unlike the course of chancroid, the glands do not suppurate. In both erosive and gangrenous balanitis

the parts are extremely tender. Urination is not painful unless the phimosis is such that, in urinating, the urine is dammed back and distends the prepuce.

In erosive balanitis systemic symptoms are trivial or absent. In the gangrenous form there is some sepsis, but in view of the intensity of the infective process it is usually comparatively slight. The patients are indisposed and have slight fever. Occasionally the symptoms are acute, with the temperature reaching 103 or 104 degrees.

ETIOLOGY

The disease is an infection caused by a symbiosis of organisms identical with those found in Vincent's angina and noma. Matzenauer contends that the same infection also produces hospital gangrene. Tunncliffe, from her studies of Vincent's angina, believes that the spirillum and the vibrio are different forms of the same organism, and that the infection is not a symbiosis, but is due to one organism which under different conditions shows different forms.

The vibriones occur as curved rods with pointed ends, and are about 2 microns long and 0.8 of a micron in diameter. They stain with most dyes and are gram-positive if decolorization is carefully done with 70 per cent. alcohol. The spirilla have loose, wavy spirals, and are 6 to 30 microns long, and 0.2 of a micron broad. They travel rapidly by quick back and forward snake-like motions. They are gram-negative, stain with most dyes, but are best examined under the dark field illuminator. The vibriones may be cultivated on serum agar. They are anaerobic, and in the lesions occur abundantly in the deeper part of the necrotic tissue. The spirilla are less abundant and are found more superficially in the lesions. Both are demonstrable in the tissues of the lesion, in the neighboring affected glands, and in the blood vessels.

The organism in the spirillar form occurs as a saprophyte in the mouth. It is only pathogenic when vibriones are also present and under anaerobic conditions, or under conditions of greatly lowered resistance. On the penis it only causes infection when protected from the air by a long prepuce. The infection of the penis is believed to occur from saliva. The affection is a disease of the vagabond class, and it is not extremely rare in public venereal clinics.

DIAGNOSIS

The most characteristic features of the affections are: the presence at or near the corona of the erosive or gangrenous lesions; the peculiarly bad-smelling purulent discharge; the occurrence under a long foreskin; and the presence in the secretion of vibriones and spirilla. In the severe gangrenous cases the rapidly spreading gangrene is very characteristic. The lesions are usually mistaken for chancroids. In balanitis gangrenosa there is a more intense inflammatory reaction, more edema of the prepuce, and more marked phimosis than in chancroid. The indolent glands are enlarged, painless, and do not suppurate as they almost invariably do in chancroid under a long prepuce. In chancroid, vibriones and spirilla are absent.

The lesions do not resemble an uncontaminated chancre, but, as in chancroid, a mixed infection with syphilis may occur and be entirely masked. In the case of mixed infection, the *Spirochaeta pallida* can also be demonstrated in the secretion.

Early diagnosis is of great importance, for a delay in proper treatment for a few hours may mean extensive spread of gangrene.

TREATMENT

The essential fact in the treatment of the condition is to expose the lesions so that oxygen can reach them. Otherwise their spread cannot be controlled. The prepuce should be opened by a dorsal slit, so that the glans is completely uncovered. Then the parts should be kept clean by washing with dilute hydrogen peroxid solution. The best procedure is to keep the parts continually moist either with wet dressings or by continuous irrigation with dilute hydrogen peroxid solution. If this cannot be used, the parts should be frequently irrigated with a bland antiseptic solution and left exposed to the air without dressings. With the use of 2 per cent. hydrogen peroxid solution healing is rapid.

(To be continued)

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, SECRETARY.

DICHLORAMINE-T, ABBOTT.—Paratoluenesulphonedichloramide.— $\text{CH}_3\text{C}_6\text{H}_4\text{SO}_2\text{NCl}_2$.—The dichloramide of paratoluenesulphonic acid, $\text{CH}_3\text{C}_6\text{H}_4\text{SO}_2\text{OH}$.

Actions and Uses.—Dichloramine-T, Abbott is said to be a powerful germicide, acting much like the monochloramine chlorazene, but capable of being used in solution in eucalyptol and liquid petrolatum, thus insuring a gradual and sustained antiseptic action. As in the case of chlorazene, dichloramine-T, Abbott is said to act essentially like the hypochlorites, but to be less irritating to tissues. Dichloramine-T, Abbott should not be administered internally.

Dichloramine-T, Abbott is claimed to be useful in the prevention and treatment of diseases of the nose and throat; it has been used with success as an application to wounds.

Dosage.—Dichloramine-T, Abbott, dissolved in chlorinated eucalyptol-Dakin and chlorinated paraffin oil-Dakin (which see), is used in concentrations of 2 to 10 per cent. When used as a spray a 10 per cent. solution of dichloramine-T, Abbott, in chlorinated eucalyptol-Dakin, is mixed with four times its volume of chlorinated paraffin oil-Dakin. For application to infected wounds a 10 to 15 per cent. solution of dichloramine-T, Abbott, in chlorinated eucalyptol-Dakin, is mixed with one-half to twice its volume of chlorinated paraffin oil-Dakin. (The solution of dichloramine-T, Abbott in eucalyptol is fairly stable, but the dilutions of this with chlorinated paraffin oil-Dakin should be prepared freshly when wanted.)

Manufactured by the Abbott Laboratories, Chicago. No U. S. patent or trademark.

Paratoluenesulphonedichloramide was introduced into medicine by H. D. Dakin and co-workers under the name "Dichloramine-T." It is prepared by chlorinating paratoluenesulphoneamide with subsequent purification (JOURNAL A. M. A., July 7, 1917, p. 27).

Dichloramine-T, Abbott is a pale yellowish crystalline powder, having a strong chlorous odor. It melts at 78 to 83 C. It is insoluble in water, soluble in chloroform and benzene, soluble with difficulty in petroleum ether, slightly soluble in liquid petrolatum and soluble in eucalyptol.

Strong mineral acids liberate chlorine from dichloramine-T, Abbott. It reacts with most substances, such as acids, alcohol, hydrogen peroxide, amines, certain metals, etc. It liberates bromine from bromides and iodine from iodides in neutral solutions.

If 15 Cc. of a saturated aqueous solution of anilin is treated with 0.05 Gm. of dichloramine-T, Abbott, the solution acquires a brownish color, which becomes deep blue upon supersaturation with ammonia water.

Two Gm. of dichloramine-T, Abbott are treated with 10 to 15 Cc. of concentrated hydrochloric acid and heated to dryness. The residue is dissolved in a mixture of 1 part alcohol to 1 part water, and an excess of sodium carbonate added. The alcohol is removed by evaporation, and the cooled solution (with considerable insoluble material) is placed in a separating funnel and shaken with chloroform. The chloroform is drawn off, evaporated, the residue dissolved in smallest amount of cold chloroform, and then treated with an excess of petroleum ether. A white precipitate is formed, which, after drying, melts at 134 to 136 C. (Pure paratoluenesulphoneamide melts at 137 C.)

If 0.1 Gm. of dichloramine-T, Abbott is treated with a few drops of sulphuric acid, chlorine is evolved but no blackening occurs (readily carbonizable matter).

One Gm. of potassium iodide is dissolved in about 20 Cc. of glacial acetic acid, and any iodine set free is reduced by the careful addition of sodium thiosulphate solution. About 0.1 Gm. of dichloramine-T, Abbott (accurately weighed) is then added and titrated with tenth-normal volumetric sodium thiosulphate solution. The available chlorine content should not be higher than 31 per cent. or lower than 28 per cent. Each Cc. of thiosulphate solution is equivalent to 0.0177 Gm. of chlorine.

CHLORINATED EUCALYPTOL-DAKIN.—Eucalyptol, chlorinated at ordinary (room) temperature.

Actions and Uses.—Chlorinated eucalyptol-Dakin is used as a solvent for dichloramine-T.

Dosage.—Solutions of dichloramine-T in chlorinated eucalyptol-Dakin should preferably be made as required and without the use of heat. If kept in the dark, stock solutions may be used for thirty days.

Prepared by the Abbott Laboratories, Chicago. No U. S. patent or trademark.

Eucalyptol is treated with potassium chlorate and strong hydrochloric acid. After standing twelve hours at room temperature, the eucalyptol is washed, first with water and then with sodium carbonate solution. Dry sodium carbonate is then added to the chlorinated eucalyptol and this allowed to stand for twenty-four hours. The chlorinated eucalyptol is filtered and dried by addition of calcium chloride (JOUR. A. M. A., July 7, 1917).

Chlorinated eucalyptol has the color and odor of eucalyptol.

CHLORINATED PARAFFIN OIL-DAKIN.—Liquid petrolatum, chlorinated at ordinary (room) temperature.

Actions and Uses.—Chlorinated paraffin oil-Dakin is used as a diluent for solutions of dichloramine-T, in chlorinated eucalyptol-Dakin.

Dosage.—Solutions of dichloramine-T in chlorinated eucalyptol-Dakin and chlorinated paraffin oil-Dakin are unstable, and should not be over four days old. In any instance they should be discarded as soon as a distinct precipitate appears.

Prepared by the Abbott Laboratories, Chicago. No U. S. patent or trademark.

Liquid petrolatum is treated at room temperature with potassium chlorate and strong hydrochloric acid, exposed to bright day light and allowed to stand over night. The chlorinated product is then washed with water, sodium carbonate solution and the oil drawn off, shaken with calcium chloride and charcoal and filtered (JOUR. A. M. A., July 7, 1917).

Chlorinated paraffin oil-Dakin has the general physical properties of liquid petrolatum.

HYCLORITE.—A solution of chlorinated soda, each 100 Gm. of which is stated to contain sodium hypochlorite 4.05 Gm., sodium chloride 3.20 Gm., calcium hydroxide 0.25 Gm., inert salts 0.92 Gm. It contains not less than 3.85 per cent. available chlorine.

Actions and Uses.—Hyclorite has the action and uses of solution of chlorinated soda, U. S. P., but its available chlorine content is greater. One volume of hyclorite diluted with 7 volumes of water has the same available chlorine content as neutral solution of chlorinated soda, and is isotonic.

Dosage.—Hyclorite is used full strength or diluted with 1 or 2 parts of water for direct application to mucous membrane, muscular tissue, bone infections, etc. For irrigation of wounds, throat and body cavities dilutions of 1:100 to 1:1,000 are used. For use in the irrigation method of treating infected wounds dilute 1 part of hyclorite with 7 parts of water.

The available chlorine content of hyclorite decreases at the rate of about 12 per cent. per year. In order that due allowance for this decrease may be made when diluting for use, each bottle of hyclorite bears the date of bottling.

Manufactured by the General Laboratories, Madison, Wis. No U. S. patent. U. S. trademark applied for.

Hyclorite is prepared by decomposing chlorinated lime suspended in water with sodium carbonate and adding to the solution obtained, a freshly prepared solution of electrolyzed sodium chloride.

Hyclorite has the properties of solution of chlorinated soda, U. S. P., but contains no carbonate. When exposed to air a pellicle forms on its surface due to the formation of calcium carbonate.

About 10 Gm. hyclorite are weighed and transferred to a dish with about 100 Cc. of water and an excess of pure ammonium hydroxide solution is added. After about one-half hour the solution is evaporated to complete dryness on a water bath. To the residue is added about 50 Cc. of water, 2 drops of methyl orange test solution and an excess (measured) of tenth-normal hydrochloric acid volumetric solution and then the residual acidity determined by titration with tenth-normal sodium hydroxide volumetric solution. The alkalinity found corresponds to not more than 0.25 Gm. calcium hydroxide per 100 Gm. of hyclorite. Each Cc. of tenth-normal hydrochloric acid volumetric solution consumed corresponds to 0.0037 Gm. Ca(OH)_2 .

Mix in a flask about 5 Cc. of hyclorite, accurately weighed, with 50 Cc. of distilled water, add 1 Gm. of potassium iodide and 5 Cc. of acetic acid and titrate with tenth-normal sodium thiosulphate volumetric solution, starch test solution being used as indicator. It shows not less than 3.85 per cent. available chlorine.

Each Cc. of tenth-normal sodium thiosulphate volumetric solution used corresponds to 0.003546 Gm. of available chlorine. Due allowance should be made for the decrease in available chlorine content of about 12 per cent. per year, date of bottling being stamped on each bottle.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address . . . "Medic, Chicago"

Subscription price Five dollars per annum in advance

*Contributors, subscribers and readers will find important information
on the second advertising page following the reading matter*

SATURDAY, SEPTEMBER 29, 1917

EXPERIMENTAL PELLAGRA

An important advance in the study of that perplexing disease, pellagra, has been made in the discovery by Chittenden and Underhill¹ of Yale University that symptoms closely resembling those found in human subjects can be induced experimentally in dogs. As may be anticipated, diet plays the dominant part in initiating the pellagra-like condition. When the animals are fed on a ration consisting of boiled dried peas, cracker meal and cottonseed oil or lard, they rapidly develop symptoms indicating abnormal nutrition. Unless definite changes in the food are made, this condition eventually terminates in death.

The pathologic manifestations which attend the usually quite sudden onset of the symptoms center especially along the alimentary tract. A foul mouth and bloody diarrhea are accompanied by hemorrhagic conditions in the lower bowel. There may be ulcers in the duodenum, particularly in those animals which die with exhibition of nervous symptoms, such as convulsions. Thus there is much to remind one of the alliterative description of pellagra as a sequence of "diarrhea, dermatitis, delirium and death."

The hasty interpreter might be inclined to attribute the failure of dogs to thrive on the exclusive vegetarian diet mentioned to the low level of nitrogen intake which usually characterizes such dietaries. So far as the mere quantity of protein involved is concerned, this appears not to be the case. Chittenden and Underhill insist that the pellagra-like outcome cannot be ascribed to a diminished nitrogen intake, to an inability to maintain nitrogen equilibrium, or to poor utilization of nitrogen and fat. The partition of the nitrogenous waste products in the urine is normal when compared to that of animals maintained on the same level of nitrogenous intake.

Equally important with the ability to initiate a condition of experimental pellagra is the finding that the pathologic appearances exhibited by dogs on these exclusive vegetable diets can be made to disappear and that the normal nutritive rhythm can be reestablished

by the addition of meat to the dietary. This reminds one, of course, of the comparable experience of Goldberger and others in the management of human pellagrins. The Yale investigators note that in the production of the symptoms it is immaterial whether the transition from a diet containing meat to one of purely vegetable origin is sudden or gradual. The final outcome is said to be the same.

It is of further moment that under suitable conditions these nutritional disturbances may be manifested even when raw meat is included in the diet. By quantitative variations in the food intake the condition is reported to be produced in varying periods of time ranging from one month to six or eight months. Strangely enough, a large intake of peas appears to be less detrimental to dogs than smaller quantities. Chittenden and Underhill remark that if one assumes that the untoward symptoms are induced by a lack of some essential substance or substances of the so-called "vitamin" class, these results may be interpreted to indicate that boiled peas contain a small quantity of these essential substances, too small, indeed, to maintain life for prolonged periods when the intake of boiled peas is below a certain quantity, but capable of prolonging life greatly when large quantities are ingested.

We have recently voiced the necessity of caution in the interpretation of pellagra and related manifestations of nutritive disorder on the basis of a deficiency of vitamins.² McCollum and Pitz³ of the University of Wisconsin have lately urged that "there is no reason whatever why we should assume, as Voegtlin, Goldberger, Funk and others have done, that pellagra is due to a lack of a specific unidentified dietary factor, a 'vitamin'." They are inclined to the belief that an improper amount and character of the inorganic constituents of the diet, proteins of poor quality taken regularly at low planes, and an inadequate supply of fat-soluble vitamin (such as is found in butter fat rather than in lard or cottonseed oil) have contributed to nutritive failure in all the diets described by Goldberger and his associates as being employed by peoples where the incidence of pellagra is high.⁴

Apart from any hypothesis of etiology, the facts developed experimentally by Chittenden and Underhill¹ are of great importance because they afford another scientific method of attacking the pellagra problem. Their observations give added evidence of the inferior value of the proteins of legumes such as peas and beans. One further conclusion of these recent investigators should not be overlooked, in view of the debate which has centered about it in the past. They assert that infection plays no part in the produc-

1. Chittenden, R. H., and Underhill, F. P.: The Production in Dogs of a Pathological Condition Which Closely Resembles Human Pellagra, *Am. Jour. Physiol.*, 1917, **44**, 14-67.

2. Vitamin Deficiency and Disease, editorial, *THE JOURNAL A. M. A.*, Sept. 8, 1917, p. 826.

3. McCollum, E. V., and Pitz, W.: The "Vitamine" Hypothesis and Deficiency Diseases: A Study of Experimental Scurvy, *Jour. Biol. Chem.*, 1917, **31**, 229.

4. Goldberger, Joseph: Pellagra Causation and a Method of Prevention, *THE JOURNAL A. M. A.*, Feb. 12, 1916, p. 471.

tion of the abnormal nutritive conditions of dogs as just described. Their verdict is that failure of dogs to thrive on the selected vegetable diet must therefore be ascribed to the character of the food. Let enthusiasts beware, however, from associating pellagra with vegetarianism per se. A ration of peas, wheat and cottonseed oil is not the ideal of the vegetarian regimen.

THE KIDNEYS IN DIABETES INSIPIDUS

Only a few years ago the chronic polyuria that was formerly referred to under the uncharacteristic designation of diabetes insipidus was regarded as a comparatively rare malady. The advance of clinical medicine has, however, brought to light an unexpected number of cases, some of which have been subjected to careful study with the aid of the newest methods of science. Although the pathogenesis of the disease is still decidedly debatable and many observers are inclined to associate it in some way with the central nervous system, other competent investigators have championed the hypothesis that chronic polyuria is primarily the result of a disease of the kidney.¹

One salient characteristic of the disease is the inordinately low specific gravity and the enormous volumes of the urine. It has been maintained by those who incline to the kidney factor as the determining agency in the disease that the kidneys of affected patients are not able to alter the concentration of the urine. This has been denied, however, for some patients at least, by a number of observers, the most recent being Christie and Stewart² of Lakeside Hospital, Cleveland. In a study of the therapeutic effect of pituitary posterior lobe extract they found the kidneys in a typical case to have the power of effecting a very considerable concentration of the urine under the influence of the drug. Kidney functional tests gave a normal response; and no indication could be obtained that the chronic polyuria was in any way associated with a pathologic alteration in the kidney. It may be added that histologic examination of the kidneys in diabetes insipidus lends no support to the view that the condition is due to any structural alterations in these organs. With respect to the mode of action of the gland extract, the blood flow in the hands seemed to be increased during the antidiuretic action of posterior lobe extracts. This is taken by Christie and Stewart to support the view that a vascular effect in the opposite direction on the renal vessels may be responsible for the diminution in the secretion of urine.

1. Meyer, E.: *Deutsch. Arch. f. klin. Med.*, 1905, **83**, 1; *Ztschr. f. klin. Med.*, 1912, **74**, 352. Mosenthal, H. O.: *Renal Function as Measured by the Elimination of Fluids, Salt and Nitrogen, and the Specific Gravity of the Urine*, *Arch. Int. Med.*, November, 1915, p. 733. The Cause of Chronic Polyuria, editorial, *THE JOURNAL A. M. A.*, June 14, 1913, p. 1884.

2. Christie, C. D., and Stewart, G. N.: Study of a Case of Diabetes Insipidus with Special Reference to the Mechanism of the Diuresis and of the Action of Pituitary Extract on It, *Arch. Int. Med.*, July, 1917, p. 10.

Some time ago we called attention to the current view as to how the excretion of water in general by the kidneys is regulated.³ When the relative volume of the blood serum is increased by the drinking of water, the serum becomes more dilute as regards salts, and therefore has a diminished specific conductivity. The latter change has actually been measured.⁴ The Cleveland observers have taken the opportunity offered by the extreme changes in secretory activity in chronic polyuria to measure the relative volume of the serum. It was found, in accord with predictions, to be detectably diminished when the water excretion was lessened by posterior lobe extract or by restriction in the intake of water.

THE SPRAYING OF GARDEN CROPS AND THE PUBLIC HEALTH

Modern agriculture has come to depend more and more extensively on the use of insecticides and fungicides in combating some of the menaces that arise in the growing of farm products. These weapons against the enemies of agriculture include, in addition to poisons of organic nature, salts of lead, arsenic, and copper. The spraying of growing forms of vegetable life with solutions of such poisonous substances at once suggests the possibility of danger not only to live stock which may eat grass on which the spray has dropped, but also to the human consumer of garden products that have been subjected to remedial treatment. The list includes some of the common vegetables, fruits and berries which have been sprayed either to overcome an insect enemy that attacks them or some organism that infests vegetable life in their vicinity. Cabbages and lettuce, for example, may be sprayed to protect them from destruction by damaging organisms; whereas apples may become exposed to insecticides because the latter are used to combat an invasion of the orchards by insect pests, like the browntail moth, which are concerned with the foliage rather than with the fruit of the tree. Indeed, orchards in some states were being sprayed with arsenate of lead, in August, with this end in view.

The question has thus naturally arisen as to the possible danger to persons eating fruit from trees sprayed at this time in the growing season, especially in the case of early fruit, which would be nearly or quite ripe at the time the trees were sprayed. Obviously a copious rainfall tends to decrease the amount of poison remaining adherent to the edible products; but rain is not a dependable agent for the eradication of danger. The New Hampshire Agricultural Experiment Station has conducted extensive investigations in the past few years on the residues of lead arsenate on fruit and vegetables after sprayings

3. Excretion of Water by the Kidneys, editorial, *THE JOURNAL A. M. A.*, Nov. 25, 1916, p. 1604.

4. Wilson, T. M.: *Ain. Jour. Physiol.*, 1905, **13**, 150; Haldane, J. S., and Priestley, J. G.: *Jour. Physiol.*, 1916, **50**, 296. Priestley, J. G.: *Ibid.*, 1916, **50**, 304.

with this widely used insecticide.¹ In the case of apples, the report points out, the maximum amount of the poison that may be expected to occur on the fruit in the ordinary course of events would not exceed 0.5 mgm. per apple. However, as much as 5 mgm. has been found on the surface of an apple after direct spraying with the poison. It is pointed out that such fruit would surely attract attention and in picking and handling would lose a material part of this residue, even if no rains intervened. It is believed, therefore, that under ordinary conditions no apples will reach the consumer carrying such amounts of arsenate of lead per fruit that a healthy human adult can eat enough at one time to cause fatal poisoning. Nevertheless experiments by Carlson and Woelfel at the University of Chicago have shown that lead arsenate, used as an insecticide or spray on fruit trees, is sufficiently soluble in human gastric juice to cause lead and arsenic poisoning. Measures must, therefore, be taken to remove this spray from the fruit. As Carlson has written, from the standpoint of public health rather than of the toxicologist, the question is not how much of the poison may be ingested without producing acute or obvious chronic symptoms, but how completely man can be safeguarded against even traces of the poison. Even extremely small doses of protoplasmic poisons when repeated may gradually produce deterioration and disease.

In the case of small fruits, such as the berries, the possibility of danger is even greater. In the case of the strawberry, to cite an instance investigated in New Hampshire, the surface of the fruit is of such a nature that larger amounts of the poison may be retained and quite possibly may escape notice. These residues also would be less likely to be rubbed off in handling and probably would wash off less rapidly. One portion of strawberries, consisting of one-fourth quart of the berries, may carry as much as 8 mg. of oxid of arsenic. This would probably seldom or never constitute a dangerous dose for an adult person in good health, but it might for a child or for an adult in weakened condition. It seems imperative, therefore, that strawberries fully formed or nearly so should not be directly sprayed with arsenate of lead, unless they are to be thoroughly scrubbed before using. Similar conclusions apply to currants, blackberries and other "small fruits."

The green vegetables which often require treatment by spraying are likewise not exempt from some degree of menace. A whole head of cabbage and lettuce directly sprayed and used without removal of outer leaves, may carry a relatively large amount of the poison. We are told that arsenate of lead should be applied only lightly and sparingly to cabbage or to lettuce that is ready for market. If these vegetables are sprayed the outer leaves should be removed and the

heads should then be washed. If this is done, it is believed that there is no danger that these vegetables will carry to the table an amount of arsenic involving a dangerous dose for a human being. The well known experiences of cumulative effects with metallic poisons of the type here discussed, make timely a word of caution in view of the growing necessity for spraying as a procedure in the conservation of many edible products.

LARREY, THE ORIGINATOR OF RAPID EVACUATION OF THE WOUNDED

When Napoleon wrote in his will: "I leave 100,000 francs to Larrey—the most virtuous man I have known," he meant not only probity and honor, but virtue in the Roman sense. Larrey, the soldier, was the dutiful, reliable, courageous man of Roman type; Larrey, the physician, was the big human personality of large benevolent impulses, the kind of medical officer who actually carried a wounded soldier on his back in emergency. He was the generous, warm-blooded meridional, who came up to Paris from the Pyrenees, the type of Frenchman depicted in the canvasses of Ingres and David d'Angers. No French army surgeon has been so well beloved by his comrades since Ambroise Paré. He was one of the brilliant group of military surgeons whom Napoleon knew so well how to gather around him—Larrey, Percy, Desgenettes, a memorable trio. Larrey's system of movable field hospitals or flying ambulances (*ambulances volantes*) was introduced in September, 1792, when, as aide-surgeon-major of the French Army of the Rhine, he made the suggestion to General Custine, a suggestion as fraught with consequences as that of the Earl of Stair (or Pringle) at the battle of Dettingen. It created real first aid and rapid evacuation of the wounded from the battlefield, which is now the chief end of medical administration in campaign. It undoubtedly served as a model for Letterman when he devised his improved system of ambulance and field hospital service for the Army of the Potomac in 1863. It was immediately followed by Baron Percy's innovation of telling off and training soldiers as field litter-bearers, to pick up the wounded in the progress of a battle and carry them on stretchers to a first aid station. To quote Larrey's¹ own words:

My proposition was accepted, and I was authorized to organize this movable field hospital, which I named the flying ambulance (*ambulance volante*). I then conceived the idea of a system of carriages (*voitures d'ambulance*) suspended on springs, which should combine solidity with speed and lightness. This institution created a sensation among the soldiers; they now all felt confident that they would receive succor at whatever moment they might be wounded!

This, and the centric idea which went with it—that the combatant forces are to feel in action that medical men are with them, that the wounded will be removed to places of safety as rapidly as possible—is Larrey's

1. O'Kane, W. C.; Hadley, C. H., Jr., and Osgood, W. A.: Arsenical Residues after Spraying. New Hampshire Agr. Exper. Station, Bull. 183, June, 1917.

1. Larrey: Mémoires de chirurgie militaire, Paris, I, 64.

greatest achievement. But he did a host of other important things.

He was an opponent of meddlesome surgery, which, in his day, was as pestiferous a nuisance as meddlesome midwifery; he believed in leaving simple wounds alone to heal of themselves. He washed wounds with a simple saline solution, and employed the powerful antiseptic, Labarraque's solution, in putrid and sloughing wounds (Da Costa). In place of the fierce purging and bleeding of his time, he fed the wounded a rich diet, even using a laryngeal tube or a nasal catheter for artificial feeding in wounds about the jaws and neck. His method of dressing wounds, cleansing away of débris, trimming of dead tissue and saturation with moist loose bandages, has some present day features. He showed the imperative necessity of drainage in large wounds, head injuries and pleural injuries, and insisted that all punctured wounds should be enlarged by incision and drained. He substituted immediate amputation for the secondary operation then common, but employed conservative resection when he could avoid amputation. He was ahead of his time in his knowledge of the symptoms of brain injuries, and discovered what is now known as Battles' sign—the discoloration over the mastoid process after fracture of the base.² In 1802, while in Egypt, he published at Cairo, his account of Egyptian ophthalmia or granular conjunctivitis, a disease which is mentioned and prescribed for in the Ebers Papyrus,³ but which had remained unnoticed for some 3,400 years, until Larrey saw it. He was the first to point out the contagious nature of this disease, which is the outstanding feature of his historic monograph, and now a point of greatest importance to our immigration inspectors, who pass on the conjunctivae of Levantines and Orientals coming into the port of New York.

Such was the remarkable man who died seventy-five years ago and whose life is recorded elsewhere in our columns⁴—one of the greatest names in the history of military medicine and one of the most honored names in France.

2. For these details of Larrey's achievement, we are indebted to the admirable summary by Dr. J. C. Da Costa in *Johns Hopkins Hospital Bull.*, Baltimore, 1906, 17, 213-215.

3. See H. Joachim's translation of the Papyrus Ebers, Berlin, 1890, 81, 83.

4. See page 1106.

Alarming Mortality Among Negroes.—An alarming mortality among the negroes of Baltimore is shown by the statistics in the health department. Since 1912 there have been 10,813 negro births in the city, while 12,982 have been claimed by death. Among the white race the figures show that during the same period 54,483 births were reported, while 38,889 died. Dr. Blake has made an investigation and found that more than 99 per cent. of all births were reported. Since 1912 there has been a gradual increase in the birth rate in Baltimore. In 1912, 9,387 babies were born; in 1913, 10,309; in 1914, 10,662; in 1915, 11,460, and in 1916, 12,662. The annual number of negro births during the same period has ranged from 2,011 in 1912 to 2,423 in 1916. The greatest number of deaths in any one year since 1912 among the whites occurred in 1916, when 7,983 persons died; the smallest number was 7,525. The average annual death rate among the negroes for the same period was approximately 2,500.

Current Comment

THE OPERATION ON PRESIDENT CLEVELAND

Last week's issue of the *Saturday Evening Post* has a most readable account by Dr. W. W. Keen of Philadelphia of the operation that was performed on President Cleveland twenty-four years ago—in 1893—soon after the president entered on his second administration. The operation, which was performed on a private yacht, was for sarcoma of the jaw. It was quite extensive; a rather large part of the bone was removed; and yet there was rapid recovery and few knew that an operation had been performed. The late Dr. Joseph D. Bryant, who was President Cleveland's physician, performed the operation, Drs. Keen, E. G. Janeway and John F. Erdmann assisting. While the article is not of particular scientific or surgical importance historically, it is of decided interest. Dr. Keen emphasizes the critical financial and political conditions that prevailed at the time and shows how it was absolutely necessary that the dangerous condition of the president should not be made known. It is remarkable that a quarter of a century elapsed before this historically important occurrence was made public.

THE TREATMENT OF ANTHRAX WITH NORMAL SERUM

Human anthrax is increasing steadily and of late rather sharply in this country. It is coming to be recognized by students of industrial conditions as an important occupational disease. As such it must be guarded against with especial care in these days when it is so essential to maintain satisfactory conditions throughout the whole industrial organization. The resistance of anthrax spores to drying and other influences renders the disease difficult to eradicate when once it gets a foothold. Until more stringent measures for the disinfection of hides, wool and similar animal products imported from anthrax infected regions are put in force, a further increase in cases may be anticipated. The case mortality from anthrax, while high, is not as great as is sometimes stated. In the most carefully reported series it seems to range from 13 to 24 per cent., the difference being probably due in part to variations in the extent of diagnosis and in part to inclusion of mild cases. The specific anti-anthrax serum produced by Sclavo is said to have lowered the mortality rate considerably, its use in 164 cases being accompanied by a death rate of 6 per cent., as contrasted with a rate of 24 per cent. in Italy generally. Sclavo's serum has not come into common use in spite of the considerable degree of success that has attended its introduction. One reason may be that the preparation and marketing of the serum seem to entail a high expense, the cost of the initial dose running as high as thirty dollars or more. The country of Argentina with its great cattle-raising industries has suffered more severely from anthrax in recent years than any other part of the world, and it is appropriate that a new and interesting method of treatment should be proposed by R. Kraus, head of the bacteriologic institute of the national department of health of

that country.¹ The method, although its theoretical interpretation presents some difficulties, is simplicity itself in practice. It consists in the inoculation, usually intravenously, of normal bovine serum in quantities of 20 to 30 cubic centimeters or more. Intramuscular and subcutaneous injections are said to have given results substantially as satisfactory as the intravenous injections. The serum is heated twice for half an hour at 56 degrees C. before injection. In the report cited it is stated that fifty cases of bacteriologically verified anthrax were treated by this method without a single death. We understand that since this report was published the number of cases treated by Kraus with normal serum has risen to over ninety with but one death. These results are more favorable than those reported from the use of the specific antiserum.

RABBIT-FOOT THERAPY

Few but ignorant darkies have any great faith in the therapeutic efficacy of the left hind foot of a rabbit caught in the churchyard in the dark of the moon. In the light of modern therapeutics one is tempted to believe, however, that had some one person or firm an exclusive proprietary right to this particular brand of rabbits' feet, there would be many intelligent people—and not all of them laymen—ready to swear by rabbit's foot therapy. In medical journals (whose advertising pages set forth the virtues of the pedal extremities of *Lepus sylvaticus*) many solemnly scientific articles would probably appear relating the success that the writers had had with this form of therapy in the treatment of some distressingly stubborn conditions that had failed to respond to all previous efforts. Is it ubiquity that has saved the homely cotton-tail from being a therapeutic hero?

UNIVERSITY OF TEXAS FREED FROM POLITICS

Three months ago reference was made¹ to the attempt by the governor of Texas to secure political control of the University of Texas and its medical department. That attempt aroused a vigorous protest throughout the state. At a special session of the legislature, articles of impeachment were filed and Governor Ferguson was suspended; an appropriation of \$1,629,407.17 for the university, including \$197,500 for the medical department, which Governor Ferguson had vetoed, was again passed, and three regents of the university named by Governor Ferguson were replaced by those who have the best interests of the university at heart. Ten of the twenty-one charges in the bill for impeachment are now reported to have been returned against Governor Ferguson. Among these charges were his efforts "to coerce and influence the Board of Regents of the University of Texas" and "that he sought to violate the law by removing regents without adequate cause." This vigorous action by the Texas legislature, following the attempt of its state executive to convert the state university into a part of his political machine, will have a deterring effect on further attempts in a similar direction.

Medical Mobilization and the War

NEWS OF THE BASE HOSPITALS

Base Hospital No. 3, Mount Sinai Hospital, New York, has been mobilized, and is expecting orders for duty abroad. The medical personnel includes Major M. A. Dailey, M. C., U. S. Army, commanding officer; Capt. William A. Schwab, quartermaster, and the following officers of the Medical Reserve Corps: director (chief of medical service), Major Nathan E. Brill; assistant director (medicine), Capt. Louis Hauswirth; physicians, Capt. Herbert L. Celler, Edwin Sternberger; Lieuts. Daniel Poll, Herbert Emsheimer, Joseph Rosenfeld, Nathan Rosenthal, and A. S. Kversky, neurologist; assistant director (laboratory), Major George Baehr and Lieut. Bernard S. Denzer; assistant director (Roentgen ray), Capt. Leopold Jachss; assistant director (chief of surgical service), Major Howard Lilienthal; surgeons, Capt. Edwin Beer, Walter M. Brickner, Robert T. Frank, Leo B. Mayer, Sidney Cohen, Ira Cohen, S. H. Geist; Lieuts. Alfred Braun, E. Bleier, registrar, and dentists, Lieuts. Jacob Asch and Louis Stern.

Base Hospital No. 23, Buffalo, is now mobilized at Fort Porter, N. Y., under the command of Major G. V. Rukke, M. C., U. S. Army, and is awaiting orders to embark for overseas service. The following is a list of the medical personnel: director, Major Marshall Clinton; registrar, Mr. E. J. Fairbairn, civilian employee; adjutant, Lieut. Timothy F. Donovan; quartermaster, Capt. J. H. Hickey; mess officer, Lieut. H. C. McDowell; commanding officer detach. medical department, Major N. G. Russell; chief surgical service, Major Marshall Clinton; chief medical service, Major N. G. Russell; pathologist, Capt. J. B. Betts; assistant pathologist, Lieut. R. N. De Niord; dental surgeons, Lieuts. C. L. Storms and E. J. Knoche. Ward officers: surgical—Capt. H. A. Smith, F. W. McGuire, J. P. Brennan, D. C. McKenney, L. Burrows; Major J. F. Fairbairn and Lieuts. W. L. Machemer and H. C. Fairbanks. Medical—Capt. F. P. Goodwin, R. E. DeCe, Baldwin Mann, and Lieuts. H. C. McDowell, J. A. P. Millet, H. F. May and H. K. Hardy.

Base Hospital No. 27, University of Pittsburgh Medical School, has been mobilized at Allentown, Pa.

Base Hospital No. 31, of the Youngstown (Ohio) Hospital has been mobilized at Allentown, Pa., under command of Major Adam E. Schlanser, M. C., U. S. Army, and is awaiting orders for service abroad. The personnel includes: Drs. C. R. Clark, director and chief of medical service; James A. Sherbondy, assistant director and chief of surgical service; B. W. Wilson, first assistant, medical service; C. C. Wolferth, chief of laboratory; S. M. McCurdy, registrar; M. P. Jones, first assistant, surgical service; A. E. Brant, staff surgeon and urologist; J. U. Buchanan, D. A. Nesbitt, E. R. Thomas, C. H. Moses, W. K. Allsop, staff surgeons; J. L. Washburn, ophthalmologist; F. J. Bierkamp, rhinologist and laryngologist; R. R. Morrall, orthopedic surgeon; P. G. Bordon, neurologist; D. B. Phillips, C. D. Barrett, R. W. Fenton, W. H. Bunn, staff physicians; O. D. Hudnut, roentgenologist; C. M. Reed, pathologist; F. W. Ward, W. H. McCreary, dentists.

Base Hospital No. 32, Indianapolis, was mobilized, September 1, at Fort Benjamin Harrison, Ind., under command of Major Harry R. Beery, M. C., U. S. Army. Following is a list of the medical personnel: director, Major Edmund Dugan Clark; Majors Orange Garrett Pfaff and Bernays Kennedy; Capt. Carleton Buel McCulloch, Alois Bachman Graham, Charles Dolph Humes, Eugene Bishop Mumford, Lafayette Page, Harry F. Byrnes and Joseph Kent Worthington; Lieuts. Scott Robert Edwards, Ralph Landis Lochary, Raymond Cole Beeler, Robert Martin Moore, Leslie H. Maxwell, Paul Thomas Hurt, Smith Quimby, Ralph Lincoln Sweet, John Thomas Day, Joseph Warren Ricketts, Frank Columbia Walker, Jack Walter Scherer and James Vincent Sparks. The last two officers are dentists.

Base Hospital No. 34, attached to the Episcopal Hospital, Philadelphia, was called into active service, September 14, at Allentown, Pa. Following is a list of the medical personnel: Majors Ralph G. Devoe, Astley P. C. Ashhurst, Emory G. Alexander, John B. Carson; Capt. Ralph S. Bromer, R. I. Levin, John W. Moore, Henry G. Welker; Lieuts. Benjamin F. Buzby, Irvine M. Boykin, Royce E. Durham, John S. Eynon, Lewis W. Frank, Rutherford L. John, John Paul Jone, John D. Paul, Raymond J. Sprowl, George Wilson, Karl D. Winter and John B. Wolfe; also Lieuts. George A. Cole-

1. *La Prensa Médica Argentina*, Dec. 30, 1916, and Feb. 10, 1917.

1. "Politics Endangers a Great University," *Current Comment*, *The Journal A. M. A.*, June 23, 1917, p. 1916.

man and Faver W. Croll of the dental section of the M. O. R. C.

Base Hospital No. 36, Detroit, has been mobilized at the State Fair Grounds.

Members of Naval Base Hospital No. 5, recruited at the Methodist Hospital, Philadelphia, were ordered to report, September 12, to the Navy Yard in that city, for duty, and sailed, September 17, for France. This unit is under the directorship of Dr. Robert G. LeConte, Philadelphia. The members of Lieut.-Col. LeConte's staff are: Lieuts. William Hewson, J. Leon Herman, J. H. A. Cleaver and George E. Darby, Bella Bella, B. C. The officers of the unit are: assistant director, Lieut.-Com. James E. Talley, Lieuts. George G. Ross, B. B. Vincent Lyon, Grayson P. McCooch, Percival M. Kerr, Elwyn, and John A. Hugo.

NEWS OF THE TRAINING CAMPS

At Fort Benjamin Harrison

TRENCH WARFARE

The past week has been comparatively uneventful. There has, however, been one outstanding novelty in the week's program, in the assignment of details from each company for duty in the trenches. These have been dug by members of the Officers' Training Camp under the supervision of Lieutenant Hays of the French Army, and are most elaborate and realistic in construction. The trench details repair to their posts in the afternoon and prepare themselves for the night attack. When darkness comes on an opposing force attempts to take the trenches, to the accompaniment of sentry's challenges, illuminating rockets, and the other excitements of a night attack. After the attack the medical detail is supposed to go "over the top" with litters and collect the wounded, who are men previously detailed for the duty. They load them on the litters and carry them back to the regimental aid station in the trenches. The first night or two there was rain and mud in plenty, so that the elements did their best to help reproduce the conditions familiar in Flanders. The men came back to camp ready for a twenty-four hour sleep, some of them sheepishly confessing that they had been picked off by their own outposts, but all agreed that the experience was well worth the wounds and disability resulting from it.

REGULAR ARMY CANDIDATES

Candidates for the Regular Army Medical Corps who have taken their preliminary examinations have been grouped together in Companies 3 and 4, for the purpose of more intensive training and closer observation by the regular officers in charge. Some of them have already been detailed temporarily to ambulance companies and field hospitals, so as to give them the chance of studying the routine of these units at first hand. Major Darby, M. C., is conducting a most strenuous class in setting up exercises for their exclusive benefit, comprising body-rolls, somersaults, and other acrobatic feats.

LECTURES

There have been no lectures of importance during the week except for one by Major Bell of the Canadian Army on his experiences during nine months of trench warfare on the western front. Much of this time was devoted to answering questions, though his audience would have been delighted to hear him talk for an extra hour or more.

MEETING OF MILITARY SURGEONS

Colonel Ashburn announced to the assembled student officers that there is to be a meeting of the Association of Military Surgeons in Indianapolis on October 8 and the two following days. Some of the program was outlined, and the cooperation of every one was asked in making the meeting a roaring success. The country-wide fame of some of the expected visitors is of itself sufficient to make it a memorable occasion, and it is sincerely hoped that there will be a good turn-out of the profession to hear the speakers.

THE CAMP VIEW OF DRAFTING THE MEDICAL PROFESSION

Some animated discussion has been provoked in this camp by the appearance in the last issue of *THE JOURNAL* of a letter written by Major Richard Derby, M. R. C. He states that "a fair proportion of the physicians who have volunteered are men who have been attracted to a new life through a failure to succeed in their old," and again that "we have not obtained through the volunteer system the men best qualified for the important duty of caring for our sick and wounded." As applied to the personnel of this training camp, at least—and there is no evident reason why this camp should differ in this respect from the other Medical Officers' Training Camps in the country—such statements would seem, to say the least of it, distinctly unjustifiable. While it is true unfortunately that the average age is high, and that therefore there is evidently a lack of younger volunteers, the vast

majority of the older men in training are men highly respected in their communities, who have made considerable sacrifices to follow what they considered to be the path of duty. Furthermore, if a comparison were drawn between the sum of those men who now hold commissions in the Medical Reserve Corps, or are continuing in civil life only because their services are more valuable to the country in their present capacity, and the sum of those who are taking no active part in the country's program of medical preparedness, who could then say that the pick of the country's physicians is not already in the country's service?



The Bivouac at Fort Benjamin Harrison.

COMPANY NEWS AND PERSONAL

Major F. W. Loughran, M. R. C., assistant sanitary inspector, has left for New York on leave of absence.

Capt. R. M. Wilder has returned from his leave of absence, and is again at his desk in the Adjutant's Office.

Capt. Richard Weil ordered to the Rockefeller Institute.

The total strength of the training camp in medical officers alone is now 1,275.

Company 1 gave a banquet on Wednesday, September 19, at the University Club, Indianapolis, in honor of their chief instructor, Captain Celler. Eighty of the old members were present. The old company has been broken up and distributed among the other old companies. Many of the men are candidates for the regular corps. A new company has been formed this week, with Captain Celler still in command. He is to be assisted by Capt. S. J. Young and Lieuts. H. S. Osborne, V. C. von Unruh and Roy T. Morris. Lieutenant von Unruh has also been appointed assistant to Major Snyder in the teaching of equitation. The company is now under the direct supervision of Colonel Shockley, M. C.

Company 2 has lost Lieutenant Bayless from its corps of instructors. His place has been taken by Captain Stanton.

Company 7 has added Lieutenant Hoyt to its instructing staff, by transfer from Company 1.

Company 8 has lost Major Caccini, its chief instructor. His place has been taken by Major Phillips.

Company 10 now has Major McCormack, M. C., in immediate command.

THE BIVOUAC

Several of the companies, through the kindness of Capt. F. Hutchins, Company 4, have had the privilege of enjoying a night's bivouac in the prettiest section of the surrounding country. During the day's trip the men were assigned problems in sanitary tactics, including choice of locations for ambulance companies, with their respective field dressing stations, and for the establishment of a field hospital, the disposition of the defending and attacking forces having been previously announced. The work is shown in the accompanying illustration.

FOR THE CONTROL OF VENEREAL DISEASES

At Jackson, Mich., September 12, a conference of men and women, prominent in business and professional life in the state, was held for the purpose of considering the menace of venereal diseases in relation to the public health. Dr. C. G. Parnall, health officer of Jackson, in explaining the purpose of the meeting said that any movement designed to attack the problem must take cognizance of two main features: the prevention of venereal diseases in the Army and the control of these diseases in the civil population. Addresses were made among others by Dr. W. H. Martin, associated with Major Snow, in charge of venereal disease work in the United States Army; Avery G. Clinger, stationed at Battle Creek Cantonment as head of the War Department Commission on training Camp Activities; Major Neil M. Wood, head of the base hospital at Camp Custer; Dr. A. S. Warthin, head of the department of pathology of the University of Michigan; Dr. J. H. Kellogg of Battle Creek and Dr. Richard Olin, secretary of the state board of health. A tentative program was outlined for the prevention of venereal diseases involving the following propositions:

PROGRAM FOR THE PREVENTION OF VENEREAL DISEASES

1. Prostitution is to be suppressed vigorously and continuously, through the enforcement of the State laws, and the issuance of certificates of health to prostitutes for use in soliciting is not to be included in this program.
2. Prostitutes brought to the attention of the police or health authorities are to be examined; and all persons, male or female, capable of spreading venereal disease are to be isolated, under the provisions of the public health act, or local ordinance, and treated at public expense as long as there is danger in the opinion of the health officer, of their exposing others.
3. Under no circumstances are infected prostitutes to be "floated" into other communities, and if they are known to go from one community to another, the health officials of the place of destination are to be notified at once.
4. The State law requiring the reporting of syphilis and gonococcus infections by physicians, office numbers, is to be enforced to the letter, and, in addition, physicians are to be urged to obtain and furnish to the local health officers the names of the persons who are suspected of disseminating infection. The local health officers are therefore to investigate and supervise or isolate infection cases according to the circumstances.
5. To provide and encourage the instruction of young men and women in the advantages of a clean life and the dangers from venereal disease.
6. To provide adequate opportunities for expert diagnosis, treatment and advice for infected persons financially unable to secure proper attention for themselves, and to encourage the continuance of treatment until the patient is cured, or at least becomes noninfectious.
7. To provide free laboratory tests for syphilis and gonococcus infections for physicians, and to encourage greater use of the tests for these diseases available at the laboratory of the Bureau of Communicable Diseases of the State Board of Health.

A permanent committee to carry on the work was appointed as follows: Dr. W. H. Sawyer, Hillsdale; Miss Eleanor Hutzell, Detroit; Rev. Caroline Bartlett Crane, Kalamazoo; Dr. A. S. Warthin, Ann Arbor; Fred L. Woodworth, state dairy and food commissioner, Lansing; Dr. C. G. Parnall, Jackson; Dr. R. M. Olin, secretary of the state board of health, Lansing; Rev. Charles D. Williams, Detroit, and Mr. James Couzens, Detroit.

By a resolution Governor Sleeper was asked to appoint a commission to make recommendations for the control of venereal diseases within the state. On this commission the governor later appointed the following: Drs. R. M. Olin, Lansing; W. H. Sawyer, Hillsdale; A. S. Warthin, Ann Arbor; C. G. Parnall, Jackson, and Guy L. Keifer, Detroit. This commission met with Governor Sleeper at Lansing, September 18. The chief features of the immediate program outlined at that meeting include the investigation of the source of the infection, the segregation and hospital treatment of all infected prostitutes and the development of hospitals for such treatment.

PUBLIC HEALTH SERVICE RESERVE CORPS

It is quite probable that Congress will enact a law providing a reserve corps for the Public Health Service, a subject already referred to in these columns. The original measure, a Senate Joint Resolution, which had the approval of the Public Health Service and the Treasury Department, passed the Senate and was referred to the Committee on Interstate and Foreign Commerce of the House. This committee has already reported, recommending the measure in the form of a bill; and while the committee has made some modifications they are not seriously in conflict with Senate's measure. The House substitute covers most of the essential features of the original measure as passed by the Senate, so that if it passes the House, which now seems extremely probable, it will undoubtedly be approved by the Senate.

The bill provides for a reserve corps to be composed of the officers of state, county and municipal health organizations, and other persons skilled in sanitary science. Such officers must make voluntary application to the Surgeon-General for appointment, and, with the assent of the proper executive officers of the respective states, counties and municipalities, may be commissioned with the grade of assistant surgeons, past assistant surgeons, surgeons, or senior surgeons in the Reserve Corps of the Public Health Service for four years, or during the war. Sanitary engineers, assistant sanitary engineers, epidemiologists and assistant epidemiologists on the recommendation of the Surgeon-General, may also be commissioned as such. The duties of the reserve corps shall be directed toward the proper sanitation of ports and places within the United States or within its jurisdiction, especially places in which or near which industrial and military forces are to be mobilized, in which the corps shall cooperate with local health organizations and officials in charge of industrial establishments. The bill provides for an elastic organization which may be immediately expanded, whereby the government can instantly attack civilian epidemics which threaten to spread to military forces, which permits sanitation under federal direction of areas in contiguity to military camps, augments existing agencies for the collection of morbidity reports, and brings into the service of the United States as an aid to military operations a body of highly trained sanitarians, engineers and epidemiologists who would otherwise be unavailable for military duty.

SURGEON-GENERAL'S OFFICE REQUESTS
INFORMATION ON REHABILITATION
OF THE INJURED

The Surgeon-General's Office has addressed a letter to the secretaries of all county medical societies relative to the rehabilitation of partially handicapped persons who have been successful following injury. Arrangements are being made for special treatment for the wounded, including special efforts for functional restoration of damaged parts and vocational reeducation for those who, from the nature of their illness or injury, are unable to follow their previous occupation.

INFORMATION REGARDING SUCCESSFUL CRIPPLES

To aid in this work the Surgeon-General desires to know what those who are suffering from chronic illnesses or who are partially disabled as a result of injuries, are now doing. For example, a person who has lost the right hand may still be a successful carpenter or market gardener; one having lost both lower extremities may be successful in some line in which he is not required to move from place to place; a man with chronic heart disease may be suitably occupied in work in which there is no special stress on that organ. The collection of this experience should be of remarkable assistance as showing what the various types can do.

The Surgeon-General requests that medical societies and physicians aid in this work by securing a list of partially disabled persons in the county who are successfully following trades or occupations. The information desired in reference to each case should include: (a) character of disability, medical or surgical; (b) the work at which the patient is employed, and degree of success; (c) the way in which he learned or entered his occupation after his injury or illness. The names of the disabled are not necessary.

If any man who has been successful after an injury or illness desires to write a short autobiography stating his experience, this will be very useful and will be utilized in preparing a booklet to be distributed to the men at the proper time.

EXEMPTION OF MEDICAL STUDENTS
AND INTERNS

Provision for Permitting Medical Students Who Have
Been Accepted for the Draft to Continue Their
Professional Studies

In accordance with the supplemental regulations authorized by the President, the Surgeon-General of the Army has approved the following forms which are to be filled out and returned to him. This should be done without delay. It must be understood that medical students permitted to continue their studies under these provisions are not exempted and may be called to duty at any time that the President deems their services especially needed by the Army.

AFFIDAVIT OF DEAN AND STUDENT

The dean or secretary will make his affidavit and send it to the student accepted for the draft, who will make his affidavit and forward both affidavits with a copy of the order of the local board calling him to report for physical examination (Form 103), to the Surgeon-General of the Army, Washington, D. C. Affidavits must be executed by some one legally qualified to administer an oath.

AFFIDAVIT OF THE DEAN OR SECRETARY OF THE MEDICAL SCHOOL

I,, Dean of
..... Medical School, do swear that the official records of this
school show that entered this school
....., and that he has successfully done the
Mo. Yr.
work of his class.

Date
Subscribed and sworn to before me this
day of, A. D. 1917.

AFFIDAVIT OF THE STUDENT ACCEPTED FOR THE DRAFT

I,, having been accepted for the
draft by local board am a student in
second
..... Medical School in the third year, having entered said
fourth
school
Mo. Yr.

I hereby apply to the Surgeon-General of the Army to be ordered to report at once to my local board for military duty and thus to be inducted into the military service of the United States, immediately thereupon to be discharged from the National Army for the purpose of enlisting in the Enlisted Reserve Corps of the Medical Department. I have been called by local board, physically examined and accepted, and there is no claim for my exemption or discharge now pending and I have not been ordered to military duty. In compliance with the supplemental regulations governing the execution of the Selective Service Law authorized by the President and issued under date of August 29, 1917, I am making this application and am enclosing herewith a copy of the order of the local board calling me to report for a physical examination (Form 103).

I do hereby pledge myself to enlist in the Medical Enlisted Reserve Corps and to promptly respond either before or after my graduation on an order from the Surgeon-General to active duty.

Date
Subscribed and sworn to before me this
day of, A. D. 1917.

AFFIDAVIT OF THE MEDICAL STUDENT WHO HAS BEEN ACCEPTED FOR THE
DRAFT, AND IS NOW ON ACTIVE DUTY IN A CANTONMENT OF
THE NATIONAL ARMY

I,, having been accepted for the
draft by local board, am a student in
second
..... Medical School in the third year,
fourth
having entered said school
Mo. Yr.

I hereby apply to the Surgeon General of the Army to be ordered to be discharged from the National Army for the purpose of enlisting in the Enlisted Medical Reserve Corps of the Medical Department. I have been called by local board, physically examined and accepted, and am now in active service in the National Army at Camp, located at,
City

In compliance with compiled rulings No. 11 of
State
Provost Marshal General, Part 1 (Z), I am making this application and am enclosing herewith a copy of the order of the local board calling me to report for a physical examination (Form 103).

I do hereby pledge myself to enlist immediately in the Medical Enlisted Reserve Corps and to promptly respond either before or after my graduation to an order from the Surgeon General to active duty.

Date
Subscribed and sworn to before me this day
of, A. D. 1917.

Provision for Permitting Hospital Interns Who Have Been
Accepted for the Draft to Temporarily Continue
Their Professional Duties

In accordance with the supplemental regulations authorized by the President, the Surgeon-General of the Army presents the following form to be filled out and returned to him. This should be done without delay. It should be understood that hospital interns permitted to continue their hospital duties under these provisions are not exempted from the draft and may be called to duty at any time that the President deems their services especially needed by the Army. The spirit of the supplemental regulations issued by the President does not permit the recognition of an internship continuing more than twelve months.

The superintendent of the hospital will execute his affidavit, ask the drafted intern to fill out his and return both affidavits with a copy of the order of the local board calling him to report for physical examination (Form 103), to the Surgeon-General of the Army, Washington, D. C. Affidavits must be executed by some one legally qualified to administer an oath.

AFFIDAVIT OF THE SUPERINTENDENT OF THE HOSPITAL

I,, do swear that I am Superin-
tendent of Hospital located at
....., and that
City State

....., M.D., is a bona fide intern in this
hospital, devoting his entire time to his intern work and receiving
therefor no compensation; that I regard his continuance in this position
as essential to the best interests of this hospital; that the daily average
number of patients in this hospital is, and that the
number of interns in this hospital is; that the
drafted intern herein specified began his internship
Month

....., and it naturally terminates
Day Year Month
.....
Day Year

Date
Subscribed and sworn to before me this
day of, A. D. 1917.

AFFIDAVIT OF THE DRAFTED HOSPITAL INTERN

I,, having been accepted for the
draft by local board am an intern in
Hospital located at
City State
graduated from Medical School
..... I began my internship in this hospital
Mo. Yr.
....., and my term of service
Mo. Day Yr.
expires
Mo. Day Yr.

I hereby apply to the Surgeon-General of the Army to be ordered to report* at once to my local board for military duty and thus to be inducted into the military service of the United States, immediately thereupon to be discharged from the National Army for the purpose of enlisting in the Enlisted Reserve Corps of the Medical Department. I have been called by local board, physically examined and accepted, and there is no claim for my exemption or discharge now pending and I have not been ordered to military duty. In compliance with the supplemental regulations governing the execution of the Selective Service Law authorized by the President and issued under date of August 29, 1917, I am making this application and am enclosing herewith a copy of the order of the local board calling me to report for a physical examination (Form 103).

I do hereby pledge myself to enlist in the Medical Enlisted Reserve Corps and to promptly respond at any time to an order from the Surgeon-General to active duty.

Date
Subscribed and sworn to before me this
day of, A. D. 1917.

* This report may be made in person, by mail or by telegram.

Physicians Recommended for Commission in the Reserve Corps

During the week ending Sept. 22, 1917, 709 physicians were recommended for commission in the Medical Reserve Corps, the proportion being thirteen majors, eighty captains and 616 lieutenants.

Physicians Go to Join Staff of American Hospital in Paris

At the request of Dr. Joseph A. Blake, Dr. J. B. McCook of Hartford, Conn., and Dr. W. Irving Clark of Worcester, Mass., will be sent to the American Red Cross Hospital in Paris.

Medical History of the War

Col. C. C. McCulloch, M. C., U. S. Army, and Major Fielding H. Garrison, M. R. C., U. S. Army, have been constituted a board to collect and prepare material for a medical and surgical history of the war.

Red Cross Commission to Russia Returns

The major portion of the Red Cross Commission to Russia is now in Japan on its way back to this country and is expected home about October 20. It is announced that Mr. Raymond Robins of Chicago is to remain in Russia and, in addition to his work as director of the Red Cross, will supervise the four principal relief organizations.

Statistics of the Dental Corps

The Surgeon-General's Office has completed the enrolment of, and now has at its disposal, 178 Dental Corps officers, 221 National Guard dental officers, and 2,473 Dental Reserve Corps officers, making a total of 2,872, or enough to supply in the proportion of one dentist to 1,000 men, as authorized by law, an army of 2,872,000 men. No more dental officers will, therefore, be required in the immediate future.

Doctors and Nurses Decorated

Justine Godart, undersecretary for the Army Medical Service, on September 15, visited the Chateau in the department of Yonne where the French Hospital of New York has conducted a military hospital of 250 beds since early in 1916. Decorations were conferred on Drs. John C. Irwin and Thomas M. Savage, and on nine of the nurses on duty in the institution.

Second Infant Welfare Unit Goes to France

The American Red Cross announces that Dr. Charles Ulysses Moore of Portland, Ore., has been sent to France to reinforce the Infant Welfare Unit now at work there under the direction of Dr. William P. Lucas of the University of California. With Dr. Moore will go sixteen nurses who have had special training in children's diseases and social welfare work. A third detachment of physicians for this service is expected to sail shortly.

Red Cross Commission to Roumania Goes to Jassy

According to cable advices, the American Red Cross Commission to Roumania left Petrograd last week for Jassy. Conference with Ambassador Billings, minister to Roumania, revealed the fact that immediate supplies, including medical equipment of every kind are badly needed. Wounds are now being dressed with sawdust. An urgent need also exists for ambulance transports with drivers and machines. A typhus epidemic threatens for the winter.

Public Health Nurses to Work in Region of Cantonments

Fifty public health nurses have been assigned for duty by the American Red Cross to the zones around the various cantonments. Nurses have already taken up their work in the civil districts around the cantonments at Hattiesburg, Miss.; Fort Riley, Kan.; Des Moines, Iowa; Louisville, Ky.; Little Rock, Ark.; Ayer, Mass.; Chillicothe, Ohio; Atlanta, Ga.; Newport News and Petersburg, Va. These nurses will act as visiting nurses in the territory surrounding the camps and will endeavor to prevent the spread of tuberculosis, malaria and social diseases, and to strengthen the local infant welfare programs.

Appropriations for Sanitary Units

September 16, it was announced by the National Red Cross that appropriations had been made to assist local authorities in protecting health about Army camps as follows: for Newport News, Va., \$21,000 was provided; \$5,000 for three nurses to work with the Massachusetts Health Department at Ayer; \$14,000 to Atlanta, Ga., chiefly for the destruction of malaria-bearing mosquitoes around Camp Gordon; \$10,000 for Chillicothe, Ohio. In all \$106,000 has been appropriated.

Germans Agree Not to Attack Hospital Ships

A dispatch to Paris from Madrid states that King Alfonso has obtained from the belligerent powers an agreement permitting the free movement of French and British hospital ships in the Mediterranean and the Atlantic as far as the English Channel. This agreement also provides for the removal from French hospital ships of German officers who have been held prisoners thereon, and the removal of French prisoners from exposed positions on the war front.

Sanitary Unit Established

P. A. Surg. Joseph R. Ridlon, U. S. P. H. S., has announced that a provisional allotment of \$10,000 has been made for the sanitary unit of the American Red Cross at Anniston, Ala., and the unit has been established with Emmett W. Ledbetter as business manager and Dr. Ridlon as director. Work has already been begun at the task of making mosquito-proof the area adjoining Camp McClellan. A laboratory will be established in Anniston which may be used by any physician in the city or county for the examination of specimens.

American Public Health Association to Hold Special War Meeting

• War and its relation to public health will be the chief topic at the meeting of the American Public Health Association, Washington, D. C., October 17 to 20. Papers are to be presented by President W. A. Evans, Chicago; Surgeons-General Gorgas and Braistead; Colonel Goodwin of the British Army, and others. Special symposiums will be devoted to the control of venereal diseases in the Army and Navy, and to laboratory service in war time.

Making of Comfort Kits

The American Red Cross has issued circulars, which can be obtained on application at any Red Cross chapter, relative to the making of comfort kits and bags for the men of our Army and Navy. The circular embodies the suggestions of the War Department, of General Pershing and of Major Grayson M. P. Murphy, as to what the men wish. Three types of kits are suggested: a simple bag with drawstrings and two bags with pockets, one for the trenches and one suitable for hospital use. These kits are to be made of plain khaki.

Conference of Presidents of the Examining Boards Called to Meet at Fort Benjamin Harrison

Capt. George W. Kreider, M. R. C., has called a meeting of the officers and members of the various examining boards for the Medical Reserve Corps to take place at Fort Benjamin Harrison, Monday, October 8, at 11 a. m. This conference has the endorsement of the Surgeon-General, and Dr. Kreider states that already nearly one half of the boards have responded favoring the conference at that time. Important subjects relative to the work will be brought before this conference.

Medical Patriots of Rochester, N. Y.

Major John M. Swan, M. R. C., writes that the item in THE JOURNAL for September 22, page 1014, relative to St. Louis' contribution to the Medical Reserve Corps, leads him to send the following facts relative to the contribution of Rochester: "Fifty-five physicians have been examined and have accepted commissions in the Medical Reserve Corps, or are on duty with the Second Ambulance Company, N. G., N. Y.; Third Regiment, N. G., N. Y., now the 112th Infantry, National Army, or the New York Naval Militia. There are about 415 physicians in Rochester, which makes the percentage of Rochester physicians in the service of the govern-

ment, at the present time, or who have accepted their commissions and stand in readiness to obey any order, 13.1 per cent."

Reconstruction Hospital Plans

It has been decided by the Army Medical Department to erect in Boston, New York, Philadelphia, Baltimore, Washington, Buffalo, Cincinnati, Chicago, St. Paul, San Francisco, Los Angeles, Denver, Kansas City, St. Louis, Memphis, Tenn.; Richmond, Va.; Atlanta and New Orleans, reconstruction hospitals wherein will begin a rehabilitation for private life, of soldiers who return wounded from the war front. Sites have already been chosen and it is probable that Boston, New York, Washington and Chicago will be the first cities to establish these hospitals. Each hospital will accommodate 500 patients with provision for doubling the capacity if necessary. In these institutions industrial training will be taken up and additional educational facilities will be furnished to those fitted for them. Workshops and employment bureaus will also be established for the benefit of these disabled soldiers.

Sanitary Supervision of Army Clothing Production

The production of army clothing on a tremendous scale has permitted abuses to creep in in the way of the production of such clothing in unsanitary surroundings and conditions, as the business has been farmed out by contractors and subcontractors in sweat shops and in homes. Objectionable conditions were found by the New York Child Labor Committee in instances in which the work had been given out to be done in homes, in which dangerous sanitary conditions existed and small children were found working in violation of the law. To meet the situation Secretary of War Baker appointed a board of control of labor standards, consisting of Louis E. Kirstein of Boston, Mrs. Florence Kelley, secretary of the National Consumers League, and Capt. Walter E. Kreusi of Quartermaster's Department, U. S. R. They are charged with taking such steps that the Quartermaster-General will be enabled to enforce the maintenance of sound industrial and sanitary conditions in the manufacture of army clothing, to inspect factories, to see that proper standards are established in government work, to pass on the industrial standards maintained by bidders on army clothing and to act so that just conditions prevail.

Physical Disqualification for Military Service in Italy

The Italian war department has recently issued a new official set of regulations as to the physical disqualifications for army service. The list as published recently in our Naples and Milan exchanges contains eighty-six clauses, besides a separate list of infirmities which exempt the recruit from active war service but permit him to serve on light duty, the sedentary service as it is called. One clause of the regulations provides that a register of these relatively disqualified men is to be kept at all the mobilization centers, and these men are to be called on for the sedentary service. No one is to be placed permanently on the sedentary force except those excluded by the specified infirmities from the active fatiguing war service. There has been considerable talk in Italy of late because hitherto hernia has exempted men from military service. One member of parliament, in discussing the matter recently, urged compulsory operations on men with hernia, saying that a simple operation of this kind would give the country 100,000 new and valid recruits. The new regulations alter this, as hernia now does not exclude absolutely from military service unless the hernia cannot be reduced and kept under control with suitable apparatus. It comes in the list of the infirmities permanently placing the man in the sedentary service, except what are called "button hernias." By these new arrangements, hernia no longer exempts from service but holds the man back in the sedentary service. It is optional for him, however, of course, . . . although, naturally, this is not mentioned in the *Elenco* . . . it is optional for him to have his hernia corrected by an operation which would advance him into the active ranks. Among the seventeen other infirmities which class the man permanently as fit only for the sedentary service, are facial paralysis, large and knobby hydrocele, varicocele or systocele, one leg from 3 to 5 cm. shorter than its mate, habitual dislocation of a joint, and permanent dislocation of one thumb or big toe or loss of one big toe. The *Elenco* specifies further in regard to hernia and some of the other infirmities that they are not to be classified until after the man has been under observation in a military hospital.

Orders to Officers of the Medical Corps

Lieut.-Col. G. F. Juenemann, M. C., to Gettysburg, Pa., American reorganization camp, for duty.

Lieut.-Col. E. H. Hartnett, M. C., will report in person to C. O., Western Dept., for duty.

Major J. S. Lambic, Jr., M. C., to Philadelphia, Pa., for duty as C. O. of Base Hospital No. 38, Jefferson Hospital, Philadelphia.

Major P. Waterman, M. C., to 26th Division as director of ambulance companies, with station in Boston.

The retirement of Col. G. E. Bushnell, M. C., from active service on Sept. 10, 1917, is announced.

Officers of M. C. to duty as follows: Lieut.-Col. J. W. Hanner to Camp Devens, Ayer, Mass., 76th Division, as chief surgeon; Lieut.-Col. S. J. Morris to Walter Reed General Hospital; Major John A. Burket to Camp Sherman, Ohio, 83d Division; Major L. P. Williamson from Ayer, Mass., to Washington in connection with the division of gas defense; Major D. W. McEnery to Camp Dix, N. J., 78th Division, as division sanitary inspector; 1st Lieut. R. B. Hill from 2d Regiment of Engineers, American University, to 20th Engineers.

Lieut.-cols. of M. C. to duty as follows: W. H. Moncrief to Washington; G. McD. Van Poole to Fort B. Harrison; M. A. W. Shockley and H. F. Pipes to Fort B. Harrison.

Majors of M. C. to the place specified for duty: T. H. Johnson, Philadelphia, Pa., No. 20, University of Pa. Hospital; A. von Schrader, Albany, N. Y., No. 33, Albany Hospital and Medical College.

Major E. G. Bingham, M. C., to duty as C. O. of base hospital and as commandant of medical officers' training camp at Fort Des Moines.

Orders to Officers of the Medical Reserve Corps

ALABAMA

To Camp Beauregard, Alexandria, La., for duty, Lieut. R. Jackson, Birmingham.

To Camp Sheridan, Montgomery, Ala., in the ophthalmic division, section surgery of the head, Capt. C. A. Tippen, Montgomery; as chief of medical service, Lieut. J. S. McLester, Birmingham.

To Fort Oglethorpe for a course of instruction, Lieuts. Andrew L. Glaze, Jr., Athens; Lucius L. Terry, Solon W. Wright, Bessemer; Rufus Jackson, M. Rogers, Birmingham; Beaman S. Cooley, Boaz; W. Theo. Langley, Camp Hill; William S. Sewell, Center; Moses E. Sherer, Childersburg; Joseph T. Banks, Dadeville; Conrad Wall, Forest Home; Thomas Y. Greet, Gadsden; Horace Van de Voort, Gastonburg; Austin F. J. Boyd, Hamburg; Francis G. Hendrick, Huntsboro; Charles W. Brasfield, Linden; Howard P. Rankin, Midway; Frederick W. Wilkerson, Montgomery; Otis W. Little, James D. Perdue, Mt. Vernon; Edward C. Hagler, Northport; John F. Jenkins, Opeliker; James P. Vansant, Piedmont; Zadoc L. Weatherford, Red Bay; Julius F. Peavy, Jr., Robertsedale; Richard B. McCann, Seale; Edmond R. Lett, Tallassee; William C. Hatchett, Toney; James W. Beard, Lucian M. Tompkins, Troy; Maxwell Moody, James H. Somerville, Jr., Tuscaloosa; William M. Pierce, Tusculumbia; Bryant B. Edwards, Union Springs, and Walter E. Allen, Ward.

To Walter Reed Hospital, Washington, for treatment, Lieut. H. L. McWhorter, Collinsville.

ARIZONA

To Camp Logan, Texas, for duty in division of ophthalmology, section of surgery of the head, Capt. A. R. Warner, Komatke.

ARKANSAS

To Camp Pike, Ark., for duty, Lieut. F. L. Castleberry, Little Rock.

CALIFORNIA

To Camp Dodge, Iowa, for duty in the division of ophthalmology, section of surgery, Lieut. W. J. Hosford, Santa Cruz.

To Camp Doniphan, Ft. Sill, Okla., for duty, Lieut. A. E. Edgerton, Stockton.

To Camp Funston, Ft. Riley, Kan., from Gas School, Ft. Sill, Okla., and report in person to the commanding general for duty as instructor in gas defense, Capt. Rutherford B. Irones, San Diego.

To Camp Kearny, Linda Vista, Calif., for duty as chief of division of otolaryngology, section of surgery of the head, Capt. R. S. Anthony, Los Gatos; for duty with 40th Division National Guard, Lieuts. G. Hoskins, Ferndale; W. D. Rolph, Riverside; C. L. Morris, Santa Barbara; and G. H. Sciaroni, Sutter Creek.

To Camp Logan, Houston, Tex., from Gas School, Ft. Sill, Okla., and report in person to the commanding general for duty as instructor in gas defense, Capt. Fred. F. Sprague, Los Banos.

To Camp Mills, Garden City, N. Y., 42d Division, for duty, Lieut. A. H. Martin, Courtland.

To Camp Travis, Tex., for duty, Major H. C. Moffitt, San Francisco.

To Fort McDowell, Calif., for duty, Lieuts. W. J. Haber, and J. F. Chapman, San Francisco.

To Houston, Tex., Av. School, for duty, Capt. L. F. Luckie, Los Angeles.

To report in person to commanding general Western Department, for duty, Capt. E. L. Wemple, San Francisco; Lieuts. G. P. Tolman, Sacramento; and L. G. Seidenfeld, San Francisco.

COLORADO

To Camp Doniphan, Okla., for duty in division of ophthalmology, section of surgery of the head, Capt. A. C. Magruder, Colorado Springs; from Gas School, Ft. Sill, Okla., and report to commanding general for duty as instructor in gas defense, Lieut. William M. Banc, Denver.

To Fort Benjamin Harrison for a course of instruction, Lieut. Orion A. Grantham, Johnstown.

To Fort Oglethorpe, for a course of instruction, Lieut. Harry B. Sobernheimer, Mecker.

To Linda Vista, Calif., for duty in division of ophthalmology, section of surgery of the head, Lieut. F. N. Stiles, Grand Junction.

To San Francisco, Calif., for duty, Capt. W. A. Jones, Denver.

CONNECTICUT

To Camp Bartlett, Westfield, Mass., for duty, Lieut. W. F. Collins, New Haven.

To Camp Mills, Garden City, N. Y., 42d Division, for duty, Lieut. F. C. Young, Colchester.

To Fort Benjamin Harrison, for duty, Capt. L. I. Mason, Willimantic.

DISTRICT OF COLUMBIA

To Camp Lewis, American Lake, Wash., for duty as chief of the medical service, Lieut. C. S. White, Washington.

To Camp Sheridan, Montgomery, Ala., for duty, Lieut. J. L. Gariss, Washington.

To Fort Oglethorpe for a course of instruction, Lieuts. Charles Bell, and John H. Digges, Washington.

FLORIDA

To Camp McClellan, Anniston, Ala., from Gas School, Ft. Sill, Okla., and report in person to the commanding general for duty as instructor in gas defense, Lieut. George G. Tillman, Barton.

To Camp Sevier, S. C., for duty in division of ophthalmology, section of surgery of the head, Capt. J. Halton, Sarasota.

To Camp Taylor, Louisville, Ky., from Gas School, Ft. Sill, Okla., and report in person to the commanding general for duty as instructor in gas defense, Lieut. Lester J. Efrd, Tampa.

To Fort Oglethorpe, for a course of instruction, Capt. Joseph N. Fogarty, Key West; Lieuts. Joseph H. Chirles, Clearmont; Henry E. Parnell, Ft. Myers; William E. Whitlock, Ft. White; Charles L. Kennon, Elijah T. Sellers, Jacksonville; Hugh St. C. Geiger, Kissimmee; Dwight D. Rivers, Lake City; Archie C. Watson, Live Oak; Adam C. Walkup, McIntosh; James R. McEachern, Monticello; Harold M. Beardall, Orlando; John C. Holley, Pace; MacMiller Harrison, Palmetto; Baldwin S. Stutts, Pt. St. Joe; Daniel B. Williams, South Jacksonville; William J. Lancaster, Tampa; from Gas School, Ft. Sill, Okla., and report to the commandant, Medical Officers' Training Camp, for duty as instructor in gas defense, Richard Leffers, Lakeland.

To Syracuse, N. Y., for regimental duty, Capt. H. F. Watt, Ocala; Lieuts. W. H. Pickett, Gainesville; A. L. Izlar, Ocala; and J. W. McClane, St. Petersburg.

GEORGIA

To Camp Gordon, Ga., for duty in the division of ophthalmology, section of surgery, Capt. R. R. Daly, Atlanta.

To Fort Oglethorpe, for a course of instruction, Lieuts. Cecil Stockard, James R. Smith, Atlanta; Henry D. Coffee, Auburn; David M. Silver, Augusta; Joseph E. Mercer, Baxley; Philip G. Fitzgerald, Blakely; A. Nathan Dykes, Columbus; Whitfield W. Crook, Cuthbert; Leslie L. Blair, Marietta; Carl H. Verner, Martin; Homer G. Lightner, Montezuma; Hugh W. Wade, Quitman; Burton P. Bradley, Joseph H. Mull, Rome; George L. Fugary, Savannah; John C. Call, Sylvania; Robert C. Walker, Waycross; and John W. Bradley, Woodstock.

HAWAII

To Fort Kamehameha, H. T., from Ft. Ruger, H. T., for duty as post surgeon and surgeon of the Coast Defense of Oahu, Major E. W. Bayley, Ft. Ruger.

To Fort Oglethorpe, for a course of instruction, Major Harry R. McKellar, Ft. Shafter.

ILLINOIS

To Camp Custer, Mich., from Fort Benjamin Harrison, for duty as chief of medical service, Major E. E. Irons, Chicago.

To Camp Devens, Mass., for duty in the division of ophthalmology, section of surgery, Lieut. W. G. McDeed, Monticello.

To Camp Grant, Rockford, Ill., from Gas School, Fort Sill, Okla., and report to the commanding general for duty as instructor in gas defense, Capt. John S. Sweeney; for duty in the division of ophthalmology, section of surgery, Lieuts. H. S. Cradle; for duty, F. M. Phifer, Chicago.

To Camp Logan, Texas, for duty in division of ophthalmology, section of surgery of the head, Lieut. J. F. Strauss, Chicago.

To Camp Pike, Ark., as chief of medical service, Major A. A. Small, Chicago.

To Camp Shelby, Miss., for duty in division of ophthalmology, section of surgery of the head, Lieut. C. M. Wilmot, Spear.

To Camp Sherman, Chillicothe, Ohio, Base Hospital, as surgical chief, Capt. J. A. Harvey, Chicago; as C. O. of Red Cross Ambulance Co. No. 9, S. V. Balderton; with Red Cross Ambulance Co. No. 9, Lieuts. H. M. Fogo, Evanston, and J. E. McNeel, Chicago.

To Camp Taylor, Ky., Eighty-Fourth Division, for duty, Capt. F. S. O'Hara, Springfield; for duty as chief of medical service, Lieut. W. W. Hamburger, Chicago.

To Fort Benjamin Harrison, for a course of instruction, Capt. Eugene F. Wahl, Edwardsville; Lieuts. Ira J. Magee and Thaddeus S. Pierzynski, Chicago. For duty with Base Hospital No. 36, Lieut. F. L. Stone.

To Fort Des Moines, Iowa, for duty, Lieut. L. C. Gatewood, Chicago.

To Fort Kamehameha, H. T., from Schofield Barracks, for duty, Lieut. C. S. Brewer, Fairbury.

To Hattiesburg, Miss., from Fort Riley, and report in person to the commanding general, Camp Shelby, for duty, Lieut. Alexander W. Burke, Chicago.

To Fort Sheridan, Ill., for duty, Lieut. K. J. Henrichsen, Chicago.

To Jefferson Barracks, Mo., for duty, Lieut. S. Horwitz, Peoria.

To Neurological School, University of Pennsylvania, for a four weeks' course of intensive training in brain surgery, Lieut. George H. Schroeder, Chicago.

To report to commanding officer, Ambulance Co. No. 9, for duty, Lieut. J. P. Cleary, Chicago.

To Syracuse, N. Y., for regimental duty, Lieut. C. W. Shaffer, Chicago.

To Waco, Texas, Aviation School, for duty, Lieut. E. C. Gaffney, Lincoln.

INDIANA

To Camp Custer, Battle Creek, Mich., for duty, Lieut. T. I. Padgett, Jasonville.

To Camp Dix, N. J., for duty in the division of ophthalmology, section of surgery, Lieut. G. G. Van Mater, Peru.

To Camp Funston, Fort Riley, Kan., Lieut. R. C. Shanklin, South Bend.

To Camp Green, Charlotte, N. C., from Gas School, Fort Sill, Okla., and report in person to the commanding general for duty as instructor in gas defense, Capt. Leonard A. Ensminger, Indianapolis.

To Camp Shelby, Hattiesburg, Miss., from Gas School, Fort Sill, Okla., and report in person to the commanding general for duty as instructor in gas defense, Lieut. James A. Work, Elkhart.

To Camp Sheridan, Montgomery, Ala., from Gas School, Fort Sill, Okla., and report in person to the commanding general for duty as instructor in gas defense, Lieut. Oliver O. Alexander, Terre Haute.

To Fort Benjamin Harrison, for a course of instruction, Lieut. Joseph A. Graham, Hammond.

To Fort Oglethorpe, for a course of instruction, Lieut. Edwin W. Rodengeiser, Indianapolis.

IOWA

To Camp Dodge, Iowa, for duty in the division of ophthalmology, section of surgery, Capt. L. L. Henninger, Council Bluffs.

To Camp Grant, Ill., for duty in the division of ophthalmology, section of surgery, Lieut. E. J. Lambert, Ottumwa.

To Fort Oglethorpe, Ga., Lieut. J. A. White, Olin.

To Fort Riley, for duty, Capt. A. Negus, Keswick, and W. S. Norton, Muscatine.

To Washington, for duty, Capt. G. McConnell, Waterloo.

KANSAS

To Ambulance Co. No. 9, from post hospital, Schofield Barracks, Lieut. L. A. Clary, Hutchinson.

To Camp Cody, Deming, N. M., for duty and report in person to commanding general for purpose of making examinations in his specialty of recruits for the National Army, Major John E. Hewitt, Wakefield.

To Fort Houston, Texas, for duty, Lieut. P. B. Matz, Leavenworth.

To Fort Leavenworth, for duty, Capt. J. F. McGill, Fort Scott.

To Fort Oglethorpe, for a course of instruction, Lieuts. Richard C. Henderson, Pittsburg, and William J. Stewart, Summerfield.

KENTUCKY

To American University, Wash., for duty, Lieut. F. K. Foley, Central City.

To Camp Beauregard, La., for duty in division of ophthalmology, section of surgery of the head, Capt. R. Lockhart, Owensboro.

To Camp Shelby, Miss., for duty in division of ophthalmology, section of surgery of the head, Capt. O. Le R. Smith, Lexington.

To Fort Benjamin Harrison, for a course of instruction, Lieuts. Augustus B. Riley, Hartford, and Frank B. Dewitt, Rockport.

LOUISIANA

To Camp Beauregard, Alexandria, La., from Gas School, Fort Sill, Okla., and report in person to the commanding general for duty as instructor in gas defense, Lieut. Francis S. Furman, Shreveport.

To Fort Oglethorpe, for a course of instruction, Lieuts. William T. McNeese, Angie; Spears O. Turner, De Ridder; Harper L. Crow, Elmgrove; George B. LeSuer, Gonzales; Edwin O. Simonton, Jonesboro; Wiley R. Buffington and Irenaeus N. Tucker, New Orleans; Christopher L. Mengis, Norwood, and Clifford P. Rutledge, Shreveport.

To Syracuse, N. Y., for regimental duty, Lieut. H. N. Stilphen, New Orleans.

MAINE

To Camp Mills, Garden City, N. Y., for duty in division of ophthalmology, section of surgery of the head, Capt. W. E. Kershner, Bath; Forty-Second Division for duty, Lieut. H. S. Babcock, Castine.

MARYLAND

To American University, Washington, Second Regiment of Engineers, Lieut. F. H. Herman, Baltimore.

To Camp Devens, Ayer, Mass., Lieut. G. B. Wislocki, Baltimore.

To Camp Meade, Annapolis Junction, Md., for duty, Lieuts. J. H. Truitt, Bowie; F. O. Miller, Elliott City, and W. H. Kable, Woodshoro.

To Camp MacArthur, Waco, Texas, from New York Neurological Institute, New York, and report in person to commanding general and to commanding officer base hospital, for the purpose of making examination in his specialty, Lieut. George H. Preston, Baltimore.

To Camp Sheridan, Montgomery, Ala.; from Boston Psychopathic Hospital, Boston, and report in person to the commanding general, and to the commanding officer base hospital, for the purpose of making examination in his specialty, Lieut. Milford Levy, Baltimore.

To Fort Benjamin Harrison, for a course of instruction, Capt. Compton Wilson, Friendship.

To Fort Oglethorpe, for a course of instruction, Capt. Henry R. Carter, Jr., Lieuts. James S. Akehurst, Robert G. Fuller, William R.

Ceraghty, George H. Reinhardt, Harry C. Schmeisser, David Silberman, Daniel C. W. Smith, Horace B. Titlow, Baltimore; Alexander McC. Stevens, Easton; Oscar H. McNemar, Edenton; Richard E. Yellott, Fallston; Charles L. Magruder, New Market; Samuel J. Price, Queens-town, and Joseph W. Long, Walkersville.

MASSACHUSETTS

To *Atlantic City*, N. J., from Washington, D. C., for the purpose of attending a conference on the question of reconstruction hospitals, and on completion of this duty to return to his proper station, Major Elliott G. Brackett, Boston.

To *Ayer*, Mass., for duty as chief of division of otolaryngology, section of surgery of the head, Capt. W. F. Knowles, Boston.

To *Camp Devens*, Ayer, Mass., for duty, Major W. B. Lancaster, Brookline; Lieuts. V. S. Merritt, Springfield; A. A. K. Yoosuf, Worcester; from Gas School, Fort Sill, Okla., and report in person to the commanding general for duty as instructor in gas defense, Lieut. Daniel F. Mahoney, Boston.

To *Camp Dix*, Wrightstown, N. J., from Gas School, Fort Sill, Okla., and report in person to the commanding general for duty as instructor in gas defense, Capt. Frederick R. Hsley, Medford.

To *Camp McClellan*, Ala., for duty as chief of the medical service, Capt. W. H. Robcy, Jr., Boston.

To *Camp Jackson*, Columbia, S. C., from Gas School, Fort Sill, Okla., and report in person to the commanding general for duty as instructor in gas defense, Lieut. John M. Birnie, Springfield.

To *Camp Meade*, Annapolis Junction, Md., for duty, Lieut. W. J. Lally, Pittsfield.

To *Fort Banks*, Mass., for duty, Lieut. E. B. Hodskins, Bernardston.

To *Fort Ethan Allen*, Vt., for duty, Capt. H. M. Field, Norwood.

To *Fort Porter*, N. Y., with Base Hospital No. 23, Lieut. J. A. P. Millet, Boston.

To *Fort Sill*, Okla., for duty, Lieut. J. H. Anderson, Brockton.

To *Neurological School*, University of Pennsylvania, for a four weeks' course of intensive training in brain surgery, Major William F. Wesselhoeft, Boston.

To *Base Hospital No. 44*, Massachusetts Homeopathic Hospital, Boston, as recruiting officer, Capt. R. C. Wiggin, Boston.

Par. 3352, Sept. 5, 1917, War D., relating to Lieut. Harry F. Byrenes of Springfield, is revoked.

MICHIGAN

To *Camp Custer*, Battle Creek, Mich., for duty, Lieuts. C. M. Freedman, Ada; R. A. Davis, Clinton; F. M. Gowdy, St. Joseph, and A. W. Seidmore, Three Rivers.

To *Camp Gordon*, Atlanta, Ga., for duty as chief of division of otolaryngology, section of surgery of the head, Lieut. G. A. Bulson, Detroit.

To *Camp Lee*, Petersburg, Va., from Gas School, Fort Sill, Okla., and report to the commanding general for duty as instructor in gas defense, Capt. Hugh McD. Beebe, Ann Arbor.

To *Camp Meade*, Md., for duty, as chief of the medical service, Major N. B. Foster, Ann Arbor.

To *Camp Mills*, Garden City, Long Island, N. Y., for duty, Lieut. C. F. Kuhn.

To *Camp Sherman*, Ohio, Eighty-Third Division, for duty, Capt. O. H. Clark, Kalamazoo.

To *Fort Benjamin Harrison*, for duty with Base Hospital No. 36, Major H. G. Berry, Mount Clemens; Capt. J. Sill, Onaway; Lieuts. R. E. Scrafford, Bay City; G. P. Raynale, Birmingham; R. A. Shank-wiler, Detroit; A. J. Warren, Mount Clemens, and G. P. Sackrider, Owosso.

To *Fort Des Moines*, Iowa, for duty, Capt. W. P. Morrill, Benton Harbor.

To *Youngstown*, Ohio, Base Hospital No. 31, for duty, Lieut. O. D. Hudnutt, Otsego.

Par. 2347, Aug. 17, 1917, War D., which recommends the revocation of so much of Par. 48, Special Orders, No. 165, War D., July 16, 1917, as relates to Lieut. Floyd W. Lockwood, South Lyon, is revoked.

MINNESOTA

To *Camp Kearny*, Linda Vista, Calif., for duty in division of ophthalmology, section of surgery of the head, Capt. E. A. Meyerding, St. Paul.

To *Camp Wheeler*, Macon, Ga., from Gas School, Fort Sill, Okla., and report in person to the commanding general for duty as instructor in gas defense, Capt. Chelson C. Pratt, Mankato.

To *Fort Benjamin Harrison*, for a course of instruction, Capt. Robert H. Managan, International Falls; Lieuts. Garnett Belote, Caledonia, and Carl N. Harris, St. Paul.

To *Fort Riley*, from Gas School, Fort Sill, Okla., and report in person to the commandant, Medical Officers' Training Camp, for duty as instructor in gas defense, Lieut. Bret V. Bates, Wheaton.

To *Fort Worth*, Texas, Aviation School, for duty, Capt. J. C. Staley, St. Paul.

To *Minneapolis*, Red Cross Ambulance Co. No. 37, for duty, Lieuts. R. I. Dorge, Dassel, and First Minnesota Field Artillery, J. E. Soper, Norwood.

To be detailed as a member of the board appointed by Par. 23, Special Orders No. 154, War Department, July 3, 1915, to determine the result of the preliminary examinations of applicants, and the final examinations of candidates for admission to the Medical Corps, from Army Medical School, Washington, D. C., Lieut. Raymond W. Whittier, Morton.

MISSISSIPPI

To *Camp Mills*, Garden City, N. Y., Forty-Second Division, for duty, Lieut. W. R. Harris, Swan Lake.

To *Camp Pike*, Ark., for duty in the division of ophthalmology, section of surgery, Capt. E. P. Odeneal, Biloxi.

To *Columbus*, N. M., Twelfth Cavalry for duty, Capt. W. E. Richards, Columbus.

To *Fort Oglethorpe* for a course of instruction, Capt. John A. Harris, Webb; Lieuts. Charles E. Lehnberg, Artesia; Hewitt Johnston, Biloxi; Norman A. McLeod, Brookhaven; Charles G. Bell, Canton; Bernard H. Booth, Drew; Timothy D. Welch, Ellisville; David G. Lenkowitz, Fort Adams; Arthur G. Trotter, Greenwood; George J. Mancill, Indianola; John W. Brandon, Jr., Money; Iris J. Slay, Rhodes; Archibald W. McNeal, Ruleville; Carlos R. McKee, Sanhill; John K. Kellis, Shuqualak; Reginald F. Annis, Stillmore, and John G. Backstrom, Tutwiler.

MISSISSIPPI

To *Fort Ruger*, H. T., from Fort Shafter, for duty as post surgeon, Capt. J. C. Ballard, Biloxi.

To *Fort Sill*, Okla., for duty as chief of surgical service, Major J. W. Barksdale, Winona.

MISSOURI

To *Camp Doniphan*, Okla., for duty in division of ophthalmology, section of surgery of the head, Lieut. W. L. Small, Kansas City.

To *Camp Logan*, Houston, Texas, to make examinations in his specialty of recruits for the National Army, Lieut. George A. Griot, St. Louis.

To *Camp Funston*, Kan., for duty in the division of ophthalmology, section of surgery, Lieut. J. C. Hynes, St. Louis.

To *Camp MacArthur*, Texas, for duty as chief of the medical service, Capt. C. H. Campbell, St. Louis.

To *Camp Pike*, Little Rock, Ark., from Gas School, Fort Sill, Okla., and report in person to the commanding general for duty as instructor in gas defense, Capt. August A. Gossow, St. Charles.

To *Camp Wadsworth*, S. C., as chief of medical service, Capt. L. Sale, St. Louis.

To *Camp Sherman*, Chillicothe, Ohio, to take charge of the division of ophthalmology, section of surgery, Major C. A. Wood, St. Louis.

To *Honolulu*, H. T., Department Hospital, for duty, Capt. R. K. Ogilvie, Blodgett, and R. S. Bryan, St. Louis.

To report in person to Capt. A. E. Schlanser, Base Hospital, No. 31, Youngstown, Ohio, for duty, Capt. K. P. Jones, Kansas City.

MONTANA

To *Fort Benjamin Harrison*, for a course of instruction, Lieut. Grover C. Sherrard, Opheim.

NEBRASKA

To *Camp Travis*, Texas, for duty in the division of ophthalmology, section of surgery, Lieut. C. L. Hooper, Lewellen.

To *Fort Oglethorpe*, for a course of instruction, Lieut. David A. Walker, Comstock.

NEW HAMPSHIRE

To *Camp Mills*, Garden City, N. Y., for duty, Capt. P. Bartlett, Hanover.

To *Camp Taylor*, Louisville, Ky., Base Hospital, as roentgenologist, Lieut. F. A. Sprague, Concord.

To *Fort Benjamin Harrison*, from Gas School, Fort Sill, Okla., and report in person to the commandant Medical Officers' Training Camp, for duty as instructor in gas defense, Lieut. John A. Drew, Rumney.

NEW JERSEY

To *American University*, Wash., for duty, Lieut. A. G. Sacco, West Hoboken.

To *Camp Bowie*, Fort Worth, Texas, from Gas School, Fort Sill, Okla., and report in person to the commanding general for duty as instructor in gas defense, Lieut. Friend B. Gilpin, Cranford.

To *Camp Hancock*, Ga., for duty in division of ophthalmology, section of surgery of the head, Lieut. J. J. L. Young, Newark.

To *Camp McClellan*, Ala., for duty in division of ophthalmology, section of surgery of the head, Capt. W. W. Osgood, Jordan.

To *Camp Mills*, Garden City, N. Y., for duty, Capt. J. S. Brown, Mont Clair; Lieuts. C. F. Becker, Camden; with Forty-Second Division, J. W. Coghlan, Newark.

To *Camp Shelby*, Miss., for duty as chief of medical service, Capt. G. H. Lathrope, Morristown.

To *Fort Benjamin Harrison*, for a course of instruction, Lieut. Runkle F. Hegeman, Somerville.

To *Fort Oglethorpe*, for a course of instruction, Capt. Absalom S. Wescoat, Atlantic City; Thomas S. McCabe, Newark; Lieuts. George W. Potts, Asbury Park; Irving E. Charlesworth, Bridgeton; Abram C. Reeves, East Orange; Leo E. Froomess, Julius Gerendasy, Michael Vinciguerra, Elizabeth; Edward P. Essertier, Hackensack; Jacob Blumberg, Adolph Von P. Fardelmann, Jersey City; Arthur M. Greenwood, Longport; Frank H. Pinckney, Morristown; Philip Conlon, William Satterer, Newark; Arthur G. Hilliard, New Brunswick; Samuel A. Vandewater, Oradell; Edwin N. Riggins, Orange; Arthur H. Temple, Passaic; Orville R. Hagen, Charles J. Murn, Paterson; Marshall F. Lummis, Pitman; Clarence LeF. Vreeland, Pompton Lakes; William D. Sayre, Red Bank; Henry J. Harp, Sussex; George E. Harhen, Verona; Charles M. Gray, Vineland; from Gas School, Fort Sill, Okla., and report in person to the commandant, Medical Officers' Training Camp, for duty as instructor in gas defense, Lieut. Philip Du Bois Bunting, Elizabeth.

To *Hoboken*, N. J., for duty, Lieut. J. Toporoffsky, Paterson.

To report in person to commanding general, Western Department, for duty, Lieut. H. D. Williams, Trenton.

To *Syracuse*, N. Y., for regimental duty, Lieut. W. L. Corwell, Bridgeton.

NEW MEXICO

To *Camp Cody*, N. M., for duty in division of ophthalmology, section of surgery of the head, Lieut. J. W. Tinder, Roswell.

NEW YORK

To *Camp Bartlett*, Westfield, Mass., for duty, Capt. J. W. Colbert, New York City; Lieuts. F. J. A. Bennett, Auburn; L. W. Livermore, Gowanda; H. E. McGarvey, New York, and W. H. McShane, Troy.

To *Camp Devens*, Ayer, Mass., for duty in the division of ophthalmology, section of surgery, Capt. O. H. Johnson, New York.

To *Camp Devens*, Ayer, Mass., for duty in the division of ophthalmology, section of surgery, Capt. O. H. Johnson, New York.

To *Camp Dix*, N. J., for duty as chief of medical service, Capt. D. Bovaird, New York.

To *Camp Doniphan*, Okla., for duty as chief of the medical service, Major S. Strauss, New York.

To *Camp Funston*, Kan., for duty as chief of medical service, Capt. A. MacFarlane, Albany.

To *Camp Gordon*, Atlanta, Ga., for duty, Lieuts. W. E. Barron, Addison; W. N. Barnhardt, Central Islip, and A. F. A. Barry, Stony Point.

To *Camp Jackson*, Columbia, S. C., for duty, as chief of the medical service, Major W. W. Herrick, New York.

To *Camp Lee*, Va., for duty in the division of ophthalmology, section of surgery, Capt. L. E. Hetrick, New York.

To *Camp Meade*, Md., for duty in the division of ophthalmology, section of surgery, Capt. R. L. Crockett, Oneida.

To *Camp Mills*, Garden City, Long Island, N. Y., for duty, Capt. G. P. Coopernail, Redford; Lieuts. W. H. Ordway, A. A. Levine, New York; G. K. Smith, Syracuse; for duty with Forty-Second Division, M. R. Bradner, Warwick; from Gas School, Fort Sill, Okla., and report in person to the commanding general for duty as instructor in gas defense, Charles N. B. Camac, New York.

To *Camp Sherman*, Chillicothe, Ohio, and report in person to the commanding general and to the commanding officer of the base hospital, for duty as chief of the medical service, Major Dudley DeV. Roberts, Brooklyn; to assume command of Field Hospital Detachment No. 4, H. S. Satterlee, New York.

To *Camp Upton*, N. Y., Seventy-Seventh Division, for duty, Major R. Derby, New York.

To *Camp Wadsworth*, S. C., for duty as chief of division of otolaryngology, section of surgery of the head, Lieut. F. V. Hoehn, Waterloo.

To *Fort Benjamin Harrison*, for a course of instruction, Capt. Charles H. Erway, Elmira; Lieuts. Arbor D. Munger, Brooklyn; Adolph J. Newman, New York; for duty with Base Hospital No. 36, E. Smith, Jr., Port Henry.

To *Fort McDowell*, Calif., for duty, Capt. K. E. Williams, Rome.

To *Fort Oglethorpe*, for a course of instruction, Lieuts. Oliver L. Stringfield, Brooklyn; Wellington A. Lebkicher, Fordham; Frank P. Eves, Constantine P. Faller, Gilbert J. Levy, and John K. Norwood, New York.

To *Fort Porter*, N. Y., with Base Hospital No. 23, Lieuts. A. A. Gartner and W. L. Machemer, Buffalo.

To *Fort Slocum*, N. Y., for duty, Capt. J. C. E. Daunais, Cohoes, and W. Stanton, Webster.

To *Fort Worth*, Texas, for duty, Capt. R. B. Anderson, Brooklyn, and Lieut. A. M. Caccini, New York.

To *Hoboken*, N. J., for duty, Lieuts. J. Bernstein, O. H. Heffter, Brooklyn; S. Strauss, New York; C. A. Lawler, Salamanca, and J. M. Gillette, Sloatsburg.

To *Takoma Park*, D. C., for duty and report in person to the commanding officer, Walter Reed General Hospital, for instruction in tuberculosis examinations, Capt. Joseph Muir, New York.

To *Wichita Falls*, Texas, Aviation School, for duty, Lieut. C. Atkinson, Brooklyn.

To *U. S. Army General Hospital No. 1*, New York, for duty with Base Hospital No. 3, Capt. L. Hauswirth, New York.

Par. 4194, Sept. 17, 1917, War Department, relating to Capt. Joseph MacDonald, New York, is revoked.

Par. 3604, Sept. 10, 1917, War Department, relating to Lieut. Arthur Krida, Schenectady, is revoked.

NORTH CAROLINA

To *Boston*, Twenty-Sixth Division, N. G., for duty, Lieuts. T. A. Mann, Durham, and J. H. Cutchin, Whitakers.

To *Camp Bowie*, Texas, for duty in division of ophthalmology, section of surgery of the head, Lieut. L. N. West, Raleigh.

To *Camp Gordon*, Atlanta, Ga., for duty, Lieut. I. M. Taylor, Morganton.

To *Camp Greene*, N. C., for duty in division of ophthalmology, section of surgery of the head, Lieut. M. Saliba, Wilson.

To *Camp Jackson*, S. C., for duty in the division of ophthalmology, section of surgery, Capt. J. P. Matheson, Charlotte.

To *Fort Oglethorpe*, for a course of instruction, Lieuts. William H. Soruggs, Jr., Asheville; Hamilton W. McKay, Charlotte; Eugene R. Hardin, Clinton; Robinette B. Hayes, Fayetteville; Paul A. Petree, Germantown; Henry F. Starr, Julius G. Thomas, Greensboro; Numa H. Crews, Leland C. McIntosh, Henderson; Vance P. Pecry, Kinston; Nicholas B. Cannady, Laurinburg; William N. Thomas, Oxford; Robert P. Beckwith, Rosemary; Sanford W. Thompson, Jr., Sanatorium; Thel Hooks, Smithfield; Julius A. Doshier, Southport; Richard B. Whitaker, Vineland, and Hugh T. Moore, Wilmington.

To *Neurological School*, University of Pennsylvania, for a four weeks' course of intensive training in brain surgery, Lieut. Charles A. Woodard, Durham.

OHIO

To *American University*, Wash., Second Regiment of Engineers, Capt. E. B. Jones, Columbus.

To *Camp Sherman*, Chillicothe, Ohio., Lieuts. W. L. Freyhof, Cincinnati; from Gas School, Fort Sill, Okla., and report in person to the

commanding general for duty as instructor in gas defense, Albert J. Brainard, Cleveland.

To *Camp Taylor*, Ky., for duty in the division of ophthalmology, section of surgery, Lieut. M. F. McCarthy, Cincinnati.

To *Columbus Barracks*, for duty, Lieut. L. M. Tinker, Frankfort.

To *Fort Benjamin Harrison*, for a course of instruction, Lieut. Edward Kuck, Cincinnati.

To *Fort Oglethorpe*, for a course of instruction, Lieuts. Israel W. Mayerberg, Scotttown, and Howard E. Harman, Seetonia.

To report in person to Capt. A. E. Schlanser, Base Hospital No. 31, Youngstown, Ohio, for duty, Majors J. A. Sherbony, B. W. Wilson; Capt. F. J. Bierkamp, R. R. Morrall, J. L. Washburn, C. C. Wolferth, Youngstown; Lieuts. W. K. Allsop, Steubenville; R. W. Fenton, Struthers; C. D. Barrett, J. U. Buchanan, W. H. Bunn, C. H. Moses, D. A. Nesbit, C. McF. Reed, Jr., and E. R. Thomas, Youngstown.

To *Youngstown*, Ohio, Base Hospital No. 31, for duty, Capt. A. E. Brant and S. M. McCurdy, Youngstown.

To *Washington*, for duty, Capt. E. F. McCampbell, Columbus.

Leave of absence for one month, Lieut. F. W. McRae, Jr., Cleveland. Par. 2619, Aug. 22, 1917, War Department, it is recommended that so much thereof as relates to Lieut. Harry N. McClellan, Dayton, is revoked.

OKLAHOMA

To *Fort Clark*, Texas, to Field Hospital Co. No. 7, Lieut. C. R. Ozias, Linn.

To *Fort Oglethorpe*, for a course of instruction, Lieuts. Fred L. Patterson, Fargo, and John M. Lee, Oklahoma.

To report by telegraph to commanding general, Southern Department, for duty, Lieut. J. H. Mallory, Apache.

OREGON

To *American Lake*, Wash., Ninety-First Division, Camp Lewis, for duty, Lieut. I. H. Cramer, Portland.

To *Camp Beauregard*, La., for duty in division of ophthalmology, section of surgery of the head, Lieut. J. R. Wetherbee, Portland.

To *Camp Travis*, Fort Sam Houston, Texas, from Gas School, Fort Sill, Okla., and report in person to the commanding general for duty as instructor in gas defense, Lieut. Daniel Grant, Portland.

To *Fort Oglethorpe*, for a course of instruction, Lieut. Daniel W. Ward, Forest Grove.

To report by telegraph to commanding general, Western Department, for duty, Lieut. H. W. Steelhammer, Silberton.

PENNSYLVANIA

To *American University*, Wash., Second Regiment of Engineers, Lieut. V. B. Eiler, Titusville.

To *Camp Bartlett*, Westfield, Mass., for duty, Capt. W. T. McConville, Honesdale, and D. H. Body, Pittsburgh; Lieut. W. R. Campbell, East Smithfield.

To *Camp Bowie*, Texas, for duty, Lieut. J. T. Bunting, Philadelphia.

To *Camp Cody*, Deming, N. M., from Gas School, Fort Sill, Okla., and report in person to the commanding general thereof for duty as instructor in gas defense, Lieut. Asa L. Hickok, Meshoppen.

To *Camp Custer*, Mich., for duty in the division of ophthalmology, section of surgery, Lieut. M. H. Powers, Point Marion.

To *Camp Gordon*, Ga., for duty as chief of medical service, Lieut. J. C. Gittings, Philadelphia; for duty in the division of ophthalmology, section of surgery, Lieut. C. L. Kaucher, Reading; from Gas School, Fort Sill, Okla., and report in person to the commanding general thereof for duty as instructor in gas defense, Capt. Ferdinand L. Benz, Philadelphia.

To *Camp Greene*, N. C., for duty, Lieut. J. M. Wainwright, Scranton.

To *Camp Hancock*, Augusta, Ga., to duty and report in person to the commanding general for purpose of making examinations in his specialty of recruits for the National Army, Capt. John F. Culp, Harrisburg; from Army Medical School, Washington, D. C., and report in person to the commanding general for duty with the First Regiment Engineers, Pa., National Guard, Lieut. Joseph T. Murphy, Pottsville.

To *Camp Lee*, Va., for duty, Major L. Litchfield, Pittsburgh.

To *Camp McArthur*, Waco, Texas, from Gas School, Fort Sill, Okla., and report in person to the commanding general thereof for duty as instructor in gas defense, Lieut. Clifford B. Farr, Philadelphia.

To *Camp McClellan*, Anniston, Ala., for duty in division of ophthalmology, section of surgery of the head, Lieut. C. M. Stiles, Philadelphia; to duty and report in person to commanding general for purpose of making examinations in his specialty of recruits for the National Army, Lieut. Aaron L. Bishop, Philadelphia.

To *Camp Mills*, Garden City, Long Island, N. Y., for duty, Capt. W. J. Monaghan, Girardville; Forty-Second Division, for duty, Lieuts. G. H. Tibbins, Beech Creek, and J. S. Sharpe, Haverford; for duty in division of ophthalmology, section of surgery of the head, Lieut. I. S. Tassman, Philadelphia.

To *Camp Sevier*, Greenville, S. C., for duty in division of ophthalmology, section of surgery of the head, Lieut. C. E. G. Shannon, Philadelphia; from Gas School, Fort Sill, Okla., and report in person to the commanding general thereof for duty as instructor in gas defense, Lieut. Joseph Leidy, Philadelphia.

To *Camp Sheridan*, Montgomery, Ala., for duty as chief of medical service, L. H. Prince, Philadelphia; in division of ophthalmology, section of surgery of the head, Lieut. N. G. Shafritz, Mont Alto.

To *Camp Travis*, Fort Sam Houston, Texas, for duty, Lieut. W. H. Guy, Pittsburgh.

To *Fort Benjamin Harrison*, for a course of instruction, Lieut. Edward E. Hamer, Pittsburgh.

To Fort Oglethorpe, for a course of instruction, Capts. David M. Bell, Canonsburg; David O. Thomas, New Kensington; John J. McKenna and Thomas W. Penrose, Philadelphia; Lieuts. Le Roy Umburn, Albion; George T. McNish, Alverton; William C. Hensyl, Berwick; Charles B. Dotterer, Boyertown; Thomas S. Hicks, Braddock; James W. Silliman, Bradenville; Herbert E. Simrell, Clark's Summit; Charles J. Shillott, Columbia; Russell G. Witman, Conshohocken; John H. Stearns, Delaware Water Gap; Audley W. Ricketts, Dempseytown; John J. Sweeney, Doylestown; Roy Truckenmiller, Drifton; Harold A. Chering, Edinboro; Ignatius A. Bednarkiewicz, John H. Lloyd, Richard O. Miller, Jesse C. Stille and Paul T. Young, Erie; Lawrence N. Breene, Farrell; Wilder J. Walker, Greensburg; Adam M. Robinhold, Hamburg; Clyde L. Williams, Harmonsburg; John R. Dyson, Hazleton; Sem G. Beck, Hecktown; Frank B. Stevenson, Indiana; John W. Merryman, Kennett Square; William E. Hyskell, Madera; Edgar K. Wells, Masontown; Edward Y. Ord, McKeesport; Joseph C. McFate and William B. Skelton, Meadville; John J. Hislop, Miners Mills; Porter M. Wall, Monongahela; Henry A. Carskadden and William W. Woods, Mont Alto; Wilbur E. Turner, Montgomery; Stephen S. P. Wetmore, Morrisville; Frank P. Summa, Nanticoke; Samuel H. Pettler, New Brighton; Frank F. Urey, New Castle; Henry Bley, New Ringgold, Theodore Peters. Norristown; Andrew Anders, Othmar F. Barthmaier, William P. Belk, Arthur E. Bogart, Reuben A. Bogia, James N. Coombs, William F. Craig, Vincent J. Fenerty, Jacob J. Rutberg, Charles S. Shafer, Samuel Stalberg, Carl Stoepler and Arthur R. Woods, Philadelphia; Myron Rudolph and William J. Stewart, Pittsburgh; August G. Hinriche, Pittston; John G. Striegel, Pottsville; De La Ray Signor, Quarryville; Thomas M. Snyder, Reading; Connell Edward Murrin, Scranton; William A. Ostrander, Smethport; John Whann, Jr., Soldier; Harry S. Van Etten, Stroudsburg; Arthur J. Denman, Susquehanna; Abner H. Bauscher, Temple; Martin W. Freas, United; James L. Brennan, Washington; Israel P. P. Hollingsworth and George K. Strode, West Chester; Clark H. Yeager, Wilkes-Barre, and Howard A. Collins, Winburne; from Gas School, Fort Sill, Okla., and report in person to the commandant, Medical Officers' Training Camp, for duty as instructor in gas defense, Lieut. Gibson Smith, York.

To Fort Slocum, N. Y., for duty, Capt. L. A. Spaeth, Philadelphia.

To Fort Worth, Texas, for duty as chief of surgical service, Capt. J. S. Rodman, Philadelphia.

To Hawaii, for duty, Lieut. C. N. Haines, Sayre.

To Spartanburg, S. C., charge of division of otolaryngology, Lieut. W. P. Barndollar, Pittsburgh.

To Syracuse, N. Y., for regimental duty, Lieut. R. W. Cotton, McKees Rocks.

To Takoma Park, D. C., Walter Reed Hospital, for treatment, Lieut. F. D. Lohr, Derry.

To Wrightstown, N. J., Camp Dix, for duty, Lieut. I. W. Knight, Philadelphia.

To Home, from Fort Oglethorpe, on account of being physically disqualified for active service, Lieut. Thomas V. McLaughlin, Wilkes-Barre.

PHILIPPINE ISLANDS

To Fort Oglethorpe, for a course of instruction, Lieut. William J. Burke, Manila.

PORTO RICO

To Camp Hancock, Augusta, Ga., from Little Silver, N. J., and report in person to the commanding general for duty with the First Regiment Engineers, Pennsylvania National Guard, Capt. Emmett I. Vaughn, Central Aguirre.

RHODE ISLAND

To Camp Sevier, Greenville, S. C., from Fort Benjamin Harrison, and report in person to the commanding general thereof and to the commanding officer of the base hospital for duty to the chief of the surgical service, Lieut. George W. Gardner, Providence.

SOUTH CAROLINA

To Camp Wadsworth, Spartanburg, S. C., from Gas School, Fort Sill, Okla., and report in person to the commanding general thereof for duty as instructor in gas defense, Lieut. Lindsay Peters, Columbia.

To Fort Oglethorpe, from Medical Officers' Training Camp, Camp Greenleaf, Fort Oglethorpe, and report in person to the commanding officer for duty as assistant to the sanitary inspector, and by letter to the commanding general, Southwestern Department, Major Francis L. Parker, Charleston.

SOUTH DAKOTA

To Boston, from Gas School, Fort Sill, Okla., and report in person to the commanding general, Twenty-Sixth Division, for duty as instructor in gas defense, Capt. Felix E. Ashcroft, Deadwood.

TENNESSEE

To Camp Hancock, Augusta, Ga., from Gas School, Fort Sill, Okla., and report in person to the commanding general thereof for duty as instructor in gas defense, Capt. Lee A. Stone, Memphis.

To Camp Meade, Annapolis Junction, Md., for duty in charge of the division of ophthalmology, section of surgery, Major E. C. Ellett, Memphis.

To Camp Wadsworth, S. C., for duty in division of ophthalmology, section of surgery of the head, Lieut. T. W. Rhodes, Whiteville.

To Fort Benjamin Harrison, for a course of instruction, Lieuts. Roy Granbery, Bolivar, and Charles N. Griffith, Tullahoma.

To Fort Oglethorpe, for a course of instruction, Major Cary A. Snoddy, Knoxville; Capt. Edward C. Mitchell, Memphis; Lieuts. Leon D'C. Cotten, Alexandria; Harry E. Hall, Apeson; William C. Sain, Bolivar; Leopold Shumacker, Chattanooga; Guy C. Anderson, Eads; Daniel B. Cliffs, Franklin; John G. Seay, Germantown; Granville I. Walker, Gillises Mills; William D. Cagle, Labelville; William H.

Ballard, Laconia; Owen S. Deathridge, Fleetwood Gruver, John H. Lassiter, Eugene M. Orr, and Charles D. Walton, Nashville; James M. Oliver, Portland; Francis M. Boyatt, Oneida; Robert B. Griffin, Ridgely; James L. Smith, Selmer; John O. Boals, Somerville, and Frederick W. Lee, Springfield.

TEXAS

To Camp Bowie, Texas, for duty as chief of division of otolaryngology, section of surgery of the head, Capt. W. J. Mathews, Abilene.

To Camp MacArthur, Waco, Texas, for duty in division of ophthalmology, section of surgery of the head, Capt. N. H. Bowman, Beeville; for duty and report in person to commanding general for purpose of making examinations in his specialty of recruits for the National Army, Lieut. James J. Johnson, Sulphur Springs.

To Camp Travis, Texas, for duty in the division of ophthalmology, section of surgery, Capt. R. K. Cole, Dallas.

To Fort Benjamin Harrison, for duty with Base Hospital No. 36, Lieut. S. S. Fay, Galveston.

To Fort Clark, Texas, to Ambulance Company No. 7, Lieut. W. A. V. Cash, Abilene.

To Fort Oglethorpe, for a course of instruction, Lieuts. Thomas A. Booth, Cleveland; Jesse C. McKean, Lometa; Richard P. Price, Swenson; Daniel H. Brook, Travis.

To Fort Sam Houston, Texas, with Red Cross Ambulance Company No. 40, Lieut. H. A. Logsdon, Fort Worth.

To Fort Shafter, H. T., from Schofield Barracks, for duty as post surgeon, Major F. Hadra, San Antonio.

To report by telegraph to commanding general, Southern Department, Lieut. F. C. Parrott, Lott.

As commanding officer of Red Cross Ambulance Company No. 40, Lieut. W. S. Horn, Fort Worth.

VIRGINIA

To Camp Gordon, Ga., Eighty-Third Division, for duty, Capt. F. E. Jenkins, National Soldiers' Home.

To Camp Green, N. C., for duty in division of ophthalmology, section of surgery of the head, Capt. G. A. Renn, Norfolk.

To Camp Hancock, Ga., for duty in division of ophthalmology, section of surgery of the head, Capt. W. J. Olds, Front Royal.

To Camp Upton, Yaphank, L. I., from Gas School, Fort Sill, Okla., and report in person to the commanding general thereof for duty as instructor in gas defense, Lieut. Herbert D. Snyder, Norfolk.

To Camp Wheeler, Ga., for duty in division of ophthalmology, section of surgery of the head, Capt. F. E. Jenkins, National Soldiers' Home.

To Fort Oglethorpe, for a course of instruction, Lieuts. William F. Passer, City Point, and Chauncey E. Dovell, Clear Brook.

To Memphis, Tenn., S. C. Aviation School, Lieut. H. C. Mallory, Greenbackerville.

To Petersburg, Va., in charge of ophthalmic division, section of surgery of the head, Capt. B. R. Kennon, Norfolk.

To report in person to the President, Physical Examining Unit, Aviation Section, Signal Officers Reserve Corps, to be established in Richmond, Va., for duty, and by letter to the officer in charge, Aviation Section, Signal Corps, U. S. Army, 119 D Street N.E., Washington, D. C., and Lieut. William W. Gill, Richmond, Va.

WASHINGTON

To Camp Lee, Petersburg, Va., for duty, Lieut. S. E. Lambert, Spokane.

To Camp Lewis, American Lake, Wash., for duty, Capt. E. C. Wheeler, Tacoma; Lieuts. C. C. Harbaugh, Sedro Woolley and F. W. Wichman, Tenino; for duty in the division of ophthalmology, section of surgery, Capt. W. E. Joiner, Seattle, and Lieut. F. G. Sprowl, Spokane; from Gas School, Fort Sill, Okla., and report in person to the commanding general thereof, for duty as instructor in gas defense, Capt. Nevin D. Pontius, Seattle.

WEST VIRGINIA

To Camp Cody, Deming, N. M., to duty and report in person to commanding general for purpose of making examinations in his specialty of recruits for the National Army, Capt. Lewis C. Covington, Charleston.

To Camp Lee, Va., for duty in the division of ophthalmology, section of surgery, Lieut. N. R. Price, Marlinton.

To Camp Sherman, Ohio, for duty in the division of ophthalmology, section of surgery, Capt. R. H. Powell, Fairmont.

To Camp Wadsworth, Spartanburg, S. C., for duty in the division of ophthalmology, section of surgery of the head, Lieut. C. F. Mahood, Alderson.

Paragraph 2352, Aug. 17, 1917, War D., which recommends the revocation of so much of Par. 119, Special Orders No. 189, War D., Aug. 15, 1917, as related to Lieut. William C. Williams, Caretta, be revoked.

WISCONSIN

To Camp Kearny, Calif., as chief of surgical service, Major J. R. McDill, Milwaukee.

To Camp MacArthur, Texas, for duty in division of ophthalmology, section of surgery of the head, Lieut. L. J. Bennett, Fort Atkinson.

To Camp Pike, Ark., for duty in the division of ophthalmology, section of surgery, Lieut. W. W. Pretts, Platteville.

To Fort Benjamin Harrison, for a course of instruction, Lieut. George E. Towel, Mosinee.

To Fort Snelling, Minn., for duty, Capt. R. M. Nichols, Sheboygan Falls.

To Hoboken, N. J., for duty, Capt. F. J. Peirce, Cheyenne.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CONNECTICUT

Personal.—Dr. George Blumer, dean of the Yale Medical School, has been appointed a member of the board of education of New Haven.

ILLINOIS

Medical Schools Merged.—Word has been received that Loyola University has taken over the Chicago College of Medicine and Surgery and merged it with its own medical department.

Chicago

Billings and Post on Way Back.—As noted elsewhere in this issue, the Red Cross Commission to Russia is now on its return to this country. Drs. Frank Billings and Wilber E. Post of Chicago are members of this commission.

Women for War Service.—Nearly 100 women physicians, at a meeting held in the rooms of the State Council of Defense, September 22, volunteered to assist in the registration of Chicago women for war service. The registration week will begin November 5.

Poliomyelitis.—There have been 153 cases of infantile paralysis in the city for the first twenty-one days of September, with two deaths. All cases are hospitalized within twenty-four hours after being reported. To defray the cost of hospitalization of cases and to fight the disease generally, the health commissioner has asked an appropriation of \$118,000.

Personal.—The following is the medical staff of the newly organized Eleventh Infantry: Major B. McPherson Linnell and Lieuts. Walter H. Meents, Claude H. Searle, Wilmette, and Louis B. Cardwell.—Dr. John Ridlon has been commissioned major, M. R. C., U. S. Army, and assigned to special work in orthopedic surgery.—Dr. J. Clarence Webster, who was operated on some months ago, and who has been convalescing in Canada, has returned to Chicago.

Infantile Paralysis.—The total number of cases of infantile paralysis the first eight months of 1917 was eighty-two, as compared with 155 for the same period of 1916. In 1916 the disease began to abate by the end of August. This year, however, the number of cases increased, and for the first fourteen days of September, eighty-seven new cases were reported, as compared with twenty-five for the same period in 1916. In the eighty-seven cases, twenty-three patients died, a percentage of 26.4, as compared with 16.1 for the total number of cases in 1916. A conference of physicians called by the health commissioner to discuss ways and means of preventing a spread of the epidemic reported that there is an active focus of the disease in the lower northwest side of Chicago, and that proper intensive measures should be adopted, with ample funds for stamping out the disease. It was said that no cases of infection due to contact with other cases have been observed. Two cases, however, occurred in the same family within three days. Careful investigation failed to show any relation of the disease to the milk supply. Early in 1916 the health commissioner asked the city authorities for \$500,000 as a contingent fund to fight the disease. The sum was not granted on account of lack of funds. The health commissioner has now renewed his demand for sufficient funds to combat the disease.

INDIANA

Sanatorium Transformed to Hospital.—A forty-bed sanatorium, refurnished and equipped, was turned over recently to the Methodist state hospital board at Princeton. There was a clear deed and a maintenance fund of \$7,000.

Hospital Opened.—The new hospital at Marion was opened for inspection, August 24. The transfer of patients began, August 27, and was completed in two days. The hospital has been built and furnished by public subscription at a cost of \$70,000, and will accommodate seventy-five patients.

District Physicians Hold Meeting.—South Bend has been chosen as the place for the 1918 meeting of the Thirteenth District Medical Association. The following officers were elected at the recent meeting at Rochester: Dr. John C. Fleming, Warsaw, president; Dr. Samuel C. Loring, Ply-

mouth, vice president; Dr. C. Norman Howard, Warsaw, secretary-treasurer, and Dr. Hugh M. Miller, South Bend, counselor.

Typhoid Fever.—September 21, ninety-eight cases of typhoid fever were reported in South Bend. Under the advice of Surg. Julius O. Cobb, U. S. P. H. S., the following measures have been recommended: chlorination of the water supply; boiling of all well water; the use of pasteurized or boiled milk, and antityphoid inoculation.

State Health Board to Exhibit.—The state board of health, in connection with the Indiana Anti-Tuberculosis Society and the Marion Society for the Prevention of Tuberculosis, is preparing a very extensive health exhibit at the state fair which is to be housed in three tents each 30 by 60 feet. Motion pictures will be shown, and the state board of health will be represented in the departments of public hygiene, pure food, weights and measures, water analysis, and laboratory.

Personal.—Dr. Augustus L. Marshall has been elected secretary of the Indianapolis Medical Society, succeeding Dr. Leslie H. Maxwell, who is on duty with Base Hospital No. 32.—Dr. Lewis P. Drayer has been appointed secretary of the health board of Fort Wayne, succeeding Dr. John H. Gilpin, who is on duty at Fort Benjamin Harrison.—Dr. Edmond D. Clark, Indianapolis, director of Base Hospital No. 32, gave a dinner to the members of the staff at the university club, August 29.—Dr. Sarah C. Jackson, Jeffersonville, one of the founders and trustees of the Odd Fellows' Home at Greenburg, has retired from practice, and has gone to the home to live. A dinner was given in her honor by the physicians and other friends at Jeffersonville.

MARYLAND

Personal.—Dr. Frank Martin and Dr. William H. Smith, who are on the staff of the University of Maryland Base Hospital Unit, have left for Philadelphia, where they expect to review the study of brain surgery, preparatory to going to France with the unit.—Dr. John S. Fulton, secretary of the Maryland State Board of Health, who is a captain in the Medical Reserve Corps, has been named on a board appointed by Major-Gen. William C. Gorgas to prepare a medical and surgical history of American participation in the European War.—Dr. Wright S. Sudler has been appointed one of the health officers of Baltimore County, vice Dr. William E. McClanahan, Highlandtown, who has received a commission as captain in the Medical Reserve Corps.

MASSACHUSETTS

Personal.—Col. Frank P. Williams, Boston, of the Massachusetts National Guard, has been assigned to the twenty-sixth division as divisional sanitary inspector.—Dr. Gualtiero De Amezaga, Roxbury, Boston, was seriously injured in an automobile accident at Winchester, August 29.

Correction of Speech Disorders.—Dr. Walter B. Swift, Boston, has been appointed medical supervisor of speech classes in the public schools of Fall River. He has instructed teachers who will install his methods and systems of treating speech disorders in the school and form classes for phonetics, stuttering and mental defects.

MICHIGAN

Hospital Under Quarantine.—The Homeopathic Hospital at Ann Arbor was placed under quarantine, September 7, on account of the occurrence of four cases of virulent diphtheria. Two diphtheria patients died.

Personal.—Dr. Clara M. Davis, Lansing, has returned after six months in the Orient.—Dr. Allison H. Edwards has taken charge of the Grand Rapids Tuberculosis Sanatorium pending the appointment of a superintendent to succeed Miss Emma Frieby, resigned.

NEW YORK

Personal.—Dr. Frank L. Christian, Elmira, has been appointed superintendent of the Elmira Reformatory and the Eastern New York Reformatory, Napanoch.

Gibson Acquitted.—Dr. William B. Gibson, health officer of Huntington and coroner of Suffolk County, was acquitted, September 7, of the charge of having performed an illegal operation on a woman of Huntington.

Appropriation for Farm Hospital Granted.—The request of Dr. Walter S. Goodale for an additional \$100,000 for the

equipment of the West Farm Hospital was granted by the Buffalo City Council, September 14.

Typhoid Fever.—September 7, there were reported in the epidemic of typhoid fever at West New Brighton, Staten Island, fifty cases of typhoid fever, and 1,000 citizens had been inoculated with antityphoid serum. The inoculations will be continued.

New York City

Budget for 1918.—Health Commissioner Haven Emerson estimates the expense of his department for 1918 as \$4,101,046, or \$727,457 more than the appropriation for 1917. Of this increase, \$368,389 is for personal service, and \$314,595 for new positions.

Public Health Service Changes.—Senior Surg. George W. Stoner, U. S. P. H. S., who for the past four years has had charge of the Marine Hospital at Stapleton, L. I., has been retired from active duty, having served forty years. Dr. Claude H. Lavinder is now in charge at Stapleton.

Medical Examiners Replace Coroners.—At a meeting of the Board of Estimate and Apportionment, September 13, the four coroners in Manhattan, two in Brooklyn, two in the Bronx, two in Queens, and two in Richmond borough will retire at the end of the year, and will be replaced by a chief medical officer in each borough. This will decrease the expenses of the office at least \$40,000 a year.

New Broad Street Hospital Completed.—The new Broad Street Hospital has been opened for the reception of patients without any formal ceremony, the dedication having been deferred until some time next month. A dispensary is conducted in connection with the hospital, and two motor ambulances have been placed at the disposal of the public. This hospital was erected at a cost of \$270,000, and is one of the best equipped hospitals of its size in the city. This will meet the needs of that portion of the city lying below Canal Street and between the North and East rivers.

Indictments in Diploma Case.—The Grand Jury has filed additional indictments against "Dr." Nicholas Clements and his wife, Rose Clements, and Joseph Budd, all of whom were recently arraigned, and who are alleged to have conducted a diploma factory where it was possible to purchase regent's certificates, college diplomas, and even licenses to practice medicine. Further investigations have resulted in the discovery of several additional persons who are alleged to have been practicing medicine under diplomas or licenses obtained from this source. One of these diplomas purported to be from a medical institution of high standing in Vienna, Austria.

• **Medical Colleges Open to Women.**—Announcement has been made that the College of Physicians and Surgeons of Columbia University will be open to women during the coming month. This step has been hastened by conditions arising from the war, and has been made possible by a gift of \$50,000 from George W. Breckenridge, San Antonio, Texas.—Women are also for the first time to be admitted to the medical department of New York University.—Preliminary work in biology, chemistry and physics will be offered at the New York Homeopathic Medical College and Flower Hospital.

NORTH CAROLINA

Public Health Laboratory.—Wilmington and New Hanover county have a well equipped laboratory for the free diagnosis of infectious disease, with a competent bacteriologist and chemist in charge. The bulletin of the health authorities of these municipalities complains that the facilities of the laboratory are not used as freely as they should be by the physicians of the district. It is said that cases of typhoid fever are still being diagnosed by the symptoms rather than by the laboratory findings, and fever cases that subside in a few days after the administration of quinin are called malaria, while those in which the treatment fails may be found to be typhoid fever. It is said that many cases of paratyphoid fever proceed to recovery without differential diagnosis. Criticism of the board and the laboratory, which it is claimed, is not justified, is sometimes heard. A plea is made for a better acquaintance with the laboratory and its purposes.

OHIO

Epidemic of Typhoid Fever.—September 7, it was reported from Harrod that twenty-five persons had become ill with typhoid fever, which was supposed to have been caused by ice cream cones eaten at a family reunion. Many of the cases are said to be serious.

Dentists and Anesthetics.—In a rule made by Attorney-General McGhee, September 6, dentists may legally administer anesthetics both in the practice of dentistry and in other cases. The state medical board has contended heretofore that only physicians could legally administer anesthetics.

Personal.—Dr. Allen W. Freeman, Richmond, Va., epidemiologist in the United States Public Health Service, and formerly assistant state health commissioner of Virginia, has been elected state health commissioner of Ohio, to succeed the late Dr. George H. Matson, at a salary of \$6,000 a year. He will enter on his duties, October 1, with headquarters at Columbus.

Taking Care of the Poor.—At Marion, September 7, twenty-five members of the local medical society associated themselves together as a staff to take care of such indigent patients as require hospital care who may be reported to them by the Social Service League. A division of the work will be made into the various specialties. The arrangement, it is understood, is to be continued during the war.

OKLAHOMA

Personal.—Dr. Samuel M. Hunter, Oklahoma City, has succeeded his son, Dr. George Hunter, as city physician.—It is reported that the state board of medical examiners has revoked the license granted Dr. Thomas E. Shepherd, Tulsa, who is charged with having performed a criminal operation in May last which resulted in the death of the patient. The complaint to the state board was signed by Dr. S. De Zell Hawley for the county medical society.

OREGON

Personal.—Dr. Frank M. Brooks, Portland, has been appointed a member of the state board of health, to succeed Dr. Marius D. Marcellus, who was called to the colors.—In the places of Dr. Henry E. Clay, Salem, and Dr. David N. Roberg, secretary of the board, who have also joined the Army, Drs. William H. Dale, Harrisburg, and Robert E. L. Holt, La Grande, have been serving.

PENNSYLVANIA

Typhoid Fever.—Typhoid fever is reported to be epidemic at East Petersburg, where there are at present fourteen cases.

Personal.—Dr. Charles B. Dreher, Tamaqua, was given a banquet, September 14, to commemorate the completion of half a century in the practice of medicine.—Dr. W. Roland Davies, West Scranton, has been elected president of the Craftmen's Club.—Dr. Lowell M. Gates has been elected president of the American Bank of Commerce, Scranton.

Philadelphia

Addresses County Medical Society.—Dr. Alfred Gordon, Philadelphia, delivered an illustrated lecture before the York County Medical Society at its annual meeting, September 6, on the differential diagnosis and treatment of the more common neurologic conditions met with in general practice.

Personal.—Dr. Earle B. Stokes has been commissioned first lieutenant, N. G., Pa., and assigned to duty with the First Cavalry.—Lieut. Charles S. Pancoast, having been found physically disqualified for military service, has been mustered out of the service of the United States under date of August 3, and was honorably discharged from the Pennsylvania National Guard, August 4.

Medical Institutions.—Jefferson Medical College held its ninety-third annual opening exercises, September 24. The introductory address on "How to Study" was delivered by Dr. Chevalier Jackson, professor of laryngology.—The Woman's Medical College opened its school year, September 19, with an address by Dr. Martha Tracy, dean of the college. There has been an increase of 50 per cent. over last year in the entrance enrolment.

Medico-Chirurgical Notes.—The board of review appointed to assess damages for property taken by the city for the parkway has awarded \$714,500 to the University of Pennsylvania for the old Medico-Chirurgical College and Hospital property taken by the university in the merger proceedings. With the exception of the hospital, which will be retained for use in case of war emergency, all the buildings of the group will be torn down.

SOUTH DAKOTA

Personal.—Dr. Oscar W. Phelps, Lemmon, has been bequeathed \$50,000 by the will of a former patient in Hope, Ill.

TEXAS

New Health Board.—A new board of health has been appointed from San Antonio, consisting of Charles S. Venable, John H. Burleson, Dabney Berrey and Thomas T. Jackson. The board reappointed Dr. William A. King as city health officer.

State Quarantine Station to Be Built.—It is announced that the work on the State Quarantine Station at Sabine Pass, construction of which was authorized some time ago, will be begun in the near future. An appropriation of \$85,000 was made for this purpose.

Psychiatric Appointments.—Dr. John Preston, superintendent of the State Insane Hospital, Austin, has been appointed by the Medico-Psychological Society to organize neuropsychiatric hospital units to be attached to the base hospitals and other military sanitary units. Dr. Preston has appointed the following committee to carry out these plans: Drs. Marvin L. Graves, Galveston; John S. Turner, Dallas; George F. Powell, Terrell; Thomas B. Bass, Abilene; James R. Nichols, Austin, and John W. Bradfield, Austin.

VIRGINIA

Infantile Paralysis.—August 30, the city board of health of Harrisonburg appropriated \$1,000 for fighting infantile paralysis, which had occurred in epidemic form in the city. Cases had occurred at Winchester and other places in Rockingham County. About September 16, the disease had been brought under control, and quarantine was lifted throughout the county. Since the disease was first reported in April there have been sixty-two cases, twelve of which resulted fatally.

CANADA

University News.—At a recent meeting of the board of governors of Manitoba University, a resolution was proposed that no unmarried man of 20 years or over be permitted to attend lectures or take examinations unless he furnishes satisfactory reasons why he has not enlisted. A proposal for the compulsory military training of male students was approved.

Infantile Paralysis in Ontario.—Forty-three cases of infantile paralysis, three of which have proved fatal, have been reported in the past few weeks in Ontario. The following figures show the sections of the province affected: Toronto, 7; Ottawa, 8; Edwardsburg, 7; Cardinal, 6; Cornwall, 9, and Ferguson, 2. These figures show the extreme eastern part of the province mostly affected.

Venereal Disease Committee.—The committee on the prevention of venereal diseases which has been active for some time in Toronto is to be made a permanent organization, and will be known as the Advisory Committee on Venereal Disease for Military District Number 2. Major John G. Fitzgerald has been elected president; W. S. Gundy, treasurer, and Capt. W. Gordon Bates, secretary.

Personal.—Dr. Percy W. M. Curry, Montreal, has left for Valcartier, Que., to join the C. A. M. C., and expects to go overseas shortly.—Dr. Albert E. MacCaulay, superintendent of the General Hospital, St. John, N. B., has resigned.—Dr. Alfred B. Atherton, formerly of Fredericton, N. B., has retired from practice, and has taken up residence at San Diego, Calif.—Capt. A. H. Hall, who was wounded in France, has resumed practice in Quebec City.—Dr. Robert G. Ferguson, Winnipeg, has been appointed medical superintendent of the Qu'Appelle Sanatorium, pending the return of Dr. Fred J. Hart, who is on active service.—Among the recently wounded are: Capt. J. Harold Jones, Vancouver, B. C.; Robert Mackenzie, Vancouver, B. C.; Richard W. Kenney, Winnipeg, and James E. Bloomer, Moose Jaw, Sask., all of the C. A. M. C.—Dr. William L. Denny, Western University, London, Ont., 1917, has obtained a commission in the Royal Navy as medical officer.—Dr. Duncan A. McKillop, St. Thomas, Ont., Western University, London, has been appointed surgeon with the Royal Navy.—Lieut. Donald Neil Stuart, V. C., D. S. O., R. N. R., Prince Edward Island, has been given the Victoria Cross for services in action with enemy submarines.—Capt. Alexander L. McQuarrie, medical officer of health, New Westminster, B. C., and who went overseas with the 121st Battalion as regimental medical officer, has been appointed officer commanding Canadian Sanitary Section No. 7 in England.—Major Angus W. McPherson, C. A. M. C., medical officer of health, Peterboro, Ont., has returned to Canada for two months' leave of absence.—Dr. Louis De L. Harwood, superintendent of the Notre Dame Hospital, Montreal, has left Canada to join the staff of Laval

Military Hospital in France.—Capt. L. J. Siebert and Hereward D. Livingstone, Toronto, Lieut. John M. MacDonald, Toronto, C. A. M. C., and Dr. Percival E. Faed, Grace Hospital, Toronto, have left for China.—Lieut.-Col. John R. Spier, Westmount, C. A. M. C., is in command of the Canadian Hospital, Bromley, England.—Capt. Harold A. Simpkins of the Spadina Convalescent Hospital, Toronto, has been transferred to England.—Capt. Frank S. Park, C. A. M. C., who was taken prisoner by the Germans in June, 1916, was attached to the Fourth Canadian Mounted Rifles. He asked permission to attend the allied prisoners at Minden Hospital, where there are 2,000 prisoners, and for some months has been acting as medical officer to that hospital.

GENERAL

Organization of Dental Surgeons.—The association of military Dental Surgeons of the United States has been organized, with offices in San Francisco. Dr. John D. Millikin is president of the association, which publishes a quarterly bulletin of dentomilitary news.

Correction.—Dr. F. A. Faught writes that in his discussion of Dr. Slemon's paper, *THE JOURNAL*, September 8, p. 780, lines 9, 10 and 11, should be corrected to read: "This corresponds with the 3:2:1 ratio; that is, the pulse pressure is $\frac{1}{3}$ the systolic and $\frac{1}{2}$ the diastolic."

Industrial Accidents Considered.—The International Association of Industrial Accident Boards and Commissions held its fourth annual meeting at the state house, Boston, August 21 to 24. Among the subjects discussed were, "Medical Competence and Hospital Efficiency," and "Compensation Insurance."

Correction.—Dr. Curtis F. Burnam writes that a typographical error appears in the report of his discussion on the papers on radium, *THE JOURNAL*, September 22, page 996. In the sentence: "In the cases which I am reporting I feel that the results could be duplicated by the use of 3 or 4 mg., although I have used myself as much as a gram or two with some of them," the numerals 3 or 4 should be 300 or 400.

Personal.—Rear Admiral Charles F. Stokes, U. S. Navy, retired, and until recently medical director of the board of inebriety and in charge of its country retreat at Warwick, N. Y., is reported to be seriously ill at Brian Cliff Manor, N. Y.—Dr. Ross H. Skillern, Philadelphia, has accepted a commission as major in the Medical Reserve Corps, and has been placed in charge of the nose and throat unit at Camp Sheridan, Montgomery, Ala.

Bequests and Donations.—The following bequests and donations have recently been announced:

Chicago Home for Crippled Children, \$5,000, and Iroquois Memorial Hospital, \$500, by the will of Mrs. Kate Adams Cooper, Chicago.

Misericordia Hospital, Philadelphia, a donation of \$10,000 for the establishment of a ward to be known as the Elinor C. Donnelly room.

Lincoln Hospital and Home, New York, \$81,000; New York Orthopedic Dispensary and Hospital, and New York Society for the Prevention of Cruelty to Children, each \$40,615, and St. John Guild, \$240,890, by the will of Mrs. Helen Juilliard, New York.

Yale Medical School, New Haven, a donation of \$100,000 for the Harriman Fund for Obstetrics, by Mrs. Edward H. Harriman, and a donation of \$50,000 by Charles N. Brooker, Ansonia.

Pennsylvania Hospital, the furnishings of the Tate Home; Pennsylvania Indigent Widows, and Single Women, Philadelphia, \$10,000 in trust, by the will of Susan Tate.

University Museum, Philadelphia, donation of the archeological and ethnological collections of the late Dr. William White, by his widow.

Montefiore Home, New York, \$1,000, and to Mount Sinai Hospital his residuary estate, by the will of Julian A. Hellman.

War Tuberculosis.—Preparations for the extensive campaign to prevent the spread of tuberculosis in the United States Army and in the conscripts rejected by the draft will be the theme for discussion at the meeting of the Southern Sectional Conference of the National Association for the Study and Prevention of Tuberculosis which is to be held in Chattanooga, Tenn., November 9 and 10. The officers of the conference are as follows: president, Dr. Lewis B. McBrayer, Sanatorium, N. C.; vice presidents, Dr. Louis A. Bize, Tampa, Fla.; Mr. W. N. Runn, Asheville, N. C.; Dr. Robert Wilson, Jr., Charleston, S. C.; Mr. C. E. J. Mooney, Memphis, Tenn.; Mr. Kendall Weisigner, Atlanta, Ga.; Dr. Gaston J. Greil, Montgomery, Ala., and Mrs. Edward McGehee, New Orleans, and secretary, James P. Kranz.

Mississippi Valley Conference on Tuberculosis.—The fifth session of the Mississippi Valley Conference on Tuberculosis will be held at Minneapolis and St. Paul, October 8-10, under the presidency of Mr. James Minnick, Chicago. The object of the conference is to bring up a closer relationship between

antituberculosis agencies in the Mississippi Valley, and provide for the interchange of ideas and experiences; to strengthen and extend the work of the National Association for the Study and Prevention of Tuberculosis; to arouse the people of this valley to the need for concerted action, both public and private, against tuberculosis, and to effect closer cooperation between antituberculosis societies and other health agencies. The headquarters will be at the Radisson Hotel, Minneapolis, for October 8 and 9, and at the St. Paul Hotel, St. Paul, October 10. The states of Ohio, Michigan, Indiana, Wisconsin, Illinois, Kentucky, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska and Kansas are included in the conference. On the second day the first annual meeting of the Mississippi Valley Sanitarium Association will be held, at which Dr. James W. Pettit, Ottawa, Ill., will preside. On the afternoon of October 10, the tuberculosis problems of the war will be the topic for discussion.

Poliomyelitis.—Since September 10, cases of poliomyelitis have been reported in the press from the following places: Chicago, September 21, there had been 142 cases, with 2 deaths; September 11, 3 cases and 3 deaths were reported from Rock Island; the state board of health at Des Moines, September 18, had received reports of 43 cases throughout the state, 19 of which had occurred at Davenport and vicinity, where the disease was epidemic. Other towns and counties in the state reporting cases were Deep Creek, Clinton County, Lynn, Plymouth, Fayette and Monona counties; Castana reported 3 deaths, with 1 case under quarantine; Knoxville, Marion County, reported several cases in the county; Schleswig had 1 case, September 15; Waterloo had 1 death, September 16; Kansas City, Mo., September 14, had 3 cases; September 15, Montana reported no cases since August 18. In Nebraska, September 14, 5 suspected cases had been reported to the state health authorities from Hebron, 2 from Dawson, 1 from Schuyler and 1 from Johnson; at Omaha there had been but few cases, and no alarm was felt. In New York City names and address of infantile paralysis patients are published so that parents may protect their children. The plan has worked well, it is said. Pennsylvania reported 1 case from Waynesboro, September 12, and 1 from Mahanoy City, September 14. There had been 107 cases in the state during August.

FOREIGN

Deaths in the Profession Abroad.—F. Wullyamoz of Lausanne, a pioneer in roentgenoscopy and surgery under screen control before the war, aged 40.—R. Alvarez, chief of the psychiatric clinic at Cordoba, Argentina.—A. Biondi, docent of medical pathology at the University of Naples, aged 71. From recent casualty lists in France: P. Bournet, Bornet, Tardif, Zagrewski, Dagès, M. Gohier, Chambrelent and P. Patriarche, all aide-majors.

New Medical Journal in Argentina.—The bimonthly, *El Monitor*, Santa Fe, Argentina, has appeared in a journal of forty-four pages divided into two parts, one devoted to medicine, surgery, hygiene and pharmacology; the other is given up to articles on chemistry, industrial hygiene and veterinary questions. The editor in chief is Prof. E. Escobar, who is director of the service for children's diseases at the public hospital and also of the National Industrial School. The journal aims to be a bi-monthly review of science and industry. The annual subscription is about \$6.

The Gasoline and Coal Question in the Netherlands.—One of the subjects mentioned in the president's address at the recent annual meeting of the Netherlands Medical Association was the scarcity of gasoline and coal. The outlook for gasoline is dark, the committee in charge of this matter reported. The state "benzine-control commission" admits that the conditions are cause for concern, but that it was hoped to be able to supply physicians with about 40 per cent. of the amount they used in normal times. The new price regulation by Germany has cooperated in the grave condition, it is said. The state petroleum commission announces that physicians can be supplied at present with 8 or 10 liters of petroleum for professional use, but stricter regulations are impending. The local (the Hague) coal-control commission is giving out small units of coal for various places, and among them are physicians' offices and waiting rooms. The quantities thus taken are to be credited to the amount set aside for physicians, to be estimated later. After October, the gas and electricity supply is to come under the control of the coal-supply commission. As to obtaining fodder for horses owned by physicians, nothing had been settled at the time of the meeting.

LONDON LETTER

LONDON, Sept. 1, 1917.

The War

DRASTIC FOOD CONTROL

The measures of food control taken have from time to time been previously reported in *THE JOURNAL*. Some of a most drastic character have just been taken, greatly extending the control beyond anything previously done. The object is to prevent "profiteering" (a term which has come into vogue since the war, and means making undue profits in consequence of opportunities furnished by the war). The maximum price, both wholesale and retail, at which the most important foods may be sold is now laid down by law according to schedules. Thus the maximum price at which Argentine, Canadian, American and Irish creamery butter may be sold is \$41 for 112 pounds. This, of course, is the wholesale price. Any person other than the importer or maker may not sell butter at a price which exceeds by more than \$2 a hundredweight the price paid by him or the first-hand price in force at the time, whichever is the lesser. With regard to retail sales, it is provided that no person shall sell butter at more than 5 cents a pound in excess of the cost to him, but an additional cent may be charged for giving credit or for delivery. From the terms of this order it may be assumed that the retail price of butter will vary from about 50 to 59 cents a pound. This is practically its present price, so that any advantage the order may have for the consumer will be in preventing a further increase in price. The cheese order applies only to wholesale prices of British-made cheeses. They must not be sold by a maker at prices exceeding \$29 to \$33 a hundredweight, according to the variety of cheese. No person other than the maker may sell at a price in excess of whichever is the lesser of the two following: (a) \$1.50 above the price paid, plus the cost of transport, or (b) \$2.50 above the first-hand price. The price of meat is similarly regulated. Beef now costs 42 cents a pound and mutton 36 cents. Bread now costs 24 cents for a 4-pound loaf, but according to a regulation about to come into force this price will be reduced to 18 cents. The price of wheat does not allow bread to be sold at this rate, and the government will bear the loss, which is estimated at about \$100,000,000 per annum. This measure to keep "the staff of life" at a fixed price is designed to benefit the very poor, persons who unlike munition workers and others, are not receiving greatly increased wages in consequence of the war.

CIVILIAN PHYSICIANS IN THE ARMY

Sir Alfred Keogh, Director-General of the Army Medical Corps, proposes to establish a branch to deal with questions directly affecting territorial and temporary medical officers. It will be able to collect and collate information on the many problems raised by the incorporation of so large a number of civilian physicians in the Army Medical Service. The fact that they now constitute about eleven twelfths of the service is in itself sufficient to justify the new departure. It is understood that the intention is that the staff of the branch shall include a territorial and a temporary officer having recent experience of war conditions.

Bubonic Plague in the Port of London

The steamship *Matiana*, from Bombay, arrived at Gravesend, August 13. On the voyage, between July 14 and 28, there were nine cases of bubonic plague, with six deaths, among the crew, all natives of India. The bodies were buried at sea. Three convalescent or more chronic cases were taken off at Gravesend and removed to hospital. The crew was kept under medical observation, and another case occurred which resulted in the death of the patient in hospital. The vessel called at Falmouth, August 11, but no cargo was discharged and no passengers were landed at that port. The ship remains at the official mooring station off Gravesend, and the cargo was discharged into lighters under supervision of the health officer of the Port of London sanitary authority, who is taking all necessary precautions.

The Campaign Against Venereal Disease

Considerable progress has been made with the organization of measures for the free diagnosis and treatment for persons suffering from, or suspected to be suffering from, venereal diseases. Between 140 and 150 hospitals in England and Wales have expressed their willingness to participate in the scheme of local authorities, and although in a few instances the authorities of important hospitals have been reluctant to inaugurate during the war any fresh arrange-

ments for the treatment of these diseases, this hesitation has already been overcome in some cases. The shortage on medical staffs and the pressure on the accommodations at most hospitals have presented obstacles in many instances. The former difficulty has been met to some extent by the army council arranging that certain officers of the Army Medical Corps specially skilled in the treatment of venereal disease should devote part of their time to the work of the clinics provided at general hospitals for the treatment of these diseases. Complete schemes for the diagnosis and treatment of these diseases have already been submitted by 115 out of the 145 councils which are charged with the execution of the regulations. The total population of the areas of these councils is about 29,000,000. Eighty-nine schemes, serving a population of about 25,000,000, have been approved, and the work has already started at sixty-two hospitals. It is estimated that the facilities provided at these hospitals will serve a population of at least 18,000,000 people.

PARIS LETTER

PARIS, Aug. 30, 1917.

The War

BOMBARDMENT OF HOSPITALS

For some time past the enemy has bombarded our hospitals incessantly. The hospital units at Dugny, Monthairons, Vadelaincourt and Belrupt, in the region of Verdun, have been subjected to several bombardments, during which forty-three nurses and soldiers have been killed, and fifty-five wounded. The bombardment of the hospital at Dugny began July 14, and was renewed July 22, and again August 3. From August 10 to 18, the bombardment took place every day, except August 15. August 18 it was particularly heavy. Trenches had been dug around the hospital, and afforded some protection against the enemy's attack. Mlle. de Baye, head nurse, was outside of the trench, caring for the safety of patients and superintending the personnel under her orders, when a shell burst, killing Mlle. Eugénie Pietrowska, Mmes. Vostey and Fischot, and seriously wounded Mlles. de Baye, Hartz, Leclerc, Leduc and Paque. August 20, an incendiary bomb was thrown from a German aeroplane, and struck the hospital of Vadelaincourt. The bomb penetrated a room for dressings, killing a nurse, Mlle. Vandamme. The barracks caught fire, and it spread to the neighboring buildings. The aviator threw a second bomb, which struck the operating pavilion in which three surgeons and their assistants were operating. The pavilion was entirely destroyed. Nurses and patients were driven from the hospital by the flames of the burning building. The aviator, flying very low, started in pursuit, firing his machine gun, and the result was sixty-eight victims, thirteen of whom have since died.

THE AMERICAN RED CROSS IN BELGIUM

Major Murphy, head of the American Red Cross Commission, has just returned from a journey in Belgium, where he has been studying the administration of relief work and questions of reconstruction. The American Red Cross plans to carry out an extensive program looking to the improvement of conditions in Belgium. It is the intention not only to develop further the work that has been already organized, but also to establish new branches. Major Murphy was accompanied by Warwick Greene, who was a member of the Rockefeller Foundation, and by Frédéric Hoppin, who is a member of his staff.

AMERICANS DECORATED WITH THE CROSS OF THE LEGION OF HONOR

M. Painlevé, minister of war, has just bestowed the cross of the Legion of Honor on Lady Michelham, Mrs. Borden Turner and Miss Ivens, at the same time thanking them for their devotion to the wounded. Lady Michelham has founded at Paris a hospital for French and British wounded; also two other hospitals, one at Dieppe and one at Cap Martin.

GIFT FROM URUGUAY FOR THE DEVASTATED PROVINCES OF FRANCE

M. Jules Mailhos, a noted citizen of Montevideo, Uruguay, died recently. He was of French extraction, and during his lifetime had become distinguished for generosity shown the people of France. Since the beginning of the war, especially, he had sent to the Franco-American Committee in France 100,000 francs (\$20,000), to be divided among various forms of relief work in France. His widow and his sons have recently turned over to the same committee, for devastated provinces of France, a new gift of 30,000 francs (\$6,000).

Coal Tickets

Beginning Sept. 1, 1917, coal for domestic use will be sold in Paris only on the presentation of tickets, which will be issued after the same manner as sugar tickets. Coal tickets will be furnished householders through the mayor's office, beginning with the first week of September.

Antirabic Vaccinations at the Institut Pasteur

During the year 1916, 1,391 persons have received antirabic treatment at the Institut Pasteur at Paris. Six patients, or 0.43 per cent., have died of hydrophobia. Two of these six patients were seized with the disease during the course of the antirabic treatment. One died less than two weeks after the end of the treatment. These three patients should be deducted. The corrected statistics given by the Institut Pasteur are as follows: The number of persons treated, 1,388; the number of deaths, three; mortality, 0.21 per cent.

As may be seen, the percentage of mortality from hydrophobia has slightly increased. The number of persons bitten is much larger than before the war. During the years preceding 1914, there had usually been no deaths from hydrophobia in Paris.

Professional Secrecy Imposed on Physicians

M. Mesureur, director of the Assistance Publique, having proposed to the Académie de médecine that professional secrecy as regards matters of abortion be abolished, the Syndicat des médecins of the Seine has published the following protest as drawn up at its general assembly:

"Considering the fact that professional secrecy should be inviolate, not only in the interest of the patient but of society as well; in view of the fact that the rôle of a physician is not to be an informer against, but rather the deliverer of, the sick who confide in him; bearing in mind, furthermore, that these patients would no longer consult him, if it were otherwise, and believing that the measure would be impracticable and harmful, we do hereby vigorously protest against any violation of professional secrecy, and more particularly against the proposal of M. Mesureur to the Académie de médecine that abortions should be made publicly known."

On the other hand, the Syndicat des médecins of Toulouse has expressed its opinion on this question in a letter addressed to the perpetual secretary of the Académie de médecine, to the effect that a measure of such grave and unusual import should not be decided on without a joint meeting of the various medical organizations being held. The medical society of Toulouse declared itself in favor of the proposal to accord to the medical societies and associations interested the right to prosecute directly persons guilty of abortion, without being required to give evidence of personal interest. Furthermore, it gave expression to the wish that this principle be extended in its application so as to include every misdemeanor and offense against public policy growing out of infanticide, attempts at abortion, and birth control propaganda.

Marriages

NAT BAILEY TWY CROSS BARKER, M.D., Woodland, Maine, to Miss Catherine Blaisdell of Winterport, Maine, August 30.

JOHN DENNIS BOWEN, M.D., Johnstown, Pa., to Miss Margaret A. Sullivan of Binghamton, N. Y., September 12.

FRANCIS XAVIER WALLS, M.D., to Mrs. Livingston T. Dickason, both of Chicago, in New York City, September 4.

CAPT. EDWIN MORTON MILLER, M. R. C., U. S. Army, to Miss Blanche Guthrie of Chicago, September 8.

GUY LESLIE KAY, M.D., Wilmington, Calif., to Miss Irma Mae Olesen of Santa Cruz, Calif., August 28.

NICHOLAS DUVALLY, M.D., Fall River, Mass., to ALICE ETTA RUTH BUTLER, M.D., of Boston, September 5.

J. H. WESTCOTT, M.D., Norwich, N. Y., to Miss Annie L. Mallard of Washington, D. C., September 8.

MARCUS H. HELDMAN, M.D., Great Falls, Mont., to Mrs. Ada Prior of Pasadena, Calif., September 6.

ARTHUR THOMAS BAILEY, M.D., to Miss Ethel Osman, both of Iowa City, Ia., September 3.

ARVID E. KOHLER, M.D., to Miss Hazel Giles, both of Moline, Ill., September 15.

RALPH KING, M.D., to Miss Nana Wharf, both of Chicago, September 4.

ASA JOHNSON, M.D., to Miss Hazel Perry, both of St. Paul, July 25.

Deaths

Capt. James Carroll Byrnes, Medical Director, U. S. Navy (retired), East Orange, N. J.; University of Georgetown, Washington, D. C., 1870; aged 66; a Fellow of the American Medical Association; who served as assistant surgeon in the Army in the Indian wars; entered the Navy in 1876; was surgeon of the *Cincinnati* during the Spanish-American War; was then transferred to the Pacific Fleet; was in command of the Naval Hospital at Newport in 1909, and of the Brooklyn Naval Hospital in 1910, and was retired, Jan. 12, 1913, on attaining the aged of 62 years, after fourteen years and nine months' sea service, and twenty years and two months' shore or other duty; died at the home of his sister in Brooklyn, September 15.

Capt. Charles Harvey Bowker, M. R. C., U. S. Army, Washington, D. C.; Hahnemann Medical College, Philadelphia, 1892; National University, Washington, D. C., 1900; aged 47; a Fellow of the American Medical Association, and a member of the Association of Military Surgeons of the United States; associate professor of bacteriology in Howard University, Washington, D. C.; formerly major in the Medical Corps of the District of Columbia, National Guard; recently stationed at Roosevelt, Ariz.; was drowned in Roosevelt Lake, September 9, while endeavoring to rescue a woman from drowning.

David St. John, M.D., Hackensack, N. J.; Bellevue Hospital Medical College, New York, 1875; aged 68; a Fellow of the American Medical Association; a member of the New Jersey State Medical Society, and the New York Academy of Medicine; surgical director and visiting surgeon of the Hackensack Hospital; a member of the State Hospital for the Insane, Mossir Plains; ex-president of the Bergen County Medical Society; died, September 14, at his country home in Berne, N. Y., after an illness of more than a year.

Alexander Bryan Johnson, M.D., New York; Columbia University College of Physicians and Surgeons, New York, 1885; aged 47; formerly a member of the Medical Society of the State of New York; member of the American Surgical Association; professor of clinical surgery at Columbia University, and consulting surgeon at the New York Hospital; died at his home, East Hampton, L. I., September 4, from heart disease.

William Redfield Butt, M.D., Canton, Ohio; University of Pennsylvania, Philadelphia, 1904; aged 37; a Fellow of the American Medical Association; a member of the Philadelphia Laryngological Society; Philadelphia Section on Otology and Laryngology of the College of Physicians; died, September 5, as a result of injuries received in an automobile accident.

August Henry Arp, M.D., Moline, Ill.; University of Iowa, College of Homeopathic Medicine, Iowa City, 1882; aged 56; a Fellow of the American Medical Association; a member of the Tri-State Medical Society, and of the Association of Railway Surgeons; formerly health commissioner of Moline; died at his home, September 14, from heart disease.

Joseph Orlando Orr, M.D., Toronto, Ont.; Victoria University Medical School, Coburg, Ont., 1884; aged 56; a member of the British Medical Association; the British Laryngological Society, and the Dominion Medical Association; in 1903 he became manager and secretary of the Canadian National Exhibition; died suddenly at his home, August 22.

John Gardner, M.D., LaGrange, Ohio; Rush Medical College, Chicago, 1872, and Missouri Medical College, St. Louis, 1876; aged 75; formerly president of the California State Board of Health, and for three years a surgeon-general in the Army, being stationed at the Fiji Islands; died at the home of his son, September 4, from epithelioma of the tongue.

Robert E. Green, M.D., Gainesville, Ga.; Southern Medical College, Atlanta, Ga., 1868; for many years president of the Georgia Manufacturing Company; a member of the board of trustees of the Georgia Normal and Industrial College, Milledgeville; who built and operated the first street car line in Gainesville; died at his home, September 6.

Robert J. Christie, M.D., Quincy, Ill.; University of Pennsylvania, Philadelphia, 1890; aged 53; a Fellow of the American Medical Association; a member of the Illinois State Medical Society, the Western Surgical Association, and the American College of Surgeons; died suddenly, September 8, from cerebral hemorrhage.

John M. Quigley, M.D., San Francisco; Willamette University, Salem, Ore., 1892; aged 50; formerly a member of the

Medical Society of the State of California; formerly a physician to St. Francis' Girls Directory and Orphanage; died at St. Mary's Hospital, September 12, from injuries received in an automobile accident.

George William Hazelton, M.D., Manchester, N. H., Columbia University College of Physicians and Surgeons, New York, 1884; aged 59; formerly a Fellow of the American Medical Association; a member of the New Hampshire Medical Society; died at his home, September 13, after an illness of one day.

Warren D. Silkman, M.D., Manhattan, Kan.; University Medical College, New York, 1893; formerly a member of the Kansas Medical Society; in charge of the medical work among the cantonment workers at Camp Funston; died, about September 7, from injuries received in an automobile accident.

Nic. Jose Pinault, M.D., Pass Christian, Miss.; Laval University, Faculty of Medicine, Quebec, 1874; aged 71; for many years Hennepin County physician, and a Minnesota representative at the International Medical Congress, in Rome, 1894; died at his home, September 8, from heart disease.

Arthur Tallas Yeilding, M.D., Portland, Ore.; University of Pittsburgh, Pittsburgh, 1909; aged 33; a member of the Oregon State Medical Association; a member of the staff of St. Vincent's Hospital, Portland; died at Bremerton Naval Hospital, July 16, from cerebral meningitis.

Leslie Thomas Page, M.D., Wilmington, Vt.; University of Vermont, College of Medicine, Burlington, Vt., 1891; aged 51; a Fellow of the American Medical Association; a member of the Vermont State Medical Society; died at his home, July 21, from chronic interstitial nephritis.

Edwin A. Curry, M.D., Danville, Pa.; University of Pennsylvania, Philadelphia, 1889; aged 54; formerly a Fellow of the American Medical Association; for many years a member of the Pennsylvania State Medical Society; died at his home, September 6, from paralysis.

Frank Cornwall, M.D., San Francisco; Eclectic Medical Institute, Cincinnati, 1869; aged 71; formerly a Fellow of the American Medical Association; a member of the Pacific Coast Oto-Ophthalmological Society; died at Buena Vista, Mexico, August 30, from neuritis.

David Miller Dry, M.D., Philadelphia, Pa.; Jefferson Medical College, Philadelphia, 1913; aged 28; a member of the Pennsylvania State Medical Society; formerly pathologist to the Jefferson Hospital; died in the Jefferson Hospital, about September 7.

Edward Sherburne Blanchard, M.D., Charlottetown, P. E. I.; Columbia University College of Physicians and Surgeons, New York, 1872; aged 72; medical superintendent of the Falconwood Hospital for the insane; died at his home, about August, 1917.

John Bernard Donnelly, M.D., Gardner, Mass.; Harvard University, Boston, 1893; aged 50; formerly a Fellow of the American Medical Association; a member of the Massachusetts Medical Society; died at his home, August 2, from nephritis.

Charles G. Pratt, M.D., Sparta, Mich.; Illinois Medical College, Chicago, 1900; formerly a Fellow of the American Medical Association; died at his home, August 31, from nephritis.

Leroy Frederick Morse, M.D., Cobden, Ill.; Dartmouth Medical School, Hanover, N. H., 1863; aged 78; died in the Anna State Hospital from enterocolitis, July 7.

Frank E. Maine, M.D., Albany, N. Y.; University of Pennsylvania, Philadelphia, 1878; aged 60; died at the Albany Hospital, July 31, from cerebral hemorrhage.

Staten E. Griffin, M.D., Colorado Springs, Colo.; Ensworth Medical College, St. Joseph, Mo., 1900; aged 46; was drowned while bathing at Mazatlan, Mex., August 29.

Thomas Jefferson Shreves, M.D., Des Moines, Iowa; Rush Medical College, Chicago, 1857; aged 82; died at his home, September 7, from senile debility.

Stewart W. Aldrich, M.D., Des Moines, Iowa; Cleveland Homeopathic Hospital College, Cleveland, 1874; aged 66; died at his home, September 3.

Amos Alexander Wheeler, M.D., Miami, Mo.; Bellevue Hospital Medical College, New York, 1868; aged 74; died at his home, about August 30.

Jefferson D. Cole, M.D., Newbern, Tenn.; Vanderbilt University, Nashville, Tenn., 1884; aged 55; died at his country home, August 29.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

ESKAY'S NEURO PHOSPHATES

Report of the Council on Pharmacy and Chemistry

For the information of the profession the Council has prepared and authorized for publication the following report on Eskay's Neuro Phosphates. W. A. PUCKNER, Secretary.

Eskay's Neuro Phosphates (Smith, Kline & French Co., Philadelphia) is offered to physicians under the claims that it contains alcohol, 17 per cent., and sodium glycerophosphate, 2 grains, calcium glycerophosphate, 2 grains, and strychnin glycerophosphate, $\frac{1}{64}$ grain, in each dessertspoonful. It is called a "Nerve Tissue Reconstructive," and its advertising claims are based on the discredited theories that certain disorders are due to a deficiency of phosphorus in the nerve structure of the body, and that glycerophosphates are assimilated more readily than ordinary phosphates. This assumption was based on the knowledge that the lecithins, which form a part of the nerve structure, contained the glycerophosphate radical in the molecule. In line with this, Smith, Kline & French Co. aver:

"Eskay's Neuro Phosphates is of marked value in many acute and chronic conditions, in nervous exhaustion following mental and physical strain, neurasthenia, paralysis, anemia, tuberculosis, marasmus, debility and wasting diseases generally, and the nerve-weakness of the aged. It is particularly useful in convalescence from acute diseases and in the nervous condition following la grippe."

In its report on "The Therapeutic Value of the Glycerophosphates" (THE JOURNAL, Sept. 30, 1916, p. 1033) the Council pointed out that the therapeutic use of the glycerophosphates was based on the assumption that the inorganic phosphates cannot supply the body's needs of phosphorus or that the use of organic compounds "spared" the system the necessity of making such synthesis. The report presented evidence to show that the glycerophosphates are not absorbed as such, but that they are split into inorganic phosphates before absorption. The Council showed that there was convincing evidence that the animal organism synthesizes its complex organic phosphorus constituents from inorganic phosphates, and that organic phosphorus is of no more value as a food than inorganic. Despite this the Neuro Phosphates advertising makes use of the fallacious assumption regarding the action of the glycerophosphates.

Pleading for the particular mixture represented by the proprietary, it is asserted that:

"Sodium glycerophosphate is of special value in neurasthenia, Addison's disease, phosphaturia and phthisis."

and that calcium glycerophosphate "is employed in bone fracture, rachitis, tuberculosis and various wasting diseases."

The phosphorus content of $\frac{1}{64}$ grain of strychnin glycerophosphate is ridiculously small. Yet it is asserted that this strychnin salt is of superior value because it combines the effects of strychnin with a "food-like form of phosphorus." Eskay's Neuro Phosphates has an acid reaction which is capitalized, thus:

"Experiments have shown that the acid glycerophosphates are more rapidly absorbed and are more efficient than the neutral salts."

And as a further illustration of extravagant claims:

"As a glycerophosphoric acid in the form of lecithin is normally present in spermatozooids, it is but natural that the glycerophosphates should exhibit aphrodisiac effects (as has been observed), but this result does not seem to obtain in all cases."

Is this a clumsy attempt to exploit this "nerve phosphate" as a "lost manhood" cure?

The Council held Eskay's Neuro Phosphates ineligible for New and Nonofficial Remedies because unwarranted therapeutic claims are made for it and because the administration

of strychnin, calcium, phosphate and alcohol is not conducive to rational therapeutics, particularly when such a mixture is marketed under a name which indicates but one of its constituents.

K-Y LUBRICATING JELLY

Report of the Council on Pharmacy and Chemistry

Because of inquiries received, the Council has authorized publication of the following report declaring K-Y Lubricating Jelly inadmissible to New and Nonofficial Remedies.

W. A. PUCKNER, Secretary.

K-Y Lubricating Jelly (Van Horn and Sawtell, New York), originally advertised as a lubricant for instruments and the hands, is now also recommended as a therapeutic agent. If the claims for "K-Y" were limited strictly to such effects as result from the purely mechanical properties of a lubricant, it might be held that it would not come under the purview of the Council. The preparation, however, while introduced as a lubricant, is now offered for a broader field of use, and the manufacturers make claims which are not supported by any evidence available to the Council. Evidence the following, taken from a circular that accompanies the package:

"K-Y allays smarting and burning at once through its pronounced soothing and cooling effects, and thus makes an admirable dressing for burns."

"Many physicians make a practice of anointing the bodies of their measles and scarlet fever patients with 'K-Y', in this way affording gratifying relief from itching and irritation, and effectively preventing dissemination of infectious material."

And this from another circular:

"I had one of the most troublesome cases of pruritus vulvæ that I had ever seen. I guess I must have tried everything and the case had been referred to me by another man, who had previously tried everything, including cauterization. Well, one day I was examining her, and of course K-Y on the speculum—the irritation seemed to quiet down, and the following day she said she felt no effects from it at all. Then later on, it returned, and I couldn't imagine what had done so much good, unless it could have been the lubricant, so I told her to buy a tube, which she did. Every once in a while she has a return of it slightly, but she just applies K-Y and clears it all up."

The manufacturers state that they do not know why K-Y is so soothing, but suggest:

"Possibly the cooling action of the combination, and the effect of the 4% boric acid contained, are factors that enter. Be all that as it may, the fact certainly remains that oftentimes, after other local measures fail, 'K-Y' Lubricating Jelly gives relief."

Elsewhere it is claimed to be germicidal, and to give relief in other conditions, thus:

"Diabetic and uremic irritations, not only of the genitalia, but of other parts, have been found fully as amenable as pruritus vulvæ to the soothing influence of 'K-Y' Lubricating Jelly, especially if the previous application is removed with water every time a new one is put on."

The foregoing citations are obviously intended largely for the public, and make it plain that "K-Y" Jelly is not in the class of nonmedical and harmless external applications; on the contrary, these claims tend to create the impression that the spread of measles and scarlet fever can be prevented in the stage of desquamation. To place such statements in the hands of the patient supported by the tacit endorsement of a prescription is to create a false and dangerous sense of security and to lead to a failure to observe other and more important means of preventing dissemination of these diseases.

The Council held K-Y Lubricating Jelly in conflict with Rules 1, 4, 6 and 10, and authorized publication of this report.

The Medical Officer Must Be an Administrator.—The army medical officer of today must not only be a trained scientist but a capable administrator. In other words, his duties in the zone of advance, the line of communications, and the interior, are in every respect as onerous and exacting as those of the line or engineer officer, and the story of his accomplishment, in the present war, will, when told, make a brilliant record.—Lieut.-Col. C. C. McCulloch, Jr., U. S. Army: The Scientific and Administrative Achievement of the Medical Corps of the United States Army, *Scientific Monthly*.

Correspondence

OBSERVATIONS OF MEDICAL SERVICE ABROAD

To the Editor:—I have recently visited many European military hospitals, including first aid stations, clearing hospitals, and third line or base hospitals. In many places I have found American surgeons actively engaged and doing splendid service. In several large well-equipped hospitals the service is light and many beds are empty. In such cases the surgical staff is for protracted periods more or less inactive.

It is to be feared that at first men who had come from large hospitals in America, having enjoyed an active daily service normally, were surprised, not to say disappointed, to find time hanging heavily on their hands. This feeling was soon corrected and surgeons are now interesting themselves in the solution of problems of various types which are constantly developing.

Briefly the military surgeon of today must be forewarned that war is not waged for the purpose of filling hospitals, and he must be fully reconciled to wait patiently under his assignment. After an advance resulting in a large casualty list, he will lead a strenuous life for a more or less protracted period. Empty beds with idle ambulances in large number are not a regrettable feature of military life.

It should be further clearly understood that men who have specialized and who are highly trained will find their services acceptable at many points. But the average man, however capable, must win his spurs under new conditions before he can hope to become conspicuous in a foreign environment.

THOMAS W. HUNTINGTON, M.D.,
Hotel Excelsior, Rome, Italy.

[EDITOR'S NOTE.—Dr. Huntington (of San Francisco) is a member of the American Red Cross Commission to Italy. This committee consists of Mr. George F. Baker, Jr., chairman; Mr. John R. Morron, Dr. Victor G. Heiser, Dr. Thomas W. Huntington and Mr. Nicholas F. Brady.]

DRAFTING PREMEDICAL STUDENTS

To the Editor:—The question of the exemption of freshman medical students is one on which there has been much discussion, and perhaps the readers of THE JOURNAL would be interested to know the attitude of one who has been drafted, and called into service.

THE JOURNAL has been for some time my constant companion in my hours of leisure and in these times, at least, my consolation that I might find at the last moment some hopes of continuing my medical work next year.

The last number, that of September 15, contained a very encouraging letter from the dean of the University of Virginia, department of medicine, which prompted this letter. He has stated my case, as well as that of many more in the same predicament.

We were told when the war first broke out between the United States and Germany that medical students would not be subject to call in case of draft and that "premedics" might be considered as medical students. When the draft became a reality, and the exemption lists included no clause for us we were still told that it was only diplomacy that kept the government from declaring a class exemption of medical students. Some of us rather doubted this and spoke of entering officers' training camps; then the dean of the school of medicine came out with a letter from a high official from Washington stating for a fact that we were free. Now many of us had already had military training in various lines and could have easily earned our commissions but were told that we could better serve our country by staying in school and then giving her a trained instead of an untrained service. Some of the boys disregarded this and went to the camps; they are now going about with silver bars on their shoulders; proud that they were counted as worthy to be officers in the great National Army, while we who thought we were best

serving our country by staying in school are going about with our hands on our hearts wondering what will be done with us next. In fact some of us have ceased wondering as we are called in the first draft. It is not as though we were trying to avoid the draft or hiding under the banner of our college, afraid to go. I venture to say that if the plain truth had been told us in the first place there would not have been one of us who would not have been in some branch of the service before the day of registration.

An objection raised is that the medical schools would be crowded with slackers and draft dodgers of every description. This immediately loses its significance when we realize that every medical school requires some premedic work and that premedic work no one would take who did not intend to pursue the further study of medicine. The fact that we entered last September in the premedical department of the university proves that we had then determined to study medicine, and hence according to all justice should be considered medical students, and exempt from draft under that clause.

It is not as though the government had no redress for those who tried to evade her orders by entering medical schools at this time; the questions of standards of scholarship and attendance could be brought to bear on all medical students in the freshman year at this time. The government could very easily require a certain minimum grade and a minimum standard of attendance, all those falling below either of which to be at once liable for call and military service. This could be very easily accomplished by utilizing the professors of military surgery that the government assigns to the various medical schools. So there is absolutely no excuse for such a drastic, not to say unjust and outrageous, procedure on the part of our government.

Furthermore, the demand for doctors at the end of the next four years is going to be just as great if not greater than it will be at the end of the next year and two following. This has been amply proved by authentic statistics available to all those who care to take the time to peruse the recent editions of the daily papers or, for the profession, the last three or four editions of THE JOURNAL. Under these circumstances it seems not only unjust but absolutely prohibitive and criminal that the government at this time should undertake to jeopardize the future healthful well-being of this country as well as those across the sea by exposing these young men to the dangers and possible casualties, not to speak of the many fatalities, of this war.

This does not exhibit on our part any lack of patriotism or love of country, but rather shows that we have the great welfare of the country at heart for the future, and should this war last—which God forbid—beyond the next four years, the need of physicians would be an obstacle that would be absolutely insurmountable. At any rate, the next two years would fit us to be of infinitely more value as assistants in the Medical Corps than we are now as riflemen. Any one can learn to shoot a gun in an hour but it takes much longer for one to acquire skill in manipulating a scalpel.

PHILLIP J. BEYHAN, Chicago.

"RED CROSS" BASE HOSPITALS

To the Editor:—My attention was directed to a contribution by Dr. Joseph B. DeLee (THE JOURNAL, Aug. 24, 1917, p. 665), advocating the construction of military hospitals in France in the shape of a cross with roofs to be painted in red color. In view of the deliberate bombing of an American base hospital by German flyers and the resulting killing and maiming of innocent "noncombatants," the doctor's plan would produce the very opposite effect he aims at. The best plan is to make all sanitary formations and institutions as invisible as neutral tints can render them. In addition it would be wise to disperse the buildings of large institutions over a fairly wide area and to place them under the shelter of natural foliage, or artificial for that matter, schemes employed to hide artillery batteries from aerial reconnaissance. In view of the fact that antiaircraft guns are effective only when the machines fly at moderate height we may even have to go farther and construct hospitals under bomb proofs.

Time was when the emblem of the Red Cross stood for the humanitarian in warfare, but today it is a beautiful target for the enemy's policy of frightfulness. In the same sense the putting on of a brassard by sanitary personnel on the firing line would only tend to increase their mortality and casualty rate. I have in my field library a book entitled "Rules of Land Warfare." I read it before my last promotional examination some time ago, but I have not opened it since the present mobilization for obvious reasons.

GUSTAVUS M. BLECH, M.D.

Major, N. G., Ill., Camp Logan, Houston, Texas.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

EOSINOPHILIA

To the Editor:—1. What is the significance of eosinophilia? 2. What is its diagnostic and prognostic significance in arthritis, periartthritis and periostitis of the spine? 3. Does it occur in malignant diseases? 4. Please give references to the best recent books and articles on infections of the spine.

E. W., Evansville, Ind.

ANSWER.—1. Eosinophilia is physiologic in childhood, the average increase being about 1 or 2 per cent. above the normal adult finding. There are some racial distinctions. The natives of southern China show between 15 and 20 per cent. of leukocytes as eosinophils. Pathologic eosinophilia occurs in splenomyelogenous leukemia, in sarcoma, osteomyelitis, osteomalacia, chlorosis, secondary anemia following infection, extirpation of the spine, chronic splenic tumors, bronchial asthma, emphysema, pemphigus, eczema, psoriasis, urticarias, leprosy, herpes zoster, and other skin diseases associated with toxic agents. They are also sometimes found increased in scarlet fever, acute rheumatism and malaria, as well as sometimes in syphilis, gonorrheal infections and in forms of ovarian diseases with the exception of cancer. Any parasite, from pin worms to uncinarias, may cause an eosinophilia which is not necessarily constant, and does not bear any relation to the severity of the infection. 2. Its relation to infections of the bones would be of the same character as its relation to the infections and bone diseases mentioned in the previous answer. 3. No great weight could be attached to eosinophilia in making a diagnosis of malignancy. 4. The following are recent articles on infection of the spine:

L. P. Gould: Osteomyelitis of the Spine, *The Lancet*, 1917, **1**, 374.
D. N. Eisendrath: Osteomyelitis of the Spine, *American Surgeon*, 1917, **65**, 147.

A. Kinder: Osteomyelitis of the Spine, *New Zealand Medical Journal*, 1915-1916, **14**, 215.

CHOICE OF ANESTHETIC—RESPONSIBILITY

To the Editor:—(a) Please inform me who should make the choice or selection of an anesthetic for a hazardous surgical case, the expert anesthetist or the operating surgeon?

(b) On whom does the responsibility rest if a patient should die from an anesthetic, on the operating surgeon or on the expert anesthetist?

THOMAS G. ALLEN, Philadelphia.

ANSWER.—(a) The operating surgeon.
(b) On the operating surgeon.

Tetanus in Court Plaster.—Investigation by the Hygienic Laboratory of the Public Health Service following press reports of infection with tetanus from court plaster, resulted as follows, as given in *Public Health Reports*, September 7: Out of thirteen specimens examined, two were found to be contaminated with tetanus bacilli. The specimens examined were procured from drug stores in the original packages as they go to the consumers. It was found that court plaster is not clean in the surgical sense, but whether the contamination with tetanus bacilli occurred during the process of manufacture through infected ingredients will be the subject of another investigation. It is not believed that the contamination was intentional. The report of the laboratory investigation is given in full in the publication referred to.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARIZONA: Phoenix, Oct. 2-3. Sec., Dr. John Wix Thomas, 306 Goodrich Bldg., Phoenix.

CALIFORNIA: Los Angeles, Oct. 9-13. Secretary, Dr. Charles B. Pinkham, State Capitol, Sacramento.

COLORADO: Denver, Oct. 2. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

DISTRICT OF COLUMBIA: Washington, Oct. 9-11. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington, D. C.

GEORGIA: Atlanta, Oct. 9-11. Sec., Dr. C. T. Nolan, Marietta, Ga.

IDAHO: Pocatello, Oct. 2. Sec., Dr. Charles A. Dettman, Burke.

ILLINOIS: Chicago, Oct. 9-11. Superintendent of Registration, Mr. F. C. Dodds, Springfield.

IOWA: Des Moines, Oct. 9-11. Sec., Dr. G. H. Sumner, State House, Des Moines.

MICHIGAN: Lansing, Oct. 9-11. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.

MINNESOTA: Minneapolis, Oct. 2-5. Sec., Dr. Thomas S. McDavitt, Lowry Bldg., St. Paul.

MONTANA: Helena, Oct. 2. Sec., Dr. William C. Riddell, Power Bldg., Helena.

NATIONAL BOARD OF MEDICAL EXAMINERS: Chicago, Oct. 10-18. Sec., Dr. J. S. Rodman, 2106 Walnut St., Philadelphia.

NEW JERSEY: Trenton, Oct. 16-17. Sec., Dr. Alexander MacAlister, 438 E. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 8. Sec., Dr. R. K. McClanahan, East Las Vegas.

NEW YORK: Albany, Buffalo, New York City and Syracuse, Oct. 2-5. Chief, Examinations Division, Harlan S. Horner, State Education Bldg., Albany.

OKLAHOMA: Oklahoma City, Oct. 9-10. Sec., Dr. Ralph V. Smith, 502 Daniel Bldg., Tulsa.

PORTO RICO: San Juan, Oct. 2. Sec., Dr. M. Quevedo Baez, San Juan.

RHODE ISLAND: Providence, Oct. 4-5. Sec., Dr. Byron O. Richards, State House, Providence.

UTAH: Salt Lake City, Oct. 1-2. Sec., Dr. G. F. Harding, Templeton Bldg., Salt Lake City.

WYOMING: Laramie, Oct. 10-12. Sec., Dr. H. E. McCollum, Laramie.

Book Notices

PHYSICAL CHEMISTRY OF VITAL PHENOMENA, FOR STUDENTS AND INVESTIGATORS IN THE BIOLOGICAL AND MEDICAL SCIENCES. By J. F. McClendon, Assistant Professor of Physiology in the University of Minnesota. Cloth. Price, \$2 net. Pp. 240, with 30 illustrations. Princeton: Princeton University Press, 1917.

Physical chemistry, that lusty infant prodigy, offspring of the union of physics and chemistry, has already come in many instances to the assistance of the practitioner, giving aid in diagnosis and helping in the explanation of physiologic processes. One has only to recall the most recent innovations of the determination of the hydrogen ion concentration of the blood and spinal fluids, the diagnosis of syphilis by the colloidal gold test, or the distinguishing of epidemic cerebrospinal meningitis from tuberculous meningitis by the cataphoresis of the proteins of the spinal fluid. Hence a book of this title should attract the interest of practitioners and students alike. This book, however, makes no pretense to having been written for clinical men. It is rather intended for advanced students who already understand much about the subject. It contains many interesting facts for such students, and quite a long and useful literature list at the back in which both titles and authors are cited. It treats of such things as osmotic pressure, adsorption, hydrogen ion determinations, surface tension, enzyme action, permeability of cells, anesthesia and narcosis, cytolysis and disinfection, amoeboid motion, muscle contraction, oxidations, artificial parthenogenesis and cell division. Truly an appetizing bill of fare, if only well cooked and seasoned!

But alas for the "if." It is not well cooked; much of it, indeed, is quite raw, and the seasoning has been generally omitted, so that even a robust appetite will not make it all palatable. This is not saying that there is not much that is good in the book and many facts that are stimulating and instructive. The chapter on the method of hydrogen ion determination is decidedly worth while; and the book is certainly no worse than many German books on similar lines. Perhaps the title makes us expect too much, and in the outcome we have so little—so little except words, and of these

there are so many and such long ones! There is hardly a properly formed scientific statement in the first chapter. It is full of conclusions and interpretations stated as if they were facts, and of conclusions which do not follow from the premises. Throughout the book there is a scarcity of objectively described facts. Almost never do we find a clear, simple statement of what the objective facts really are; always these facts are obscured by interpretations, or the interpretations are substituted for them.

The author, in accordance with the prevailing style of the hour, attempts to explain all the phenomena of life by inventing what he calls a plasma membrane and putting it around a colloidal solution and calling it protoplasm. Since he is the inventor of this membrane, it is his privilege to make it as ingenious as he can. The main differences between the theories of the physical-chemical zoologists and physiologists at the present time consist in the ingenuity of their imaginary membranes. If only these membranes are sufficiently complex, it becomes possible to explain all the phenomena of life by means of them. If any new facts are discovered which the old membrane cannot account for, it becomes the simplest thing in the world to take that membrane off, to devise a new one with more modern improvements, wrap it about a colloidal solution of a nondescript character, and there you have protoplasm! This membrane has pores in it so graduated in size or otherwise so constructed that they let through positive but not negative particles, and, behold! there is the explanation of the electrical phenomena of protoplasm. Or sometimes the pores close, and then you have anesthesia. And so on. To explain how this is all possible it is only necessary to fall back on surface tension. Surface tension explains all things. This is a perfectly safe refuge and one calculated to satisfy the greatest doubter, for no one understands what surface tension may be doing in such complex systems, and almost no one understands it even in the simplest cases. In saying this we do not aim especially at the author of this book, for he has only put together the publications and conclusions of other men; but we are aiming at the whole glib, superficial school of biologists, who pretend to solve fundamental problems of the greatest complexity.

This book is typical of much of modern biology. It is not possible to say about it anything worse than this. Biology is in a period of inflation. Real values are obscured. Worthless properties are being worked as fabulously rich mines, but the ore contains only a trace of real metal. A little glitter and some mathematical formulas lead astray all but those who have been already once deluded. Words take the place of real explanations; we have purely verbal solutions of the most abstruse problems. These words lull us to sleep; they form a wire entanglement, serving to keep out truth and light.

One comes back from reading a book of this character, and most books on this subject, with the feeling of having been wandering in a terrible morass. Some of the ill smelling mud still clings to one. "Permeability" and "adsorption" are words covering a multitude of scientific sins. This must truly be the red light district, the demi-monde of science, which intoxicates and ruins its habitués. This realm of biology is truly that demiscience which Paul Shorey anathematizes. Words juggled from one meaning to another; conclusions unrelated to their premises; a trackless waste—the biologic authors wander through this series of sink holes, struggling out of one only to fall into another, and the reader, if he is not sure of foot and alert of eye, falls with them.

THE TREATMENT OF TABETIC ATAXIA BY MEANS OF SYSTEMATIC EXERCISE. By Dr. H. S. Frenkel, Medical Superintendent of the Sanatorium "Freihof" in Heiden (Switzerland). Second English Edition by L. Freyberger, J.P., M.D., M.R.C.P. Cloth. Price, \$3 net. Pp. 209, with 130 illustrations. Philadelphia: P. Blakiston's Son & Co., 1917.

The first edition of this book, which is an adaptation and not a translation of Dr. Frenkel's book, appeared in 1902. In the second edition, revised by Dr. Freyberger, "redundances" have been removed, a few unnecessary illustrations taken out, and the remainder partly regrouped. "Notes on the medical treatment that is often required during Frenkel treatment" are added by Dr. Freyberger.

A number of changes in the make-up of this edition reflect credit on the former one. In size it conforms more readily to standard volumes; the illustrations are not so clear. The legends of some of the diagrams which were left untranslated in the former edition are rendered into English. Some of the measurements of diagrams are omitted, and in some errors appear, as 9 inches for 63 ct. Certain important statements marked by italics in the former edition are left unemphasized.

The text, as in the former edition, presents a clear and comprehensive exposition of a method of treatment which deserves wider recognition and more general application. Frenkel introduces in a general part his description of the method by broad definitions of coordination, and ataxia. He reviews the theories of the causes of ataxia, and describes and upholds the sensory theory. A full description of methods of examining the sensibility is given, and an extensive description of muscular hypotonia, which plays so important a rôle in the disability of the tabetic, is presented.

In a special part, the mechanism of movements of the human body is described, so that the rationale of the following directions for treatment is established, and the exercises may be followed logically and clearly. The practice rooms and apparatus, which are very simple, are described, and the exercises classified, minutely explained and commented on freely. The large number of illustrations assists in making the book one which, if read, cannot but lead to a clearer understanding of tabetic ataxia by the general practitioner, and to the more consistent employment of reeducational methods by specialist and general practitioner as well.

It is impossible to omit a criticism of the more or less parasitic notes on the medical treatment of tabes dorsalis which are added by Dr. Freyberger. Among other things, the author demands that before the case should be definitely pronounced nonsyphilitic, an examination of the spinal fluid should prove "an entire absence of spirocheta pallida," whereas nothing is said of the cell count, the colloidal gold chlorid test, or globulin tests which, in contrast to the *Spirochaeta pallida*, are so frequently found pathologic.

Just why intravenous or intramuscular injections of anti-syphilitic medication are interdicted during the period of Frenkel treatment is left as great a mystery as why we should defer Frenkel treatment until "the effects of the anti-syphilitic treatment are beginning to be well established."

The author states that the following preparations will be found useful in the preliminary treatment, and he includes with salvarsan and neosalvarsan such agents as collargol, sodium and gold chlorid, and various proprietary combinations, as Enesolum, Iodglidinum, and Ioha. Although he states that salicylate of mercury is the best substitute for mercurial inunctions or injections of mercurial oil, he describes neither one.

The author's preference for proprietary remedies is seen in his collection of choice drugs for symptomatic treatment: Trivalium, Arsenriferroloium, Bromo-lecithinum, Diplosalinum, Hedonalum, etc. Combretum for morphinism occupies as much space as is devoted to salvarsan.

Nothing at all is said of intraspinal treatment. Apparently Freyberger does not believe that all cases of tabes dorsalis are syphilitic, as he says that "iodides are excellent tonics in nonsyphilitic cases of tabetic ataxia."

An adequate criticism of this chapter would take up more space than the chapter itself, which might better have been omitted.

Habit.—Habit keeps us all within the bounds of ordinance, and saves the children of fortune from the envious uprisings of the poor. It alone saves the hardest and most repulsive walks of life from being deserted by those brought up to tread therein. It keeps the fisherman and the deckhand at sea through the winter; it holds the miner in his darkness, and nails the countryman to his log cabin and his lonely farm through all the lonely months of snow. In most cases, by the age of 30, the character has set like plaster, and will never soften again.—William James.

Social Medicine, Medical Economics and Miscellany

BARON LARREY, THE FRENCH ARMY SURGEON

HOWARD D. KING, M.D.
NEW ORLEANS

Seventy-five years have elapsed since the death of Baron Larrey, surgeon-in-chief of the armies of Napoleon. In the annals of military surgery Larry will forever stand pre-eminent as a leader. In this hour of stress and conflict a brief biography to the famous French army surgeon should prove timely.

D. J. Larrey was born in 1766, at Beaudéan, near Bagnères-Adour, Haut Pyrénées. His parents were in modest circumstances, but of good peasant stock. At the age of 13, with very little previous education, he was sent to study under his uncle, who was surgeon and professor of surgery of the General Hospital at Toulouse, and also an associated correspondent of the Royal Academy of Surgery at Paris. At Toulouse under the guidance of this relative he passed through the usual medical courses. In 1787 he went to Paris, and was in this city only a few days when he received the appointment of assistant surgeon in the navy, a post which he accepted only because it enabled him to indulge his natural taste for traveling. Larrey was ordered to join his ship at Brest, but his resources were so low that he walked from Paris to that port, and on his road he visited Laval, sought out the house where Ambroise Paré, the father of French surgery, lived, desired to see his chamber, and, yielding to the delusion of a warm imagination, almost fancied his great predecessor to be present.

APPOINTMENT AS SURGEON IN NAVY

On his arrival at Brest he was subjected to a second examination, and passed in such a distinguished manner that, contrary to all precedent, he was appointed full surgeon at the age of 21, to a small frigate, *La Vigilante*. The ship being delayed in port during the winter he employed himself in giving lectures to the young students in anatomy and surgery. In the following April the ship sailed for Newfoundland, to protect the cod fisheries, and to cruise off the coasts of North America. This voyage was without event, save that on reaching Brest in 1788 the provisions had run so low that each member of the crew was reduced to a daily ration of 4 ounces of biscuit and a bottle of putrid water. Again on shore Larrey immediately set off for Paris, and studied clinical surgery under Sabatier and Desault, the latter of whom he speaks of as a surgical genius, and as one to whose instruction he felt greatly indebted.

At this critical period the first clouds portending the French revolution were fast gathering in the political horizon, and civil dissensions had already risen to such a height in Paris that several battles were fought in the garden of the Tuilleries, at the Bastille, and in the Champs de Mars. A large number of the wounded combatants came under the immediate care of Larrey, who thus early observed that delay in amputation after certain gunshot wounds caused an increase in tetanus. He also gave a great deal of his time to the study of the problems of infections and bone necrosis.

CREATION OF AMBULANCE VOLANTE

The invasion of France by the continental powers shortly following, he was appointed full surgeon to the Army of the Rhine, commanded by Marshal Luckner, and he joined on April 1, 1792. It was in this campaign that he observed the faulty arrangement of the ambulance service, which it was customary to station a league in the rear of the soldiers, so that the wounded were left undressed and unattended till after the battle, when they were removed to the regimental hospitals. Owing to the great obstruction of the roads by baggage and the movements of the troops, it was often days before the wounded received surgical assistance, and as a consequence many perished for want of timely first aid.

Larrey proposed to General Custine to establish an *ambulance volante*, or a means by which the wounded might receive first aid on the battlefield. This reform produced a great sensation in both military and medical circles. At the close of the campaign on the Rhine the military surgeons were highly spoken of by General Beaurharnios, in his despatches to the Directory, and Larrey was ordered to Paris to complete his *ambulance volante*, and to adapt and introduce it into the other armies of the Republic.

LARREY'S SERVICE IN EGYPT

In the year 1797, after having seen service in Spain, he received orders, apparently at the request of Napoleon, to set out for Italy, and to establish the *ambulance volante* in that army; but hardly had he arrived at headquarters when the peace of Campo Formio was signed. Next Bonaparte committed the great military error of transporting a French army to Egypt, at which time he demanded that Larrey join the expedition. In this position Larrey earned the high regard of the Corsican. He was with Bonaparte when he crossed the Red Sea and it was at this time that Larrey nearly lost his life by drowning.

AN OFFICER OF THE LEGION OF HONOR

The peace of Amiens saw Larrey back in France, and on his arrival in Paris he found Napoleon first consul, who not only ordered Berthier, in a public document, to express his satisfaction at the zeal and manner in which he had fulfilled his public duties, but confirmed all the medical officers he had promoted in Egypt, named him surgeon-in-chief to the Consular Guard, and presented 1,500 francs to Madame Larrey. On Napoleon assuming the purple Larrey was one of the first named of the Legion of Honor. Bonaparte afterward created him an officer of the Legion, presenting the decoration with his own hands. Following this appointment Larrey was made Inspector General of the French Army. But he was to be still further honored, for after the battle of Eylau he was promoted to the rank of Commandant of the Legion of Honor, Chevalier of the Iron Crown, and, after the battle of Wagram, he was made Baron of the Empire, with a pension of 5,000 francs. At this juncture his good fortune ceased, and on the first deposition of the emperor he proposed to retire with him to Elba, and to share his banishment, but Napoleon opposed this mark of devotion in his faithful friend. "You belong to the army," he said, "and must continue with it; but I part from you with the deepest regret."

Almost immediately after his escape from Elba, Napoleon despatched a messenger to the Tuilleries for Larrey, and after displaying the most touching regard and satisfaction at seeing his old friend, declared, "I hope soon to have the opportunity of recompensing you for the sacrifices you have made, and for the services you have rendered the wounded." One of those *coups de theatre* with which the returned emperor attempted to support his power was summoning deputies from the different provinces to receive a tricolored standard. Larrey was among those elected for the Haut Pyrénées, and the emperor selecting him from the rest, placed the emblem of French military glory in his hands, expressing his delight in entrusting it to a man who honored humanity by his disinterestedness and courage, and whom he had often seen in the parching deserts of Lybia giving to others the water and wine he greatly needed for his own support.

When the preparations for opening the fatal campaign of 1815 were completed Napoleon sent General Drouet to Larrey with orders to join the army, and more especially to direct the ambulance of the guard, and to be near his person. It was at Waterloo after the tide of battle had turned against the French, and the charges of the British cavalry had nearly reached the French ambulances, Napoleon still remembered his friend, and sent one of his aides-de-camp to point out to Larrey a cross road by which he might escape. He had not proceeded very far when he was chased by the Prussian cavalry, but was fortunate to outdistance his pursuers. In his flight he was thrown from his horse to the ground where he lay for some time unconscious. On recovering conscious-

ness he again attempted flight but fell in with the Prussian cavalry a second time and was made prisoner at Sambre. The Prussians stripped him of everything but his redingote, and in this forlorn state he was happily mistaken for Napoleon, and carried with his hands tied behind him to Commandant Bulow, by whom he was recognized. Larrey had saved the life of Prince Blucher's son, who had been seriously wounded, and made prisoner during the German campaigns, and this act of kindness being remembered Larrey was now treated with much consideration, had his wounds dressed, more cleanly and commodious quarters assigned him, and afterward obtained permission to proceed to Brussels, in order that he might succor his wounded countrymen.

THE DOWNFALL OF NAPOLEON

After the downfall of Napoleon at Waterloo Larrey suffered many humiliations at the hands of the Bourbon dynasty. He was deprived of his office of inspector general, and all of his pensions cut off. He was retained, however, as surgeon of the guard, for fear, as he alleged, that the troops would mutiny at his removal. From 1815 to 1818 his position was most trying, for among his misfortunes he lost his mother, and a favorite brother, a surgeon at Nismes. In 1818 his fortunes appeared to be on the mend. The pension of 3,000 francs granted him by Napoleon for services at Lutzen, Wurchen, and Wagram was restored to him by unanimous decree of the legislative assembly. The declining years of his career, also, were cheered by many honors and distinctions. The king of the Belgians invited him to organize the ambulance of his army, while Louis Phillippe granted him the decoration for his services to the wounded in the three days of July. He also made trips to Italy and England. His last official service to the French government was an inspection of the French hospitals at Algeria. On his return from Africa he set off for Paris to make his report to the government, but died en route at Lyons, July 25, 1842.

HIS SERVICE TO MEDICINE

Larrey's claims to distinction as a surgeon are great. That he was admirably fitted for the high professional offices he attained is today admitted by the whole surgical world. Up to the day of his death no one ever held a higher place as a military surgeon. It is impossible to study his works without being convinced of his sound sense and good judgment, and the rapid manner in which he interpreted disease and applied the resources of his art to the relief of the patient. On account of his boldness, which was coupled with a most skilful technic, Larrey enriched surgery with many and far reaching advances.

Before the last Revolutionary Wars there were scarcely more than two or three examples of amputation at the shoulder joint, an operation first performed by Ledran. This operation, however, Larrey frequently and repeatedly performed, and even extended, by removing large sections of the shoulder and scapula, and with such success that out of 111 cases, ninety-seven were cured. Modern hospital records show no greater achievement than this wonderful list of successes. The facility with which he performed this operation was quite wonderful, the limb being removed in two minutes, and the loss of blood negligible.

Up to Larrey's time it was the custom to delay amputations until the line of demarcation had formed. The impatience of Larrey refuted the wisdom of this surgical dogma, and with the French army surgeon it was always a case of now or never. Larrey had profited by the surgical experience of the surgeons who had participated in the American Revolution and the different Indian conflicts, who, having no great hospitals to which to send their wounded, performed most of their major operations on the field, and had lost very few men. These observations led him to adopt, as soon as the *ambulance volante* was introduced into the French armies, the practice of immediate amputation in the field. Larrey declares the advantages of this procedure to be great in that shock was considerably lessened, and the cases of tetanus considerably reduced. From the foregoing it can be seen that the trench dressing station of today is really an American institution revived. How much does modern military surgery

owe to the medical men who served under Washington, Greene, Putnam, Wayne?

In the dressing of wounds it was his invariable custom, after cleansing away débris and trimming the parts, to apply loose bandages, and to allow them to remain on several days without being disturbed. Once the bandage was secured it was followed up by pouring some cold lotion over it till it became well saturated through and through. The wounds were always kept moist. This mode of treatment resembles, at least to some extent, the tissue lavage methods now in general use in war hospitals.

As a practitioner he was most resourceful in his therapeutic endeavors. His practice in syphilis was beneficial to the patient despite the criticism it engendered on the part of his confrères. Larrey was one of the first to use the mercurial ointment on the soles of the feet and other parts of the body. For this he was violently assailed in some quarters. His knowledge of syphilis was particularly acute, especially as to the effect this disease had on the arterial system.

As a surgeon he was highly practical, but if we view him as a physiologist or philosopher we shall find many false shadows. Let us look at his character as a man, and take that character from one best able to appreciate it, from Napoleon himself. It is well known that Napoleon left to Larrey by his will 100,000 francs, at the same time recording the notable fact that Larrey was the most virtuous man he had ever known. The manners and person of Larrey were endearing and simple. He will stand forever as one of the bright ornaments of French surgery. His place is beside Pasteur and the great Paré. His long and brilliant career in the military service of France entitles him to a niche in that hall of fame consecrated to those whose motto consists of the single word—duty.

820 Baronne Street.

Dehydration of Foods

It would seem that the old fashioned method of drying fruits and vegetables, which became almost obsolete since the rise of the modern canning industry, is again coming into vogue and is being extended to food products not heretofore subjected to this process. Instead of the primitive methods of the household in former days, however, improved, scientific and mechanical methods are being employed and are being adapted not alone to factories, but to the home and the farm, where products over and above present market demands may be dehydrated and placed on the market as required. Considering the large percentage of water in all fruits and vegetable products amenable to dehydration, the saving in bulk and weight is a transportation economy, as well as one of freight costs to the consumer, which is of great importance under present circumstances. As examples of products not heretofore saved as food, in addition to about all the vegetables and fruits raised on the farm, are beet tops, the outer green leaves of the stalks of celery, fruit on the point of becoming overripe, undersized fruits and vegetables which would otherwise waste, and many other products which will suggest themselves to farmers and gardeners. Practical and efficient apparatus have now been devised to dehydrate all such products cheaply and effectively on the farm. One such apparatus, described in the *Scientific American*, consists of a series of trays for containing the fruit or vegetables, one tray superposed on the other. The hot air as the agent of dehydration is applied to the bottom tray and passes upward through all the other trays, not passing off until completely saturated, thus economizing in the matter of heat. The contents of the lower tray become cured first, when this tray may be removed, the remaining trays dropped to occupy this space, and another tray of fresh product added at the top. The process thus becomes a continuous one. In the process of dehydration about 10 per cent. of the water is allowed to remain in the products, which prevents their structural disorganization and preserves their flavors and other natural qualities when cooked. The possibilities of the dehydration process in augmenting and making available large quantities of food heretofore not utilized to the best advantage will be apparent.

Medicolegal

Physicians May Testify as to What Is Learned After Treating Patients

(*Strafford et ux. vs. Northern Pac. Ry. Co. et al. (Wash.)*,
164 Pac. R. 71)

The Supreme Court of Washington says that in this personal injury case a physician was asked to describe, and did describe, the nature and extent of an examination he made while the injured plaintiff was a patient in the hospital under his care, but was expressly warned by counsel not to state what he found as the result of his examination, and heeded the admonition. After he had answered counsel's questions he was asked whether he had made two subsequent examinations of the plaintiff and he stated that he had, but not as her physician or surgeon, or for the purpose of treating her, but for the purpose of enabling him to testify as to her condition. As to discoveries made at these two examinations he was permitted to testify fully. Clearly this was not error. As to these two examinations he was as competent to testify as any other physician or surgeon would be under the same circumstances. The fact that he had previously treated the plaintiff did not preclude him from testifying to matters he had subsequently learned as to her condition under circumstances not precluding his right to testify. In order to render a physician incompetent, the information he is called on to disclose must have been acquired while he was attending the patient in a professional capacity for the purpose of treating her ailments. The privilege when the examination is made by the physician for the express purpose of publishing the results; such, for example, as testifying in an action for personal injuries. There was therefore no error committed in the admission of the physician's evidence. The same was true of the testimony of another physician who, while he had formerly treated the plaintiff in a professional capacity, testified to no condition the knowledge of which was acquired by him while so treating her. He also subsequently examined her under circumstances similar to those related of the physician first mentioned, and testified to conditions learned at such examination. The statutory rule was not violated in permitting him so to do.

Barring of Action for Roentgen-Ray Burn

(*Ogg vs. Robb (Ia.)*, 162 N. W. R. 217)

The Supreme Court of Iowa affirms a judgment in favor of the defendant that the plaintiff's alleged cause of action was barred by the statute of limitations. The court says it was alleged that in 1901 the plaintiff, then under 17 years of age, broke his right wrist. In July of that year, the defendant called the plaintiff into his office, without the knowledge or consent of the plaintiff's parents, and experimented on him with a Roentgen-ray machine to secure pictures of his hand and wrist. That the defendant continued for ten days in said experiments, and used the Roentgen-ray machine on the plaintiff's hand and wrist many times and made long and close exposures. That as a result the skin on the hand and wrist became discolored. That the defendant then informed the plaintiff and his parents that the use of the Roentgen-ray machine caused such discoloration, and then falsely and fraudulently informed them that this discoloration was of no particular consequence and would be temporary in its effects, fraudulently concealing from them the true effect of radio-exposure produced by the Roentgen-ray machine. That the defendant then treated the discoloration for a time and it apparently disappeared, leaving a scar, but with the usual use of the hand. That the plaintiff and his parents fully relied on the statement and advice of the defendant as to the temporary effect of the Roentgen rays, and nothing further was done in regard thereto until 1912. That the use of said machine by the defendant produced a cancerous condition which was latent until 1912, and the plaintiff had no knowledge of said condition until then. That then the tissues of the right hand where the Roentgen rays had been applied broke down and became an epithelioma or malignant can-

cerous growth, which caused great pain and necessitated the amputation of the right forearm. Was the plaintiff's cause of action concealed by the statement of the defendant that the original burning was but temporary and was of no particular consequence, and that the defendant fraudulently concealed the true effect produced by the use of the Roentgen-ray machine? The plaintiff alleged that he was burned in 1901 and, as he alleged, by the negligence of the defendant. This fact was known to the plaintiff and his parents. All damages which subsequently developed were traceable to and based on that act. By the original act the plaintiff was injured, and, as the petition alleged, by the negligence of the defendant. He would have been entitled to some damages at that time; and, if it be true that cancer necessarily and in all cases is the result of such burning, or if cancer is the probable result, such fact could be shown as bearing on the question of damages in an action for the original injury. If cancer is not the necessary or probable result of such burning, then the defendant's statement would be more or less of an opinion, and in that case the fact that later and in 1912 a cancerous condition did develop and the plaintiff's damages might thereby be increased, would not constitute a new cause of action. It would seem then that the plaintiff's cause of action accrued at the time of the original injury.

Giving Egg and Toast to Typhoid Fever Patient

(*Ennis vs. Banks et al. (Wash.)*, 164 Pac. R. 58)

The Supreme Court of Washington reverses a judgment for \$9,000 damages that was rendered in favor of the plaintiff on the second trial of this case, after this court had reversed a judgment for \$1,500 rendered on the first trial. The court says that defendant Banks was called on the 22d to see the plaintiff's son, whom he found suffering with typhoid fever, and who was the next day removed to a hospital conducted by said defendant. From that time until the 14th of the following month the patient was a very sick man. Gas would accumulate, almost constantly, in his stomach and bowels, and, on the 11th, the defendant called into consultation two other physicians. It was then concluded that an operation was necessary, in order to remove the gas, but the plaintiff would not consent to it. The patient had before this been fed on a milk diet, which apparently did not agree with him, and was subsequently fed on beef broth. The latter diet seemed to agree with him better than the milk diet. On the 12th and 13th, the patient seemed to be somewhat improved. On the 14th, the defendant caused to be prepared a slice of bread, about three inches square, from which the crust was removed, and which was toasted and soaked in boiling milk until soft, and on it was placed an egg that had been broken into hot water and allowed to coagulate. The patient ate about two-thirds of the egg and toast. About three hours afterward, an eggnog was given to the patient, who then vomited the eggnog, the egg and toast. The patient at that time seemed to be worse. The plaintiff then had the patient removed to her home, about a block away, and called a homeopathic physician, who treated the patient two days, when he died. Afterward, this action was brought, based on alleged malpractice in feeding the patient the poached egg and toast.

The evidence showed that the patient's death might have been due to one of three causes: first, the disease itself; second, the carrying of the patient from the hospital to another place, and third, the change of diet. Under the rule established when the case was before this court previously, the court is constrained to hold that it was for the jury to determine which of these causes resulted in his death, and whether the defendant, in administering the toast and egg, was guilty of malpractice. But instructions on general negligence, which, in effect, told the jury that, for want of ordinary care generally, the defendant was liable, should not have been given, as the jury were thereby led to believe that they might consider any acts of negligence, or general acts, and make up their verdict outside the issues of the case.

An instruction to the effect that, in determining ordinary skill and diligence, the advanced state of the profession at

the time might be considered, was misleading, since there was no evidence in the case that there was any advanced state of the profession at that time. Again, each school of medicine is entitled to practice in its own way, and because one does not use the methods of the other is no reason for holding the one for malpractice. The issue in this case was a simple one. It ought to have been covered in, at most, a half dozen instructions, to the points that unless the jury could say that the patient died solely from the effect of the soft toast and egg which was administered to him, and not from the disease, or from being carried from the hospital, at the stage of the disease he was then in, there could be no recovery of damages; that there could be a recovery only in case the giving of the toast and egg was the prime cause of the patient's death, and the defendant knew, or should have known, such result would follow. Before the plaintiff would be entitled to recover for malpractice, the jury ought to have been told that they must find the defendant did not use his judgment in administering the egg and toast, under the circumstances, but was guilty of malpractice in administering such toast and egg at that time.

Society Proceedings

COMING MEETINGS

- Amer. Acad. of Ophthal. and Oto-Laryng., Pittsburgh, Oct. 29-30.
Am. Assn. for Study and Prev. of Inf. Mort., Richmond, Va., Oct. 15-17.
American Association of Railway Surgeons, Chicago, Oct. 17-19.
Delaware State Medical Society, Middletown, Oct. 8-9.
Kentucky State Medical Association, Louisville, Oct. 16-18.
Medical Association of the Southwest, Kansas City, Oct. 15-17.
Minnesota State Medical Association, St. Paul, Oct. 10-12.
Mississippi Valley Medical Association, Toledo, O., Oct. 9-11.
Nevada State Medical Association, Reno, Oct. 18-19.
New Mexico Medical Society, Las Cruces, Oct. 4-6.
Southern Medical Association, Memphis, November 12-15.
Vermont State Medical Society, Barre, Oct. 11-12.
Virginia State Medical Society, Roanoke, Oct. 23-26.
West Virginia State Medical Association, Fairmont, Oct. 2-4.
Wisconsin State Medical Society, Milwaukee, Oct. 3-5.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Obstetrics and Diseases of Women and Children, York, Pa.

September, LXXVI, No. 3

- 1 Development of Prenatal Care in Borough of Manhattan, New York.—R. W. Lobenstine, New York.—p. 381.
- 2 Maternal Mortality from Childbirth in United States and Its Relation to Prenatal Care. G. L. Meigs, Washington, D. C.—p. 392.
- 3 Prenatal Care; Opportunity for Medical Profession. A. B. Emmons, Boston.—401.
- 4 Some Economic Hints from France. T. C. Merrill, Washington, D. C.—p. 405.
- 5 Obstructive Jaundice. C. G. Heyd, New York.—p. 409.
- 6 Rupture of Uterus; Report of Cases. W. A. Scott, Toronto.—p. 423.
- 7 An Operation for Procidentia in Nulliparous Woman. W. M. Ford, New York.—p. 438.
- 8 Case of Antepartum Mammary Hyperemia Due to Unrecognized Malignant Disease. G. W. Kosmak, New York.—p. 444.
- 9 Case of Papilocystoma of Ovaries. A. Peskind, Cleveland.—p. 448.
- 10 Results of Interposition Operation. D. R. Ayres, New York.—p. 451.
- 11 Postoperative Treatment of Vesicovaginal Fistulae. C. G. Child, Jr., New York.—p. 455.
- 12 Gas Bacillus Infection; Case of Acute Endometritis and Septicemia Following Parturition. S. Graves, Louisville, Ky.—p. 458.
- 13 Cervicoplastic Treatment of Sterility. A. Sturmdorff, New York.—p. 469.
- 14 Retained Placenta. E. P. Barnard, Philadelphia.—p. 477.
- 15 Retained Adherent Placenta. C. B. Reynolds, Philadelphia.—p. 479.
- 16 Surgeon's Responsibility to Economics of Hospital. E. Marvel, Atlantic City, N. J.—p. 482.

American Journal of Orthopedic Surgery, Boston

September, XV, No. 9

- 17 *To What Extent Have Sun's Rays an Influence in Treatment of Bone and Joint Tuberculosis? A. H. Freiberg, Cincinnati.—p. 625.
- 18 *Association of Arterial Hypertension and Chronic Arthritis. P. P. Swett, Hartford, Conn.—p. 635.
- 19 Suspension with Extension in Treatment of Fractures of Limbs. J. Blake, France.—p. 644.
- 20 *Apophysitis of Os Calcis. A. D. Kurtz, Philadelphia.—p. 659.
- 21 Osteochondritis Deformans Juvenilis; Report of Case. A. B. Galvin, Springfield.—p. 664.

17. **Sun Rays Treatment of Bone Tuberculosis.**—From an experience with three cases Freiberg concludes that exposure to the sun's rays resulted in speedy improvement, which can fairly be attributed to this agency. The retrogression which ensued on having to abandon the systematic use of the sunlight seems to emphasize this fact, and makes it desirable to continue this during the winter in his own environment. The results obtained by Freiberg seem to indicate the value of this method, even in the vicinity of large cities and at low altitudes, where, according to Rollier, the potency of the ultraviolet rays is greatly diminished by the stratum of moist and unclean air through which they must pass. It is by no means certain that the ultraviolet rays are the essentially active or the only active part of sunlight, in a therapeutic sense. In Freiberg's experience the use of the quartz ultraviolet lamp, the so-called Alpine sun lamp, has failed to show that it may be considered even a fair substitute for sunlight. Its light, on the other hand, is quite rich in ultraviolet rays. It seems worth while to strive to construct a form of shelter for patients which will protect them from unendurable cold and especially humid winds, thus making possible the continuance of treatment during bright days of the whole winter season. It seems necessary to expose the whole body surface in order to obtain the best results. Such shelters should, therefore, have as covers some material permitting the easy passage of the ultraviolet rays. An investigation in this direction is under way, but has not yet yielded any result of value.

18. **Arterial Hypertension and Chronic Arthritis.**—Seventy cases of these combined lesions have been studied sufficiently by Swett to warrant the assertion of a definite diagnosis. The average blood pressure readings of the seventy cases was 182. In thirty-seven, or 52.6 per cent., Heberden's nodes were present. The author is convinced that arterial hypertension and chronic hypertrophic arthritis occur simultaneously in a large number of instances. The effect of treatment directed against the hypertension by means of general régime, or by specific medication, is to improve or arrest the progress of both conditions in the vast majority of the cases.

20. **Apophysitis of Os Calcis.**—Three cases are cited by Kurtz. The condition is one that is caused by an overstrain of the epiphyseal junction some time before complete ossification occurs. The prognosis is good for ultimate recovery, provided the proper treatment is carried out. The indications are rest, until pain has subsided, and then some means should be used to relieve the strain from the heel while it is functioning. This may be met by the use of the rubber pad in the heel of the shoe.

Annals of Surgery, Philadelphia

September, LXVI, No. 3

- 22 Conservatism in Surgery. S. J. Mixer, Boston.—p. 257.
- 23 *Carrel Method of Treating Wounds. C. L. Gibson, New York.—p. 262.
- 24 Shock, with Particular Reference to Condition as Seen in War Surgery. E. W. Archibald, Montreal, and W. S. McLean.—p. 280.
- 25 Injection of Gasserian Ganglion for Neuralgia of Fifth Cranial Nerve; Report of Cases. G. T. Vaughan, Washington.—p. 287.
- 26 *Empyema of Thorax. H. Lilienthal, New York.—p. 290.
- 27 Dilatation of Heart with Acute Myocarditis Following Abdominal Operations; Report of Cases. E. A. Vander Veer, Albany, N. Y.—p. 295.
- 28 Epigastric Hernia without Palpable Swelling. A. V. Moschcowitz, New York.—p. 300.
- 29 Paraffin Hernia; Report of Cases. A. F. Jonas, Omaha.—p. 308.
- 30 Case of Hypernephroma in Folds of Falciiform Ligament of Liver. F. N. G. Starr, Toronto.—p. 318.
- 31 *Indications for Cholecystectomy. M. F. Porter, Fort Wayne, Ind.—p. 321.

- 32 Acute Suppurative Cellulitis of Stomach; Report of Three Cases. E. Rixford, San Francisco.—p. 325.
- 33 A Suture Method of Gastro-Enterostomy. F. T. Stewart, Philadelphia.—p. 334.
- 34 Simple Method of Resecting Transverse Colon. J. E. Summers, Omaha.—p. 337.
- 35 *Cases of Carcinoma of Splenic Flexure of Colon. J. A. Hartwell, New York.—p. 339.
- 36 *Infections in Prostate Cases. E. S. Judd, Rochester, Minn.—p. 362.
- 37 Selection of Cases for Prostatectomy. J. B. Deaver, Philadelphia.
- 38 Artificial Impaction of Hip; Report of Cases. F. J. Cotton, Boston.—p. 380.

23. **Carrel Method of Treating Wounds.**—Gibson is of the opinion that, while the Carrel method of treating wounds has not worked any miracles, he has been able to control suppuration more promptly than by any other method, and certainly the results of the bacterial examinations as recorded in his charts show in practically all instances an immediate and constant diminution of the bacteria.

26. **Empyema of Thorax.**—The 100 patients whose cases Lilienthal tabulates represent thirty-eight minor thoracotomies with 18.4 per cent. mortality; forty-four major thoracotomies, many of them preceded by minor thoracotomy, death rate 27.2 per cent. Resection of ribs with their periosteum and gauze packing in encapsulated empyema treated as if it were an abscess, seven cases with no deaths. Resection and drainage by the old method seven cases with one death, or 16.6 per cent. In all cases there has not been a single thoracoplastic collapse operation. There have been a number of revisions, secondary and even tertiary, but eventually all the patients went home with symmetrical chests and fully expanded lungs.

31. **Indications for Cholecystectomy.**—Porter says it is neither necessary nor advisable to remove the gallbladder except when it is diseased or injured beyond the probability or possibility of restitution, and that this power of restitution may be presumed to be lost only when one or the other of the following conditions obtains: Hydrops with obliteration of the cystic duct; calcareous degeneration or fibrous degeneration with contraction; chronic empyema; the cholesterol or strawberry gallbladder; carcinoma; extensive laceration or perforation; gangrene other than localized gangrene, such as is sometimes caused by pressure of a stone.

35. **Carcinoma of Splenic Flexure of Colon.**—The splenic flexure is the third most common site for the growth of colonic cancer. This growth tends to the production of obstruction with indeterminate premonitory symptoms. This complication occurs acutely in nearly three fourths of the cases coming to operation. A recognition of the foregoing facts, and a more careful detailed study, with a possible exploratory operation, should lead to an early diagnosis in a majority of the cases, and thus forestall acute complications. The probable operative mortality of all cases up to the present time is over 60 per cent., and the per centage of prolonged cures is exceedingly low, 10 to 25 per cent. These appalling results are largely due to the delayed diagnosis, and an improper mode of attack. The latter should follow the principle of the two or more stage operation with provision for external colonic drainage, either as a preliminary, or at the time of resection; always the former in the presence of serious obstruction or abscess formation. The distal portion of the transverse colon, the flexure and the entire descending colon must be resected in order to obtain the requisite conditions for a secure anastomosis with an ultimate patency of the colonic lumen.

36. **Infections in Prostate Cases.**—In prostatic cases, a definite reaction occurs during the preoperative treatment. In some cases this reaction may be due to infection in the kidney. Several days after the beginning of treatment or after the operation has been performed, in a very large majority of cases, the urine shows a considerable number of colon bacilli. Judd does not believe that this can be due to contamination in every instance, although he is unable to say whether it comes from the kidney, the bladder, or the prostate itself. He suggests that the infection may be walled off in the kidney and therefore no organisms will show in the urine. Simultaneously with any form of treatment, the infection

becomes active and the urine immediately shows bacteria. Colon bacillus vaccine may modify the infection, though it does not decrease the number of colon bacilli in the urine.

Archives of Ophthalmology, New Rochelle, N. Y.

September, XLVI, No. 5

- 39 Binocular Metamorphopsia Produced by Optical Means. J. A. Lippincott, Monte Carlo.—p. 397.
- 40 Case of Primary Sarcoma of Iris. G. H. Bell, New York.—p. 427.
- 41 Trypanosome Keratitis; Experimental Study. A. C. Woods and G. E. de Schweinitz, Philadelphia.—p. 431.
- 42 Tonsil as Source of Infection in Iritis and Focal Choroiditis; Case Reports. J. Dunn, Richmond, Va.—p. 446.
- 43 Glaucoma as Result of Herpes Zoster Frontalis; Report of Cases. J. E. Weeks, New York.—p. 460.
- 44 Treatment of Detachment of Retina; Müller's Resection of Sclera. E. Török, New York.—p. 466.

Boston Medical and Surgical Journal

September 6, CLXXVII, No. 10

- 45 Newer Methods of Diagnostic Technic. F. T. Lord, Boston.—p. 299.
- 46 Review of Literature of Last Nine Years on Nephritis of Infancy and Childhood. L. W. Hill, Boston.—p. 313.
- 47 Diagnosis of Focal Sepsis. J. M. Anders, Philadelphia.—p. 319.
- 48 *Bruck's Serochemical Test for Syphilis; Report of Four Hundred Cases Compared with Wassermann Reaction. C. E. Smith and H. C. Solomon, Boston.—p. 321.
- 49 *Paresis or Dementia Praecox? H. I. Gosline, Trenton, N. J.—p. 324.
- 50 Shock at the Front. W. T. Porter, Boston.—p. 326.

48. **Bruck's Serochemical Test for Syphilis.**—The results of the Bruck serochemical test in 405 cases are presented by Smith and Solomon. In 101 of these cases there were definite clinical manifestations of syphilis, in which the Wassermann and Bruck tests agreed positively in seventy-four, or 75 per cent. The two tests agreed negatively in twelve instances, and were at variance in 15. In the group which showed syphilis of the nervous system there were sixty-four cases of clinically certain general paresis, of which the Wassermann and Bruck tests agreed in fifty-four instances, or practically 85 per cent. In other forms of central nervous system involvement the agreement was 100 per cent. in the fifteen cases tested. In the cases with no apparent involvement of the nervous system the agreement was somewhat less, being 76 per cent. This may be in keeping with the fact that the Wassermann test was not so strongly positive in these cases. The advantages of the test are: (1) the short time required to perform the test; (2) the limited amount of apparatus necessary, and (3) the simplicity of the technic. The disadvantages of the test seem, for the most part, to be bound up in the personal variations that are apt to occur.

49. **Paresis or Dementia Praecox?**—It seems proper to Gosline to call those cases paresis which show the mental picture and the physical signs of paresis, whether they have the positive signs of syphilitic infection or not, and to call those cases dementia praecox which have the mental and objective signs of dementia praecox, regardless of whether they have a syphilitic infection or not. Only in this way, says the author, can the problem be solved as to why certain paretics recover with more dementia than others, why some are less amenable to treatment than others, and, finally, why some have negative findings for syphilis.

Journal of Experimental Medicine, Baltimore

September, XXVI, No. 3

- 51 *Human Pulmonary Distomiasis Caused by Paragonimus Westermanni. K. Nakagawa.—p. 297.
- 52 *Distribution in Human Body of Spirochaeta Icterohemorrhagiae. R. Kaneko and K. Okuda, Japan.—p. 325.
- 53 *Rat as Carrier of Spirochaeta Icterohemorrhagiae, Causative Agent of Weil's Disease (Spirochaetosis Icterohemorrhagica). Y. Ido, R. Hoki, H. Ito and H. Wani, Japan.—p. 341.
- 54 Clinical Aspects of Spirochaetosis Icterohemorrhagica or Weil's Disease. R. Inada, Japan.—p. 355.
- 55 Etiology and Pathology of Rat Bite Fever. R. Kaneko and K. Okuda, Japan.—p. 363.
- 56 Circulating Immunity Principles in Rat Bite Fever. Y. Ido, H. Ito, H. Wani and K. Okuda, Japan.—p. 377.
- 57 *Pulmonary Embolism; Experimental Study. F. C. Mann, Rochester, Minn.—p. 387.
- 58 Viscous Metamorphosis of Blood Platelets. J. H. Wright and G. R. Minot, Boston.—p. 395.

- 59 *Studies on Bacterial Anaphylaxis and Infection. H. Zinsser and J. T. Parker, New York.—p. 411.
- 60 Increased Virulence of Hog Cholera Bacillus Produced by Passage Through Rabbits. C. Ten Broeck, Princeton, N. J.—p. 437.
- 61 Significance of Agglutinins in Immunity of Rabbit to Hog Cholera Bacillus. C. Ten Broeck, Princeton, N. J.—p. 441.

51. **Pulmonary Distomiasis.**—Nakagawa says that the chief causes of pulmonary distomiasis are the eating of raw or insufficiently cooked crabs infected with the cercariae of *Paragonimus westermanni*, and the drinking of river water containing them.

52. **Spirochaeta Icterohemorrhagiae in Body.**—The material examined by Kaneko and Okuda came from necropsies performed on forty-three patients who died at various stages of illness. The distribution of the spirochetes in the various organs of the human body differs according to the degree of development of the immune bodies. The spirochetes disappear first from the liver and suprarenals, but remain for some time in the muscle, prostate, thymus, appendix, testicles, epididymis, etc. In the kidneys they can be found for a long time. Their mode of disappearance would seem to indicate distribution varying with the different stages of the disease. And not alone the general distribution, but the local position of the spirochetes changes with the different stages. In the early stage, they are located mainly extracellularly, in the interstices; in the later stage, owing to the development of the immune bodies, in the blood, in the main intracellularly, and within the kidney tubules.

53. **Carrier of Spirochaeta Icterohemorrhagiae.**—In thirty-four out of ninety-two cases, or 37 per cent., examined by the authors, spirochetes identical with *Spirochaeta ictero-hemorrhagiae* were present in the kidneys or in the urine, as demonstrated directly by dark-field illumination and indirectly by inoculation. The organisms cannot be demonstrated in the blood and the liver, but in the urine of rats harboring *Spirochaeta ictero-hemorrhagiae* in the kidneys, they are present without exception. Urine containing spirochetes, even in small amounts (0.1 to 0.2 c.c.), infects guinea-pigs when injected intraperitoneally. In Japan, the rat is undoubtedly a carrier of the causative agent of *Spirochaetosis ictero-hemorrhagica*. *Mus decumanus* was found to be a carrier in 40.2 per cent. of 149 cases. *Mus alexandrinus* in 0.8 per cent. of twenty-four cases. On the basis of these findings, the authors conclude that the extermination of rats and field mice is a highly important prophylactic measure against Weil's disease.

57. **Pulmonary Embolism.**—The mechanism by which death is produced by an embolus which blocks only a small part of the pulmonary blood circulation is unknown. Mann's investigation was made for the purpose of determining this unknown factor, a purpose he has not been able to accomplish, as it has been possible to produce death experimentally only by a more or less complete blocking of the pulmonary circulation. Emboli made of paraffin and the animal's own blood were sent into the venous circulation of dogs. Death did not occur until the pulmonary circulation was practically occluded. The results were the same whether the blood pressure of the animal was normal or depressed by ether or disease and whether the procedure was carried out under ether or local anesthesia.

59. **Bacterial Anaphylaxis and Infection.**—An analysis of bacterial anaphylaxis and its relation to the occurrences in the animal body during an infectious disease is being made by Zinsser and Parker. They show that the sensitization of the tissues of guinea-pigs, as indicated by the isolated uterus, required three to five days when passive sensitization was employed, and that in these relations conditions with bacterial sensitization were entirely analogous to those revealed for serum anaphylaxis by Dale and Weil especially. It has become apparent that the sensitized uterus reacted not at all with whole bacteria or whole red cells, or, in other words, that before reaction with sensitized organs could occur an extraction or solution of the bacterial cell must take place. The mechanism of injury in the sensitized animal or in the human being so far along in typhoid that antibodies have begun to develop is in part one in which antigen, derived

from the bacilli and brought into solution, or rather suspension, in the blood stream, reacts with antibodies which are from the beginning, or have subsequently become, integral parts of the cell protoplasm, the entire process taking place within the cell. The symptoms which appear as the incubation time ends are largely those due to cellular sensitization which probably begins before any considerable amount of circulatory antibodies is present. Cure would consist of a gradual checking of growth and final destruction of the bacteria, and the consequent cessation of antigen liberation, but delicate hypersusceptibility would probably persist for some time after cure and immunity have been established. Just what the relation between tissue hypersusceptibility and immunity is remains a problem for further study.

Journal of Urology, Baltimore

August, I, No. 4

- 62 *Severe Renal Insufficiency Associated with Attacks of Urticaria in Hypersensitive Individuals. W. T. Longcope and F. M. Rackemann, New York.—p. 351.
- 63 *Lymphoid and Cystic Bodies in Urethra as Evidence of Tuberculosis. P. S. Pelouze, Philadelphia.—p. 367.
- 64 *Median Prostatic Bars as Found at Necropsy. A. Randall, Philadelphia.—p. 383.
- 65 Primary Nonpapillary Carcinoma of Renal Pelvis; Report of Case and Review of Literature. H. L. Kretschmer, Chicago.—p. 405.
- 66 Diverticulum of Bladder; Case Reports. J. A. Gardner, Buffalo.—p. 439.

62. **Renal Insufficiency with Urticaria.**—A study of the renal function in six cases of urticaria, four of which were hypersensitive to one or more foreign proteins, showed more or less profound disturbances of the functional activity of the kidney in three instances. In one case the disturbance was limited to a marked albuminuria and cylindruria. In two cases the attacks of urticaria and erythema were accompanied by albuminuria, cylindruria, increase in blood urea, profound depression of the index of urea excretion, decrease in the output of phenolsulphonephthalein and retention of chlorids and water. These observations show that during severe attacks of urticaria and erythema multiforme in the spontaneously sensitive, a much more profound intoxication of the body tissues takes place than can be demonstrated in the usual case of serum disease. Longcope and Rackemann suggest that it is probable that the intoxication causes a general disturbance in protein metabolism as well as an injury to the kidney.

63. **Lymphoid and Cystic Bodies in Urethra.**—In approximately 3,500 cystoscopies within the last three and one-half years, Pelouze has seen fifty-one cases. Of this number, he has studied forty-two cases, of which thirty-seven show reasonably certain evidences of tuberculosis. Five are still being studied for further confirmation of a coexisting tuberculous focus. Nine of these cases were observed only once, and did not return for further study. The most striking points in the entire group of cases are the following: Many were, or had been, in direct daily contact with cases of tuberculosis. Thirty-two had had a more or less recent specific urethritis. Almost all of this latter number were being treated for "chronic urethritis." The urine was usually clear but contained shreds. An associated follicular prostatitis was the rule. Frequency of urination was present in twenty-one cases. Burning pain in the fossa navicularis was present in thirty-five cases, usually only at urination. It was the most common symptom calling attention to the lesions. Burning pain at the vesical neck or in the perineum, either constant or intermittent, was present in nineteen cases.

64. **Median Bars as Found at Necropsy.**—Three hundred necropsy specimens of adult male prostates were examined by Randall. They have shown median obstruction to the vesical outlet in 18 per cent. of fifty-four cases. These have been shown to be either (1) fibrous, 10 per cent., or (3) glandular, 8 per cent. The fibrous type of bar has been subdivided into two varieties according to whether the process has encroached on, or drawn up (1) the urethral, or (2) the vesical surface in its development. They are the result of an inflammatory reaction and but a part of a generalized chronic interstitial prostatitis. The glandular type has been

subdivided into two varieties according to whether the hypertrophic process is confined to (3) the posterior prostatic commissure, inside the prostatic capsule and under the sphincter muscle, in which case a thick, broad bar is formed, or the (4) subcervical glands of Albarran, occurring just under the mucous membrane and within the sphincteric ring. Evidences of chronic inflammatory reaction has been the rule likewise in these glandular hypertrophies.

Medical Record, New York

September 8, XCII, No. 10

- 67 Incompetency of Ileocecal Valve vs. Lane's Kink as Cause of Ileac Stasis. J. H. Kellogg, Battle Creek, Mich.—p. 399.
- 68 Diagnosis and Therapy of Chronic Intestinal Toxemia. G. R. Satterlee, New York.—p. 402.
- 69 Diagnosis of Pulmonary Tuberculosis in Children of School Age. M. Fishberg, New York.—p. 406.
- 70 Milk Bacteria which Proliferate Before and Those which Survive Pasteurization: A New Method of Milk Sterilization. J. M. W. Kitchen, East Orange, N. J.—p. 409.
- 71 Autoserum Treatment for Chorea. R. D. Moffett, New York.—p. 414.
- 72 Some Disfiguring Affections of Eyelids. D. W. Montgomery, San Francisco.—p. 416.
- 73 Outlines of New York Concerning Alcoholic Problem. T. D. Crothers, Hartford, Conn.—p. 418.

Michigan State Medical Society Journal, Grand Rapids

July, XVI, No. 7

- 74 Abdominal Injuries—Symptoms, Treatment; Report of Case. L. J. Dretzka, Detroit.—p. 301.
- 75 Correct Interpretation of Bladder Symptoms in Female. W. T. Dodge, Big Rapids.—p. 302.
- 76 Contributions to Medical Literature by Profession of Detroit During Last Sixteen Years—(1900-1915 both Inclusive). W. H. Morley, Detroit.—p. 304.
- 77 Disturbances of Menopause and Their Relation to Blood Pressure. G. M. Johnson, Traverse City.—p. 308.
- 78 Relation of Physician to Compensation Act. C. S. Gorsline, Battle Creek.—p. 310.
- 79 Early Diagnosis of Pulmonary Tuberculosis. H. S. Hatch, Lansing.—p. 312.
- 80 *Case of Full Term Ectopic Gestation Retained Eighteen Years. Operation and Recovery. R. Peterson, Ann Arbor.—p. 316.
- 81 Case of Visceral Syphilis. U. J. Wile, Ann Arbor.—p. 317.
- 82 Spindle Cell Sarcoma Arising in Cavernous Lymph and Heman-gioma of Musculospiral Nerve. M. M. Peet, Ann Arbor.—p. 320.
- 83 Case of Amelanotic Melanotic Sarcoma over Scapula Region. H. M. Malejan and V. Russell, Ann Arbor.—p. 321.

September, XVI, No. 9

- 84 Penetrating and Nonpenetrating Injuries of Eye; Report of Cases. S. R. Edwards, Grand Rapids.—p. 391.
- 85 Two Cases of Cervical Ribs Associated with Symptoms of Hyperthyroidism. H. B. Schmidt, Detroit.—p. 394.
- 86 Shell Shock; General Discussion. W. H. Marshall, Boyne Falls.—p. 396.
- 87 Head Injuries; General Discussion. F. W. Walker, Detroit.—p. 399.
- 88 Medieval Care of Insane in Modern Times. "County Care System." H. S. Hulbert, Ann Arbor.—p. 401.
- 89 Two Cases in which Symptoms Seemed to Be Dependent on Disease of Teeth. N. B. Foster, Ann Arbor.—p. 406.
- 90 Report of Two Cases of Retroperitoneal Hematoma Following Purse String Watkins Operation for Cystocele. R. A. Bartholomew, Ann Arbor.—p. 410.
- 91 *Late Results in Splenectomy. Q. O. Gilbert, Ann Arbor.—p. 412.
- 92 Malaria; Report of Case. H. S. Bartholomew, Lansing.—p. 413.

80. Full Term Ectopic Gestation Retained Eighteen Years.—A woman, aged 46, consulted Peterson for an abdominal tumor which has existed for eighteen years. Five years after marriage there was cessation of menstruation, the usual morning sickness and enlargement of the breasts. There was a gradual increase in the size of the abdomen until at the ninth month she was as large as a woman at term. She felt life at the fifth month but does not remember at what time movement ceased. She thought she was pregnant but never had any labor pains. Shortly after the cessation of menstruation for nine months, she began to flow regularly again. She remained the same size, that is, the size of a woman at term, for two years, then gradually became smaller. For the past six years her abdomen has been of about the same size. During the past year she has not been feeling well and has lost 10 or 15 pounds. The tumor rose rather abruptly from the pubes, the highest point being half way between this point and the umbilicus. The growth was symmetrical, smooth, somewhat tender and distinctly fluctuating. It was fixed and apparently quite densely adherent to the

parietal peritoneum. Posterior to the cervix could be felt an irregular, tender mass about the size of a small hen's egg apparently attached to the tumor which could be made out as a cystic mass by palpation through the culdesac. It was impossible to palpate the appendages. On cutting through the abdominal wall, the fluctuating sac was found densely adherent to the parietal peritoneum, omentum and portions of the intestine. During the enucleation of the sac the latter was nicked in one portion, giving exit to an oily fluid of about the consistency and color of pea soup. When the sac was cut open it was found to contain the greater portion of a fetal skeleton.

91. Results in Splenectomy.—Gilbert records the blood cell changes, one year after splenectomy in two patients. He found a tremendous bone marrow stimulation immediately after operation, as evidenced by the marked leukocytosis, the increased nuclear red forms and increase in the large mononuclear and transitional groups. One year later he found the differential count very much the same, except for the increase in the lymphocytes and the marked increase in the number of nucleated red cells. The actual number of nuclear particles has remained about the same. One would think, then, that there must be a more essential factor in the blood cell destruction than the spleen. It would seem that the spleen has a very definite relation to bone marrow cell production, and it has a most definite relation to the maturing of the red cells, especially in the destructive metabolism of the nucleus of the red cells. In these two patients who have returned after a definite remission there is now much greater evidence of hemolysis than before. The spleens were removed and both show marked evidence of bone marrow activity with the principal change in the large number of normoblasts with all stages in the formation of nuclear particles.

Modern Hospital, St. Louis

September, IX, No. 3

- 93 Herman Knapp Memorial Eye Hospital, New York City. A. Knapp, New York.—p. 153.
- 94 Clinical Laboratory of Albany Hospital. C. F. Graham, Albany, N. Y.—p. 158.
- 95 Government's Work in Eradication of Trachoma. J. McMullen, Lexington, Ky.—p. 163.
- 96 Emergency Hospital for After-Care of Infantile Paralysis. L. C. Ager, Brooklyn.—p. 166.
- 97 *White Operation Room. W. L. Secor, Kerrville, Texas.—p. 170.
- 98 New York Children's Eye Clinics. W. M. D'A. Carhart, New York.—p. 171.
- 99 Medicine and Metrics. H. V. Arny, New York.—p. 174.
- 100 James J. Gray Clinic in Atlanta, Ga. C. C. Hinton and H. F. Hentz, Atlanta, Ga.—p. 177.
- 101 Standardization of Hospitals; Class II and III, Semipublic Institutions. J. A. Hornsby, Chicago and others.—p. 180.

97. White Operating Room.—The illumination of a room depends on two factors, the amount of light admitted to the room and the amount of light reflected from the surfaces it strikes within the room. After a study of the coefficient of reflection of various colors, H. A. Gardner published his results in the *Journal of the Franklin Institute* for January, 1916, and showed that the coefficient of reflection of white is 88 per cent., of light green 42 per cent., medium green 14 per cent. and dark green 11 per cent. Acting on this principle Secor built an octagon operating room, the ceiling of which was carried to a point, giving the effect of eight triangular panels; four of the sides from tip of pointed ceiling to floor are of heavy ground glass, which admits an abundance of north light. The walls, furniture, etc., are all white; to obviate the effect of the glare they use beaks on their caps, and on bright days large amber-tinted spectacles are worn. The cap used is a modified Mayo cap with small beak, and, to make it cooler, the back part of the skirt is cut away. The beak is made of several thicknesses of muslin with a number of rows of machine stitching and does not in the least hinder sterilization.

Nebraska State Medical Journal, Norfolk

August, II, No. 8

- 102 Society's Duty to Mentally Deficient Children. D. G. Griffiths, Beatrice.—p. 381.
- 103 Epilepsies. B. F. Williams, Lincoln.—p. 385.
- 104 Manifestations of Late Hereditary Syphilis. H. B. Hamilton, Omaha.—p. 388.

- 105 School Hygiene. J. W. Straight, Hastings.—p. 392.
- 106 Advantages and Disadvantages of Country Physician. G. W. Sullivan, St. Edward.—p. 396.
- 107 Functional Kidney Diagnosis in Urologic Diseases. G. W. Covey, Lincoln.—p. 397.

New York Medical Journal

September 8, CVI, No. 10

- 108 Treatment of Paralysis. B. D. Evans and F. H. Thorne, Morris Plains, N. J.—p. 437.
- 109 Imperfect Sight of Normal Eye. W. H. Bates, New York.—p. 440.
- 110 Psychotherapy and Drama. S. E. Jelliffe, New York.—p. 442.
- 111 Drugless Healing Cults. J. M. Taylor, Philadelphia.—p. 447.
- 112 Prostatic Hypertrophy with Tabes. E. M. Watson, Buffalo.—p. 448.
- 113 Plea for Early Diagnosis of Pulmonary Tuberculosis. S. A. Silk, Washington, D. C.—p. 449.
- 114 Diagnosis of Early and Late Gastric Cancer. H. Weinstein, New York.—p. 453.
- 115 New Group of Symptoms in Terminal Gastric Catarrh. R. Upham, Brooklyn.—p. 455.

Oklahoma State Medical Association Journal, Muskogee

September, X, No. 9

- 116 Surgery of Cystocele, Rectocele and Procidentia Uteri. A. L. Blesh, Oklahoma City.—p. 353.
- 117 Use and Abuse of Serums and Vaccines. C. W. Fisk, Kingfisher.—p. 358.
- 118 Focal Infections and Their Distal Consequences. E. Lamb, Clinton.—p. 362.
- 119 Sick Headache. C. W. Heitzman, Muskogee.—p. 367.
- 120 Hemorrhage from Ruptured Ovarian Cyst Simulating Ectopic Pregnancy; Report of Case. C. S. Neer, Vinita.—p. 369.
- 121 Acidosis of Pregnancy. W. M. Sanger, Oklahoma City.—p. 371.
- 122 Adynamic Ileus; Report of Two Cases. I. W. Robertson, Henryetta.—p. 373.

Pennsylvania Medical Journal, Athens

August, XX, No. 11

- 123 Bilateral Metastatic Panophthalmitis Following Pneumonia, with Fatal Issue. G. A. Lawrence, Philadelphia.—p. 379.
- 124 Ligation of Superior Pole of Thymus in Operating for Goiter. L. F. Stewart, Clearfield.—p. 751.
- 125 Some of More Unusual Affections Involving Deep Urethra and Bladder. E. R. Kirby, Philadelphia.—p. 755.
- 126 Abnormal Coagulation Time of Blood and Methods of Overcoming It. G. M. Dorrance, Philadelphia.—p. 761.
- 127 Early Differential Diagnosis Between Dementia Praecox and Manic Depressive Insanity. F. X. Dercum, Philadelphia.—p. 765.
- 128 Shall County Society Organ Be Continued? A. B. Hirsh, Philadelphia.—p. 767.
- 129 Secretary as Factor in Society. L. B. Kline, Catawissa.—p. 770.
- 130 Focal Infection. J. Daland, Philadelphia.—p. 771.
- 131 Alcohol as Revealed by Modern Scientific Research (Ethyl Alcohol). S. C. Smith, Philadelphia.
- 132 Commitment of Insane in State of Pennsylvania. T. Diller, Pittsburgh.—p. 778.
- 133 Prognosis, Sequelae and Complications of Infantile Paralysis. A. J. M. Treacy, Philadelphia.—p. 782.

Southern Medical Journal, Birmingham, Ala.

September, X, No. 9

- 134 Modern Treatment of Acute Infectious Diarrhea. A. J. Waring, Savannah, Ga.—p. 711.
- 135 Evils of Drug Addiction and of Traffic. W. D. Partlow, Tuscaloosa.—p. 713.
- 136 *Case of Huge Dilatation of Esophagus. J. Friedenwald, A. Cotton and A. C. Harrison, Baltimore.—p. 717.
- 137 Public Health Administration and What Has Been Accomplished in Glynn County, Georgia. T. F. Abererombie, Brunswick, Ga.—p. 722.
- 138 Intensive Community Sanitation in Virginia; Methods Adopted and Some Results. E. L. Flanagan, Richmond, Va.—p. 724.
- 139 Our Professional Allies, Public Health Nurses. C. C. Aven, Atlanta, Ga.—p. 730.
- 140 Gunshot Injuries of Spinal Cord; Report of Two Cases. C. W. Roberts, Atlanta, Ga.—p. 734.
- 141 *Cholecystitis with and without Gallstones, with Classification of Symptoms. G. A. Hendon, Louisville, Ky.—p. 737.
- 142 Streptococcus Septicemia with Metastatic Infection in One Eye. C. W. Vest, Baltimore.—p. 740.
- 143 Passage of Wounded Man from Front Line Trenches to Base. T. H. Goodwin, Washington, D. C.—p. 744.
- 144 Medical Preparedness in Great Drive for Democracy. J. C. Bloodgood, Baltimore.—p. 746.
- 145 What European War Has Taught Us in Transportation and Handling of Injured. J. H. Ford, Leon Springs, Texas.—p. 752.
- 146 Why Cyclopegia or Mydriatic as Routine? J. M. Crawford, Asheville, N. C.—p. 758.
- 147 Eye Strain and Its Relation to Reflex Nervous Troubles. L. M. Scott, Jellico, Tenn.—p. 760.

136. **Huge Dilatation of Esophagus.**—The esophageal dilatation in this case was fusiform in shape, the smaller portion of which extended as high up in the neck as the cricoid cartilage. The esophageal sac held as much as 1.750 c.c. of water. The stomach was about normal in size, with a capacity of 750 c.c. The other abdominal organs were normal.

141. **Cholecystitis.**—One of Hendon's patients was a male, 26 years of age. While at work he was suddenly seized with pain in the region of the gallbladder and went home and sent for his physician. Two days later he was admitted to a hospital. His pain was excruciating; pulse, 120; temperature, 101.6. A tumor was perceptible in the gallbladder region. Incision showed the gallbladder very black and distended; when opened it was found filled with blood clot. There were no stones present. He made a smooth convalescence and died one year later from nephritis.

Southwest Journal of Medicine and Surgery, El Reno, Okla.

July, XXV, No. 7

- 148 Focal Infections. A. B. Leeds, Chickasha.—p. 157.
- 149 Surgical Acidosis. W. E. Dicken, Oklahoma City.—p. 163.
- 150 Electrotherapy. J. Y. Simpson, Kansas City, Mo.—p. 173.
- 151 Heat in Cancer of Uterus. F. A. Hoge, Fort Smith, Ark.—p. 176.
- 152 Focal Infections. W. H. Livermore, Chickasha.—p. 179.

Southwestern Medicine, El Paso, Texas

August, I, No. 8

- 153 Administration of Base Hospital. C. R. Snyder.—p. 9.
- 154 Ambulance Company. W. H. Allen.—p. 13.
- 155 Clinical Features of Labyrinthitis. E. R. Carpenter, El Paso.—p. 19.
- 156 Pathology of Acute Acidosis. W. W. Watkins, Phoenix, Ariz.—p. 23.
- 157 Conservation of Kidney Tissue by Surgeon. W. Smith, Tucson, Ariz.—p. 32.

Surgery, Gynecology and Obstetrics, Chicago

September, XXV, No. 3

- 158 *Symposium on Relation of Glands of Internal Secretion to Gynecology and Obstetrics. R. T. Frank, New York.—p. 225.
- 159 *Relation of Pituitary Gland to Female Generative Organs. E. Goetseh, Baltimore.—p. 229.
- 160 *Physiologic and Pathologic Importance of Parathyroid Gland from Experimental Aspect. C. Voegtlin, Washington.—p. 244.
- 161 *Pineal Gland; Influence of Pineal Gland on Growth and Differentiation with Particular Reference to Its Influence on Prenatal Development. C. P. McCord, Detroit.—p. 250.
- 162 *Relation of Parathyroid System to Female Genital Apparatus. E. H. Pool, New York.—p. 260.
- 163 *Thyroid Gland in Relation to Gynecology and Obstetrics. D. Marine, Cleveland.—p. 272.
- 164 Thymus Gland and Its Possible Relation to Female Genital Tract. A. M. Pappenheimer, New York.—p. 276.
- 165 *Endocrine Function of Pancreas and Its Relation to Sex Life of Women. A. J. Carlson, Chicago.—p. 283.
- 166 *Experimental and Clinical Evidence as to Influence Exerted by Suprarenal Bodies on Genital System. S. Vincent, Winnipeg, Manitoba.—p. 294.
- 167 *Relation of Ovary to Uterus and Mammary Gland from Experimental Aspect. L. Loeb, St. Louis.—p. 300.
- 168 *Transplantation and Retention of Ovarian Tissue after Hysterectomy. W. P. Graves, Boston.—p. 315.
- 169 Preparation and Standardization of Ovarian and Placental Extracts. W. H. Morley, Detroit.—p. 324.
- 170 *Placenta Regarded as Gland of Internal Secretion. R. T. Frank, New York.—p. 329.
- 171 *Relation of Sex Glands to Metabolism. J. R. Murlin, and H. Bailey, New York.—p. 332.
- 172 Study of Ovarian Transplantation and Ovarian Secretion. F. H. Martin, Chicago.—p. 336.
- 173 Autonomic System as Integrator with Special Reference to Urogenital Organs. H. C. Jackson, New York.—p. 346.

158-163. Abstracted in THE JOURNAL, July 21, 1917, pp. 235, 236 and 237.

165-168. Abstracted in THE JOURNAL, July 21, 1917, pp. 236 and 237.

170 and 171. Abstracted in THE JOURNAL, July 21, 1917, p. 237.

Vermont Medicine, Rutland

August, II, No. 8

- 174 *Neutralization of Virus of Poliomyelitis by Nasal Washings. H. L. Amoss and E. Taylor, Burlington.—p. 189.

174. Neutralization of Virus of Poliomyelitis by Nasal Washings.—Tests were made by Amoss and Taylor to determine the effect of concentration of washings on the activity of the virus. Amounts of virus which would certainly produce the infection if injected directly were added to a filtered washing fluid obtained from persons not having been exposed to the infection. The mixtures were separately reduced to small volume in vacuo at low temperatures and injected into monkeys. The results obtained were variable, for reasons which at first were not obvious, but the tests nevertheless showed that the filtered virus in certain amounts may withstand concentration in washing fluids without losing entirely its infective power. The nasopharynx was rinsed with double distilled water and the washings were fractionally sterilized by heating to 60 C. for three successive days. Each person's specimen was handled separately. The virus employed was obtained by filtering a 5 per cent. suspension of glycerolated poliomyelitic monkey spinal cord. To each 30 c.c. of the washings 7.5 c.c. of the filtered virus were added. The mixture was then incubated at 37 C. for twenty-four hours. Control mixtures of virus and distilled water were subjected to the same incubation. Each cubic centimeter of the mixtures then contained 0.2 c.c. of the filtrate, or at least two minimum lethal doses of the virus. The results of this experiment suggest that the nasal washings of a person suffering from acute poliomyelitis may exercise no restraining influence on an active virus, while those from healthy persons, under identical conditions of preparation, inhibit its activity. The secretions of apparently normal persons vary in the so-called neutralizing power. In each series of experiments the potency of the virus was established by control experiments. The secretions of three persons out of six examined varied in their power to neutralize 0.2 c.c. of the virus filtrate at different times under nearly identical conditions, yet the only known clinical differences consisted in the presence of a rhinitis which appears to remove the inactivating power of the secretions.

The neutralizing substance is apparently rendered inactive by heating to 70 C. Apparently inflammatory conditions of the upper air passages tend to remove or diminish the power of neutralization. But irregularities have been noted, even in the absence of these conditions. The neutralizing substance is water soluble and appears not to be inorganic; it appears to be more or less thermolabile, and its action does not depend on the presence of mucin as such. It is suggested that the production of healthy carriers through contamination with the virus of poliomyelitis may be determined by the presence or absence of this inactivating or neutralizing property in the secretions. Whether this effect operates to prevent actual invasion of the virus and production of infection can only be conjectured. The authors suggest that probably the property is merely accessory and not the essential element on which defense against infection rests. It is more probable that other factors exist which help to determine the issue of the delicate adjustment between contamination and infection.

West Virginia Medical Journal, Huntington

July, XIII, No. 1

- 175 Local Anesthesia in Surgery of Colon and Rectum. W. M. Beach, Pittsburgh.—p. 1.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

August 25, II, No. 2956

- 1 *Trench Nephritis, Its Later Stages and Treatment. J. M. Clarke.—p. 239.
- 2 *Reamputation. W. A. Chapple.—p. 242.
- 3 *Method of Flapless Amputation, with Subcutaneous Division of Bone at Higher Level. W. S. Handley.—p. 244.
- 4 Thomas Splint for Fractures of Femur. W. Rankin.—p. 248.
- 5 Dakin's "Dichloramin-T" in Treatment of Wounds of War. J. E. Sweet.—p. 249.
- 6 Expeditious Method for Study of Enteric Stools. F. B. Bowman.—p. 250.

1. Trench Nephritis.—This paper deals with cases of nephritis in a base hospital, the initial stage being over. The seventy-four cases are placed in four groups: 1. Thirteen cases in which there was either a distinct history of a previous attack of nephritis or definite signs of an affection of the kidneys of some standing. 2. Ten cases in which the nephritis was found to have cleared up on admission, though the symptoms of an attack before admission were quite definite. 3. Nineteen cases which completely recovered in the hospital and were discharged cured. 4. Thirty-two cases which left this hospital not cured, though the majority were greatly improved. The onset in nearly all appears to have been sudden, and edema of the face and limbs, with pains in the back, and dyspnea the chief symptoms; the latter was only partly accounted for by the frequency of bronchitis. Edema at onset was present in fifty-seven out of seventy-four patients. Hematuria, generally slight, occurred in many. The chief symptoms of the disease while in the hospital were edema, most often of the face and limbs, much less often general anasarca; as a general rule, edema showed a disposition to clear up fairly quickly, but in bad cases was persistent, sometimes for many weeks, and in a few attended with ascites and pleural effusion; dyspnea, often but not always associated with some bronchial or pulmonary complication; pains in limbs and back, headache, less frequently vomiting, only occasionally diarrhea, a feeling of great prostration and sometimes mild cyanosis; anemia was only present in the more severe cases and uremic fits in one only.

The average duration before admission to this hospital was two to three weeks, and that of the whole illness until the cases were sufficiently recovered for discharge was, in Group 1, 9.6 weeks; in Group 2 (convalescent on admission), three weeks; in Group 3 (recovered in the hospital), 6.8 weeks, and in Group 4, 8.1 weeks. Of sixty-eight patients, three died, eight were discharged slightly improved as permanently unfit, eleven much improved but the urine contained casts and more than a trace of albumin, six fairly well and able to do light work, and thirty-two recovered completely; of eight patients Clarke has not sufficient information.

The treatment consisted of rest in bed; a fixed diet of 2½ pints of milk, 6 ounces of bread, 1 ounce of rice, ½ ounce of butter, 4 ounces of potatoes, 4 ounces of greens, 1 ounce of jam and fruit occasionally. As improvement took place the bread was increased to 8 ounces and the yolk of one or two eggs was added. Later on, 4 ounces of cooked fish or chicken were added and sometimes more bread and butter. Salt was not used as a condiment, nor added by the cook, except in cooking green vegetables. The amount of water was not restricted when once the kidney began to secrete freely. Many of the patients had only a simple diaphoretic mixture with a saline or other purgative required. Hot air baths were used when free diaphoresis was necessary. Nitroglycerin was given when the blood pressure was raised. Iron was given in the later stages if there was anemia. In many cases with deficient urinary excretion on admission, sodium carbonate was used with very satisfactory results in establishing a free flow of urine.

2. Reamputation.—Assuming that a reamputation of a limb has to be done, Chapple suggests early reamputation and the saving of weeks of painful and tedious healing; the control of bony proliferation, the avoidance of spurs, and the protection of the bone end from infection, by careful technic in the treatment of the periosteum; the covering of the end of the bone with muscle fascia and skin in such a way as to (a) approach the normal heel as a model and (b) provide for the most distant muscle attachments possible; the use of button sutures in every case of primary and secondary amputation in cases in which the flaps are large and the skin is stitched, in order to (a) keep severed muscles and tendons as nearly as possible in apposition, (b) give immunity from the results of suppuration if it occur, (c) prevent hemorrhage between the flaps, (d) give the minimum area of flaps and the maximum length of stump in cases in which shortness is a locomotive disability.

3. Method of Flapless Amputation.—Handley suggests the trial of a method which, while retaining all the important

advantages of the guillotine method, will obviate the necessity of a secondary operation. It is also, he says, the best way of doing the secondary amputation in cases previously submitted to the Kelly method. In such cases it is necessary (a) to remove such a length of bone that an adequate covering of soft tissue is provided for what remains; (b) to excise the calcified granulations, which do not afford a suitable bed for the spreading epithelium. If calcified granulated tissues are allowed to remain, it is certain that ultimately the skin will be adherent to the end of the bone; (c) to do what is necessary with minimum exposure of fresh raw surfaces, since all these cases are necessarily accompanied by sepsis. Handley makes two punctures at the end of the bone at the outer side of the limb, separated by about one third of its circumference and situated 4 inches above the end of the stump. Through one of them a curved pair of forceps is introduced closed, and is insinuated round the bone until it is able to seize the end of the Gigli saw introduced through the outer puncture. The pair of forceps is then withdrawn, bringing with it the saw. The bone is now divided, care being taken not to rasp the soft tissues. The punctures are made on the side of the limb remote from the main artery so as to avoid all risk of injury to the large vessels by the action of the saw. The end of the bone is now seized by lion forceps and with the aid of a periosteal elevator is easily separated from the soft tissues and removed. Excise the layer of calcified granulated tissue and insert one or two sutures, making ample provision for drainage. In patients exhausted by long continued suppuration it may even be advisable to perform the operation in two stages. The first stage is the subcutaneous division of the bone at the selected level. This operation should run an aseptic course. In a few days the ends of the marrow canal will be sealed by a layer of granulation tissue, and the isolated distal end of the bone can be removed with a minimum risk of osteomyelitis in the proximal end. The method can be used for primary amputations, and Handley has successfully employed it on several occasions.

Journal of Tropical Medicine and Hygiene, London

August 15, XX, No. 16

- 7 Tropical Diseases Met with in Balkanic and Adriatic Zones. A. Castellani.—p. 181.

Lancet, London

August 25, II, No. 4904

- 8 Students' Number.—p. 267.

Archives des Maladies du Cœur, etc., Paris

August, X, No. 8, pp. 353-400

- 9 *Subacute Endocarditis plus Pulmonary Endarteritis with Chronic Heart Disease. R. Lutembacher.—p. 353.

9. **Subacute Endocarditis with Chronic Heart Disease.**—Lutembacher gives illustrated descriptions of the necropsy findings in thirteen cases of chronic heart disease. They confirm the assumption that patients with chronic cardiovascular disease do not die from the progress of the disease but succumb to superposed infectious processes, independent of asystolia. The subacute septicemia entails anemia and thrombosis. His patients were all young, without much dilatation of the heart, and compensation had been perfect or had only occasionally briefly lapsed. Suddenly, after some casual infectious sore throat or childbirth they began to exhibit symptoms of infectious disease, slight jaundice and symptoms of embolism in spleen, kidneys or skin. Although the germs are not very virulent and the infectious process keeps subacute, yet its tenacity and fatal outcome render it actually malignant. There is another form of this secondary endocarditis in which the infectious process soon dies out. The outlook is grave only in case embolism develops; otherwise, after infarction in spleen or kidney, all subsides. Lutembacher reiterates that the embolism accident is only the expression of an infectious process; in several of the cases here described the emboli were swarming with microbes, generally streptococci. The clots were found in the right or left cavities of the heart or in the pulmonary artery. One in the left auricle was 5 cm. in diameter and 3 cm. thick. Some

were pedunculated. The clinical picture from the clot in the left cavities may prove misleading if the chronic heart affection is not known. The general infection, anemia and rapid pulse suggest paratyphoid or tuberculosis; the renal infarcts may be diagnosed as a tuberculous process in the kidney. Death occurs in from three to nine months unless the infection dies out and after infarction of spleen or kidney, or hemiplegia, the patient throws it off.

Archives de Médecine des Enfants, Paris

July, XX, No. 7, pp. 337-392

- 10 *Twelve New Cases of Infantile Scurvy. J. Comby.—p. 337.
11 Tubercles in the Pons. A. d'Espiné and V. Demole.—p. 355.
12 Case of Subcutaneous Emphysema in Diphtheria. Le Soudier.—p. 360.
13 *Congenital Obliteration of the Bile Ducts. J. Comby.—p. 363.

10. **Infantile Scorbutus.**—This later series brings to forty-one Comby's record of scurvy in infants at Paris during eighteen years. None of the children had been getting breast milk or fresh milk or even simply boiled milk; all had been fed with sterilized flour foods. Signs of rachitis were present in nearly every case. The artificial feeding is responsible for both, he declares, saying that if the milk is sterilized—dead milk—there may be both scurvy and rachitis; if the food is fresh—living milk—the child is exposed to danger of rachitis alone. The diagnosis of scurvy is easy for a physician who has once seen a case, but very difficult otherwise. Cases in this series had been mistakenly diagnosed acute articular rheumatism, infectious polyarthritis, polyneuritis, acute myelitis, infantile paralysis, meningitis, typhoid, osteomyelitis, fracture in a child with rickets, syphilitic osteoperiostitis, osteosarcoma, coxalgia or Pott's disease. All the children easily and rapidly threw off their scorbutus, no matter how old or how severe the course. All that is necessary is to think of the possibility of scorbutus and stop all feeding from cans, returning to fresh milk, raw or merely boiled, giving two or three teaspoonfuls a day of orange or grape juice or lemonade. Children over 18 months old can be given soft mashed potato. Meat juice is not necessary. Every child taking sterilized milk is liable to develop scurvy.

13. **Congenital Obliteration of Bile Ducts.**—Comby summarizes and comments on Holmes' recent article with this title in an American journal, endorsing the latter's views.

Bulletin de l'Académie de Médecine, Paris

August 7, LXXVIII, No. 31, pp. 107-118

- 14 Technic for Treatment of Arteriovenous Aneurysm in the Neck. (Artériographie transjugulaire suivie de capitonnage veineux.) R. le Fort.—p. 108.
15 *Device to Protect the Ears against Shock from Explosions. (Obturbateurs d'oreilles à chambre de détente.) L. and M. Verain.—p. 111.
16 *Malaria at Salonica. E. Marchoux.—p. 112.
17 *Continuous Aspiration in Treatment of Purulent Pleurisy. J. S. Dauriac.—p. 115.

15. **Device to Protect the Ear Against the Air Shock of Explosions.**—Verain says that over 600 pairs of these little shock absorber obturators are already in use on the firing line and are proving extremely useful, especially for gunners and artillery men in general. They consist of a hollow celluloid or metal olive about 12 mm. long by 9 or 10 mm. wide, provided with a perforated transverse septum inside or other protecting contrivance. The little obturator fits tight into the outer ear but does not deafen it although absorbing the air shock.

16 and 17. See Paris Letter in THE JOURNAL, September 15, p. 926.

Journal de Médecine de Bordeaux

August, LXXXVIII, No. 9, pp. 169-192

- 18 *Traumatic Periosteoma. H. L. Rocher.—p. 171.
19 Case of Regular, Total Hexadaetylism. J. Vergely.—p. 174.
20 Fractures of Lower Jaw. J. Vitrac.—p. 176.
21 A Week at the University of Jena in 1909. R. Cruchet.—p. 180.

18. **Traumatic Periosteoma.**—Rocher describes nine cases in which a bullet or scrap of shell grazed the bone or it was injured by contusion otherwise, and the irritated periosteum developed an exuberant bone growth. In four of the cases

the field was practically aseptic, no infectious process developing. In the others the persistence of a fistula indicated that something was wrong. The probe introduced into the fistula passed through a cavity in the periosteoma and the tip could be felt scraping bare bone. When inaccessible to palpation, the periosteoma was shown up by the Roentgen rays. He advises immediate excision, with care to clear away every trace of fungous tissue which otherwise might keep up the suppuration. An electric head lamp is almost indispensable for these operations. Any scrap of periosteum left may bring recurrence. He completes the operation by swabbing with zinc chlorid.

Nourrisson, Paris

July, V, No. 4, pp. 193-256

- 22 The Intoxication with Disease of the Digestive Apparatus in Infants. A. B. Marfan.—p. 193.
- 23 Causes of Chronic Stridor in Infants; Four Cases, M. Lavergne and Donzeau.—p. 220.
- 24 Extraction of Brooch in Throat of Seven Months Infant for Thirty-Four Hours. E. Apert.—p. 230.

Paris Médical

August 11, VII, No. 32, pp. 129-144

- 25 *Malarial Erythema. H. de Brun.—p. 129.
- 26 *Erythema after Use of Salvarsan and its Substitutes. G. Milian.—p. 131.
- 27 Traumatic Facial Diplegia. R. Oppenheim and G. L. Hallez.—p. 136.
- 28 Superficial Tension of Royat Mineral Waters. G. Perrin.—p. 139.

25. **Malarial Eruptions.**—De Brun states that his systematic examination of 160 patients with malaria has convinced him that it must be classed with the eruptive diseases. He found the eruption marked in sixty-two of the 160 and it developed later in some of the others. Probably the reason why it has escaped attention hitherto, he remarks, is because the eruption is not of a noticeable tint and it fluctuates. It is generally of a pale pink or light violet color but may sometimes be a bright pink or lilac. It may spread all over the body, sparing only the face, neck, soles and palms. The general aspect is much like that of measles only for the lighter tint and that it never displays the miniature flat papules of measles, and is usually restricted to certain regions, mostly the sides of the chest and thorax. In the milder cases the eruption is represented merely by a few scattered patches, not more than ten or twelve in all, scattered on the flanks, the sides of the chest, the region above the trochanters, the vicinity of the false ribs or the axillary margin of the pectoralis. The erythem disappears under pressure but returns at once, and it is liable to blanch as the region is exposed to the air. The erythem is most pronounced in the morning; bed rest seems to favor its eruption. There was never any subjective symptom from it and he never saw signs of desquamation. The erythem seems to appear and disappear in waves. The momentary complete eclipses are characteristic, as also the final complete disappearance. Probably the patients with negative findings had been examined only during the intermissions of the eruption. No regularity in the development of the waves could be detected; the eruption was noted as well in the febrile as in the afebrile patients, and whatever its intensity, its evolution was always silent. In short, he adds in conclusion, the erythem of malaria occupies a special place in the group of toxidermias.

26. **Eruptions Under Salvarsan.**—Milian noted eruptions of different types in over 3 per cent. of 326 men being treated with salvarsan or neosalvarsan and in over 7 per cent. of 206 women. They were more common possibly with intravenous than with intramuscular injections of the drug. In three more recent cases there was a grave exfoliating erythrodermia and in two others rubeola developed immediately after the injection. He is inclined to accept the idea that the drug has a stimulating action on certain germs, including the unknown germ of rubeola, notwithstanding its destructive action on spirochetes. The phenomenon, he continues, is like mercurial stomatitis. The mercury does not cause the stomatitis directly, but it stimulates germs already present on the gums to start the stomatitis. Boils are liable to develop under salvarsan in those with furunculosis, and lichen planus to flare up anew.

Presse Médicale, Paris

July 26, XXV, No. 42, pp. 433-440

- 29 *Diagnosis of Tuberculous Otitis. M. Lermoyez.—p. 433.
- 30 Management of Malaria in Soldiers. Wurtz.—p. 435.
- 31 Aspect of Stools in Atypical Forms of Amebic Dysentery. C. Mattéi and M. Bloch.—p. 436.
- 32 Alcohol in Disinfection of the Hands. E. Viguier.—p. 437.

29. **Tuberculous Otorrhea.**—Lermoyez insists that many cases of otitis media are the work of the tubercle bacillus. He found tuberculous otorrhea ten times to every ninety osteomyelitic cases. In 20 per cent. of the tuberculous otorrheas both ears were affected. Fully 75 per cent. of all the cases he has encountered were in children, but among the adults affected there were four times as many men as women. He declares that we must stop looking at such patients through the keyhole and bring them out into the open for examination. A suppurating bone process requires treatment along the same lines whether it is in the ear or hip joint, and exclusion of tuberculosis and syphilis is the first step. The tuberculous nature of the process may be suspected only from the lack of normal healing after a mastoid operation. Even a retrospective diagnosis like this may be important as a guide to further treatment. Other aids in the differential diagnosis are the insidious onset, the paradoxical deafness, the white caries, pale granulations, and the persisting fistula. Microscopic examination of one of the pale granulations may reveal the tuberculous follicle, and inoculation of guinea-pigs is conclusive. He warns against tuberculin tests, as any reaction at the focus to a tuberculin test is liable to have disastrous effects in the ear. It might even bring on facial paralysis, labyrinthitis or meningitis, and hence should be strictly proscribed.

Progrès Médical, Paris

July 28, XXXII, No. 30, pp. 249-256

- 33 *The Oculocardiac Reflex in Bradycardia. A. Mougeot.—p. 249.
- 34 *Emetin plus Arsenic in Treatment of Amebic Dysentery. H. Aimé.—p. 253.

August 4, No. 31, pp. 257-264

- 35 *Paroxysmal Stuttering. M. Briant and J. Philippe.—p. 257.
- 36 Choice of Anesthetic in War Surgery. G. Jeanneney.—p. 261.
- 37 Invaliding of Soldiers with General Paralysis. J. Crinon.—p. 262.

33. **Significance of the Oculocardiac Reflex in Bradycardia.**—Mougeot's experience with fourteen patients with bradycardia has confirmed the assumption that the persistence of the oculocardiac reflex eliminates true heart block from the diagnosis and proves the nervous origin of the bradycardia. On the other hand, a negative response to the ocular test does not decisively disprove the nervous nature of the trouble. In some of the men suffering from shell shock he has found total sinus bradycardia with no oculocardiac reaction. He explains the mechanism for this, ascribing it to the anastomoses described by Ramon y Cajal between the posterior root of the trigeminal and the tenth and eleventh pairs.

34. **Combined Emetin and Arsenic Treatment of Amebic Dysentery.**—Aimé reports prompt improvement in eighteen cases of amebic dysentery, that had long resisted other measures, when he instituted combined emetin and atoxyl treatment. The atoxyl was the only form of arsenic available at the time. Three of the men were apparently completely cured and ten others much improved. Even in the five cases listed as failures, the general health showed great benefit.

35. **Stuttering as Symptom of Shell Shock.**—Briant and Philippe comment on the remarkably small number of cases of stuttering brought on or aroused by the emotional stress of the war. In one case the soldier had stuttered from childhood. His speech had been natural until the age of 4 when, after a severe fright, he began to stutter and has had periods of stuttering since, alternating with periods of normal speech. The stuttering came on again in a severe form after shell shock, the features of the case analogous to those with rebellious deafmutism of emotional origin. The course of training which conquered the tendency to stuttering is described in detail. It commenced with breathing exercises, showing the patient the tracings and how he must learn to manage the diaphragm to bring the tracing to normal, training him in exerting the muscles necessary to regulate dia-

phragm functioning. This was accompanied by reading exercises in solitude, slowly reading the words in a low voice to himself, noting the letters that start the stuttering and meeting each one with a deeper, more prolonged respiration. The breathing exercises are done more readily while walking slowly than when seated or reclining. Any overexertion, exhaustion or strong emotion is liable to bring a setback. In the case described the stuttering was conquered in the course of three weeks.

Revue Médicale de la Suisse Romande, Geneva

March, XXXVII, No. 3, pp. 93-172

- 38 Recklinghausen's Disease in Grandmother, Mother and Daughter, Otherwise Apparently Healthy. C. Du Bois.—p. 93.
39 *Estimation of Arterial Blood Pressure by Auscultation Findings. J. Tschertkoff.—p. 104.
40 Microscopic Study of Gonorrheal Lesions in the Male. J. Wintsch.—p. 113.
41 *Purpura Affecting the Bladder. C. Perrier.—p. 139.
42 *Fastening the Tube in the Throat. (La méthode du Prof. Polverini, de Milan, pour la fixation du tube, dans les sténoses laryngées.) E. Bernasconi.—p. 144.
43 Acute Circumscribed Edema of Lip and Cheeks, also around the Anus. E. de La Harpe.—p. 151.

May, No. 5, pp. 253-328

- 44 *Mushroom Poisonings in Geneva District in 1916. M. Roch.—p. 253.
45 Heart Disturbances and Military Service. E. Thomas.—p. 270.
46 *Dilatation with Metallic Mercury and Catheterization under Screen Control for Cicatricial Stenosis of the Esophagus. E. Kummer and G. Moppert.—p. 284.
47 *Remission for Nine Days in Case of Fatal Mushroom Poisoning. P. Gautier and C. Saloz.—p. 291.

39. **Auscultation of the Blood Pressure.**—Tschertkoff gives the tabulated findings with Korotkoff's method and with Pachon's oscillometer. He declares that the former is the simplest, the easiest and the least exposed to subjective errors. The findings are as exact as with the oscillometer for the minimal pressure and are more reliable for the maximal. The Riva-Rocci cuff is placed on the arm at the lower third and we listen through a small phonendoscope or stethoscope placed lightly on the humeral artery in the bend of the elbow. As the cuff is inflated we hear nothing, but as the mercury drops we hear four phases of sounds and a phase of silence. These phases are so distinct and significant that this rapid method seems destined to supplant all others. He tabulates the findings in twenty-eight reclining patients, the arm lying along the body, also in eleven reclining with the wrist on a level with the heart, and in ten in which the oscillometer and the Korotkoff were each applied to the humeral artery.

41. **Purpura Affecting the Bladder.**—Perrier's patient was a man of 31. There were other manifestations of the purpura on the skin. The previously healthy man was free from venereal disease and the hematuria had developed after a few days of high fever. In a second case, the young man had no appreciable manifestations of the purpura except in the bladder. When one has once seen the patches of purpura in the bladder it is impossible ever to mistake them again unless possibly for the patches of ecchymosis sometimes found in the bladder with incipient local tuberculosis.

42. **Fastening the Intubation Tube in the Throat.**—Bernasconi expatiates on the great advantages of Polverini's method of holding the tube in place by a thread brought out through the middle of the neck below the chin. There are no blood vessels or nerves in this region to be injured, and the needle passes readily through the aponeurosis, the thyroid membrane and adipose tissue. When it is a question otherwise of tracheotomy, this method of fastening the tube will be found comparatively simple and always reliable. The O'Dwyer tube has two small holes drilled at the front near the usual thread hole. The finger is introduced into the throat as for intubation. An ordinary long and stout needle, carrying a long, strong but not too heavy silk thread, is inserted into the neck exactly on the median line, and is passed through the thyroid membrane at the junction of the middle and lower thirds. With the index finger of the left hand introduced into the throat, as for intubation, the point of the needle is felt as it enters the throat and is guided upward until it can be seized and drawn out of the mouth, with its

thread, above, the ends of the thread projecting from the throat below. The upper end is passed through the two holes made for it in the head of the tube and is tied in a double knot, about 50 or 60 cm. below the upper free ends of the thread. The tube is then placed in the throat, and the long lower ends of the thread projecting from the neck are tied over gauze and protected by gauze fastened to the neck with adhesive plaster. The tube can be drawn out to be cleansed by pulling on the upper ends of the thread after untying the lower ends. If the tube has to be worn a long time, Polverini usually cuts off the upper ends of the thread as the child is liable to bite them off and the parts left might slide down and obstruct the tube. In the five cases inspected by Bernasconi, the children had worn their tubes for several months and ate fluid and solid foods as if there was nothing in their throats. As the holes are in the front of the head of the tube, this prevents its twisting around the thread. (This method of ensuring the stability of intubation has already been described in THE JOURNAL, Feb. 10, 1917, p. 495.) The results in the twenty cases in which Polverini has applied this method in the last ten years have apparently confirmed its harmlessness while there could never be any question as to its efficiency. Two illustrations show the exact technic.

44. **Mushroom Poisoning.**—Roch relates that there was an unusual number of cases of mushroom poisoning in the Geneva district last fall. He knows of 100 cases, with four deaths, and summarizes the details from the twenty-four families involved. Early and profuse vomiting was what saved many from death, and the physician should strive to ensure this in all cases. When any one shows signs of mushroom poisoning, all who have partaken of the meal should be made to vomit freely, even although they show no symptoms at the time of anything wrong. Aside from this indication, it seems useless to give emetics and purgatives because they do not act until there is nothing left to evacuate. They merely increase and prolong the emetic-cathartic phenomena of the poisoning to no purpose. No benefit seemed to be derived from charcoal, but at least it did no harm. Treatment can be only symptomatic, drinking copiously, injecting saline and giving laudanum, camphor or caffeine as indicated. Roch analyzes the clinical picture induced by the different mushrooms. The *Entoloma lividus* was responsible for a number of the poisonings. This mushroom was exceptionally abundant last September. It has a delicate white meat, with a tempting odor, and deceptively resembles some harmless varieties. One or two hours after eating there is sudden uncontrollable vomiting, diarrhea for four or five days, intense thirst, sometimes pupil disturbances and syncope, the throat intensely dry. The gravity of the accidents with mushroom poisoning is usually in inverse proportion to the length of the incubation. When the vomiting comes on early the attack is usually mild. Roch's article is a comprehensive study of poisoning from the various species of mushrooms.

46. **Treatment of Cicatricial Stenosis of the Esophagus.**—The patient in the severe case described, with illustrations, was a robust man of 42. By persevering retrograde dilatation over several months he is now practically cured. Kummer and Moppert found metallic mercury a great help in this. The mercury does not stick to the walls, and by its weight it settles down on the constricted portion of the esophagus and, by its property of separating into minute globules, its heavy droplets worm their way through the stricture and help dilate it. They say that there need be no fear of poisoning as metallic mercury is not absorbed at all. At first they rinsed it out through the gastrostomy opening, but later allowed it to pass off through the bowel. It took from one to eighteen days for the 10 c.c. to be entirely voided. It never caused any disorder except sometimes a little tension in the abdomen the few hours that preceded its evacuation by the rectum. Another advantage of the mercury was that it cast such a clear shadow that this, besides its mechanical aid, materially facilitated the working of the dilating catheter into the stricture during radiology. In conclusion they endorse the suggestion that when a caustic has been swal-

lowed, an esophagus sound should be introduced at once and left permanently until healing is complete. The presence of the sound not only wards off stricture but it allows the patient to be fed from the first.

47. **Mushroom Poisoning.**—The robust man had apparently recovered from the poisoning with the amanita mushroom and had returned home from the hospital. After nine days of complete remission, the symptoms returned and proved fatal the thirtieth day after the mushrooms had been eaten.

Correspondenz-Blatt für Schweizer Aerzte, Basel

August 4, XLVII, No. 31, pp. 993-1024

48 *Problems of Metabolism and Immunity in Dermatology. B. Bloch.—p. 993.

49 *Cause of Granulation of Blood in Malaria. L. Hirschfeld.—p. 1007.

50 Metal-Albumin Preparation for Diagnosis of Pregnancy. III. (Schwangerschaftsreaktion mit Dia-Sorcym-Placentae.) K. Kottmann.—p. 1012.

48. Problems of Metabolism and Immunity in Dermatology.

—Among the points to which Bloch calls attention is the pre-eminently important part played by the skin in the phenomena of allergic immunity and sensitization. This is in marked contrast to serum immunity, as in tetanus and diphtheria, in which the blood is the bearer of the defensive forces. The history of our knowledge of immunity, beginning with Jenner's vaccination, has almost invariably made its progress by study of the skin, from Koch's fundamental inoculation of guinea-pigs with tuberculosis to the Pirquet reaction, trichophytosis, syphilis and tuberculosis. Infectious diseases which are followed by allergic modifications that confer immunity, and the acute exanthems, scarlet fever, measles, etc., which are likewise distinguished by conferring immunity, all play such an important rôle in the skin that this suggests that the skin has some biologic function not yet fully understood. The skin is open to the external world and is thus exposed to all infections coming from without and it has adapted itself to defensive reactions. This adaptation is acquired, not natural, as is evidenced by the lesser reacting power of the skin of animals and of young infants. By this function of the skin part, at least, of the invading germs are held back and the internal organs spared. He reiterates that the body fluids are not concerned in immunity; it is of tissue origin. He has presented direct proof of this with trichophytosis; a scrap of skin from a person who had had this affection, transplanted into a normal person, conferred allergy on the latter. This seems to be the case also with variola. In discussing the part played by the skin in syphilis, he remarks that salvarsan cures so quickly that the tissues have not had time to develop allergic modifications under the influence of the spirochetes. The consequence is that a new infection from without, or the rousing of some slumbering nest of spirochetes, induces a response in the body the same as if the individual had never been infected with syphilis. We are liable now to encounter patients with a fresh primary lesion, buboes and syphilids, all at once.

49. Granulation of Malarial Blood Is Due to the Anemia.

Hirschfeld discusses the layer of granulations which is evident, even to the naked eye, when a smear is taken of malarial blood. The corpuscles seem to pile up at some one point of the smear. He noticed this in several hundreds of patients with acute or chronic malaria, and it was extremely pronounced in malarial coma and blackwater fever. His analysis of the conditions has shown that the red corpuscles drop out of the blood plasma the more readily, the more diluted the blood. Hence the speed with which the blood corpuscles form a sediment, in their own blood plasma, is directly proportional to the degree of the anemia. It is this rapid dropping out of the reds in malarial blood which gives it the granulated aspect. It has nothing to do with the coagulability of the blood nor with agglutination phenomena. As soon as the number of corpuscles falls below a certain ratio to the blood plasma, then this rapid dropping down of the reds is liable to occur. In other words, it is a phenomenon of hypoglobulia. By adding plain plasma to any blood a point is reached at which the reds drop to the bottom. It is a sign of anemia, he emphasizes, but he has had no chance to study it on any but malarial subjects. In physiologic salt

solution the reds are in a condition of suspension balance, and they do not drop down. In normal blood the corpuscles are so close together that the elasticity of the others prevents the sinking to the bottom of a corpuscle that has started to fall. In anemic blood this hindrance to sedimentation is lacking, the corpuscles being so few and far apart.

Gazzetta degli Ospedali e delle Cliniche, Milan

July 8, XXXVIII, No. 54, pp. 761-776

51 *Auscultation through the Mouth. G. A. Notari.—p. 767.

51. **Auscultation Through the Mouth.**—Notari describes a puzzling case in which by auscultating the percussion sounds through the mouth an exact differential diagnosis was possible. This oral auscultation has been introduced mainly by Cardarelli, Galvagni, Frugoni and other Italians. It throws light on certain respiratory and heart disturbances otherwise inexplicable. In the present case, the tracings show intermittent respiratory functioning not synchronous with the heart action. In all the other cases published the heart was evidently responsible for the respiratory intermittent functioning, but in this case the diaphragm seemed to be exclusively responsible. Oscillatory vibration of the diaphragm was manifest on oral auscultation, a respiratory neurosis, in an otherwise clinically normal soldier.

Policlinico, Rome

August 19, XXIV, No. 34, pp. 1033-1060

52 *Vitiligo with Inherited Syphilis; Two Cases. P. F. Arullani.—p. 1033.

53 Geometric Principles Applied to Roentgen Localization of Foreign Bodies. G. Egidi.—p. 1038.

54 Industrial Hygiene. (Per la vigilanza igienico-sanitaria del lavoro.) A. Ranelletti.—p. 1040.

55 The Red Cross and Tuberculosis. P. Bolognini.—p. 1043.

56 Suggestions to Improve the Surgical and Medical Service at the Front. G. Perez.—p. 1045; G. Pisano.—p. 1046.

57 Suggestion to Use Pine Tar in Early Treatment of Wounds. T. Rossini.—p. 1048.

52. **Vitiligo with Inherited Syphilis.**—The Wassermann reaction was negative in one of the two cases reported, and was not tested in the other, but the diagnosis of inherited syphilis was beyond question in both. The father of one had progressive paralysis and the daughter, a woman now 30, showed signs of incipient tabes besides the vitiligo and tendency to hysteria. The skin affection had been manifest for fifteen years in this case and for ten in the other patient, a man of 41. There was nothing to suggest tuberculosis in either case.

Riforma Medica, Naples

July 21, XXXIII, No. 29, pp. 729-748

58 Factitious Talipes. A. Mori.—p. 729. Concluded in No. 30, p. 755.

59 Symptoms of Hysteria Complicating Relics of Neuritic Phenomena; Cure by Suggestion. A. Ziveri.—p. 735.

August 4, No. 31, pp. 769-788

60 Consent to Operations. (Sulla obbligatorietà degli atti operativi.) L. Ferrannini.—p. 769.

61 Mixed Typhoid and Paratyphoid Infections. A. Zironi.—p. 771.

62 The Latest Regulations as to Physical Disqualifications for Military Service. Editorial.—p. 787.

August 11, No. 32, pp. 789-808

63 *Syphilis in the Army, and Prophylaxis. G. Moscati.—p. 789.

64 *Gas Gangrene and Phlegmons. A. Nacciarone.—p. 790. Commenced in No. 31, p. 772.

65 Primary Tuberculous Ulceration of the Tongue. P. Amorosi.—p. 798.

66 The Inventor of the Immersion Objective for Microscopes. G. B. Amici, 1786-1863. A. Ferrannini.—p. 803.

63. **Syphilis in the Army.**—Moscati emphasizes the necessity for seeking out every syphilitic in the army and ensuring him thorough treatment year after year. According to the system in vogue, men on the firing line with early syphilis are treated there and a course in the hospital is not considered necessary at this stage. The consequence is that the men conceal their syphilis. Rheumatoid pains, etc., are reported to the physician and the men are sent to the home zone hospitals for treatment of "rheumatism." Moscati has found a large proportion of the rheumatism cases to be syphilis alone or associated with rheumatism. The percentage of cases of syphilis during peace times is out of proportion to

the number of cases of declared syphilis now in military circles. Some new factor has intervened and this, he thinks, is either the disinclination to confess venereal disease or ignorance of its existence. It is undoubtedly a fact that ignored syphilis is responsible for the nonhealing of wounds in certain cases.

64. Gas Phlegmon and Gas Gangrene.—Nacciarone reports in detail about twenty cases to emphasize the advantages of the technic advocated. When applied within the first six hours he counts on 90 per cent. of cures even when the gas gangrene had developed into a vast lesion. When the bone lesion was limited or only the soft parts were involved and not over twelve hours had elapsed he was able to cure 88 per cent. of the patients without mutilations. In those in which twenty-four hours had elapsed, he cured 85 per cent., including 4 per cent. requiring mutilating operations. In 82 per cent. the complete functional use of the limb was restored. He warns that treatment of wounds with balsam of Peru cuts off the oxygen and thus favors the development of anaerobic germs. Whatever the state of the infection, he begins by degreasing with benzin, then drying and dabbing with 10 per cent. tincture of iodine, swabbing the whole limb with this. Then he incises the limb lengthwise, making as many long incisions parallel to the axis of the limb as are necessary to open up all the muscles involved and open the bone to the air. The first incision is carried through the hole made by the projectile. For the leg he makes at least three incisions, one each in the front, rear and side. There must be ample access to inspect the spaces between each muscle. After the skin is incised, he separates the muscles and fascia with the fingers, refraining from injuring the vital connections between muscles and vessels, but making way for copious irrigation of all the interspaces between muscles and aponeuroses, not leaving even the remotest crevice unopened up. He uses up in ten minutes as much as 20 liters of the iodine antiseptic solution. He has even used 40 liters in some cases, sponging it into every crevice with gauze held with forceps. When no more gas can be forced out by pressure on the tissues and there is no further odor in the depths, he delimits the part involved with the actual cautery to form a wall against further extension, or makes a ring of subcutaneous injections of a 2 per cent. iodized solution. Three or four drain tubes are then introduced at the best points for effectual drainage, draining besides with gauze, after flushing again with the iodine solution. The gas process generally extends upward. This treatment is repeated from one to three times in the twenty-four hours, clearing out any necrotic tissues found. The fetid odor usually lasts for three or four dressings. When suppuration sets in, the patient may be regarded as out of danger from the gas infection. In addition to these local measures, which he describes with minute detail, he combats the general intoxication by saline infusion (for which he uses a special formula) and stimulates the organic defences by giving a little quinin twice a day, with camphorated oil, a little brandy and tepid black coffee. His experience with iodine, he declares, speaks for itself, the men with severe gas gangrene returning to their posts, with complete functional use of their limb, in thirty or forty days. His formula for the antiseptic fluid with which he combats the gas infection is as follows: iodine, 1 gm.; sodium iodide, 1 gm.; sodium chloride, 3 gm.; sodium carbonate, 2 gm., with water to 1,000 gm. It is not necessary to boil the water, he says, these ingredients rapidly sterilizing it. He finds it convenient to keep a mother solution constantly on hand consisting of 25 gm. each of iodine and sodium iodide; 75 gm. sodium chloride, and 50 gm. sodium carbonate, with 1,000 gm. water. From 40 to 120 c.c. of this mixture are added to each liter of the water ready to use.

Rivista Critica di Clinica Medica, Florence

June 16, XVIII, No. 24, 253-260

67 Extremely Painful Hyperesthesia of the Knee of Hysterical Origin in Soldier. (Simulazione o nevrosi?) A. Sbrocchi.—p. 257. Conclusion.

July 14, No. 28, pp. 285-292

68 *Chronic Hemorrhagic Purpura and its Pathogenesis. F. Schupfer.—p. 285. Commenced in No. 23, p. 245.

69 Paralysis from War Wounds; Four Cases. G. Barbensi.—p. 290. Commenced in No. 27, p. 280.

July 28, No. 30, pp. 301-308

70 *Clinical and Experimental Research on Infectious Jaundice in Troops on Active Service. I. Civalleri.—p. 301. Commenced in No. 29, p. 293.

71 Infectious Hemorrhagic Purpura with Initial Abdominal Symptoms in Soldier. L. Tomasetti and A. Costa.—p. 303.

68. Chronic Hemorrhagic Purpura.—Schupfer reports in detail with necropsy a case of this kind in a woman of 29 who was under observation for fourteen years, and compares this case with twenty-six others encountered during the same period. He is convinced that it is more than a coincidence that tuberculosis was evident in a large proportion of the cases and in two there was an unmistakable hereditary burden, so that 55.54 per cent. of the total twenty-seven were plainly tuberculous. The necropsy of the case described in detail showed tuberculous cavities in the left lung with numerous tubercle bacilli. The right suprarenal was intact but the left was much enlarged and the seat of tuberculous disease. The woman had had fifteen severe recurrences of the purpura in the course of ten years. No tendency to hemophilia was discoverable in the family. The first attack subsided under ergot, epinephrin, iron and sodium salicylate. There was no further trouble for nearly a year. Then the febrile purpura returned with enlargement of the spleen, but subsided under injections of normal horse serum, calcium chlorid by the mouth and gelatin in enemas. Schupfer reviews the literature on the subject of chronic purpura, and claims that the tubercle bacillus is indirectly responsible in certain cases, and the endocrine system is probably involved in all.

70. Camp Infectious Jaundice.—Civalleri regards the jaundice in question as undoubtedly the same disease as that described by Japanese authors as spirochetosis, but he was unable to transmit the disease from man to guinea-pigs except in one instance, while the transmission from man to man was common. Transmission from guinea-pig to guinea-pig was unfailing, using the urine. The bile also gave positive results as it swarmed with the spirochetes. Transmission from one guinea-pig to others was also demonstrated by means of contaminated food.

Brazil-Medico, Rio de Janeiro

July 14, XXXI, No. 28, pp. 233-242

72 *Circular Heart Murmur. (Sopro circular de Miguel Couto.) J. L. de Mesquita.—p. 233.

July 21, No. 29, pp. 243-250

73 The Protozoan Parasites of the Mollusk *Polydora Socialis*. G. de Faria and others.—p. 243.

74 Research on Nematodes of *Allodapa* Species. A. de B. Barreto.—p. 243.

75 Epidemic Poliomyelitis with Cephaloplegia for Ten Days in Year Old Child. Recovery. R. Morcira.—p. 244.

72. Circular Heart Murmur.—De Mesquita refers to the murmur with circular propagation to which attention was called a while ago by Miguel Couto, the leading internist of Brazil. He had noticed it only with mitral insufficiency. De Mesquita reports two cases which show that it may be encountered both during and without asystole. His further experience has demonstrated that neither mitral relative insufficiency nor passive congestion of the lungs has anything to do with its production. In a typical case described, the girl had had acute rheumatism a year before. The heart was somewhat enlarged and the murmur was holosystolic. It was heard starting at the apex and running around the thorax in a circle, heard in the left axilla, the interscapular region, and the right axilla, and it was still perceptible in the front right half of the chest. De Mesquita discusses the mechanism of its production. Its disappearance seems to be a favorable omen.

Cronica Medica, Lima, Peru

August, XXXIV, No. 650, pp. 269-310

76 *Physiopathologic Study of Cholesterol. H. Castañeda.—p. 273.

77 *Alcoholic Polyneuritis. E. Odriozola.—p. 282.

78 Factitious Affections. G. F. Davila.—p. 287. Conclusion

79 Regulation of Prostitution. Committee Report.—p. 306.

76. Present Status of Our Knowledge of Cholesterol.—Castañeda describes the present assumptions as to the production of cholesterol in the body and its elimination, mentioning the various tests for it in vogue. The significance of the cholesterol content of the blood in different conditions is also discussed.

77. Alcoholic Polyneuritis.—Odriozola analyzes a case in a syphilitic in which the rapid onset of the symptoms of polyneuritis seemed to exclude tabes and the absence of sphincter trouble excluded diffuse myelitis. With syphilitic paralysis there is contracture, while in this case the paralysis was of the flaccid type. The known abuse of alcohol suggested a toxic origin for the pains and paraplegia. The prognosis of alcoholic polyneuritis is favorable, as a rule, but he has had two cases in which fatal bulbar symptoms became superposed, the clinical picture deceptively simulating Landry's ascending paralysis. In treatment, besides massage of the groups of muscles involved and reeducation of movements, systematic galvanization of all the muscles involved and strychnin are liable to give great relief and improvement. Atrophy of the muscles comes on early but the above measures properly applied arrest it almost without fail. Practically complete recovery depends only on the perseverance and skill with which the above measures are applied.

Prensa Medica Argentina, Buenos Aires

July 30, IV, No. 6, pp. 67-76

80 Transplantable Spontaneous Pavement Epithelioma in White Rat. A. H. Roffo.—p. 67.

81 Transverse Displacement of the Testicle plus Supernumerary Testicle. L. E. Pagliere and E. Pozzi.—p. 68.

August 10, No. 7, pp. 77-88

82 *Enrichment of Tubercle Bacilli in Sputum. L. Ymaz.—p. 79.

83 *Echinococcus Cyst in the Liver Perforating into Pleura. C. I. Allende and N. D. Rosso.—p. 80.

82. Enrichment of Bacilli in Sputum.—Ymaz first treats the sputum with a 50 per cent. antiformin solution in an amount equal to or only a little less than that of the sputum. It is possible to use instead ordinary Javel water or sodium hydrate. This does not seem to affect the shape or staining properties of the bacilli. Boiling the mixture is a help. He then adds to the homogenized sputum an equal amount of syrup (*jarabe*) with specific gravity of 1.260. A small amount of ether is added and well mixed, to form an emulsion, but not agitating with the receptacle closed. Then, after lively centrifugation the bacilli will be found in the whitish zone that forms at the plane separating the two fluids. The ether aids in bringing the bacilli to the surface. He says this technic is an efficient method for enrichment while it does away with the necessity for estimating the specific gravity.

83. Echinococcus Cyst of the Liver Perforating Into the Pleura.—An operation for supposed purulent pleurisy was done on a married woman of 43, and the pleura was found to contain pus and numbers of daughter cysts, some empty and others intact. The cavity was drained with a large rubber drain but the temperature persisted high and dulness at the seventh rib confirmed the assumption of an echinococcus cyst in the upper part of the liver. This was drained from below the diaphragm through a second incision, suturing the lips of the cyst to the skin. Bile came away with pus but the condition rapidly improved. The retrospective diagnosis was that the cyst had perforated first into a bronchus, the symptoms and expectoration at the time having been ascribed to an acute bronchial affection. A few weeks later the cyst perforated into the pleural cavity, the bronchial outlet evidently having proved insufficient. The ample drainage at the lowest point at both operations conquered the disease. While the cyst was being rinsed out with hydrogen dioxid, some of it got into the bronchi through the primary perforation and poured out through the mouth, causing cyanosis and asphyxia from the foam filling the air passages on that side. The blood pressure dropped rapidly and the condition seemed alarming at first, but the suffocation was gradually overcome. The patient had become unconscious but under stimulants to the heart and inhalation of oxygen she very slowly revived, the blood pressure slowly returning to normal.

The next morning there was much mental confusion and dysphasia, with a suggestion of total right hemiplegia. The motor phenomena subsided during the day but the confusion persisted and did not finally disappear until the fourth day. Recovery then was soon practically complete.

Revista de la Asociacion Medica Argentina, Buenos Aires

July, XXVI, No. 152, pp. 967-1254

84 *Tuberculosis and Paroxysmal Thyroid Insufficiency. (Caso de reumatismo tiroideo y menstruacion febril.) E. Albina.—p. 967.

85 Memoirs of a Physician Hygienist. E. R. Coni.—p. 984. To be continued. See news item in THE JOURNAL, September 15, p. 926.

86 Crime by the Irresponsible. (Informe del defensor de C. S. Godino.) R. Emiliani.—p. 1021.

87 Psammoma of the Sheath of the Optic Nerve. P. B. Ferro.—p. 1040.

88 *Surgical Repair. (Anaplasticas.) M. Gamboa.—p. 1053.

89 *Chronic Appendicitis and Sclerocystic Ovaritis. R. S. Gomez.—p. 1085.

90 *Cholelithiasis with Menstrual Hypercholesterolemia. G. P. Goñalons.—p. 1091.

91 *Coagulation Index of Blood. J. M. Hitce and R. Iribarne.—p. 1094.

92 *Correction of Atresia of the Nostrils. J. M. Jorge, Jr.—p. 1102.

93 History of Bubonic Plague. A. M. del Pont.—p. 1115. Continuation.

94 *Best Mode of Access to the Space below the Diaphragm. L. Merola.—p. 1164.

84. Tuberculosis and Paroxysmal Thyroid Insufficiency.—Albina's patient was a girl of 14 who had been menstruating for eight months. Each menstrual period was preceded by a day of subfebrile temperature, sweating and persisting pains in some of the joints. They swelled and were tender but there was no edema in the region nor atrophy of muscle tissue. All these disturbances subsided with the menses; during the intervals there was no pain or fever. The findings at one apex were suspicious of tuberculosis, and the general aspect suggested defective thyroid functioning. The lack of any benefit from the salicylates suggested that the joint troubles were of toxic origin. The diagnosis of rheumatism from thyroid insufficiency on a tuberculous soil was sustained by treatment on this assumption. Under thyroid treatment the menses returned to normal, without joint disturbances and without fever. The thyroid treatment was then stopped and treatment for incipient tuberculosis was pushed. After ten months of this the patient was restored to clinical health, with no return of pains or fever after the first month. He began treatment by giving sodium bicarbonate freely for three days and then thyroid treatment for three weeks in increasing doses.

88. Anaplastic Operations.—Gamboa gives an illustrated description of a number of particularly interesting cases treated by restorative surgical measures. One boy of 11 who had had a large angiosarcoma of the cheek removed showed five years later very little trace of the extensive operation. The defect had been covered with a pedunculated flap from the neck. The other anaplastic operations were to correct contracture or growing together of parts after burns. The left arm of one child of 11 had grown to her side. The principle which Gamboa specially emphasizes is that the scar tissue should all be cut away and discarded, and only normal skin, with its adipose tissue should be used for flaps to repair the defects. When there is flexion from contracture the whole contracting tissue should be cut away and the resulting defect patched with normal tissue. The parts must be kept in extension until the flaps have grown into place. When the plastic operation is on the fingers he advises a single large flap taken from the abdomen. When it has healed in place another operation is necessary to separate the fingers. This gave perfect functional results in his experience.

89. Chronic Appendicitis and Ovaritis.—Gomez declares that chronic appendicitis is habitually accompanied by sclerocystic degeneration of the ovaries. The symptoms from the latter should not be overlooked in studying a case of chronic appendicitis. If the cysts are small and few, it suffices to obliterate them with ignipunctures, but if they are large and numerous, or if there are blood cysts or degeneration of the corpora lutea, a wedge including the lesions should be cut out, and the uterus straightened by ligamentopexy if there

is displacement. If the lesions are bilateral or only in the left ovary or there are still other lesions to be attacked, a median laparotomy is required.

90. Hypercholesterolemia and Menstruation.—Goñalons' curves show a marked rise in the cholesterol content of the blood during the menses. In some cases the increase was marked also during the days just preceding. He analyzed twenty-seven complete menstrual cycles, recording the cholesterol content of the blood daily for thirty days and in some cases for two or three months. The blood was drawn from the fold of the elbow; the women were all healthy or convalescent.

91. Coagulation Index of the Blood—Hitce and Iribarne prevented coagulation of the blood by adding 0.0004 gm. sodium citrate to the 0.04 c.c. of blood in each of six test tubes. Then they restored the coagulating property to the blood by reactivating with progressive amounts of calcium. The amounts used in his tests were, respectively, 0 gm.; 0.0001; 0.0002; 0.0003; 0.0004 and 0.0008 gm. In addition to the coagulating power, he tested the resisting power of the red corpuscles, using a 7 per thousand salt solution in amounts of 4 c.c.; 3.8; 3.6; 3.4; 3.2 and 3 c.c. This supplied an index of coagulation for the individual blood. Discovery of an excessive tendency to coagulation suggests measures to ward off embolism. On the other hand, low coagulating power may give the clue to unsuspected liver disease.

92. Cicatricial Atresia of the Nose.—The atresia was the consequence of smallpox lesions. Jorge corrected it by making a horizontal incision just below the nose and suturing to the lower lip of the incision the edge of a square pedunculated flap from the upper arm fastened across the face. The raw side of the flap was turned upward, and the plastic operation when concluded proved very satisfactory, the patient now breathing freely through her nose, and with scarcely a trace of the incision below.

94. Access to Space Below the Diaphragm.—Merola lauds the advantages of a slanting incision with resection of the rib. The incision runs from the scapular line downward and inward, following at first the ninth rib. The operation is transpleuro-abdominal and requires a U-shaped suture. This incision is the best mode of access also to the cardia and lower esophagus, as he shows by illustrations taken from the cadaver. For this, the incision is supplemented by a vertical incision beginning at the upper end of the first. This allows a triangular flap to be turned back and after resection of the tenth rib and of part of the eleventh and twelfth, the organs below are exposed. The important field thus opened up is amazingly extensive and access to the deep lying organs rendered simple and easy. The suprarenals are under one's hand, as also the posterior aspect of the liver, etc.

Semana Medica, Buenos Aires

June 28, XXIV, No. 26, pp. 767-810

95 Hemorrhoids. J. M. Jorge, Jr.—p. 767.

96 *Lymphocytosis in Syphilitics. C. P. Mayer and A. C. Gourdy.—p. 779. Conclusion.

96. Lymphocytosis in Syphilitics.—This is the conclusion of this extensive communication which has been appearing weekly in the *Semana* nearly all the year. The present installment brings to 502 the number of cases of syphilis tested for lymphocytosis, the data in each case being given with the differential blood count on different occasions. Mayer and Gourdy regard the lymphocytosis as the most constant sign of syphilitic infection saying that it appears with the infection and persists throughout life. With inherited syphilis it does not appear until after infancy. Superposed infectious processes may mask the syphilitic lymphocytosis, but as they subside the latter reappears. It is an earlier phenomenon than the Wassermann reaction, and persists after the latter has disappeared. The lymphocytosis is reactivated by specific treatment although not directly, as the latter does not induce lymphocytosis in nonsyphilitics. They are convinced that the lymphocytosis is a biologic reaction which indicates persistence of the causal spirochetes. Also that this alone justifies the diagnosis of syphilis even when no other signs or symp-

toms of it are apparent. It may be the only sign of syphilis in the wife or husband of a syphilitic, and lymphocytosis in a wet nurse should always be regarded with suspicion. In conclusion they reiterate that the lymphocytosis persists as an indelible sign of syphilis, and that this persistence indicates that treatment for the syphilis should be kept up interminably. The lymphocyte count is therefore the indispensable complement of the Wassermann test in diagnosis and in estimation of the prognosis. Specific treatment modifies the lymphocytosis but never abolishes it entirely.

Siglo Medico, Madrid

August 4, LXIV, No. 3321, pp. 565-584

97 Mechanism of Enucleation of the Erythroblasts in Mammals. F. Mas y Magro.—p. 566. Concluded in No. 3322, p. 592.

98 *Hematuria with Kidney Stones; Four Cases. A. P. Martin.—p. 568.

99 Present Status of Catheterization of the Duodenum. S. de S. Maria, and M. de Logrono.—p. 572.

100 Acute Edema of the Male Genital Organs. (La genesis de las tumescencias penoescrotales.) Sicilia.—p. 573.

101 Psychasthenia. A. Sanchez-Herrero.—p. 574.

98. Hematuria with Kidney Stone.—Martin remarks that nephrolithiasis should be suspected when the urine shows blood after exercise but only a small amount and only transiently. In three of the four personal cases reported this transient hematuria was the only symptom to call attention to the stone in the kidney. In the other case there was pain in both kidneys and occasional hematuria. The cystoscopic findings in the bladder were normal but one kidney was very large, tender and knobby, and the diagnosis of sarcoma was confirmed by other findings.

Russkiy Vrach, Petrograd

XVI, No. 13, pp. 289-312

102 *Pretuberculosis in Children and Treatment with Tuberculin Inunctions. N. R. Blumenau.—p. 289.

103 Old Age as a Physiologic-Pathologic Process. M. S. Milman.—p. 295.

104 Experience with Vaccination against Typhoid. V. V. Pezharskaya.—p. 301. Concluded in No. 14, p. 324.

105 Physiologic Basis for Electrocardiography and Its Clinical Importance. M. M. Gubergritz.—p. 305. Continuation.

102. Treatment of "Pretuberculosis" in Children.—Blumenau is convinced that certain subjective symptoms are the work of tubercle bacilli before they have started manifest tuberculosis. This is particularly evident in children, and he recommends for it tuberculin treatment by the inunction technic. He reports experiments on guinea-pigs which apparently confirm that toxins rubbed into the intact skin, after it has been shaved and cleared of grease with ether, pass through the skin as through a special filter, and induce the production of antibodies in the organism. The animals kept well and even increased in weight although they were being given inunctions of diphtheria toxin, given by Moro's technic in a 50 per cent. ointment, rubbed into scarifications, and they survived then the subcutaneous injection of four times the fatal dose of diphtheria toxin. His experiments on animals were not numerous, but the results were so convincing that he applied the method at once to seventy children. The technic he found most effectual was to apply a drop of pure tuberculin to the forearm and then shave off a scrap of skin through it. The mixture of the superficial layer of the epidermis and the tuberculin formed a thin salve, like lanolin, and this mixture on the back of the razor was then rubbed into the skin until dry. A scrap of sticking plaster was then applied over the spot. When removed twenty-four or forty-eight hours later the skin underneath may display a strong, moderate or weak reaction, and the inunction is repeated after an interval corresponding to the strength of the reaction. The dose of tuberculin is also progressively increased to a total of four drops. At first the intervals are usually three or five days, but when the four drop dose is reached, the intervals are a week. The results in the cases of well defined tuberculosis, especially of the lungs, were what might be expected as these types are scarcely amenable to treatment. But in incipient or occult tuberculosis the therapeutic results were prompt and striking.

He gives a brief summary of eighteen cases of various types. Some of the children were only 9 or 10 months old but the majority were between 2 and 13. One child of 13, for example, had been having for six weeks pains in the chest, head and side, coughed a little, sweated freely at night and felt chilly. The appetite was poor and the child was growing thin. There was dulness over the right apex and the temperature wavered between 36.9 and 38.3 C. The tuberculin inunctions were given for a month, a total of ten inunctions. The reaction was pronounced at first but gradually grew less and less distinct while the improvement was marked in every respect. There were no further pains except occasionally in the left side at night when the child lay on that side. The cough disappeared, the appetite returned and the temperature keeps within the normal range, while the child has increased in weight. One 9 months babe had long been coughing and there was a discharge from the ears and from a fistula in suppurating cervical glands, with diffuse dry râles in the lungs. In the course of three and a half months the child had been given twelve inunctions and had increased in weight from 9,000 to 9,500 gm., the cough had ceased, and there was no further discharge from the ears or fistula. The râles had also disappeared.

The parents of children brought to the dispensary often call attention to the child's lassitude, apathy and drowsiness or the reverse, excessive nervousness and irritability, with loss of appetite, restless sleep, frequent and persistent headache, palpitations, cough, pains in the side or chest and in the bones of the arms or legs. The majority of such children are frail, and badly nourished but not all present anemia. The diagnosis of "school anemia" should not be accepted until all other causes have been excluded. It is not enough to examine the child himself; inquiry must be made as to the health of the parents and other relatives, whether any of them have had pleurisy or lingering lung trouble, or any children have died from meningitis, and whether there is any one in the building that coughs much. None of the subjective symptoms are pathognomonic of tuberculosis, of course, but when a possible source of infection is known, the tuberculin test will reveal in many instances that they are the work of chronic self-intoxication.

Hospitaltidende, Copenhagen

July 25, LX, No. 30, pp. 717-740

- 106 Bullous Psoriasis. A. Kissmeyer.—p. 717.

Ugeskrift for Læger, Copenhagen

July 5, LXXIX, No. 27, pp. 1077-1118

- 107 *Roentgenotherapy of Sarcomas. S. Nordentoft.—p. 1077.
108 *Roentgenotherapy of Syringomyelia, Acromegaly, Polycythemia, Hypertrophy of the Prostate and Retroperitoneal Tuberculous Glands. S. Nordentoft.—p. 1086.

July 12, No. 28, pp. 1119-1176

- 109 Present Status of Dietetic Treatment of Diabetes. V. Scheel.—p. 1119.

July 9, No. 29, pp. 1177-1232

- 110 *Alimentary Gastro-Enteritis and Xerophthalmia in Infants. S. Monrad.—p. 1177.

107. **Roentgenotherapy of Sarcoma.**—Nordentoft makes a practice of reporting once or twice a year on the present status of patients to whom he has given a course of treatment with the Roentgen rays at some time for malignant disease. He lists them alphabetically by arbitrary letters, the first series being Aa, Bb, etc., the third, Ca, Cb, etc. He here describes the outcome in eleven cases of sarcoma. One farmer of 37 had had one testicle removed on account of sarcoma. Within a few months there were signs of extension of the tumor into the abdomen, with great emaciation, anemia and pains requiring morphin constantly. Under a month of roentgenotherapy the pains disappeared, weight, appetite and sleep became normal and the hard tumor deep in the abdomen could no longer be palpated. Now, four months later, his earning capacity is fully restored. The pains subsided by the next day after the first exposure. Apparently complete recovery is also evident in two other men of 25 and 71 with sarcoma in the pelvis. A third succumbed later to infarction of the lung and recurrence of the tumor. One man of 60

with a large ulcerating sarcoma on the buttocks, of eight months' standing, by the fifth week after the first exposure had merely a depressed cicatrix left as the relics of his malignant disease. Another man of 70 had a tumor in the neck encroaching on the median line and causing suffocation. It had been growing for four months. Under a single exposure it subsided like dew before the sun. Six months later there was a fatal recurrence in the mediastinum. A similar sarcoma in the neck and mediastinum of a man of 64 did not seem to be influenced by the exposures and the patient succumbed, but the improvement was pronounced in a third case, the large tumor visible in the roentgenogram finally disappearing almost completely. A clinical cure was also realized in a case of sarcoma of the small pelvis in an unmarried woman. There has been no recurrence in one case of melanoma of the iris and orbit treated by Roentgen exposures after the operation, but in several similar cases the patients died within a few months from heart failure or diffuse metastasis.

108. **Widening the Indications for Roentgenotherapy.**—Supplementary to the above communication, Nordentoft describes excellent results from roentgenotherapy in a case of acromegaly, the subjective disturbances subsiding and earning capacity being regained, although the acromegalic changes were stationary. Also in a case of polycythemia, the much enlarged liver and spleen subsiding to normal size, although the blood picture showed no change. Also in a case of retroperitoneal tuberculous glands after a number of glands had been removed by a laparotomy. Great improvement followed the exposures also in a case of hypertrophied prostate with retention. Even those writers who do not admit that the prostate is sensitive to the Roentgen rays, recognize that they may have a favorable action on the irritative and nervous symptoms with hypertrophied prostate. Their action here parallels that of Roentgen exposures in case of pylorospasm and hypersecretion with gastric ulcer. Nordentoft emphasizes that roentgenotherapy in the early stages of prostate trouble might prevent the development of the hypertrophy, adding that it would be interesting to investigate whether hypertrophy of the prostate occurs among men working on or with Roentgen apparatus.

110. **Alimentary Gastro-Enteritis and Xerophthalmia in Infants.**—Monrad does not agree with Bloch's statements summarized in abstracts in THE JOURNAL, May 12 and 19, 1917, pp. 1444 and 1516), in regard to disturbances in infants from too exclusive carbohydrate feeding or fat deficiency. Monrad has examined the recent records of his service and has found that 205 infants with fat dyspepsia were kept on fat-poor diet for over two months without any symptoms developing suggesting injury from fat deficiency. His experiments and experiences apparently indicate that it is immaterial whether an infant is getting 0.75 or 0.5 or 0.1 per cent. of fat if it is getting the suitable amount of carbohydrates. He protests against Bloch's assumptions as to xerophthalmia being a fat deficiency affection, saying that it is not fat deficiency but pasteurization of the milk which entails the xerosis. Five infants with severe fat dyspepsia and complicating pyuria, otitis or pyoderma, kept on fat-poor food, did not thrive but lay with eyes closed and it was found that all had xerosis of the conjunctiva. Until a few months before this the children in his service had been given raw milk, but a change of owners at the dairy was followed by pasteurization of all the milk. These infants had thus been fed with sterilized milk mixtures, a denatured food, lacking in vitamins, and the conditions were thus propitious for the development of xerosis. Proof of this assumption was obtained by keeping the children on the same food as before but preceding each feeding with 10 gm. of raw fresh milk. The result was the prompt subsidence of the xerosis. It had entirely disappeared by the end of a few weeks. This experience, he thinks, establishes beyond question that it could not have been the small amount of fat in the fresh milk given, but the vitamin content which was responsible for the subsidence of the xerosis. Xerophthalmia must thus be regarded as a consequence of lack of vitamins.

THE JOURNAL

OF THE

American Medical Association

Annual Subscription, \$5.00

P H B Ward PhD
Urbana Ill

Single Copies, 15 Cents

Vol. LXIX, No. 12

535 North

SEPTEMBER 22, 1917

CONTENTS AND DIGEST

Influence of Large Doses of Digitalis and Digitoxin on the Blood Pressures in Man. Cary Eggleston, M.D., New York.....951

Review of experiments reported in the literature. Personal observations. Case records. Analysis of observations.

The Neurasthenic at the Threshold. Frank R. Fry, M.D., St. Louis....955

The common depreciation of the neurasthenic as a patient by the public and the profession. Its explanation as a fatigue neurosis. The abuses of the well-conceived rest method.

The Psychoneuroses: How Shall We Look on Them Today? Theodore Diller, M.D., Pittsburgh.....956

Classification of the psychoneuroses.

The Traumatic Neuroses, With Special Reference to Their Medicolegal Relations. Edward E. Mayer, M.D., Pittsburgh958

Different views with regard to traumatic neuroses. Is there an organic type of neurosis? Some attempts at classification. Incidence and recoverability.

Papers of Drs. Fry, Diller and Mayer discussed by Drs. Patrick, Booth, Gordon,

Ives, Wolfstein, Williams, Skoog, Woodbury, Woodson, Moleen, Sachs, Diller and Mayer.

Observations on Surgical Shock: A Preliminary Note. Yandell Henderson, Ph.D.; A. L. Prince, M.D., and H. W. Haggard, M.D., New Haven, Conn.965

Epinephrin, acidosis and the oxidative metabolism in shock.

Botulism: The Danger of Poisoning from Vegetables Canned by the Cold-Pack Method. Ernest C. Dickson, M.D., San Francisco.....966

Frequency with which food poisoning is caused by *B. botulinus*. Investigation of unrecorded cases of food poisoning which have occurred on the Pacific Coast in the past six years.

The Stiff and Lame Shoulder. C. Hermann Bucholz, M.D., Boston.....968

Explanation of the frequency of lame shoulder. Acute subacromial bursitis. Subacute or chronic adherent subacromial bursitis. The lame shoulder following injuries of the arm. Infectious arthritis of the humero-scapular joint. Tuberculosis of the shoulder

joint. Hypertrophic osteoarthritis. Lime salt deposits. Rupture of supraspinatus tendon and the roof of the capsule of the shoulder joint. Report of cases.

Discussed by Drs. Truslow, Brickner, Blanchard, Henderson, Oppenheimer, Meisenbach and Bucholz.

(Continued on next page)

MILITARY MEDICINE AND SURGERY

Triple Typhoid Vaccine (*Bacillus Typhosus*, *B. Paratyphosus A*, and *B. Paratyphosus B*): Observations on the Results Following Inoculation of Man, with Special Reference to the Reactions Produced and Antibody Formation. Charles F. Craig, M.D., Fort Leavenworth, Kan.....1000

The Venereal Diseases: Chancroid..1004

MEDICAL MOBILIZATION AND THE WAR 1011

ENTERED AS SECOND-CLASS MATTER, JUNE 25, 1885, AT THE POSTOFFICE AT CHICAGO, ILLINOIS, UNDER ACT OF MARCH 3, 1879.
NEXT ANNUAL SESSION, CHICAGO, 1918. COPYRIGHT, 1917, BY THE AMERICAN MEDICAL ASSOCIATION.

SAUNDERS

Bulletin

PUBLISHING SERVICE

So far this year we have published

25 new books
and

18 new editions

—a total of 43, or better than one every week. With the last quarter to run, this year promises to break all records.

NOW READY

The Mayo Clinic Volume

This volume embraces all the clinical teachings, all the important papers of W. J. and C. H. Mayo and their Associates at The Mayo Clinic of the year 1916. Of it, the *Pennsylvania Medical Journal* says: "This volume is a perfect encyclopedia of knowledge concerning the subjects under consideration. For the surgeon who wishes to be right up-to-the-minute this volume is a necessity."

Some of the more important articles in this volume are: Radium treatment, roentgen diagnosis, surgery of the tonsils, syphilis and tuberculosis of the stomach, operations in cancer of rectum, diverticula of the bladder, surgery in cancer of the uterus, diagnosis and treatment of mammary conditions, surgery of the thyroid, splenectomy and indications for it, heart-block, transfusion in pernicious anemia, trifacial neuralgia, thoracic diseases and surgery, etiology of epidemic poliomyelitis, hospital problems of gonorrhea and syphilis, dental research; in all, 96 articles.

Octavo of 1015 pages, illustrated. By WILLIAM J. MAYO, M.D., CHARLES H. MAYO, M.D., and their ASSOCIATES at The Mayo Clinic, Rochester, Minn. Cloth, \$6.50 net.

SAUNDERS, Publishers

See Pages 3, 4, 5

HENRY P. WARD
STATE UNIVERSITY

CONTENTS AND DIGEST—Concluded

EDITORIALS

Preservation of Complement: A Preliminary Report. B. W. Rhamy, M.D., Fort Wayne, Ind.....973

The Retention of Devitalized Teeth Without Danger of Focal Infection. M. L. Rhein, M.D., New York....974

Discussed by Drs. Schamberg, Brophy, Goldstine, Moorehead, Zentler, Rhein and Thoma.

The Roentgen-Ray Treatment of Acne Vulgaris. H. H. Hazen, M.D., Washington, D. C.....977

Coincident Pregnancy and Tabes Dorsalis. Edgar M. Allen, M.D., Los Angeles979

Malignant Disease of the Throat and Sinuses: Review of Cases Treated by Radium and Roentgen Rays. Henry K. Pancoast, M.D., Philadelphia..980

The Truth About Radioactive Therapy in Malignant Growths. Arthur Fenwick Holding, M.D., and William Bayard Long, M.D., New York....982

The Possibilities and Limitations of Roentgen Therapy in Malignant Disease. George E. Pfahler, M.D., Philadelphia985

New Growths of the Mediastinum, With Special Reference to Their Treatment With Radium. Curtis F. Burnam, M.D., Baltimore.....989

Papers of Drs. Pancoast, Holding and Long, Pfahler, and Burnam discussed by Drs. Snow, Millet, Soiland, Alliaume, Pfahler and Burnam.

CLINICAL NOTES, NEW INSTRUMENTS AND SUGGESTIONS

Volvulus: Report of a Case. G. H. Edwards, M.D., Orlando, Fla.....997

A New Apparatus for Intraventricular Drainage. Y. C. Lott, M.D., New York997

A Rack for Facilitating the Handling of Small Deep Skin Grafts. John Staige Davis, M.D., Baltimore....997

An Acid Polychrome-Methylene Blue Solution for Routine and Special Staining. E. W. Goodpasture, Boston998

A New Tonsillectome. Frederick W. Lamb, M.D., Cincinnati.....998

A Convenient Method for Recording Data on Roentgen-Ray Plates. C. D. Blachly, M.D., Drumright, Okla...999

A New and Simple Method for Counting Blood Platelets. Reuben Ottenberg, M.D., and Nathan Rosenthal, M.D., New York.....999

A Tonsil Suture Instrument. George E. Hourn, M.D., St. Louis.....999

The Objections to Raw Eggs in the Diet.....1006

Indigestibility of the raw white of egg.

Every Day is Fish Day.....1007

Advantages and possibilities offered by some neglected nutrient products.

The Significance of Creatinuria....1008

Effect of high protein intake on the excretion of creatin.

The Use of Volatile Irritants in Collapse1008

Lack of experimental justification for irritant injections.

CURRENT COMMENT

A British Committee of Inquiry....1009

An investigation of medical military efficiency.

"O Wad Some Power . . .".....1010

Weird logic of certain advertisers.

The Lie with Circumstance.....1010

Verbal camouflage to promote a shotgun mixture.

America—The Medical Military Utopia1010

British view of American progress in the war.

Germany and Surgical Progress...1011

The question of originality of scientific investigations.

MEDICAL NEWS 1017

MARRIAGES 1019

DEATHS 1020

PROPAGANDA FOR REFORM 1021

Identifying Fake Neosalvarsan.

New York and Oregon Perform a National Service.

CORRESPONDENCE 1023

A Selective Draft of Physicians Based on Classification.

Women Physicians and the War.

A Field Experiment on Poison-Oak Prevention. The Roll of Honor.

QUERIES AND MINOR NOTES 1024

Mencièr's Iodoform-Peruvian Balsam Mixture. Polychrome Stain for Protozoa and Blood Corpuscles.

"Nikalgin".

What is a Mil?

MEDICAL EDUCATION AND STATE BOARDS OF REGISTRATION

Coming Examinations — Michigan May Examination — Michigan June Examination..1025

BOOK NOTICES 1025

SOCIAL MEDICINE, MEDICAL ECONOMICS AND MISCELLANY

Medicopharmaceutic Ethics1026

MEDICOLEGAL

Power of Lumber Company to Contract for Services of Physician — Validity of Ordinance Restricting Location of Private Hospitals — Construction of Statute with Reference to Prescribing Intoxicating Liquors — Physician Not Guardian for Patient1027

SOCIETY PROCEEDINGS 1028

Coming Meetings.

CURRENT MEDICAL LITERATURE

American Medical Journals

Bacillus Abortus Bovinus in Certified Milk — Phenolsulphonephthalein Elimination in Children — Use of Pancreatic Vitamin in Cases of Marasmus1028

Blood Solids and Concentration of Sodium Chlorid in Plasma of Infants — Rumination in Infants — Effect of Cod Liver Oil on Growth in Case of Intestinal Infantilism — Adamantinoma Showing Epithelial Pearls — Thrombo-Angiitis Obliterans — Treatment of Gangrene in Thrombo-Angiitis Obliterans — Primary Malignant Neoplasm of Lung — Dosage of Tuberculin in Surgical Tuberculosis1029

Heredity and Infection in Diabetes Mellitus — Chronic High Blood Pressure Cases — Titrations of Diphtheria Toxins — Comparative Studies of Wassermann Tests — Virulence of Diphtheria Bacilli — Schick Test in Negro — Tethelin in Experimental Tuberculosis — Precipitin Production in Allergic Rabbits.1030

Immune Reactions with Poliomyelitic Cocci — Etiology of Myositis Purulenta Tropica — Streptococcus from Urine — Cheese Poisoning — Typhoid Treated by Injection of Sensitized Vaccine Sediment — New Fields in Neurology and Psychiatry1031

Intestinal Obstruction—Treatment of Bichlorid of Mercury Poisoning1032

Foreign Medical Journals

Alleged Perils of Uric Acid — Examination of Blood in Cases of Irritable Heart — Gunshot Wounds of Knee Joint.....1033

Irrigation and Suction Drainage for War Wounds — Thermalgia (Causalgia)—Effect of Cigaret Smoking — Appendicitis in Children1034

Retrograde Conductibility of the Heart — Receiving Cap for Telephone and Wireless Telegraph Operators — Signs of Apparent Death — Radiotherapy of War Wounds.1035

Radioscopy and Radiology—Atropin and Amyl Nitrite Tests with Bradycardia—Heart Murmurs—The Systolic Blood Pressure in Arm and Leg with Aortic Incompetency — The Abdominocardiac Reflex — Bronchial Spirochytosis1036

The Carrel Method as Applied in Base Hospitals — Amebic Suppuration in the Liver Cured with Emetin Alone—Inability to Rotate the Forearm After Fracture—Wounds of Foot and Ankle—Anastomosis of Ureter Stumps—The Alleged Titration of Digitalis —Dosage of the Bromids.....1037

Nervous Disturbances After War Wounds of the Arm—The Eye Lesions of Scarlet Fever —Tartar Emetic in Leishmaniasis in Children1038

Respiratory Affections in Infants—Ether in Treatment of Hysterical Aphonia and Mutism —Tertiary Manifestations of Syphilis in the Liver1039

Dense Fibrous Form of Pulmonary Tuberculosis—Status Epilepticus in the Pregnant—Spontaneous Rupture of the Rectum—Clinical Significance of Urobilinuria1040

TONICS AND SEDATIVES—BOOKS RECEIVED—THE PUBLIC SERVICE.....Adv. Page 20

CARREL & DEHELLY'S Treatment of Infected Wounds

Translated by Capt. H. Child, R.A.M.C.(T.), With Introduction by Surgeon General Sir Anthony Bowlby, K.C.M.G., F.R.C.S.

12 mo. Cloth, 250 pages. 78 Illustrations. \$2.00 net.

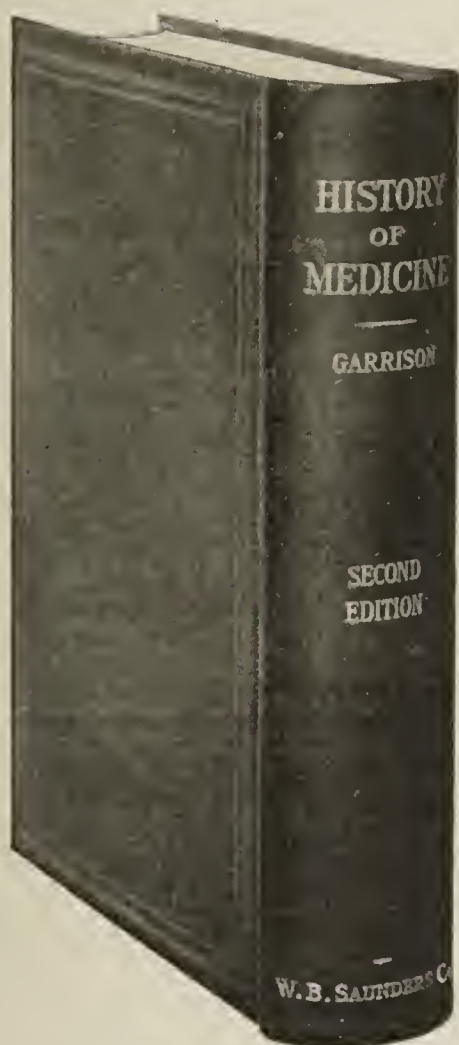
PAUL B. HOEBER, Publisher

67-69 East 59th Street, New York

Ready Soon

JUST OUT—NEW (2d) EDITION
RESET—ENLARGED BY 225 PAGES

Garrison's History of Medicine



In making this revision, Dr. Garrison added so much new material that it was necessary to reset the work from title to index. The new text and illustrations total 225 pages.

Dr. Garrison's book is complete, beginning with ancient and primitive medicine, and carrying you in a most interesting and instructive way on through Egyptian medicine, Sumerian and Oriental medicine, Greek medicine, the Byzantine period, the Mohammedan and Jewish periods, the Medieval period, the period of the Renaissance, the Revival of learning and the Reformation; the Seventeenth Century (the age of individual scientific endeavor), the Eighteenth Century (the age of theories and systems), the Nineteenth Century (the beginning of organized advancement of science), the Twentieth Century (the beginning of organized preventive medicine).

The appendices include *medical chronology* (data on important diseases, drugs, therapeutic procedures, and important surgical operations), bibliographic notes for collateral reading, and valuable suggestions for the study of medical history.

The illustrations, many of them rare portraits, will stimulate your interest in the picturesque aspects of medicine and in the personalities of its great leaders. Each period is followed by a brief survey of its *social and cultural phases*. The work is the *Baedeker of medical history*.

STRIKING FEATURES

All the important facts in medical history.

Only work treating exhaustively the modern period—the nineteenth and twentieth centuries occupying nearly one-half the work.

A biographic dictionary of the makers of medical history, arranged alphabetically.

An album of medical portraits.

Bibliographic references to all important discoveries and experiments, arranged alphabetically.

A complete medical chronology (data on diseases, drugs, operations, etc.).

A brief survey of the social and cultural phases of each period.

Suggestions for the study of medical history.

Octavo of 904 pages, with many portraits. By FIELDING H. GARRISON, M.D., Principal Assistant Librarian, Surgeon-General's Office, Washington, D. C. Cloth, \$6.50 net; Half Morocco, \$8.00 net.

W. B. SAUNDERS COMPANY

Philadelphia and London

Canadian Agency: 24-26 Hayter St., Toronto

Australian Agency: Centreway, 263 Collins St., Melbourne

LIST OF STATE MEDICAL ASSOCIATIONS

SOCIETY	PRESIDENT	SECRETARY	ANNUAL MEETING
Alabama, Med. Assn. of the State of	Wm. D. Partlow, Tuscaloosa.....	H. G. Perry, State Bd. of Health, Montgomery	Birmingham, 1918
Arizona Medical Association.....	Wm. A. Holt, Globe.....	C. E. Yount, Prescott.....	1918
Arkansas Medical Society.....	William Breathwit, Pine Bluff...	C. P. Meriwether, 309 S. Tr. Bldg., Little Rock	Jonesboro, 1918.
California, Med. Soc. of the State of	John H. Barbet, San Francisco...	Saxton Temple Pope, Butler Bldg., San Francisco	Del Monte, 1918.
Colorado State Medical Society.....	A. C. Magruder, Colorado Spgs...	Crum Epler, Pueblo.....	
Connecticut State Medical Society...	Edward K. Root, Hartford.....	J. E. Lane, 59 College St., New Haven.....	Hartford, May 15-16, '18
Delaware State Medical Society.....	James Beebe, Lewes.....	G. W. K. Forrest, 901 Jackson St., Wilm'ton	Middletown, Oct. 8-9, '17
District of Columbia, Med. Soc. of..	G. Wythe Cook, Washington.....	H. C. Macatee, 1478 Harvard St., N.W., Wash'n	
Florida Medical Association.....	Ralph N. Greene, Jacksonville....	Graham E. Henson, Jacksonville.....	Tampa, May, 1918
Georgia, Medical Association of....	Eugene E. Murphey, Augusta.....	Wm. C. Lyle, Augusta.....	Savannah, 1918.
Hawaii, Medical Society of.....	I. J. Shepherd, Honolulu.....	G. C. Milnor, 401 S. Beretania St., Honolulu	
Idaho State Medical Association...	William F. Smith, Boise.....	Ed. E. Maxey, 204 Idaho Bldg., Boise.....	1918
Illinois State Medical Society.....	Elmer B. Cooley, Danville.....	W. H. Gilmore, Mt. Vernon.....	Springfield, 1918.
Indiana State Medical Association...	John H. Oliver, Indianapolis....	Chas. N. Combs, Terre Haute.....	
Iowa State Medical Society.....	J. N. Warren, Sioux City.....	T. B. Throckmorton, Equitable Bldg., Des Moines	Ft. Dodge, May 8-10, 1918.
Isthmian Canal Zone, Med. Assn. of	Herbert C. Clark, Ancon.....	R. W. Runyan, Ancon.....	
Kansas Medical Society.....	Charles S. Huffman, Columbus...	John F. Hassig, Kansas City.....	Kansas City, 1918.
Kentucky State Medical Association...	Milton Board, Louisville.....	Arthur T. McCormack, Bowling Green.....	Louisville, Oct. 16-18, '17
Louisiana State Medical Society...	Clarence Pierson, Jackson.....	L. R. DeBuys, Maison Blanche Bldg., N. Orleans	1918.
Maine Medical Association.....	James A. Spalding, Portland.....	John B. Thompson, 109 State St., Bangor...	Portland, June, 1918
Maryland, Med. and Chir. Faculty of	Guy Steele, Cambridge.....	John Staige Davis, 1211 Cathedral St., Baltimore	
Massachusetts Medical Society.....	Samuel B. Woodward, Worcester	Walter L. Burrage, 282 Newbury St., Boston.	Boston, June 13-14, 1918
Michigan State Medical Society....	A. P. Biddle, Detroit.....	F. C. Warnshuis, 531 Powers Bldg., Gr. Rapids..	
Minnesota State Medical Assn.....	Harper M. Workman, Tracy.....	Thos. McDavitt, 814 Lowry Bldg., St. Paul...	St. Paul, Oct. 10-12, '17
Mississippi State Medical Assn.....	Willis Walley, Jackson.....	E. F. Howard, 1st Nat. Bk. Bldg., Vicksburg.	Jackson, May 14-15, '18
Missouri State Medical Association...	Robert E. Schlueter, St. Louis....	E. J. Goodwin, 3517 Pine St., St. Louis.....	Jefferson City, May, '18
Montana, Medical Association of...	Arthur Morrow, Kalispell.....	E. G. Balsam, Billings.....	Butte, 1918
Nebraska State Medical Association...	C. L. Mullins, Broken Bow.....	Jos. M. Aikin, 466 Brandeis Block, Omaha...	Omaha, 1918.
Nevada State Medical Association...	Raymond St. Clair, Reno.....	W. L. Samuels, Reno.....	Reno, Oct. 18-19, 1917
New Hampshire Medical Society...	Fred S. Towle, Portsmouth.....	D. E. Sullivan, 7 No. State St., Concord....	1918
New Jersey, Medical Society of....	William G. Schaufler, Lakewood...	Thos. N. Gray, E. Orange.....	Lakewood, 1918
New Mexico Medical Society.....	Clifford S. Losey, E. Las Vegas..	R. E. McBride, Las Cruces.....	Las Cruces, Oct. 4-6, '17
New York, Med. Soc. of the State of	Alexander Lambert, New York...	Floyd M. Crandall, 17 West 43d St., N. Y....	Albany, May 21-24, 1918
N. Carolina, Med. Soc. of the State of	I. W. Faison, Charlotte.....	Benjamin K. Hays, Oxford.....	Pine Hurst, 1918.
North Dakota State Med. Assn....	Geo. M. Williamson, Grand Forks	H. J. Rowe, Casselton.....	Fargo, May 8-9, 1918
Ohio State Medical Association....	James F. Baldwin, Columbus.....	C. D. Selby, 234 Spitzer Bldg., Toledo.....	1918.
Oklahoma State Medical Assn.....	W. A. Cook, Tulsa.....	C. A. Thompson, 507 Barnes Bldg., Muskogee	Tulsa, 1918.
Oregon State Medical Association...	Edwin E. Straw, Marshfield.....	Clarence J. McCusker, Corbett Bldg., Portland	Portland, 1918
Pennsylvania, Med. Soc. of State of	C. A. E. Codman, Philadelphia...	Cyrus Lee Stevens, Athens.....	
Philippine Islands Medical Assn....	B. C. Crowell, Manila.....	R. B. Gibson, Coll. of Med. & Surg., Manila..	Manila, 1917
Porto Rico, Med. Assn. of.....	Gabriel Villaronga, Ponce.....	Agustin R. Laugier, San Juan.....	San Juan, Dec., '17.
Rhode Island Medical Society.....	John C. Champlin, Westerly.....	J. W. Leech, 111 Broad St., Providence.....	1918
South Carolina Medical Association...	Frank H. McLeod, Florence.....	Edgar A. Hines, Seneca.....	Aiken, Apr. 16-18, 1918
South Dakota State Med. Assn.....	Herman J. G. Koobs, Scotland....	R. D. Alway, 202 S. Main St., Aberdeen....	Mitchell, 1918
Tennessee State Medical Assn.....	Edward T. Newell, Chattanooga..	Olin West, First Nat'l Bank Bldg., Nashville..	1918
Texas, State Medical Association of..	E. H. Cary, Dallas.....	H. Taylor, Texas State Bk. Bldg., Fort Worth	1918
Utah State Medical Association....	S. C. Baldwin, Salt Lake City...	W. Brown Ewing, 801 Boston Bldg., S. L. City	
Vermont State Medical Society....	C. H. Beecher, Burlington.....	W. G. Ricker, St. Johnsbury.....	Barre, Oct. 11-12, 1917
Virginia, Medical Society of.....	George A. Stover, South Boston..	Paulus A. Irving, Farmville.....	Roanoke, Oct. 23-26, 1917
Washington State Medical Assn....	G. M. Horton, Seattle.....	C. H. Thomson, Walker Bldg., Seattle.....	Seattle, 1918
West Virginia State Med. Assn.....	Jos. E. Rader, Huntington.....	J. Howard Anderson, Marytown.....	Fairmont, Oct. 2-4, 1917
Wisconsin, State Med. Society of...	H. E. Dearbolt, Milwaukee.....	Rock Sleyster, Waupun.....	Milwaukee, Oct. 3-5, 1917
Wyoming State Medical Society...	R. W. Hale, Thermopolis.....	J. D. Lewellen, Powell.....	Casper, Aug., 1918.

List of National Societies appeared in this space two weeks ago; officers of the A. M. A. last week.

Corrections will be appreciated

An Efficient Sugar for Infant Feeding
means maximum tolerance, assimilability and gain in weight with
minimum digestive disturbances and diarrhoea for the infant.

This is why nearly every pediatricist prescribes

MEAD'S DEXTRI-MALTOSE

(MALT SUGAR)

in feeding formulae for infants' diet.

Let us send you samples and literature fully describing the
simplicity of using Mead's Dextri-Maltose in any milk mixture in
the same proportion as milk or cane sugar, but with better results.

MEAD JOHNSON & CO.,

Evansville, Ind.

NEW BOOKS AND NEW EDITIONS

Fones' Mouth Hygiene

*New Work
Just Ready*

The increasing importance of *mouth hygiene* in its relation to preventive dentistry and to good health is coming to be almost universally recognized by the medical and dental professions. A wide-spread interest has been manifested in the work which Dr. Fones has been doing in training *dental hygienists* who shall be competent to render scientific and proficient service in dental prophylaxis. The medical profession fully realizes that unsanitary mouths with diseased teeth are a very potent factor for ill health and systemic infection. Physicians, especially every medical inspector of schools, should possess a copy of this work, and they will do well to place a copy in the hands of their office assistants.

Octavo, 530 pages, with 278 engravings and 7 plates. Compiled by ALFRED C. FONES, D.D.S., Bridgeport, Conn. Edited by EDWARD C. KIRK, Sc.D., D.D.S., LL.D., ROBT. H. STRANG, M.D., D.D.S., and ALFRED C. FONES, D.D.S. Cloth, \$5.00 net.

Ballenger & Wipperfurth on the Eye, Ear, Nose and Throat

New (2d) Edition Just Ready

This is a compact and concise manual for students and practitioners covering the generalized specialty of the four organs as it has now developed from clinical experience. It is well known that both authors have had an extensive experience in the medical and surgical treatment of these organs which is fully reflected in this new edition. It is thoroughly revised and strictly up to date and will be found a valuable aid to students, practitioners and specialists.

12mo, 524 pages, with 180 engravings and 8 colored plates. By HOWARD CHARLES BALLENGER, M.D., Professor of Oto-Laryngology in the Chicago Eye, Ear, Nose and Throat College; formerly Instructor in Otology, Rhinology and Laryngology in the University of Illinois, School of Medicine, and A. G. WIPPERFURTH, M.D., Formerly Professor of Ophthalmology and Otology, Chicago Eye, Ear, Nose and Throat College. Cloth, \$3.50 net.

Tuttle & Hurford on Diseases of Children

*New (3rd) Edition
Just Ready*

The senior author in the first edition of this work planned a well-balanced text-book which should reflect with honest accuracy all essential phases of pediatric knowledge. This ideal has been studiously maintained in subsequent editions. In the present edition every topic has been completely rewritten and somewhat extended to cover recent advances. All important literature relating to the subject which has appeared in the last ten years has been carefully reviewed and deductions therefrom, checked by personal experience, have been amalgamated with the earlier text in the construction of new chapters. Practitioners and students will find here in convenient and accessible form full guidance in the diagnosis and treatment of diseases of children.

12mo, 599 pages, with 47 engravings and 3 plates. By GEORGE M. TUTTLE, M.D., Clinical Professor of Pediatrics, Washington University Medical School; Consulting Physician to St. Louis Children's Hospital, and PHELPS G. HURFORD, M.D., Assistant in Pediatrics, Washington University Medical School. Cloth, \$3.50 net.

Bucholz on Therapeutic Exercise and Massage

*New Work
Just Ready*

This new book supplies the need for a work on the therapeutic use of exercise and massage. While the value of these methods is generally conceded, it is equally certain that they are not employed by medical practitioners to the extent they deserve. The correct indication for and application of these measures require not only a thorough knowledge of anatomy and physiology, but also an understanding of underlying pathological conditions. Throughout this book the author lays emphasis on these fundamental requisites. In after treatment following surgical operations and in orthopedic cases this work is particularly valuable.

12mo, 427 pages, with 90 engravings. By CARL HERMANN BUCHOLZ, M.D., Director, Medico-Mechanical and Hydrotherapeutic Departments, Massachusetts General Hospital; Assistant in Orthopedic Surgery, Harvard Medical School, Boston. Cloth, \$3.25 net.

Flint's Manual of Physical Diagnosis

*New (7th) Edition
Just Ready*

The particular need which this manual fills is the demand of the student and of many graduates in medicine for simplicity, directness, exactness, and skill in dealing with physical signs in health and disease. In the present edition the editor has retained, and as far as possible augmented by additions and modifications, those features which have heretofore so strongly appealed to the student and general reader. Certain minor methods of examination, as Inspection, Palpation, etc., have been brought into greater prominence than the distinguished author originally accorded them. Special effort has been exerted to bring the chapters devoted to examination of the heart into accord with modern ideas. The subject of Arrhythmia has been rewritten and its usual types diagrammatically presented.

12 mo., 370 pages, illustrated. By AUSTIN FLINT, M.D., LL.D., Late Professor of the Principles and Practice of Medicine and of Clinical Medicine in Bellevue Hospital Medical College, etc., Revised by HENRY C. THACHER, M.S., M.D., Associate in Medicine in the College of Physicians and Surgeons of Columbia University; Assistant Attending Physician, Roosevelt and Lincoln Hospitals, New York. Cloth, \$2.50 net.

PHILADELPHIA
706-8-10 Sansom Street

LEA & FEBIGER
PUBLISHERS

NEW YORK
2 W. Forty-Fifth Street

New and Important Books on Nursing

REED—Obstetrics for Nurses

This book is the result of 25 years of teaching and practice. It is more comprehensive than the usual textbook for nurses and yet the information is put so clearly and so readably that it is neither exhausting nor confusing. Thus it becomes a satisfactory guide for classes and remains an excellent book for post-graduate reference. That this book fills a long-felt want is evidenced by the fact that it has been adopted by the leading hospitals and training schools.

By CHARLES B. REED, M.D., Obstetrician to Wesley Memorial Hospital, Chicago; Formerly Obstetrician to German and Cook County Hospitals, and late assistant professor of Obstetrics in Northwestern University Medical School; Member and Former President of Chicago Gynecological Society; Member of Chicago Institute of Medicine; Fellow of American College of Surgeons. 375 pages, with 135 illustrations. Price, silk cloth binding, postpaid..... \$2.50

CHRISTIAN—Anatomy for Nurses

This book is written along lines that should appeal to the nurse who is about to enter the hospital for professional training, as well as the nurse who has had long experience. The various tissues and organs are thoroughly described and illustrated. There is a complete chapter on Histology. The illustrations are all original.

By WILLIAM G. CHRISTIAN, M.D., Professor of Anatomy in the Medical College of Virginia, Richmond. 225 pages, with 34 full-page plates, many in colors. Price, postpaid \$1.75

BRIDGE—Manual of Practical Nursing


This book marks an advance in training school teaching that has been long in arriving. Too frequently have pupil nurses been required to follow methods "patched up" from hastily written notebooks, haphazard bedside instruction by floor nurses, and desultory instruction from doctors. In presenting her book the author forestalls mistakes and places hospital technic on a teachable basis.

By HELEN LILLIAN BRIDGE, B.S., R.N., Superintendent and Instructor of Nurses in the Washington University Training School for Nurses, St. Louis. 84 pp., interleaved. Price, postpaid \$1.00

PEARCE—MAC LEOD—Fundamentals of Human Physiology

The object kept in view in the preparation of the present volume has been to give an elementary, yet comprehensive, review of the various facts and theories which go to form the modern science of human physiology. A complete chapter on Hygiene is included.

By R. G. PEARCE, B.A., M.D., Formerly Assistant in Physiology, University of Illinois, and J. J. R. MACLEOD, M.B., D.P.H., Professor of Physiology, Western Reserve University. 320 pages, 6x9, with 71 illustrations, and 8 colored plates. Price, silk cloth binding \$2.25

 **Sign the attached coupon and mail today**

C. V. Mosby Company, Medical Publishers

**801-807 Metropolitan Bldg.,
ST. LOUIS, U. S. A.**

[Canadian Agency: McAinsh & Co., Ltd., Toronto, Canada]

Send for complete catalogue of medical books.

JOUR.
A.M.A.
THE C. V.
MOSBY CO.,
St. Louis, Mo.

Gentlemen:

Please send me the books which are checked below: Reed—Obst. for Nurses, \$2.50; Christian — Anat. for Nurses, \$1.75; Bridge—Practical Nursing, \$1.00; Pearce—Human Physiology, \$2.25. For which I enclose check for \$..... or you may charge to my account.

Name.....

Address.....

CUT HERE AND MAIL TODAY

For Your Practical Working Library

These standard volumes have been so extensively revised as to necessitate completely resetting and printing from new plates. Many new illustrations have been added. Whatever earlier editions you may have, you will find it distinctly worth while to have these new editions, containing the latest scientific practice at your command.



Williams on Obstetrics

Every chapter in this book, in fact, almost every page, has been rewritten. New matter has been added concerning the development and structure of the placenta, the endometrium at menstruation and the relation between ovulation and menstruation. The physiology of the ductless glands has been considered in greater detail, and the metabolism of normal and abnormal pregnancy brought up to date. The use of twilight sleep and nitrous oxid anesthesia at the time of labor, new types of Cæsarean section and the effect of syphilis upon pregnancy are fully discussed. The recent fundamental work on premature separation of the normally implanted placenta is incorporated. New facts are presented on the mechanism of the third stage of labor, etc., etc. *Obstetrics, by J. Whitridge Williams, M.D., Professor of Obstetrics in Johns Hopkins University. Fourth revised edition, 1029 pages with seventeen plates and 685 other illustrations. Cloth, \$7.00 net.*

Keyes on Urology

Not only has nearly every page of this famous work of Dr. Keyes, treating of the Genito-Urinary Organs seen some change; but in addition, the revised edition has: new methods of cystoscopic diagnosis (many radiographic illustrations inserted), entire retreatment of infections of the kidney and renal tuberculosis, added material on urethroscopy and vesiculotomy, complete revision of section on Prostatism, most up-to-date point of view in reference to treatment of syphilis, etc., etc. *Urology, by Edward L. Keyes, Jr., M.D., Professor of Urology in Cornell University Medical College. Revised edition, 926 pages with 18 plates and 204 other illustrations. Cloth, \$6.50 net.*

Pusey on Dermatology

To the general practitioner skin cases are always among the most troublesome. Pusey's book has always been an able assistant in treating them. The new writing of this work makes it one of the most extensive treatises on dermatology in English. Every portion of the book has been completely revised and in many parts entirely rewritten. Special attention has been paid to the arrangement of the text, making it more convenient for reference. The new illustrations are especially valuable feature. *Principles and Practice of Dermatology, by William Allen Pusey, M.D., Emeritus Professor of Dermatology in the University of Illinois. Third revised edition, 1243 pages with 54 plates and 466 other illustrations. Cloth, \$7.00 net.*

THESE ARE APPLETON BOOKS

Why Wait? Slip This Into an Envelope Now and Have the Book You Need Immediately

D. APPLETON & COMPANY
35 West 32d Street, New York

Enclosed find for which please
send at once prepaid (or charge to my account)
the books checked.

WILLIAMS' OBSTETRICS....(\$7.00)
KEYES' UROLOGY.....(\$6.50)
PUSEY'S DERMATOLOGY....(\$7.00)

Name.....

Street.....

City.....

State..... Date.....

A New Macmillan Medical War Manual

The object of this handbook is to present a concise account of the chief chemical antiseptics which have been found useful for surgical purposes during the present war. The unparalleled severity and frequency of wound infection found there has led to considerable advances in our knowledge of these antiseptics, and of methods for their successful employment as found in Dr. Dakin's recent broad experience on the various European War fronts. We therefore believe that this work will prove of invaluable use to surgeons and others in this country who are now taking up military or industrial duties connected with the care of the wounded. The current European practice is here for the first time collected into concrete condensed form. The book contains results of much of the investigation carried out under the direction of the British Medical Research Committee. *It also presents, for the first time, unique methods of using certain disinfectants for the sterilization of drinking water and the disinfection of hospital ships, together with simple apparatus invented by Dr. Dakin and successfully used by him under actual war conditions with the French and British Army Medical Services.*

**Dakin &
Dunham's
Handbook of
Antiseptics**

By Henry Drysdale Dakin, D. Sc., F. I. C., F. R. S., and Edward Kellogg Dunham, M. D., Emeritus Professor of Pathology, University and Bellevue Hospital Medical College; Major, Medical Officers Reserve Corps, U. S. Army. Pocket handbook size; about 150 pages. **Ready Shortly.** Probable price, \$1.25.

THE MACMILLAN COMPANY, Publishers

NEW YORK
64-66 Fifth Avenue

SAN FRANCISCO
609 Mission Street

CHICAGO
25th St. and Prairie Ave.

Special Combination Offer

TO JOURNAL SUBSCRIBERS

	Annual Subscription	Special to JOURNAL Subscribers
The Archives of Internal Medicine - - - -	\$4.00	\$3.00
American Journal of Diseases of Children - - - -	3.00	2.00
Both Journals - - - - -	7.00	5.00

These journals are for the man who wishes to keep up to the minute on the new opinions, experiments and discoveries in their special fields. Very stimulating—always practical.

The ARCHIVES of INTERNAL MEDICINE

Physicians who have opportunity for wide practical experience in clinical and laboratory work contribute the articles to THE ARCHIVES. New diagnostic signs and recently observed clinical manifestations of diseases receive full discussion and they are presented in such a clear explanatory way that the reader cannot fail to grasp the important clinical significance of the subjects.

In so far as is possible, the subject matter of this journal is supplemented by photomicrographic reproductions and graphic illustrations of variations in temperature curves, tracings, and other descriptive illustrations which have been gathered and recorded by various writers after clinical observation of the conditions under discussion. Its articles are fully illustrated and discussion of cases fully covered.

AMERICAN JOURNAL of DISEASES of CHILDREN

General practitioners who feel that they are not as well prepared for pediatric work as they should be will find in this journal just what they want. In treating children you are obliged to depend largely upon objective symptoms and hence it is necessary to have an intimate acquaintance with and frequent review of recent exact methods of diagnosis.

This publication will prove a valuable guide to the general practitioner in this special work. Most of the papers selected present the discussion from the clinical side. At the close of an article a brief summary of its contents is given so that the busy physician can review the essentials of the subject and apply it in his daily work. Theoretical and laboratory papers are especially summarized in this way so as to increase their practical value.

Take advantage NOW of this special combination offer

SAMPLE COPIES.—Upon receipt of 4c in stamps to cover postage, we will mail a sample copy and subscription rates. If samples of both journals are desired, send 8c.

AMERICAN MEDICAL ASSOCIATION, 535 North Dearborn St., CHICAGO, ILLINOIS

We invite comparison

When you administer a hypodermatic tablet solution you want prompt action. You want a definite therapeutic result.

If you use a tablet of our manufacture you have assurance that both objects will be achieved.

HYPODERMATIC TABLETS

P. D. & CO.

are prepared from rigidly tested materials—materials that are guaranteed as to identity, purity and potency.

Hypodermatic Tablets, P. D. & Co., insure definite dosage. The content of each tablet is accurately determined. The medicament is uniformly subdivided by an unerring mechanical process, giving assurance that the active component is present in the precise amount indicated by the label.

Hypodermatic Tablets, P. D. & Co., are freely soluble. They dissolve completely in lukewarm water in a very few seconds.

Hypodermatic Tablets, P. D. & Co., are molded by a process that insures firmness. They are not liable to break or crumble in shipping or handling.

Test our hypodermatic tablets with those of any other manufacture. *We invite comparison.*

Home Offices and Laboratories,
Detroit, Michigan.

Parke, Davis & Co.

50 Years of Pharmaceutical Progress



Mulford

Serums and Serobacterins

Essential in
War and Peace!

Diphtheria Antitoxin

For the Prevention and Treatment of Diphtheria

Tetanus Antitoxin

For the Prevention and Treatment of Tetanus (Lock-jaw)

Antipneumococcic Serum

"Type I" and Polyvalent, for the Treatment of Pneumonia

Antimeningitis Serum

For the Treatment of Cerebrospinal Meningitis

Antistreptococcic Serum

For the Treatment of Streptococcic Infection

Antidysenteric Serum

For the Treatment of Bacillary Dysentery

Antianthrax Serum

For the Treatment of Human Anthrax

Typho Serobacterin

For the Prevention and Treatment of Typhoid Fever

Cholera Serobacterin

For Preventive Immunization against Asiatic Cholera

Neisser Serobacterin

For the Treatment of Gonorrhea

Mulford Products "Are the Standard"

These Serums and Serobacterins are prepared by methods and are adjusted to standards, many of which originated in our Laboratories

WORKING BULLETINS AND LITERATURE MAILED ON REQUEST

H. K. MULFORD CO., Philadelphia, U. S. A.

Manufacturing and Biological Chemists

29039

Stanolind

Trade Mark Reg. U. S. Pat. Off.

Liquid Paraffin

(Medium Heavy)

Tasteless — Odorless — Colorless

In Treating Hemorrhoids

STANOLIND Liquid Paraffin, used regularly, very generally relieves hemorrhoids and fissure, even when of some years' standing.

Since these morbid conditions are usually the result of constipation, and are aggravated by straining, Stanolind Liquid Paraffin aids by rendering the intestinal contents less adhesive, by allaying irritation and thus by permitting the diseased tissues to become healed.

Where a contraindication for operative treatment exists, the use of Stanolind Liquid Paraffin in these conditions will frequently give relief from distressing symptoms and may even permit the parts to be restored to a condition where operative procedure may be postponed.

The *special advantage* of Stanolind Liquid Paraffin lies in the fact that its beneficial effects are not diminished by continual use, as is the case with almost any other laxative.

Stanolind Liquid Paraffin acts by lubrication and by adding bulk to the indigestible intestinal residue.

A trial quantity with informative booklet will be sent on request.

Standard Oil Company

(Indiana)

72 West Adams Street
Chicago, U. S. A.

75



Many
Doctors
Recommend

REG. U. S. PAT. OFF.
Bran-eata
BISCUITS

For the Relief of Constipation

THE value of bran in specific cases has long been recognized by many physicians—but heretofore it has generally been necessary for the patient to mix the bran with other cereals or to bake bran bread or bran muffins to make it palatable. BRAN-EATA BISCUITS are offered as a happy solution of the bran problem. These crisply toasted biscuits are ready cooked and ready to serve—they are nutritive, delicious when broken up in milk and cream—and each biscuit contains sufficient bran to prove effective.

Doctor—

On request we will gladly and freely send you a full size package of BRAN-EATA BISCUITS. A trial in your own household will convince you of their beneficial effects. Write us TODAY.

GRAIN PRODUCTS COMPANY
OF SAINT LOUIS



MAKE THEM HAPPY!

Many of your patients would be made happy if they were allowed to have coffee.

When the stimulant caffeine is contra-indicated, coffee, from which 95% of the caffeine has been removed, is usually allowed.

Professor Von Noorden, in Disorders of Metabolism, page 94,

"I should like to call particular attention in this place to caffeine-free coffee (trade mark 'Hag') that has a very satisfying taste and incorporates only very slight quantities of caffeine."

KAFFEE HAG is real coffee, in the whole bean, from which 95% of the caffeine has been removed.

Write for a sample package—gratis.

KAFFEE HAG CORPORATION
225 Fifth Avenue New York City

DIARSENOL

PRICES EFFECTIVE MAY, 1917

Ampoules of 0.6 Gram, each	.....	\$ 3.00
" 0.5 " "	.....	2 60
" 0.4 " "	.....	2.20
" 0.3 " "	.....	1.80
" 0.2 " "	.....	1.40
" 0.1 " "	.....	1.00
" 1.0 " "	.....	5.00
" 2.0 " "	.....	9.00
" 3.0 " "	.....	13.00

DISCOUNTS

On orders for 10 Ampoules (may be assorted)
10% discount.

On orders for 25 Ampoules (may be assorted)
20% discount.

All prices duty paid

All delivery charges prepaid on
orders for 25 Ampoules or more.

TERMS CASH WITH ORDER

Supplied by

LANSPEARY'S LIMITED

(Orders shipped within 24 hours after receipt of same)

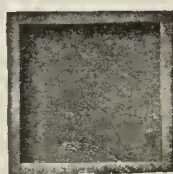
33 Ouellette Ave.

WINDSOR, ONT.

RADIUM

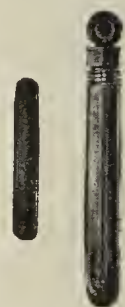
STANDARD CHEMICAL CO.

RADIUM ELEMENT CONTENT AND
DELIVERY DATE GUARANTEED



Type "A"
Dermatological
Applicator

U. S. Bureau
of Standards
Measurement



Type "B"
Universal
Applicator

Radium Chemical Company

General Offices and Laboratories

Pittsburgh, Pa.

In War and Peace, "First Aid" is now a National Thought.

Interest in "First Aid" is Interest in Iodine.

Interest in Iodine is Interest in

IOCAMFEN

(about 7¼ % free Iodine)

Smooth, stable, well-adhering, concentrated, economical liquid, produced by the interaction, and composed exclusively, of Iodine, Camphor and Phenol.

"Active Iodine in a Co-Active Vehicle"

Penetration, Protracted Action, Pain-Relief, Stimulation, Granulation. All surgical, gynecological, dermatological and general medical indications of free Iodine.

Manufactured by us in the U.S.A. and furnished in One, Four and Eight Ounce Bottles. *Gratis sample on request.*

SCHERING & GLATZ, Inc., 150 Maiden Lane, New York

In Making Ampules

"the S & D way," there's but one end-result worked for—**QUALITY.**

We buy—or more often make—the chemicals and assay them so as to be sure that they are up to the top-notch standard. Then we dissolve the chemicals, sterilize the solutions, sterilize the tubes, fill them under the most exacting aseptic conditions and with exceptional care so as to be sure that just the right amount of the solution is in each tube, label, pack, and then we have ampules that spell **QUALITY** all over.

And these are the Aseptic Ampules we offer to you thru your druggist—the most convenient way for you.

Have you our Ampule List on file?

SHARP & DOHME
Baltimore

The Economics of Nutrition

With notes on the invalid dietary



DR. A. WANDER, SOC. ANON.
BERNE, SWITZERLAND

Some new ideas on the proper dietary for invalids and convalescents

Every physician who has occasion to prescribe food suitable for convalescents or invalids will welcome new ideas on this critical subject.

Our new booklet, "The Economics of Nutrition," just from the press, is an attractive brochure embodying much valuable information on this important subject, written from a scientific, medical standpoint.

We shall be glad to send free a copy of this booklet to any physician who cares to have it. It sets forth, among other things, the facts about Ovaltine as a food.

Send name and address to American Depot

THE WANDER COMPANY

Dept. 2 23 North Franklin St., Chicago

SIOMINE

"S-IOD-AMINE"

Introducing an ideal alterative.

Of value in locomotor ataxia and all lesions of tertiary syphilis.

May be given in doses of $\frac{1}{4}$ grain to 5 grains.

Iodin content: 78.5 per cent.

No untoward effects when judiciously employed.

Easily administered.

Accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies.

Siomine is marketed in capsules only. Doses:
 $\frac{1}{4}$, $\frac{1}{2}$ and 1 grain; 2 and 5 grains.

Clinical Reports on the use of SIOMINE
will be appreciated.

Write for Booklet on Internal Iodin and SIOMINE Medication.

Manufactured by

HOWARD-HOLT COMPANY

(INCORPORATED)

Manufacturing Pharmacists, CEDAR RAPIDS, IOWA



PRESCRIBE HORLICK'S

SAFE FOR INFANT NURSING MOTHER INVALID AND CONVALESCENT

This is the season when precaution must be exercised against the dangers which abound in raw milk.

The safety of Horlick's is doubly assured. It is clean, it is sealed air-tight.

And with its quality comes dependability, uniformity and palatability. So that patients are protected by its safety, strengthened by its easily digested and well balanced nourishment, and pleased by its taste.



Horlick's Malted Milk Company

Racine, Wis.

In the Treatment of

Cystitis—Urethritis Pyelitis—Prostatitis—Bacilluria

H E L M I T O L

ACTS AS

An Efficient Urinary Antiseptic

Agreeable of Administration—Generally Well-Tolerated
by the Gastro-Intestinal and Urinary Tract.

Conveniently taken in Tablets, which readily dissolve.

Supplied in 5 gr. tablets, bottles of 25 and 100, and in powder in ounces.

Samples and Literature supplied by

THE BAYER COMPANY, Inc.
117 Hudson St., New York, N. Y.

BORCHERDT'S MALT SOUP-EXTRACT

A STANDARD AMERICAN PRODUCT

(Free From Alcohol)

For Preparing MALT SOUP

Of Recognized Value in the Treatment of Infants Suffering from Marasmus, Atrophy and Malnutrition.

Typical Malt Soup Results are obtained by using **BORCHERDT'S MALT SOUP-EXTRACT**, usual weight increase, marked change in character of stools and generally a satisfactory improvement.

BORCHERDT'S MALT SOUP-EXTRACT is composed solely of Malt Extract and Potassium Carbonate in their correct proportion according to the original Malt Soup Formula. *SAMPLES AND LITERATURE ON REQUEST*

BORCHERDT MALT EXTRACT CO., 217 N. Lincoln St., CHICAGO, ILL.



You can depend on
Merck's R & Chemicals

PILLING BLOOD PRESSURE Outfit

Auscultatory Method Consisting of

22.⁵⁰_{NET} Faught Pocket Apparatus

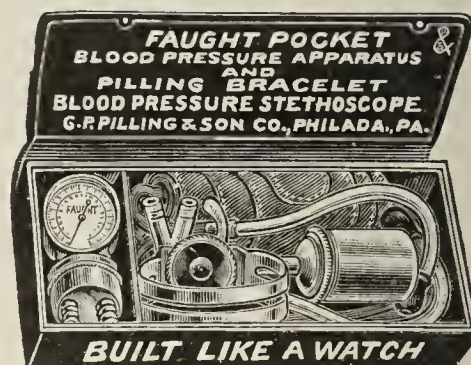
and

5.⁰⁰_{NET} Pilling Bracelet ^{B/P} Stethoscope

Both Complete in a POCKET CASE

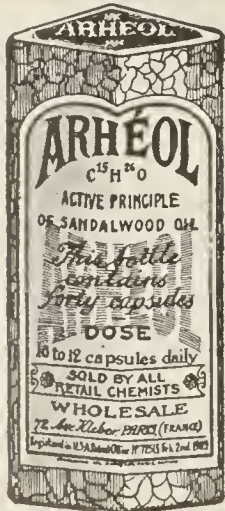
with Signed Certificate by Dr. Faught and copy of Blood Pressure Primer.

G. P. PILLING & SON CO., Philadelphia, Pa.



BUILT LIKE A WATCH

\$27.50 Net



ARHÉOL

(C¹⁵ H²⁶ O)

THE ACTIVE PRINCIPLE OF SANDALWOOD OIL

Used with conspicuous success in

Gonorrhea, Cystitis, Vesical Catarrh, Etc.

DIRECTIONS: 10 to 12 capsules daily

ASTIER LABORATORIES

45, Rue du Docteur Blanche, Paris, France

For samples and literature address

E. FOUGERA & CO.

90 Beekman Street, New York

A Satisfactory Food

should first be easily digested—then easily prepared—clean—safe and wholesome. All the above factors must be considered if the food is to enjoy the confidence of the medical profession.

Gail Borden
EAGLE
 BRAND
 CONDENSED
MILK
 THE ORIGINAL



for nearly sixty years has enjoyed this confidence, which is reflected in the consistently reliable quality of the product.

Samples, Analysis, and Literature will be mailed upon receipt of professional card.

BORDEN'S CONDENSED MILK COMPANY

Est. 1857

"Leaders of Quality"

New York

MADE IN AMERICA

Maltine Malt Soup Extract

—with which the preparation of Malt Soup becomes easy and satisfactory.

Pamphlet reflecting the views of DR. KELLER will be sent to physicians on application.

THE MALTINE COMPANY, Brooklyn, N.Y.

A Stitch In Time— Without Waste



20-inch lengths, plain and chromic, all sizes
A dozen tubes in a box. A Dollar a box

For { Face and Scalp Lacerations
Crushed and Lacerated Fingers
The "extra" suture or ligature for
finishing the major operation

"Van Horn," EMERGENCY CATGUT

Order from Your Dealer,
or Sent, Upon Receipt of Price, by

VAN HORN and SAWTELL
New York, U.S.A. London, England
15-17 E. 40th Street AND 31-33 High Holborn

All the Serological Tests Tissue Examinations Autogenous Vaccines, Etc.

Send for containers and
Instruction Booklet

Moderate Prices

Our names and reputations stand back of our work.

Established 1904

Clinical—Analytical

During the Summer Season we urge the importance of an analysis of well waters and other sources of supply.

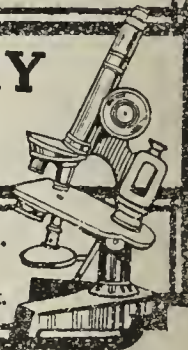
CHICAGO LABORATORY

Phone Rand. 3610 Priv. Exch.

25 E. Washington St.

CHICAGO, ILL.

RALPH W. WEBSTER, M.D., Ph.D., Chemical Dept.
THOMAS L. DAGG, M.D., Pathological Dept.
C. CHURCHILL CROY M.D., Bacteriological Dept.



The Winkley Artificial Limb Co.

LARGEST MANUFACTORY OF ARTIFICIAL LEGS IN THE WORLD

Manufacturers of the
Latest Improved Patent
Adjustable Double Slip
Socket

Artificial Leg with Sponge Rubber FOOT

Mexican Felt or
English Willow

Warranted Not to Chafe the Stump

PERFECT FIT GUARANTEED

From Casts and Measurements
WITHOUT LEAVING HOME

Thousands of our Slip Socket Legs now being worn.
U. S. Government Manufacturers



Both legs amputated five
inches below the knee

This is the Leg that is being recommended and ordered by so many
of the leading physicians and surgeons.

Send for our Large New Illustrated Catalog

MINNEAPOLIS, MINN.,

U. S. A.



This cut
shows leg
for amputa-
tion six in-
ches below
the knee,
with inside
socket
thrown out
of its proper
position in
order to
show its con-
struction.

A PURE SOAP

For 45 Years the Standard of Its Class

The purity, reliability, constant unvarying quality and special properties of **Packer's Tar Soap** have given it unique value for toilet, hygienic or therapeutic use. It is pleasant to use, and is unsurpassed for cleansing purposes.

INGREDIENTS:

PINE TAR — Antiseptic, deodorant, healing, anti-pruritic, tonic.

PURE GLYCERINE — Soothing, Softening and Cleansing.

SWEET VEGETABLE OILS — Emollient, healing.



USES:

For the Toilet and Bath.

In the Nursery.

In Obstetric and Gynecological Practice.

For the Scalp as a Shampoo. Dandruff.

In many Skin Diseases as a preliminary and an adjunct to treatment.

FOR SAMPLES AND LITERATURE, ADDRESS

THE PACKER MFG. CO., 81 and 83 Fulton Street., NEW YORK

In DIARRHEA OF INFANTS

Three recommendations are made —

Stop at once the giving of milk.

Thoroughly clean out the intestinal tract.

Give nourishment composed of food elements capable of being absorbed with minimum digestive effort.

A diet that meets the condition is prepared as follows:

Mellin's Food	-	-	-	4 level tablespoonfuls
Water (boiled, then cooled)	-			16 ounces

(Composition—maltose, dextrins, proteins and alkaline salts)

(Calories per fluidounce=6.2)

Feed small amounts at frequent intervals

It is further suggested:— As soon as the stools lessen in number and improve in character, gradually build up the diet by substituting one ounce of skimmed milk for one ounce of water until the amount of skimmed milk is equal to the quantity of milk usually given for the age of the infant; also that no milk fat be given until the baby has completely recovered.

MELLIN'S FOOD COMPANY,

BOSTON, MASS.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 N. Dearborn St. Chicago, Ill.
Phone, Superior 884. Cable Address "Medic, Chicago"

Subscription prices, per annum in advance, including postage: Domestic, \$5.00; Canadian, \$6.50; Foreign, £1 12s.

Domestic rates include United States, Cuba, Mexico, Hawaii, Guam, Porto Rico, Canal Zone and Philippines.

SINGLE COPIES of this and the previous calendar year, 15 cents; two years old, 20 cents; three years old, 25 cents; in other words, 5 cents additional is charged for each year preceding the last calendar year.

REMITTANCES should be made by check, draft, registered letter, money or express order. *Currency should not be sent unless the letter is registered.* Stamps in amounts under one dollar are acceptable. Make all checks, etc., payable to "AMERICAN MEDICAL ASSOCIATION."

WARNING: Pay no money to an agent unless he presents a letter showing authority for making collection.

CHANGE OF ADDRESS notice should give both old and new address, and state whether change is *permanent or temporary*.

WHEN COMMUNICATIONS concern more than one subject—manuscript, news items, reprints, change of address, payment of subscription, membership, information wanted, etc.—correspondents will confer a favor and will secure more prompt attention if they will write on a separate sheet for each subject.

ADVERTISEMENTS

First advertising forms go to press ten days in advance of the date of issue. In sending in copy time must be allowed for setting up advertisements and for sending proofs. Advertising rates on request.

CONTRIBUTIONS

EXCLUSIVE PUBLICATION: Articles are accepted for publication on condition that they are contributed solely to this journal.

COPYRIGHT: Matter appearing in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION is covered by copyright, but as a general thing, no objection will be made to the reproduction in reputable medical journals of anything in the columns of THE JOURNAL if proper credit be given.

CONTRIBUTIONS TYPEWRITTEN: Contributions should be typewritten—*double-spaced and with ample margins*. The expense is small to the author—the satisfaction is great to the editor and printer. We cannot promise to return unused manuscript, but try to do so in every instance. *Used manuscript is not returned.* Manuscripts should not be rolled.

ILLUSTRATIONS: Half-tones and zinc etchings will be furnished by THE JOURNAL when satisfactory photographs or drawings are supplied by the author. Negatives are not acceptable. Each illustration, table, etc., should bear the author's name on the back. Photographs should be clear and distinct; drawings should be made in black ink on white paper. Used photographs and drawings are returned after the article is published.

ANONYMOUS CONTRIBUTIONS, whether for publication, for information, or in the way of criticism, are consigned to the waste-basket.

NEWS: Our readers are requested to send in items of news, also *marked* copies of newspapers containing matters of interest to physicians. We shall be glad to know the name of the sender in every instance.

PRICE LIST

A price list describing the various publications of the Association, for example: Quarterly Cumulative Index to Current Medical Literature, American Medical Directory, Handbook of Therapy, Laws Regulating Practice, New and Nonofficial Remedies, Nostrums and Quackery, Pamphlets on Defense of Research, Great American Fraud, Propaganda for Reform in Proprietary Medicines, Pamphlets on Medical Fakes and Fakers, will be sent on request.

AMERICAN MEDICAL ASSOCIATION,
535 N. DEARBORN STREET, CHICAGO

ARMY - NAVY AND STATE BOARD QUIZ

During the war this quiz will be conducted by mail. For particulars address

H. LYONS HUNT, M.D., L. R. C. S. Edin.
Captain, M. R. C., U. S. Army

140 W. 71st Street NEW YORK CITY

Courses in Anatomy, Pathology, Diseases, Treatment, and Operative Surgery of the

EAR, NOSE and THROAT

Classes Limited. Courses begin

Nov. 5, 1917—Jan. 7—Mar. 14, 1918

For information address

ALBERT H. ANDREWS, M.D., 32 N. State St., Chicago

SCHOOL of PATHOLOGY and OPERATIVE SURGERY

Gives special courses in Individual Instruction, in General Surgery, Gynecology, Genito-Urinary, Ear, Nose and Throat, Brain and Bone Surgery on the Cadaver.

For information address

John McAllister, M.D., 43 W. 48th St., New York City

Operative Surgery

Special course in general surgery, operative technique and gynecologic surgery given to physicians. Enrolment limited to THREE.

First assistantship. No cadaver or dog-work.

For particulars address,

DR. MAX THOREK

AMERICAN HOSPITAL, 846-856 Irving Park Boulevard, CHICAGO

Practical and Theoretical Courses in EAR, NOSE AND THROAT

Anatomy, Surgery on the cadaver and the living, Functional testing and Histopathology. For information address

Dr. Julius Auerbach, Dr. Sigmund A. Agatston

120 W. 86th Street New York City

W. A. FISHER, M.D., Pres., A. G. WHIPPERN, M.D., V-Pres.

Chicago Eye, Ear, Nose and Throat College Post-Graduate Instruction

Diseases of the Eye, Ear, Nose and Throat, and Fitting of Glasses.

A House Physician is appointed in June and December. Open the year round. Write for announcement to

J. R. HOFFMAN, M.D., Sec'y, 235 W. Washington St., CHICAGO

OPHTHALMOLOGY

Special Courses given in the Anatomy, Physiology, Pathology and Diseases of the Eye and its Appendages. Also in Ophthalmoscopy, Refraction and Ophthalmic Surgery Instruction is didactic, clinical and on animals and cadaver. Classes limited. Write,

T. J. Williams, M.D., F.R.C.S., Edin.

30 N. Michigan Blvd. - - Chicago

The Army
Needs You!

Prepare Now
for Army, Navy, Government and State Board Examinations.

Good positions for doctors in all branches of the Government Service. Prepares physicians to pass the necessary Medical, Surgical, Government and State Board Requirements. Write for Mail Quiz particulars and Free Booklet. Address:

Fomon Medical Review Course, 11 N. Ashland Ave., Chicago

WASSERMANN TEST \$5.00

(Including Noguchi Control Test)

Expert work and prompt reports assured

Reports telegraphed without extra charge. Fee list and containers mailed on request.

PACIFIC WASSERMANN LABORATORIES

San Francisco, Cal., Pacific Bldg.
Los Angeles, Cal., Hollingsworth Bldg.
Oakland, Cal., Physicians' Bldg.
Seattle, Wash., Green Bldg.

Business Opportunities

Advertisements under the following headings cost \$1.50 for 30 words or less, additional words 5c each. This rate applies for each insertion.

WANTED	Partner	Sanitaria
Apparatus	Partnership	Drug Stores
Assistant	Situation	Locations for Sanit.
Books	FOR SALE	FOR RENT
Intern	Apparatus	EXCHANGE
Location	Practice	MISCELLANEOUS
Locum Tenens		

RESULTS are better when an advertisement receives several consecutive insertions, and to those who remit \$6 (\$6.25 if answers are to be sent through this office) for four insertions of a 30-word advertisement we will give, *free, two more insertions* provided the first four do not consummate a deal.

NOTICE FOR FREE INSERTIONS.—Two free insertions are given advertisers who have not closed a deal after four consecutive insertions. We cannot permit advertisers to order six insertions in advance unless six times the one time rate is paid. Notice for free insertions must be received after the fourth appearance of the advt. and within two weeks following.

COUNTING WORDS.—Two initials, each abbreviation, figures consisting of five numerals or less are counted as separate words. Headings, and name and address are part of advertisement. When answers are sent % AMA—the key, "Add-%AMA" is considered four words. Count words carefully. Write your copy plainly.

For the following classifications the rate is \$1.60 for 20 words or less—additional words 8c each. This rate applies for each insertion. No gratuitous insertions given under these headings.

Abstracting	Medical Brokers	Med. Illustrators
Automobiles	Educational	Vacation Trips
Auto accessories	Publishers	Typewriters
Carriages	Tr. Sch. for Nurses	Printers
Collections	Nurses Wanted	Salesmen
	Miscellaneous Commercial Advt.	

SPECIAL NOTE—A fee of 25c. is charged advertisers who have answers sent % A.M.A. No information can be furnished on keyed advertisements. Do not wire or write us for an address; mail your letter placing key number on envelope and it will be promptly forwarded.

Classified Ads. are payable in advance. To avoid delay in publishing remit with order

OVER 50% of the classified ads are keyed, answers being sent in care of The Journal; each week we transmit to advertisers over 500 replies.

Occasionally we receive notification from one who has answered an advertisement stating that he has had no reply and asking if his letter was transmitted. Letters sent in our care are forwarded promptly, but naturally we cannot compel an advertiser to answer all replies he receives.

It is advisable to send copies instead of original references

For current issue, ad must reach us by 4:30 p. m. Monday

Journal A.M.A., 535 N. Dearborn St., CHICAGO

N. B.—We exclude from our columns all known questionable ads. and appreciate notification from our readers relative to any misrepresentation.

APPOINTMENTS

WANTED — THE INSTRUCTORSHIP (full time) in the Department of Pediatrics and Contagious Diseases of the University of Iowa is vacant (previous incumbent drafted); good clinical, research and teaching opportunities; new contagious hospital opens soon; excellent opportunity for a trained man; salary, \$1,100. Add. Dr. A. H. Beifield, University Hospital, Iowa City, Iowa. A

THE POSITION OF FULL-TIME HEALTH officer for the district comprising Warwick and Elizabeth City counties has been created and those qualified are invited to apply for the position; salary \$3,000 and an allowance for expenses. Add. Surg. S. B. Grubbs, U. S. Public Health Service, Newport News, Va.

ASSISTANTS WANTED

WANTED — PHYSICIAN TO ASSIST IN eye, ear, nose and throat practice in western Pennsylvania; must be able to do all head operations. Add. 2900 B, % AMA.

WANTED—AT THE NEWBERRY STATE Hospital, Newberry, Mich., two assistant physicians, male, single. For particulars add. the Medical Superintendent, Newberry, Mich. B

WANTED — ASSISTANT PHYSICIAN AT Milwaukee Hospital for Insane; \$1,200 a year and maintenance. Add. Superintendent, Milwaukee Hospital for Insane, Wauwatosa, Wis.

(Continued on next page)

(Continued from preceding page)

WANTED — SECRETARIAL AND TECHNICAL — nical assistant in office of ophthalmologist and otolaryngologist in northern Illinois; preference given to woman with some training in nursing, fitting of spectacle mountings, laboratory technique and typewriting; but consideration will be given to one having proper foundation with a disposition to learn; describe general education, training, personal data, salary, etc. Add. 2986 B, % AMA.

WANTED — ASSISTANT PHYSICIAN (man) at Central Indiana Hospital for Insane; applicant must be single and have had at least one year of general hospital experience; preference will be given to those who desire to devote their time to a study of mental and nervous diseases; in writing state age, height and weight. For particulars add. the Superintendent, Dr. George F. Edenharter, Indianapolis, Ind. B

WANTED—ASSISTANT — IN PRIVATE sanatorium or rest cure, who is qualified by experience and training to take entire charge during temporary absences of head physician; the rest cure is beautifully located and the position permanent to the right man; salary commensurate with ability of applicant. Please correspond with T. Smith Pitt, Wells Depot, Maine. B

WANTED—UNMARRIED MAN AS ASSISTANT and intern in office and private hospital in middle west; practice limited to eye, ear, nose and throat; \$75 per month, board and room; in first letter state age, church, nationality, preliminary training, medical school, hospital or any special training and send photo. Add. 2954 B, % AMA.

WANTED—A BIOCHEMIST, ONE WHO is an M.D. preferred, to take charge of the biochemical department of the laboratory of a large hospital; research work encouraged; salary \$4,000; none but A1 parties need apply; give qualifications in first letter. Add. 2964 B, % AMA.

WANTED—ASSISTANT IN GOOD MIN- ing town contract practice; single man preferred; \$160 and room; give age, school, date of graduation, hospital and other experience and references. Add. Dr. M. F. Hayes, Nashwauk, Minn. B

WANTED — ASSISTANT IN GENERAL practice and sanitarium in village within 50 miles of New York; excellent opening for first-class man who wants permanent location; salary; single man preferred; state references in first letter. Add. 2957 B, % AMA.

WANTED — ASSISTANT PHYSICIAN IN private sanatorium for nervous and mental diseases and chronic cases; located in the South; must be single and able to do laboratory work; opportunity for advancement. Add. 2978 B, % AMA.

WANTED — ASSISTANT PHYSICIANS, men and women, in medical offices of Cornell University; graduates of Class A colleges; references required. Add. Dr. S. A. Munford, Cornell University, Ithaca, N. Y. B

WANTED — ASSISTANT IN CONTRACT, mining and railroad practice in Minnesota; good salary and opportunities to right man; must be willing and anxious to work; state age, experience, etc. Add. 2983 B, % AMA.

WANTED — ASSISTANT TO GENERAL surgeon, located in southern North Dakota; state qualifications, references, nationality, religion and salary expected in first letter. Add. 2871 B, % AMA.

WANTED — A FIRST-CLASS PHYSICIAN willing to work in large contract practice, small hospital in connection; salary \$125 per month and maintenance; must be registered in Pennsylvania. Add. 2919 B, % AMA.

WANTED—DOCTOR ASSISTANT — PRI- vate hospital and general practice; \$100 per month; increase and partnership later; needed at once. Add. 2969 B, % AMA.

WANTED — ASSISTANT IN PRIVATE hospital; must be competent to do ordinary laboratory work and not subject to conscription for the army; good salary to right man. Add. M. J. Kenefick, Algona, Iowa. B

WANTED — HOUSEKEEPER FOR NEW hospital, 100 beds; must be experienced in handling help, buying and cleaning; dietitian employed. Add. 2860 B, % AMA.

(Continued on next page)

Tonics and Sedatives

*Many are called but few have four
aces.*

—o—

A WAR GIFT

A "Tommy," lying in a hospital, had beside him a watch of curious and foreign design. The attending doctor was interested.

"Where did your watch come from?" he asked.

"A German give it to me," he answered. A little piqued, the doctor inquired how the foe had come to convey this token of esteem and affection.

"E 'ad to," was the laconic reply.—*Toronto Globe.*

—o—

IN GLASGOW

The customer was paying the merchant an account and handed over a wad of twenty \$5 bills.

Carefully the merchant placed the notes on the counter, and wetting the tip of his finger, he counted them one by one.

"I noticed," remarked the customer, smilingly, after the merchant had placed the wad in his inside pocket, "that you didn't 'flick' up the last one."

"No," was the canny reply, "I dinna dae more than look at the last one. That's guid enough for me without touchin' it; there might be anither underneath it."

—o—

His Ad in the Telephone Book

A. F. UPTON, M.D.
Sanitarium

Thirty-Six Years of Experience.

Children's diseases are not in my way. I have lost four cases of typhoid fever in life, and three cases of pneumonia, never lost a case of flux or croup in my life and cancers cured. Inflammatory and granulated sore eyes, neuralgia of any nature, rheumatism.

Everything from toothache to meningitis; don't take some one else's word on what I can do, but get me and let me show you what I can do by giving me a fair show and my directions strictly followed. The last case I lost of bowel trouble from teething was about twenty years ago.

A. F. UPTON, M.D.

SANITARIUM

Coleman, Texas, Phone No. 443

—Coleman (Texas) Telephone Book.

—o—

A LOGICAL CONCLUSION

"Sedentary work," said the lecturer on physical torture, "tends to lessen the endurance."

"In other words," butted in the smart aleck, "the more one sits the less one can stand."

"Exactly," retorted the lecturer, "and if one lies a great deal one's standing is lost completely."—*Judge.*

—o—

HISTORICAL COMMENT

Vice President Marshall, at a luncheon at Atlantic City, was condemning the kaiser.

"From the time he mounted the throne," he said, "from the time he ousted Bismarck and imprisoned his own mother in a castle, he showed what a dangerous bully he was."

"His memory in history will be like the memory of that other Bill, an East Side one, to whose widow a neighbor said:

"So Bill's dead."

"Yes, he's dead."

"I suppose he's hittin' the harp with the angels now."

"More likely," said the widow, "he's hittin' the angels with the harp."—*Chicago Herald.*

(Continued on next page)

Physicians use the Consulting Laboratory

in difficult diagnosis. It is of utmost importance that your specimens be examined by technicians of scientific standing and with complete laboratory equipment and wide experience.

The director of this laboratory, R. B. H. Gradwohl, M.D., assists physicians in any way possible in the interpretation of micro-chemical findings.

We make every test of merit

On every Wassermann Specimen we do the **Hecht-Gradwohl Test**; (no additional charge).

New Blood Chemical Tests which have proven so valuable in nephritis, diabetes mellitus, gout and rheumatism.

Pasteur Treatment by Mail. Course of eighteen treatments by special delivery mail daily.

Write for literature on any phase of our work. Slides, Containers, Fee List, etc., sent free.

GRADWOHL

BIOLOGICAL LABORATORIES

926 N. Grand Avenue

ST. LOUIS, MO.

R. B. H. GRADWOHL, M.D., Director

Wassermann Laboratory

2159 Madison St., CHICAGO

Alcoholic Luetic Liver Extract and Amboceptors furnished. Wassermann Test, Auto-genous Vaccines, Pathological Specimens examined. Intravenous Gravity Outfit.

GUINEA PIGS FOR SALE

Free Instructions how to do the Wassermann Test.

THE MEDICAL RESEARCH LABORATORIES

BENJAMIN GRUSEKIN, M.D., DIRECTOR

RELIABLE WASSERMANN

—AND—

AUTOGENOUS VACCINES

MARSHALL FIELD ANNEX BLDG., SUITE 800-44

PHONE: RAND. 3848

25 E. WASHINGTON ST.

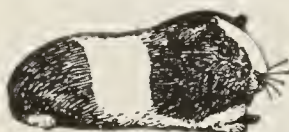
CHICAGO

NURSES FURNISHED PROMPTLY

Superintendents of Nurses and Hospitals, Surgical Nurses and Supervising Nurses, furnished hospitals anywhere in United States promptly. If you need a nurse in any department of your hospital we can put you in touch with them. Prompt reliable service rendered hospitals without charge. Write or wire.

AZNOE'S CENTRAL REGISTRY FOR NURSES
3624 Grand Boulevard, Chicago, Illinois.

GUINEA PIGS



We supply healthy stock for laboratory use on yearly contracts or small lots. Prices quoted f.o.b. destination. Safe arrival guaranteed.

J. E. HOAG & SON, Springport, Mich.

LABELS AND STATIONERY

OUR STYLES ARE ORIGINAL

Many of our customers have dealt with us for 12 years. There's a reason. JACOBUS PRINTING COMPANY 1627 Madison St. CHICAGO. Send for Catalogs Now

CALCREOSE

Accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies.

The therapeutic value of creosote is well known and has long been recognized. Its use has been neglected largely because of the difficulties of administration.

Calcreose, a chemical combination of creosote and calcium (contains 50% creosote) overcomes many of the objections.

Calcreose is of value in the treatment of bronchitis, especially the bronchitis associated with pulmonary tuberculosis, and in gastro-intestinal infections.

As high as 120 grains of Calcreose has been given daily without digestive disturbance.

Formulae and Price List

Calcreose Powder. A reddish brown powder, containing 50 per cent. creosote in combination with calcium.

Per pound, \$3.00

Calcreose Tablets. coated brown 4 grs. 100, 35c.; 500 \$1.55; 1000, \$3.00.

Calcreose is carried in stock by wholesale druggists; also supplied to physicians direct. We ship charges prepaid. Literature and samples free to physicians.

THE MALTBY CHEMICAL CO.
PHARMACEUTICAL CHEMISTS
NEWARK NEW JERSEY

TONICS AND SEDATIVES

(Continued from preceding page)

IT HAPPENED IN DUBLIN

"Well, Patrick," asked the doctor, "how do you feel today?"

"Och, Doctor, dear, I enjoy very poor health intirely. The rheumatics are very distressin', indade; when I go to slape I lay awake all night, an' my toes is swelled as big as a goose hen's egg; so whin I sthand up I fall down immajit."

—O—

A New Obstetrical Route

BUTTS—At Pine Lodge, Chungking, West China, to Mr. V. R. and Mrs. Butts (nee Ethel I. McCartney), a son. (Sent by cable.) —Toronto Globe.

—O—

THE FACTS IN THE CASE

Conscript—I am the widow's only son—Draft Board Chairman—Sorry, but we can't exempt you unless—

Conscript—Who said anything about exempting me? I'm telling you that with me out of the way maybe mother will land him.—Judge.

—O—

THE HEIGHT OF DELIRIUM

Physician (to Mrs. Colonel Blood of Kentucky)—How did your husband pass the night, Mrs. Blood?

Mrs. Blood—He seemed quite comfortable, sir, and asked for water several times.

Physician (with grave look)—H'm—still flighty.

—O—

Suggestion to Medical Reserve Officers.

Make it an invariable rule to call promptly upon new arrivals in the post, and also return promptly all calls made upon you.—Bulletin V.—Army Service Schools.

In the training camp everyone greets a new arrival like this: "Hey, doc! Where's your sword, doc? Why the spurs, doc?"

—O—

BEWARE OF CARELESSNESS

A Cincinnati man employed two negroes to work in his rather extensive gardens, which he personally oversees. One morning Sam did not appear.

"Where is Sam, George?" he asked.

"In de hospital, sah."

"In the hospital? Why, how in the world did that happen?"

"Well, Sam, he been a-tellin' me ev'y mo'nin' for ten years he gwine to lick his wife 'cause o' her naggin'."

"Well, yestiddy she done ovahheah him. Da's all."

—O—

EXPERIENCE IS A DEAR TEACHER

Gentleman—Why don't you get out and hustle? Hard work never killed anybody.

Rastus—You're mistaken dere, boss. I'se lost fowh wives dat way.—Boston Transcript.

—O—

How Sweet They Must Have Looked

The largest flag carried in the parade was that of the new government department, the food administration. It was held by about 30 young men from the department in the new uniform planned for the housewives who become members of the association.—Washington Post.

—O—

TERRIBLE PUNISHMENT

"Where are my tennis things?" demanded the wife of the professional humorist.

"Look in the nursery. You will generally find a racket and bawl there," replied the professional humorist, making a note on his cuff.—Town Topics.

(Continued on page 24)

(Continued from preceding page)

WANTED—\$150 PER MONTH FOR CAPABLE physician for contract practice, northern Minnesota; we furnish surgical instruments, dressings, drugs and auto transportation; position now open for right man; give full details first letter as to age, school, hospital experience, nationality, religion and when you could report for duty. Add. 2902 B, % AMA.

WANTED—ASSISTANT RESIDENT PHYSICIAN at state tuberculosis sanatorium in middle west; must be experienced in tuberculosis work; salary \$100 per month with maintenance. Add. 2913 B, % AMA.

WANTED — COMPETENT EAR, NOSE and throat man; state qualifications and give references first letter; cash salary, \$5,000 first year. Add. 2822 B, % AMA.

WANTED — EYE, EAR, NOSE, THROAT specialist as assistant; must be graduate A+ school and be competent in all lines special work. Add. 2823 B, % AMA.

PHYSICIANS WANTED

WANTED — PHYSICIANS INTERESTED in industrial work for a big coke and coal operation; collieries modern; associated with hospital; office, drugs and supplies furnished; want mature men with experience and good training; excellent opportunity for the right men; must have license in Virginia or able to get reciprocity; state age, married or single, experience and personal description in first letter. Add. 2974 C, % AMA.

WANTED — PHYSICIAN TO TAKE charge of x-ray and electrotherapeutic department of large office; also wanted a pathologist and bacteriologist to take charge of laboratory; must be competent men, not subject to draft. Add. Room 414, Dugan-Stuart Bldg., Hot Springs, Ark. Send photo and write with pen. C

WANTED — RESIDENT PHYSICIAN AT the Connecticut State Sanatoria; single men with some sanatorium experience preferred, but any young physicians with satisfactory references and interested in tuberculosis eligible; splendid opportunities for the right men. Add., giving references, State Tuberculosis Commission, The Capitol, Hartford, Conn. C

WANTED—AT ONCE — PHYSICIAN TO replace one leaving for front; nothing to buy but small drug stock; \$4,000 business; option on buying later if desired; good town of 900; modern office; 25 miles from Indianapolis; write quick or come and investigate. Dr. Royer, North Salem, Ind. C

WANTED—PHYSICIAN FOR \$5,000 PRACTICE in Washington; no physician closer than 18 miles; rich wheat country; collections fine; nothing to buy, but will sell office equipment if desired. Add. J. C. Brugman, M.D., Edwall, Wash. C

WANTED — PHYSICIAN TO TAKE GENERAL practice of \$5,000; town 600; nothing for sale; may lease office; collections 98 per cent.; good community and good roads; possession October 1. Add. E. G. McKeown, M.D., Edgerton, Minn. C

WANTED — WOMAN PHYSICIAN TO take good practice held by woman for 30 years; large town in New Jersey; near New York; exceptional opportunity if taken at once. Add. 2819 C, % AMA.

WANTED — WOMAN PHYSICIAN TO take practice Indiana large city; office well located; rent \$10 monthly; no opposition; exceptional opportunity; only \$300 required; buys everything. Add. 2939 C, % AMA.

WANTED — HOUSE PHYSICIAN FOR modern, thoroughly equipped medical, surgical and maternity hospital of 150 beds; active service; nominal salary offered. Add. 2837 C, % AMA.

WANTED — A PHYSICIAN TO ASSUME a very desirable contract practice with a large lumber company in West Virginia. Add. 2959 C, % AMA.

WANTED—WOMAN PHYSICIAN FOR POSITION in a large hospital for the insane in the middle west. Add. 2975 C, % AMA.

GENTLEMEN—THE RESPONSES TO ADVERTISEMENT — have been so numerous that it is a burden to open the letters. Please make no more insertions of the adv. in your columns, as enough men have already applied to supply an army division. Yours truly,

(Continued on page 24)



PROPERTIES consist of 30 buildings—accommodations for 1,200 patients—20 acres of beautiful shady lawns—model dairy—extensive farm and greenhouse systems—pure artesian water supply—large staff of specializing physicians, nurses, dietitians, physical directors and general assistants—wholesome, nutritious bill of fare—thoroughgoing diagnostic methods—complete, modern therapeutic equipment—splendid facilities for outdoor recreation.

THE BATTLE CREEK SANITARIUM

Box 250, Battle Creek, Michigan

CHRONIC ULCERS OF THE LEGS

Dressed with

DOLOMOL-ICHTHYOL 10%

(See "New and Nonofficial Remedies,"
Page 101; 1917 Edition)

**DR. O. F. BLANKINGSHIP, of the
Medical Society of Virginia,
says:**

"I prefer the Ichthyol in a dry form; healing is more rapid than with ointments. Under this treatment there is usually a complete cure in from four to six weeks."
—*Mobile Med. & Surg. Jour.*

SAMPLES ON REQUEST

PULVOLA CHEMICAL CO., Inc.
114 Linden Ave. Jersey City, N. J.

APINOL

A pine oil surgical dressing having the endorsement of many well known physicians and surgeons.

Physicians' samples furnished on request.

WHITE CHEMICAL COMPANY
Wilmington, N. C.

GENERATE YOUR OWN OXYGEN

To have it when you need it
and in the most effective form.



The AUTOGENOR

A portable outfit, generates pure oxygen instantly as fast as consumed at cost of 2½ cents per gal. without loss by leak or spoilation.

The FOREGGER CO., Inc.
Aeolian Hall, 42nd St., New York

TONICS AND SEDATIVES

(Continued from page 22)

A GOOD STORY EVEN IF IT ISN'T TRUE

It was at one of the new army cantonments. A new recruit passed a second lieutenant, but failed to salute. The second lieutenant wheeled and said:

"You, there, halt! Don't you know enough to salute an officer?"

The rookie gazed at him dumbly at a loss for a satisfactory explanation.

"Now, you stand there and salute me fifty times," ordered the lieutenant.

The rookie obeyed. A major, coming up, stopped to watch the performance to its completion. At its end, he said:

"What's this?"

The lieutenant explained.

"Don't you know that an officer must return the salute of a private?" inquired the major. "Return the fifty."

The second lieutenant did.

THE TRUTH OF THE MATTER

Boob—Most things that are bought go to the buyer.

Simp—Yeah, all except coal, and that goes to the cellar.—*Awgwan.*

Optimism

"The rain it poured,
The sea it roared,
The sky was draped in black.

"The old ship rolled,
She pitched and bowed
And lost her chartered track!

"Oh, dear! Will it clear?"
Loud wailed a dame on deck.
As they heaved the lead,
The skipper said,
'Well, it always has, by heck!'"

AN HONEST ESTIMATE

It was on the morning of St. Patrick's day the farmer thought he would treat his servant boy, so he gave him a very big glass of whisky. The farmer's wife thought that she would treat him also, but she gave it to him in a very small glass. He looked at it and asked:

"Ma'am, how are those glasses made?"
"Oh, you know, these glasses are all blown."
"Well," said the servant, "whoever blew that one must have been very short of breath."
—*Baltimore Sun.*

NO ADVANCE

Neighbor—I understand that your son got his B.A. and his M.A.

Father—Yes, but it is still his P. A. that supports him.—*Judge.*

HEREDITY

Vincent was altogether too garrulous in school to please his teachers. Such punishments as the institution allowed to be meted out were without any apparent effect upon the boy, until at last the head master decided to mention the lad's fault upon his monthly report.

So the next report to his father had these words:

"Vincent talks a great deal."

Back came the report by mail duly signed, but with this written in red ink under the comment: "You ought to hear his mother."

SOLVING THE WORLD'S PROBLEM

Professor—"Pat, what is your solution to the world problem?"

Pat—"Well, sor, I think we should have a world democracy—with an Irishman for king!"

"SPURLOS VERSENKT"

(Continued from page 22)

INTERNS WANTED

WANTED—INTERN—UNION HOSPITAL, Fall River, Mass.; 130 beds, with large outpatient department; 18 months' mixed service in 6-month periods; salary, \$20, \$30, \$50 per month each period. Add. for further information, Dr. Geo. L. Richards, 124 Franklin St., Fall River, Mass. D

WANTED—INTERN AT THRALL HOSPITAL, Middletown, N. Y.; service one year, to begin October 1; 40 beds; medical, surgical and obstetrical cases; salary \$25 per month, room, board and laundry furnished; address with stamped envelope for reply. Theo. D. Mills, President Medical Board, Middletown, N. Y.

WANTED — NATCHEZ HOSPITAL, Natchez, Miss.; four interns who are graduates of A+ college, to serve as interns for a year; services to start at once; hospital offers excellent work on the medical and surgical services. Add. all correspondence to the Surgeon in Charge, Natchez Hospital, Natchez, Miss. D

WANTED—FOUR INTERNS—HOSPITAL, 300 beds; graduates or nongraduates; good service; medical, surgical, gynecology, obstetrics and laboratory; fine opportunity for men willing to work. Add. Dr. Chas. E. Rew, Superintendent, Shreveport Charity Hospital, Shreveport, La. D

WANTED — TWO INTERNS AT ONCE— Bayonne General Hospital; city 75,000; large dispensary; good surgical, medical and special services; many accident cases; \$35 monthly, board, room, laundry; one year term. Dr. S. R. Woodruff, Bayonne, N. J. D

WANTED — INTERN AT ST. JOSEPH'S Hospital for Consumptives, New York City, until January, 1918; 500 beds; salary, \$40 per month and maintenance. Add. Dr. F. H. Dillingham, 500 West End Ave., New York City. D

WANTED — WOMAN INTERN—40-BED tuberculosis hospital; term of service one year; salary \$50 per month and maintenance. Send full information and references to Vanderbilt Anti-Tuberculosis Society, Evansville, Ind. D

WANTED — INTERN FOR ONE YEAR'S service in a 125-bed railroad hospital; services to begin at once; salary \$300 per year with maintenance. Add. 2951 D, % AMA.

LOCUM TENENS WANTED

WANTED—PHYSICIAN — FOR LOCUM tenens for year or so; can buy location, equipment, etc., later if desired; unopposed and in fine locality in western Iowa; very large practice; general and some surgery; population 500; equipment, also residence, if desired; fine town; two trunk railroads; want physician not subject to draft; good fees; nothing to buy; snap. Add. 1339, % F. V. Kniest, Omaha, Neb. F

WANTED — CAPABLE PHYSICIAN FOR \$5,000 practice; town of 500; no competition; waterworks, electric lights; only M.D. in west half county; for time of war or will sell reasonable. Dr. H. L. Saylor, Cogswell, N. D. F

PARTNERS WANTED

WANTED—A PARTNER FOR AN EYE, ear, nose and throat practice in a midwest city of 35,000, Wisconsin; cash practice, \$14,000; prefer a man under 35; must be morally clean; no bad habits; would consider a man desirous of taking up specialty; state full particulars in first letter. Add. 2976 G, % AMA.

PARTNERSHIP WANTED

WANTED—PHYSICIAN AND SURGEON of exceptional ability and high standing in his community desires to make change; would like to buy partnership with high class ethical physician and surgeon who has big following; would consider corporation, industrial or railroad contracts; excellent references. Add. 2993 H, % AMA.

GENTLEMEN — KINDLY DISCONTINUE our advertisement No. — N, as we have already had more letters than we have had time to answer. Thanking you for your promptness, Yours truly,

(Continued on next page)

(Continued from preceding page)

WANTED—GENERAL SURGEON OF UN-questionable character and ability desires to become associated with physician or group of physicians of high standard who control great amount of surgery; would consider partnership with first-class man; also railroad or corporation work; 10 years' hospital experience in large Chicago hospital; A1 references given and required. Add. 2994 H, % AMA.

NURSES WANTED

WANTED—SUPERINTENDENT OF nurses, new Greenwich Hospital of 100 beds; salary from \$100 to \$120, according to experience; personal interview necessary; this position to be filled October 15. Apply to Superintendent, Greenwich Hospital, Milbank Ave., Greenwich, Conn. T

WANTED—AN EXPERIENCED RADIOG-rapher, nurse preferred; one capable of operating machine, interpreting plates and giving treatments; when answering, give full details, including age, experience, credentials and salary expected. Add. 2962 T, % AMA.

WANTED—A FIRST-CLASS MALE NURSE or orderly for a small up-to-date surgical hospital; none but an A1 man need apply; good wages; references required. Add. Morgan Park Hospital, Duluth, Minn. T

NURSES FURNISHED—ANY KIND WORK or any state. Excellent service. Wire or write F. V. Kniest, Bee Bldg., Omaha, Neb. T

ATTENDANTS, COMPANIONS, Etc.

ATTENDANTS, ASSISTANTS, COMPAN-ions, etc. (either sex), furnished for patients, sane, insane, convalescent, located or traveling, etc. For any and all kind cases, patients, etc.; also any kind institutional employees furnished. F. V. Kniest, R. P., Medical Broker, Bee Bldg., Omaha, Neb.

LOCATIONS WANTED

WANTED — AN EYE, EAR, NOSE AND throat location; well equipped and qualified; consider partnership; some money. Add. 2876 E, % AMA.

WANTED—UNOPPOSED GENERAL PRA-ctice in southern California; beach town or decidedly low elevation not desired; write full particulars. Add. 2987 E, % AMA.

WANTED—PRACTICE—EITHER IN IOWA or Nebraska; general practice wanted where investment is not large; ready to locate immediately. Add., with full particulars first letter, 1318, % F. V. Kniest, Omaha, Neb. E

WANTED — PRACTICE OR ASSISTANT-ship in Virginia by graduate of Class A school; ten years' experience in general practice; will consider either town or country; ethical, with best of reference. Add. 2972 E, % AMA.

WANTED — LOCATION — IN GENERAL practice village or town under 5,000; competition must be right; or will consider assistantship to busy practitioner; married, aged 36; references; give full details in first letter. Add. 2653 E, % AMA.

WANTED — WISCONSIN OR ADJACENT state; practice, partnership or assistantship; well qualified in private and hospital work; A.B., A.M., Princeton; M.D., University of Pa., 1907; if private practice prefer city 5,000 to 20,000; desire immediate arrangement; send full particulars. Add. 2966 E, % AMA.

SITUATIONS WANTED

WANTED—RESPONSIBLE POSITION IN state hospital for insane or in sanitarium exclusively devoted to treatment of nervous and mental diseases, by physician of long experience institutional work; unmarried, therefore can give undivided attention to work. Add. 2910 I, % AMA.

WANTED—POSITION IN PRIVATE OR public institution for insane by male physician, aged 31, single, sober and reliable; three years' experience; minimum salary, \$100 and maintenance. Add. 2937 I, % AMA.

WANTED — POSITION—INSTITUTIONAL preferred; married; middle-aged; no children; have had large sanitarium and hospital experience as medical superintendent. Add. 2793 I, % AMA.

(Continued on next page)

Books Received

Books received are acknowledged in this column, and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender. Selections will be made for review in the interests of our readers and as space permits.

DISEASES OF THE CHEST AND THE PRINCIPLES OF PHYSICAL DIAGNOSIS. By George William Norris, A.B., M.D., Assistant Professor of Medicine in the University of Pennsylvania, and Henry R. M. Landis, A.B., M.D., Assistant Professor of Medicine in the University of Pennsylvania. With a Chapter on the Electrocardiograph in Heart Disease by Edward B. Krumbhaar, Ph.D., M.D., Assistant Professor of Research Medicine in the University of Pennsylvania. Cloth. Price, \$7 net. Pp. 782, with 413 illustrations. Philadelphia: W. B. Saunders Company, 1917.

HYGIENE AND PUBLIC HEALTH. By Louis C. Parkes, M.D., D.P.H., Consulting Sanitary Adviser to H. M. Office of Works, and Henry R. Kenwood, M.B., F.R.S., D.P.H., Chadwick Professor of Hygiene in University of London. Sixth edition. Cloth. Price, \$4 net. Pp. 787, with 89 illustrations. Philadelphia: P. Blakiston's Son & Co., 1917.

AN EPITOME OF MENTAL DISORDERS. A Practical Guide to Aetiology, Diagnosis and Treatment for Practitioners, Asylum, and R. A. M. C. Medical Officers. By E. Fryer Ballard, M.B., B.S., Captain R. A. M. C. (T.). Cloth. Price, \$2.25 net. Pp. 211. Philadelphia: P. Blakiston's Son & Co, 1917.

A TEXT-BOOK OF MATERIA MEDICA FOR NURSES, INCLUDING THERAPEUTICS AND TOXICOLOGY. By George P. Paul, M.D., C.P.H., State Director, International Health Board, Rockefeller Foundation. Third Edition. Cloth. Price, \$1.50 net. Pp. 295. Philadelphia: W. B. Saunders Company, 1917.

L'EXPLORATION RADIOLOGIQUE DES VOIES URINAIRES: LITHIASES ET PROJECTILES DE GUERRE. Par le Dr. Arcelin, Chief de service de radiologie a l'Hôpital Saint-Joseph et a l'Hôpital Saint-Luc. Paper. Price, 6 francs. Pp. 175, with 129 illustrations. Paris: Masson et Cie, 1917.

LE PALUDISME MACÉDONIEN, CARACTÈRES CLINIQUES ET HÉMATOLOGIQUES, PRINCIPES DE THÉRAPEUTIQUE. Par P. Armand-Delille, G. Paiseau, P. Abrami et Henri Lemaire. Préface du Pr. Laveran. Paper. Price, 4 francs. Pp. 111, with 15 illustrations. Paris: Masson et Cie, 1917.

OTITES ET SURDITÉS DE GUERRE, DIAGNOSTIC, TRAITEMENT, EXPERTISES. Par H. Bourgeois, Oto-rhino-laryngologistes des hôpitals de Paris, et M. Sourdille. Préface du Médecin-Inspecteur Toubert. Paper. Price, 4 francs. Pp. 188, with 31 illustrations. Paris: Masson et Cie, 1917.

THE CONVERSION OF HAMILTON WHEELER. A Novelette of Religion and Love Introducing Studies in Religious Psychology and Pathology. By Prescott Locke. Cloth. Price, \$1.25 net. Pp. 285. Bloomington, Ill.; Pandect Publishing Company, 1917.

THE TREATMENT OF WAR WOUNDS. By W. W. Keen, M.D., LL.D., Emeritus Professor of Surgery, Jefferson Medical College, Philadelphia. Cloth. Price, \$1.75 net. Pp. 169, with 22 illustrations. Philadelphia: W. B. Saunders Company, 1917.

A TEXTBOOK OF ANATOMY FOR NURSES. By William Gay Christian, M.D., Professor of Anatomy, Medical College of Virginia, Richmond. Cloth. Price, \$1.75. Pp. 222, with 34 illustrations. St. Louis: C. V. Mosby Company, 1917.

L'APPAREILLAGE DANS LES FRACTURES DE GUERRE. Par Paul Alquier et J. Tanton, Médecin Principal, Professeur agrégé du Val-de-Grâce. Paper. Price, 7 francs 50 centimes. Pp. 250, with 182 illustrations. Paris: Masson et Cie, 1917.

(Continued on next page)

HARTSHORNE AND PICABIA

Members N. Y. Stock Exchange

7 Wall St. New York

Through us you may purchase or sell listed stocks on commission. Accounts carried on conservative margin or partial payment plan.

100 Share Lots
Odd Lots

Send for Odd Lot Booklet Y-17

DEPENDABLE PRODUCTS

DISPENSE YOUR OWN MEDICINES—There are many advantages in personally supervising the administration of drugs you use. We manufacture and ship direct to physicians in any part of the U. S. everything pharmaceutical, i. e., tablets, lozenges, ointments, etc. Every product is ready for immediate use, easily dispensed. We guarantee them true to label and of reliable potency. Our complete catalog should be in the hands of every physician who dispenses. Mailed free on request.

THE ZEMMER COMPANY

Chemists to the Medical Profession

Forbes Field

Pittsburgh, Pa.

U. S. Army Officer's Uniforms

when supplied by us
are absolutely correct in cut, fit and exact fidelity to U. S. Army Regulations.

Write us for samples and catalog.

JACOB REED'S SONS

Oldest Military Tailors in America

1424-1426 Chestnut Street, Philadelphia

BOOKS RECEIVED

(Continued from preceding page)

OBSTETRICS: A TEXT-BOOK FOR THE USE OF STUDENTS AND PRACTITIONERS. By J. Whitridge Williams, Professor of Obstetrics, Johns Hopkins University. Fourth Edition. Cloth. Price, \$7 net. Pp. 1029, with 708 illustrations. New York: D. Appleton & Co., 1917.

THE SENSE OF SIGHT. By Frank Nicholas Spindler, Professor of Psychology and Education, State Normal School, Stevens Point, Wis. Cloth. Price, \$1.25 net. Pp. 156, with 25 illustrations. New York: Moffat, Yard & Co., 1917.

OBSTETRICS FOR NURSES. By Charles B. Reed, M.D., Obstetrician to Wesley Memorial Hospital, Chicago. Cloth. Price, \$2.50. Pp. 374, with 130 illustrations. St. Louis: C. V. Mosby Company, 1917.

WHAT A YOUNG MAN OUGHT TO KNOW. By Sylvanus Stall, D.D. Cloth. Price, \$1. Pp. 269, with illustrations. Philadelphia: Vir Publishing Company, 1917.

LINFADENIAS EN LA INFANCIA. Por el Dr. Juan Carlos Navarro. Paper. Pp. 343, with illustrations. Buenos Aires: "Las Ciencias," 1916.

MORTALITY CHART OF INFANCY AND OLD AGE. Paper. Rochester, N. Y., 1917.

The Public Service

U. S. Public Health Service

Changes for the seven days ended Sept. 5.

Stimpson, W. G., asst.-Surgeon-General, attend meeting of the American Hospital Association, Cleveland, Sept. 10-15, 1917.

Banks, C. E., senior surg., proceed to Manhattan, Kan., for special temporary duty.

Laughlin, J. B., asst.-surg., proceed to Greenville and Spartanburg, S. C., on special temporary duty.

Treadway, W. L., asst.-surg., deliver addresses on school and mental hygiene at the Teachers' Institute to be held at Maysville, Ky., Sept. 4-6, 1917.

Lake, G. C., asst.-surg., proceed to Montgomery, Ala., for temporary duty in bacteriology investigation.

Hayes, John H., phar., directed to report to Surg. S. B. Grubbs at Newport News, Va., for special temporary duty.

Harrington, F. E., asst. epidemiologist, proceed to Anniston, Ala., on special temporary duty.

Sullivan, M. X., biochemist, attend meeting of the American Chemical Society, Boston, Sept. 11-13, 1917.

Hommon, H. B., sanitary engineer, proceed to Leavenworth, Kan., on special temporary duty.

Shoub, H. L., sanitary bacteriologist, proceed to Newport News, Va., on special temporary duty.

Changes for the seven days ended Sept. 12.

McMullen, John, surg., proceed to Louisville, Ky., for conference relative to extra cantonment survey.

Lumsden, L. L., surg., resume duties in studies of rural sanitation in extra cantonment zones.

Williams, C. L., P. A. surg., proceed to Little Rock, Ark., on special temporary duty.

Witte, W. C., asst.-surg., deliver a lecture on rural sanitation before conference of health officers at Iowa City, Iowa, Sept. 20, 1917.

Phelps, E. B., Prof., proceed to Hot Springs, N. C., on special temporary duty.

Griffitts, T. H. D., asst. epidemiologist, proceed to designated points in southern states for duty in malaria surveys and studies.

Harrington, F. E., asst. epidemiologist, proceed to Guntersville, Ala., on special temporary duty.

Ross, F. B., scientific assistant, proceed to necessary points in Jefferson County, Ky., for duty in field studies of rural sanitation.

FOR BEST RESULTS USE
Mountings with Permanent Guarantees

Beware of Imitations



"DUCHESS"

Registered trade mark

No. J-4020. EXTRA STIFFENED 1-10 12-K gold filled finger piece mounting with non-breakable coil springs and non-strip thread bases. Guards are of the rigid type with gold riveted automatic adjusting zylo pads. 20-year guarantee.

"DUCHESS" stamped in bridge. Per dozen \$6.00

"PRINCESS"

Registered trade mark

No. J-203. Sanitary rocking scroll guard 12-K gold filled finger piece mounting, with non-breakable coil springs. Guaranteed ten years.

"PRINCESS" stamped in bridge. Per dozen \$4.00

Write for our 1917 Illustrated Catalog, full of Bargains, MAILED FREE, and save money.

MORRISON & COMPANY

Wholesale and Manufacturing Opticians

210-212 W. Madison St. Chicago, Illinois

"The Most Reliable and Lowest Price House in America"

Answers to Questions
— PRESCRIBED BY —
Medical State Boards

BY

ROBERT B. LUDY, M.D.

Fourth edition, 8vo, 776 pages; price, \$3.75 net, prepaid.

Only original state board book, not an imitator. Has real questions asked, with accurate answers by specialists.

JOHN JOS. McVEY, Publisher
1229 Arch Street, Philadelphia, Pa.

MALIGNANT INFECTION

is only one of the

Hidden Dangers of Your Profession

You need the protection from disability and accidental death afforded by insurance in the

PHYSICIANS CASUALTY ASSOCIATION
of OMAHA, NEBRASKA

A mutual accident Association writing insurance at actual cost.

Send today for information about our policies



E. E. ELLIOTT, Sec.

304 City National Bank Building
OMAHA, NEB.

The Modern Physician is the Guardian of Public Health

Employing a modern food in the nutrition disorders of infants, emphasizes the fact. Hoos' Albumin Milk (Casein Milk) is the modern food. Write

LOUIS HOOS, 5232 Kenmore Ave., CHICAGO



To Buy, Sell or Exchange a Practice, Equipment or an Automobile

Put a Classified Ad in

THE JOURNAL

(Continued from preceding page)

WANTED — ASSISTANTSHIP WITH A surgeon or a general practitioner doing major surgery; one with hospital very much preferred; salary, if otherwise satisfactory, of secondary importance; I am 32 years old, single, in best of health, 1916 graduate of A+ school, and can furnish references as to character and ability. Add. Dr. A. H. K., 982 Woodward Ave., Suite 7, Detroit, Mich. I

WANTED—LOCUM TENENS WORK OR same with view of buying if location proves right; aged 33, married, one boy in school; intern experience; graduated 1916; license in Nebraska and Illinois; I can handle your business; institutional or private, but no investment wanted; must be living basis or \$150 month; can come October 1. Add. 2985 I, % AMA.

WANTED—POSITION, LOCUM TENENS, institutional or other, by physician, 49; hospital staff experience; former instructor New York Post-Graduate; good laboratory man and radiographer; wife trained nurse has been superintendent New York hospital; position utilizing services of both acceptable; have own car. Add. 2855 I, % AMA.

WANTED — BY WOMAN PHYSICIAN— Position as resident anesthetist or assistant to one or more surgeons; graduate Class A school, 1914; aged 27 years; have had good hospital training and an experienced anesthetist; location in or near New York preferred. Add. 553, 200 Fifth Ave., New York City. I

WANTED — POSITION AS ASSISTANT with physician or contract work, or assistantship with view of partnership; graduate of A school; 1 year intern in general hospital; 4 years assistant in large mining practice; can give references as to character and ability. Add. 2945 I, % AMA.

WANTED — PHYSICIAN AND SURGEON, middle-aged, married, with 15 years' experience and success in major operative work, seeks hospital or other connections; no investment; speaks German; references. Add. 2917 I, % AMA.

WANTED—DOCTOR — EXEMPT FROM military service wishes to take charge of practice of a doctor doing military service, with prospects of buying out the same if satisfactory; in Illinois, Kansas or Wyoming. Add. 2973 I, % AMA.

WANTED — SALARIED POSITION, CONTRACT practice or assistantship; 1914 graduate; 14 months' internship Class A hospital; 1½ years' experience in industrial work; aged 29, married; immediate acceptance. Add. 2991 I, % AMA.

WANTED—DECEMBER 1, POSITION BY laboratory technician (woman); can do ordinary laboratory technic, clinical pathology, Wassermann, etc.; can go anywhere; speaks Spanish and Danish; salary \$100 per month and maintenance. Add. 2805 I, % AMA.

WANTED — POSITION AS LOCUM TENENS in Illinois; have had 10 years' experience in general practice; competent and successful; married, no bad habits; will take for period of war only or would consider purchase later. Add. 2918 I, % AMA.

WANTED—SECRETARIAL POSITION IN Chicago physician's office as medical stenographer; have had unusual experience; can furnish references; available at once. Add. 2948 I, % AMA.

WANTED—BY WOMAN PHYSICIAN, POSITION as assistant in institution for tubercular, insane or epileptic; experienced; or as manager of small hospital; graduate Class A college; good references. Add. 2920 I, % AMA.

WANTED — ROENTGENOLOGIST, FOURTEEN years' experience, would like salaried position in a large and busy hospital or private laboratory. Add. 2766 I, % AMA.

WANTED—ASSISTANTSHIP TO DERMATOLOGIST; graduate first-class school; five years practice; two years' service first-class dermatologist doing clinical and intravenous work; wish to specialize. Add. 2988 I, % AMA.

WANTED—POSITION—CONTRACT WORK —Will accept locum tenens; am 32 years of age; have had 6 years' experience in surgery and tropical medicine; can speak French and Spanish. Add. 2980 I, % AMA.

(Continued on next page)

WANTED—BY AN EYE, EAR, NOSE AND throat specialist a position as assistant to surgeon or in hospital; graduated in 1904 from A+ college; first-class operator and diagnostician; married; 39 years old; salary expected, \$2,000; New York license. Add. 2849 I, % AMA.

WANTED — POSITION — GRADUATE Class A school, 1912; aged 29, married; three years' general hospital; highest references furnished; excellent surgical training; two years' general practice. Add. 2815 I, % AMA.

WANTED—POSITION AS X-RAY OPERA- tor and laboratory assistant in hospital, or with a group of doctors; woman with experience. Add. 2967 I, % AMA.

NURSES LOCATIONS WANTED

NURSES—WRITE F. V. KNIEST, R. P., Omaha, Neb., for permanent position, any kind work anywhere U. S. Gilt-edge references.

WANTED—GRADUATE NURSE DESIRES position; aged 28, unmarried; graduated 1916; experienced as superintendent in large hospitals; desire position with some large firm, corporation, perhaps institution, or with physician or surgeon. Add. Nellie Davidson, McLean, Tompkins County, N. Y. W

SALESMEN—ORGANIZERS

DO YOU KNOW THAT IT IS AN EASY matter to organize classes of practitioners in all towns to view our motion pictures monthly? Write us for catalogue of more than 125 motion pictures and information as to how the classes will yield you a large and permanent income yearly. Territory allotted only to applicants who can furnish best personal references. Write fully; applications strictly confidential. Clinical Film Libraries, Dept. D, 110 West 40th St., New York, N. Y. JJ

MEDICAL BOOK SALESMEN — A FEW good men in various sections of the country can have excellent proposition. Write at once for particulars to P. Blakiston's Son & Co., Publishers, 1012 Walnut St., Philadelphia, Pa. JJ

WANTED — SALESMEN — EXCLUSIVE territory can be obtained for the sale of a new and important line of medical and dental publications; liberal commissions and special training; commission paid weekly; physicians desiring a change or dissatisfied with their income will benefit themselves by engaging in work of this character. C. V. Mosby Company, Metropolitan Bldg., St. Louis, Mo.

WANTED—SPECIAL REPRESENTATIVES to sell high grade medical publications; a fine chance for a few men of good personality, education and ability; all supplies and special data furnished; good commission and extra bonus; energetic man can make from \$50 per week up; will assign exclusive territory if you make good. For further information add. 2227 JJ, % AMA.

WANTED — SALESMEN NOW CALLING on physicians to sell medical publications; will take very little of your time and not interfere with your regular work; we offer a good commission and a hustler can make some extra money without much work; we can use a few good men in different parts of the country. For further information add. 2228 JJ, % AMA.

APPARATUS WANTED

WANTED—TO PURCHASE A CHEAP SET of test lenses. Add. Dr. Percy R. Wood, Cedar Falls, Iowa. L

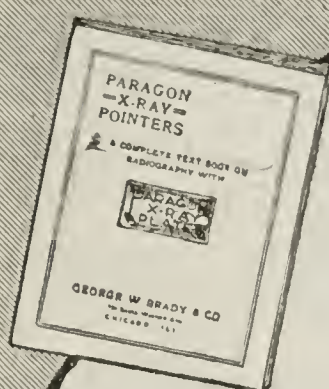
WANTED — INTERRUPTERLESS X-RAY outfit; state make, year made, Kilowatt power, accessories and lowest price. Add. 2965 L, % AMA.

WANTED — FIRST-CLASS X-RAY AND general treatment interrupterless machine, powerful enough for instantaneous moving organs radiography; send full specification, inventory of accessories, price. Dr. Roberts Emmerson, Apartado 352, Chihuahua, Mexico. L

APPARATUS, ETC., FOR SALE

FOR SALE—GENUINE VICTOR FINSSEN lamp, good as new; guaranteed in perfect condition; paid \$100; sell for \$60. W. F. Bleifuss, M.D., Elgin, Minn. K

Relief From X-Ray Trouble



All X-Ray workers realize the change in laboratory conditions due to the war cutting off the supply of imported gelatine for plate manufacturing, developer chemicals, etc. We have finally solved the problem. Paragon X-Ray plates today are unexcelled for fine quality and dependable results. Never were plates better—none are now more reliable or satisfactory.

The Busy Season is Near

You can stock up *now* on *Paragon Plates* with the assurance that you will get the much desired results. The large quantity of X-Ray plates needed for war hospitals, combined with the expected transportation delays, while moving troops, may leave you out of plates at a critical time.

Ask your dealer for plates made with the new gelatine.

Get your name on our list for new monthly Technical Bulletin. Sent free if you mention type of apparatus used.

Geo. W. Brady & Co.
757 S. Western Ave.
CHICAGO

**PARAGON
X-RAY
PLATES**

FOR SALE—JAVAL-SCHOITZ OPHTHAL- mometer, old style, made by Meyrowitz; cost \$115; sell for \$10; Victor multiplex sinusoidal outfit, cost, \$97; sell for \$50; used but little; Bausch & Lomb heavy microtome with knife, base 7 1/4 by 14 inches; sell for \$20; Bausch & Lomb hot air sterilizer and B. & L. physician's cylindrical (copper) incubator, \$10. Dr. Walter N. Sharp, 711 Hume-Mansur Bldg., Indianapolis, Ind. K

FOR SALE—ONE EUREKA NEBULIZER outfit, large air tank, mounted in glass top table, six nebulizing bottles, cord and cutoff, two-cylinder double action air pump, all in good condition; cost \$55, will take \$20; one galvanic and faradic wall plate in fine oak cabinet, wired for batteries, \$5 worth of electrodes, cost \$45, will take \$15. Dr. W. H. Terrell, Pittsboro, Ind. K

DO MORE PERFECT X-RAY WORK— Don't guess any more. Use Paragon Milli-ampere-Second Technique and be sure that every exposure will be a perfect diagnostic radiogram. Particulars free. Geo. W. Brady & Co., 757 S. Western Ave., Chicago.

FOR SALE — A MORTON-WIMHURST- Holtz influence static machine, 12 plate, in good condition; motor can be had with machine; also numerous electrodes and tubes. Add. Dr. H. D. Howe, 176 Victoria Ave., Hampton, Va. K

BOOKS WANTED AND FOR SALE

INFANTILE PARALYSIS: BIBLIOG- raphy, 1784-1916, 540 titles, typewritten. Price, \$7.50 net, postpaid. Index Office, 110 N. Wabash Ave., Chicago. M

WANTED — AMERICAN JOURNAL OF Diseases of Children, Jan. and June, 1915, Aug. and Nov., 1916; We will pay 50c each for the return of these issues in good condition. Add. Am. Med. Assn., 535 N. Dearborn St., Chicago, Ill. M

WANTED—JULY, 1909, JANUARY, 1916, IS- sues of *Archives of Internal Medicine*. We will pay 50 cents each for the return of these numbers in good condition. Am. Med. Assn., 535 N. Dearborn St., Chicago.

PRACTICES FOR SALE

FOR SALE—CALIFORNIA—SPECIALIST Medical Reserve, eye, ear, nose, throat, will sell new practice (\$2,300 first year) for cost of outfit, \$650; act quickly. H. P. Nottage, M.D., Alameda, Calif. N

FOR SALE—LOS ANGELES—\$7,000 RAP- idly growing general and surgical practice in best suburban section of Los Angeles; collections last year \$6,000; price, \$1,500; half cash, balance time; month's introduction; reason for selling, business. Add. 2870 N, % AMA.

FOR SALE — COLORADO — \$3,000 PRAC- tice; collections good; large territory; appointments; competition light; churches, school; price, \$400 cash; worth investigation. Add. 2679 N, % AMA.


FOR SALE—COLORADO—GENERAL UN- opposed \$5,000 village and country practice; level country, good roads; Union Pacific R. R. and Lincoln Highway; high school and church; \$600 buys office fixtures, including static machine, leather lounge, desk, operating table and chairs; no drugs; surgeonship for railroad and ten life insurance appointments transferable. Add. 2989 N, % AMA.

FOR SALE — SOUTHERN COLORADO— \$5,000 cash practice, 11-room modern house with offices on main street; town 800 in large prosperous irrigated farming and stock country; fine climate, roads, schools, churches; artesian water; electricity; all \$3,500; \$1,500 long time if desired; deal must be made at once; write or wire. Box 23, La Jara, Colo. N

FOR SALE—WASHINGTON, D. C.—\$10,000 general practice to man over military age; collect \$8,000 yearly; can be converted into specialty or surgical practice; only equipment to sell cheap; pay for itself in less than 3 months; can transfer my entire practice to purchaser. 1210 Mass. Ave., Apt. 4, Washington, D. C. N

FOR SALE—MIDDLE GEORGIA—ESTAB- lished \$4,000 cash practice to purchaser of office equipment; town 3,000 inhabitants; good territory; easy competition; you make terms; no time for correspondence; army service. Add. 2938 N, % AMA.


(Continued on next page)



KENTUCKY SADDLERS

Thoroughly mannered, ready for use. Every animal shipped under guarantee. State your exact wants first letter; get accurate descriptions by return mail. Visitors always welcome.

THE GLENWORTH FARMS.
Allen S. Edelen, Owner, Burgin, Kentucky



KALMERID CATGUT

A Physiologically Correct Germicidal Suture

DAVIS & GECK, INC.
217-221 Duffield Street
Brooklyn, N.Y., U.S.A.

A CLASSIFIED Inserted in THE JOURNAL is accessible to about TWO-THIRDS of the medical profession.

FOR SALE—WEST CENTRAL ILLINOIS—

A \$6,000 practice; can be greatly increased by surgery; farming community; good schools and churches; competition mild and territory large; am examiner for fourteen old-line insurance companies; all appointments transferable; price of office fixtures and drugs; all will invoice for about \$400 to \$500; other personal things optional; no real estate; cash or part down with terms to suit; best reason; best opportunity in state to make money from start; don't write unless you mean business. Add. 2667 N, % AMA.

FOR SALE—ILLINOIS—\$10,000 PRACTICE

established 22 years; \$7,000 takes modern residence, drug stock, good will and office fixtures; in a town of 1,000 inhabitants; good school, good churches and good roads; reason for selling, changing climate on account of health. Add. 2952 N, % AMA.

FOR SALE—ILLINOIS—UNOPPOSED

practice; \$150 buys practice, office fixtures, furniture and drugs; large territory within 80 miles of Chicago in corn belt; fixtures, furniture and drugs will invoice purchase price; no dead stock in drugs; this adv. appears once only. Add. 2979 N, % AMA.

FOR SALE—WESTERN ILLINOIS—VERY

desirable practice; town 400; lights, water; can transfer entire business with appointments and support of fine community to good man; business over \$4,000; only fixtures and drugs to sell. Add. 2955 N, % AMA.

FOR SALE—ILLINOIS—UNOPPOSED

village and country practice; rich farming section; one of the very best in state; will rent or sell property; a sinecure to one who will attend to business. Add. Wm. Yeates, M.D., Bonfield, Ill. N

FOR SALE—EAST CENTRAL ILLINOIS—

In wealthy farm community of 2,500; firmly established practice; fine opportunity; good schools; paved roads; competition negligible; wish to leave soon to specialize. Add. 2970 N, % AMA.

FOR SALE—CHICAGO—\$5,000 GENERAL

practice; office completely equipped; old established corner with dentist; support of two druggists; will sacrifice for \$400; leaving city; phone Douglas 1327. Add. 2992 N, % AMA.

FOR SALE—CHICAGO—SUBURBAN

practice, \$400 monthly; fast growing up-to-minute town; all commuters and families; competition right; good fees and collections; \$1,000 drugs and fine office. Add. 2990 N, % AMA.

FOR SALE—CENTRAL ILLINOIS—\$4,500

practice; \$800 buys practice, drugs, part of office furniture; a snap for some one; good school, churches and fine roads; going into government service. Add. 2956 N, % AMA.

FOR SALE—ILLINOIS—GOOD PRACTICE

—Chicago suburb; some contract work and appointments transferable; railroad surgeon; better for married man; price, \$300; this appears once. Add. 2981 N, % AMA.

FOR SALE—INDIANA—GENERAL PRACTICE

\$4,500; county seat 1,700; Pennsylvania Railroad; paved streets, good schools, churches, rich farms; large country population; roads all graveled; use auto whole year; three other doctors; two past 70; practice easily retained; property, autos optional; drugs, office fixtures, about \$1,000; partnership in city; bargain; write for particulars. Add. 2865 N, % AMA.

FOR SALE—INDIANA—UNOPPOSED

practice; home and 3-room office and outfit, \$3,500; on interurban; 8 miles to two public hospitals; going south. Add. C. D. Umberhine, M.D., Lebanon, Ind. R. R. 9. N

FOR SALE—INDIANA—TOWN 900—RICH

farming community; one other active doctor; reason, I have enlisted in the Medical Reserve Corps; price, \$300 cash. Add. 2921 N, % AMA.

FOR SALE—EASTERN IOWA—\$27,000

general practice; city 12,000; insurance appointments transferred if possible; price, invoice office equipment and drugs; modern residence optional; leaving for postgraduate. Add. 2953 N, % AMA.

FOR SALE—CENTRAL IOWA—WANT

physician, Catholic, for a No. 1 location; good town and territory; collections fine; will sell office equipment and Ford car; no drugs; going to war. Add. F. S. Carey, M.D., Williams, Iowa. N

"AMBUMATIC" WASHABLE ABDOMINAL SUPPORTERS

Patented. Made buckled or laced.

DO THE WORK "JUST RIGHT" ADJUSTABLE FOR "LIFT-UP" OR "BINDER SUPPORT"

To any part of the abdomen. Adapted to any person, any condition requiring efficient, comfortable support.

Call or send to day for folder, order blanks and catalog.

We Are Experts in Corrective

ORTHOPEDIC APPLIANCES

ELASTIC STOCKINGS, TRUSSES, CORSETS, ETC.

Your correspondence solicited, given careful attention and full information. Phone Cent. 4623

ORDER

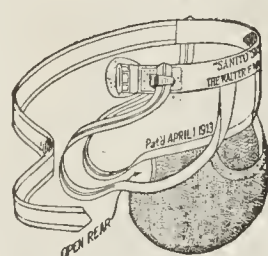
THE AMBULATORY PNEUMATIC SPLINT

To secure greatest comfort, shortest period of confinement, best results and health for your

FRACTURES

of leg, knee, thigh, and hip patients. All dealers and direct from us. Wire order. State fracture, which limb, sex. Send for booklet, prices, etc. Recommend it.

Amb. Pneu. Splint Mfg. Co., 30 (A.) E. Randolph Street, Chicago

**THE "SANITO" SUSPENSORY**

They will not chafe; 3 sizes

The Pouch is deep and anatomically shaped. The Understraps are separated at rear of pouch and avoid any pressure against urethra at that point. The pouch does not reach back under the rectum, and is therefore more sanitary. The "SANITO" fits the parts whether in the standing, sitting or lying posture.

The "SANITO" can be cleansed by boiling without injury to the rubber. After wearing the "SANITO" a few days, one will not notice that he has it on.

No. 75 is 75c each.

No. 35 is 40c each.

20% discount on sales made direct to physicians.

Samples Free to any Physician

THE WALTER F. WARE CO., Dept. K-1, Philadelphia, Pa.

**LIST No. 10**

and

Special Discounts

on Discontinued Styles

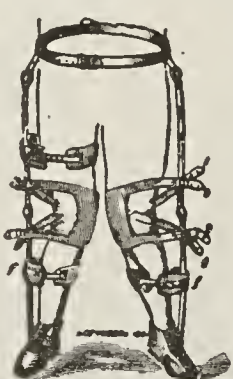
Sent on Request.

Physician's Office Furniture

W. D. ALLISON COMPANY, 915 N. Alabama St., Indianapolis, Ind.

Doctor:—**Order Orthopedic Appliances Direct from Our Factory**

Our system of measurement insures correct fitting, even in extreme cases. Scientific



workmanship guaranteed consistent with AA-I material and service. Braces for spinal curvature, bow legs, weak ankles and deformities of every description. Elastic stockings, artificial limbs, trusses, abdominal supporters etc., at factory prices. Our orthopedic department is supervised by an expert who has had over 25 years experience in this special work. We guarantee you best possible therapeutic results and pleased patients. Let us send you blank forms and directions for taking measurements, complete catalog, etc.

The Wolfertz Deformity Appliance & Truss Mfg. Co.

Established 1886—Incorporated 1906

154 N. Fifth Avenue

Chicago, Illinois

Do You Need an Intern? Find him through a Classified Ad in **THE JOURNAL**

FOR SALE—IOWA—\$5,000 20-YEAR ESTABLISHED practice in growing city 2,500 population; all conditions first class; one of the best agricultural parts of the state; will give up the location to purchaser of office furniture and stock of drugs at invoice price; do not write unless situated to investigate personally and mean business. Add. 2816 N, % AMA.

FOR SALE—IOWA—\$5,000 20-YEAR ESTABLISHED

practice and small drug store in good business town of 1,000, with gas, water, electricity, good streets and schools; wealthy farming community; one doctor in poor health; practice increased by doing surgery; hospital easily accessible; collections 99 per cent. Add. 2942 N, % AMA.

FOR SALE—CENTRAL IOWA—\$3,000

practice in thriving town of 500; collections 100 per cent.; \$500 for drugs and fixtures of first-class office; building optional; reason, specializing. Add. 2963 N, % AMA.

FOR SALE—WESTERN KANSAS—\$6,000

unopposed practice; good roads; good collections; territory 24 to 32 miles; railroad, church, accredited high school; community growing; must have \$1,500 to swing the deal; don't answer unless you have the cash; figuring on government service. Add. 2838 N, % AMA.

FOR SALE—EASTERN KANSAS—UNOPPOSED

practice; will lease office and sell office and driving outfit for \$300 and will allow purchaser to name the terms; \$200 a month business. Add. 2982 N, % AMA.

FOR SALE—LOUISIANA—\$4,000 PRACTICE

goes with my drugs, instruments, horse and saddle and my influence; good collections; automobile optional; price, \$750; don't write unless you mean business; reason for leaving good. Add. 2806 N, % AMA.

FOR SALE—MARYLAND—GENERAL

contract practice on an island in lower Chesapeake Bay; 1,000 inhabitants; good surroundings; \$1,800 to \$2,000 a year; no collections to make; fixed price, \$400; easy terms; wire if interested. Dr. John C. Woodland, Crisfield, Md. N

FOR SALE—CENTRAL MASSACHUSETTS

—Bargain to a prompt, live man; \$3,000 unopposed practice, on main line railroad; price, \$300, without real estate; residence and automobile on easy terms if desired. Add. 2961 N, % AMA.

FOR SALE—MICHIGAN—ON ACCOUNT

of poor health and other business I wish to sell eye, ear, nose and throat practice; established 27 years; this is an unusual opportunity; over 15,000 records and refractive cases which are being refitted and lenses renewed; income on broken lenses 20 to 25 per cent. on investment; finest offices in the city; will sell for about one half invoice price of equipment; office fully equipped; \$1,500 cash; city of Grand Rapids; over 130,000 population; large territory to draw from; will introduce and recommend first-class man to my patients; chances like this are very rare. Add. Dr. L. A. Roller, 303 Gilbert Bldg., Grand Rapids, Mich. N

FOR SALE—SOUTHERN MICHIGAN—

Unopposed location; village 250; railroad; large territory; averaged \$4,000 for past eight years; brick and cement residence; hot-water heat; separate two-room office; large barn and garage; immediate possession. Add. 2971 N, % AMA.

FOR SALE—MINNESOTA—WANT GOOD

physician to take practice averaging \$400 per month for invoice of equipment; town 1,800; competition right; good farming community; two banks; large sawmill; possession immediately; going to city. Add. Box 254, Frazee, Minn. N

FOR SALE—MISSOURI—A \$7,000 PROP-

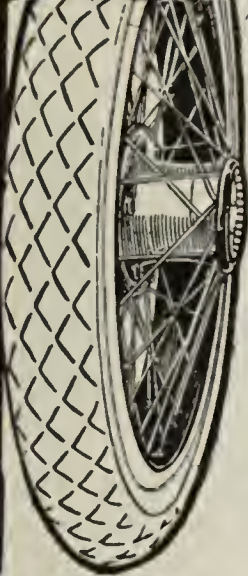
erty, \$5,000 practice, in county seat, central Missouri; 2,000 population; electric lights, waterworks and factory; at the price of property if sold at once; \$4,500 cash will swing the deal; terms on balance of \$2,500. Add. 2808 N, % AMA.

FOR SALE—NEBRASKA—GENERAL

practice — Runs about \$10,000 year; fine city 2,000; fine modern house, beautiful and up to date; one finest deals in West; fine fees; well established practice; collections almost 100 per cent.; large territory; reasons for selling sickness in family. Add. 1321 F. V. Kniest, Bee Bldg., Omaha, Neb. N

(Continued on next page)

SAVE 40% on YOUR TIRES



3500 Miles Guarantee

Your Dollars Buy More
Miles If You Buy Our
Surplus Tires By Mail

**Positively Saves 40%
Off Standard Price List**

Manufacturers of Standard
Tires sell us the surplus or
overproduction in large lots,
at immensely reduced prices,
for spot cash. When over-
stocked it is cheaper for
manufacturers to sell their
high-quality tires, even at a
sweeping reduction, than to
temporarily shut down their
plants and disrupt their or-
ganization.

That is why we can save
you 40% and guarantee these
tires to you for 3500 miles.

They were originally built
and guaranteed by the facto-
ries for 4000 and 5000 miles, and there is absolutely
no reason why you should not get 4000 or 5000 miles
and more out of them—because that's what they're
guilt for.

These Tires are firsts in every respect, only their
serial numbers are buffed. They are the same quality,
same workmanship, same mileage—that's what counts.
There is one big difference, however—the price.

Size	Plain	Skid	Tubes*	Size	Plain	Skid	Tubes*
30 x 3	\$7.70	\$8.60	\$2.20	35 x 4	\$17.00	\$18.60	\$3.85
30 x 3 1/2	9.95	11.10	2.60	36 x 4	17.20	18.65	3.95
32 x 3 1/2	11.50	12.95	2.90	35 x 4 1/2	22.70	24.70	4.65
34 x 3 1/2	12.15	13.35	3.05	36 x 4 1/2	23.05	25.15	4.75
31 x 4	14.75	16.60	3.50	37 x 4 1/2	23.95	26.10	4.95
32 x 4	15.05	16.85	3.60	35 x 5	24.90	27.25	5.40
33 x 4	15.75	17.20	3.65	36 x 5	27.10	29.60	5.65
34 x 4	16.10	17.55	3.75	37 x 5	26.40	28.85	5.80

*All tubes are firsts—guaranteed one year against
defects.

We are particularly anxious to secure your business
and would earnestly urge that you send us a *Trial*
order. You will be assured of getting reliable quality,
right prices, and a service that will satisfy you in every
respect. We ship C. O. D., subject to inspection.

When ordering state what size and style you want:
—Plain, Non-Skid, Clincher, Q. D. or S. S.
2% discount for cash with order.

Prices subject to change without notice.

ORDER NOW

Philadelphia Motor Tire Co.
Dept. A 242 Broad St., Philadelphia, Pa.

How to Apply the E. Z. PATCH



for Rubber Gloves

PUT the faulty glove on your hand—so
that the surface around the tear or
puncture is smooth; then, a few brisk
rubs by sandpaper to "rough" the fab-
ric. Now, with a pair of tweezers or
forceps, remove an E. Z. Patch from the
mounting card—moisten the RED, rub-
ber side with a drop of gasoline, and,
after permitting this to dry for a few
moments, place the moist side down
on the puncture or tear and press the
patch with your thumb for a few
seconds so it can firmly adhere.

All done, and ready for sterilization,
(or boiling) where the patch will actu-
ally vulcanize to the glove.

It's there permanently—can't peel or
come off—it's part of the restored
glove—non-poisonous and non-infecting.

A trial envelope containing 12 E. Z.
Patches, with full directions, for 25c.
Hospital size Package 100 patches for
\$1.00.

Sample on request

THE E. Z. PATCH COMPANY
Akron, Ohio

FOR SALE — NEBRASKA — GENERAL
practice, established 16 years in good live
town of 1,200; electric lights, waterworks, etc.;
to purchaser of my home and office equipment;
write for particulars. Add. 2915 N, % AMA.

FOR SALE — NEBRASKA — PRACTICE
over \$4,200; office equipment, drugs and ap-
pointments; practice will positively go to suc-
cessor; one other physician, not a regular;
town over 600, electric lights, waterworks, ac-
credited high school; prosperous American
Protestant community; good roads; nearest out-
side competition 15 miles; price, \$200; terms
to reliable man. Add. 2935 N, % AMA.

FOR SALE—NORTH DAKOTA—A \$4,000
practice in small town; office equipment and
good will, \$700 cash; Chalmers roadster, house
and small hospital optional; entering army.
Add. 2960 N, % AMA.

FOR SALE — NORTH DAKOTA — RED
River Valley, \$6,000 practice, have done
\$9,000 business in year; will sell for \$700 in-
cluding drugs, fixtures, etc. Village of 700.
Box 63 Wyndmere, North Dakota. N

FOR SALE—NEW YORK—AT \$500 — A
\$3,500 eye, ear, nose and throat practice,
with complete equipment and records; city of
500,000; joining Medical Reserve Corps. Add.
2863 N, % AMA.

FOR SALE OR EXCHANGE—NEW YORK,
central part—\$2,500 to \$3,000 unopposed
practice; new buildings; house has modern
conveniences; one acre land; beautiful coun-
try; collections good; other doctors 6, 8, 14
miles distant; terms liberal. Add. 2689 N,
% AMA.

FOR SALE—OHIO—DOCTOR'S LOCATION
in town of 400 near Toledo; no doctor there
now; pikes everywhere; good pay; good busi-
ness for right man; the people want a good
doctor; house, barn and garage \$1,500; noth-
ing better anywhere. Add. Dr. Dillman, Ann
Arbor, Mich. N

FOR SALE — OHIO — LOCATION FOR
a doctor; the only doctor leaving town offers
his modern home for sale; has \$5,000 annual
practice; near hospital, good roads, a beautiful
country town, good class of people; a rare op-
portunity. Inquire of C. E. Sheplin, Ravenna,
O., Phone 549. N

FOR SALE — NORTHERN OKLAHOMA—
Town 1,200; good office equipment; car op-
tional; large territory; competition just right;
will introduce buyer of equipment; very good
wheat crop this year, making times exception-
ally good in this section; excellent class of
people. Add. 2958 N, % AMA.

FOR SALE—EASTERN OREGON—WANT
A1 physician to take \$3,500 cash practice at
once; \$1,000 equipment for sale or commis-
sion; town and tributary country 1,500; mod-
ern conveniences; wheat belt; crops never fail;
am entering service. Add. Dr. C. H. Smith,
Weston, Ore. N

FOR SALE — PENNSYLVANIA — \$5,000
unopposed mining practice, including stock
drugs, telephone stock, automobile, etc.; modern
town; emergency hospital 90 per cent. of prac-
tice; less than two miles from office; if you
wish to make money enough to retire shortly
write or come; will give purchaser chance to
make purchase money before paying on ap-
proved security; selling on account of health.
Add. 2996 % AMA. N

FOR SALE—WESTERN PENNSYLVANIA
—\$3,200 town and country practice; no other
physician; main line railroad; churches, stores,
schools; use auto year round; collections good;
for particulars add. 2719 N, % AMA.

FOR SALE—TEXAS — \$5,000 EYE, EAR,
nose and throat practice in city 5,000; no
competition; largest unopposed territory in
Texas; \$850 buys office furniture; two thirds
cash and \$50 per month; fine town, good
work for energetic man; don't answer unless
you have the money or can make arrange-
ments; stamp for reply. Add. 2926 N, %
AMA.

FOR SALE — SOUTH TEXAS — UNOP-
posed \$2,500 country practice, 12 miles from
railroad; modern house, garage; fine winter
climate; will introduce; specializing; real estate
and practice \$2,000. Add. 2890 N, % AMA.

FOR SALE—WEST TEXAS—\$4,000 UNOP-
posed practice; railroad town; irrigated val-
ley; several smaller towns without physicians;
5-room house with bath, barn, garage; collec-
tions good; excellent location, especially health
seeker; price, \$3,000. Add. 2848 N, % AMA.

(Continued on next page)



\$4 SATIN LING FREE

Your first suit lined with a guaranteed \$4 satin lining with-
out charge—a special proposition to introduce the wonder-
ful values offered by our system of tailoring. We have no
agents—no dealers—no traveling salesmen—our values
make their own customers—and once a Bernard-Hewitt
customer, always a Bernard-Hewitt customer. That's why,
to secure your first order, we sell you this high-grade
guaranteed all-wool

Blue Serge Suit \$15

Made to Your Measure for Only \$15
and line it with a fine grade of satin free.

The suit is hand-tailored to your individual measure,
from the very finest all-wool blue, light blue, black or
gray serge (usual \$25 value), in any of the latest styles
you may select and by thoroughly reliable experienced
tailors.

If you don't care for a serge suit, our Fall Catalog, which
we will send, contains generous samples of the latest
fabrics, plain and fancy mixtures. The satin lining
goes with any selection.

All we ask is that you make a trial of our system, that
you learn how easy it is to take your own measure and
save money on every suit. We take all the risk, you none,
for this is our

GUARANTEE

Complete Satisfaction or Money Refunded

You must be pleased in every particular—in fit—in
style—in workmanship and materials, or we don't want
your money. Could anything be fairer? Write today—
wear tailor-made clothes of exceptional style and value—
dress better and save money. We specialize in doctors
storm coats—send for samples.

Catalog—70 Samples FREE!

Our big, new Fall and Winter Book is ready for you—
contains 70 samples latest woolens—also lowest prices
on men's hats, shoes and furnishings. It is your guide
to correct and economical clothes buying. Write now

Please mention Journal of A. M. A. so that
we can identify this special offer.

BERNARD-HEWITT & COMPANY

424-434 S. Green St., Desk F-139, Chicago, Ill.

Graphic Record Rubber Stamps

Showing general and special an-
atomic regions in normal state.
The use of them will systemat-
ize your diagnostic observa-
tions. Prices from 50 cts. to \$3.00.

Send for Catalog

THE BARTON J. A. CO.

87 Duane St., New York

NURSES

use the Classified Columns of
The Journal in securing positions

FOR SALE—WASHINGTON—WANT PHYSICIAN to take over my practice; town of 2,000 and large territory; can deliver \$200 a month contract and probably county and railroad work, besides a good private practice; wish to sell residence. Dr. J. L. Rogers, Newport, Wash. N

HOSPITALS, SANITARIA for SALE

FOR SALE—SIXTEEN-ROOM HOSPITAL located in middle Tennessee; county seat; only hospital in county; \$5,000 practice and equipment goes with the deal; \$12,500; on easy terms; am going to army. A. E. Goodloe, Murfreesboro, Tenn. O

FOR SALE — HAVE WELL-EQUIPPED private hospital of 14-bed capacity for sale, or will sell half interest to man with special training in electrotherapeutics and laboratory work or diseases of women practice paying \$7,000 to \$9,000 per year. Add. 2949 O, % AMA.

LOCATIONS FOR SANITARIA

FOR RENT—LARGE HOUSE AND BUILDINGS, furnished suitable for sanatorium, 25 miles from New York; 40 sleeping rooms; modern improvements; mountainous country; on main motor highway; large acreage farm and woodland; small private lake. Add. 2984 P, % AMA.

FOR SALE—BEAUTIFUL HOME—SACRIFICE; suitable for sanatorium; 20 rooms furnished; hot water heating; three open fireplaces; two bathrooms; extensive porches; grounds 120 by 200; trees, shrubs; tennis; garage; 250 yards to ocean; three minutes' walk to railroad station; 90 minutes to Philadelphia. William H. Bright, Wildwood, N. J.

FOR RENT

FOR RENT—NEW YORK CITY — TWO rooms for physician in a ground floor apartment at 1 West 85th St.; same not to be used as residence; apply between 11 and 12, Monday, Wednesday or Friday. B. Salzer, M.D.

FOR LEASE—MY PRACTICE OF \$7,000 to \$8,000 a year; house and office combined, electric lights, hot water heating plant; heated garage; office thoroughly equipped; surroundings good; suburb of Indianapolis, Ind. Add. 2977 Q, % AMA.

FOR RENT — ARKANSAS — FIFTEEN-room, well established sanatorium in city of 7,000 people; well equipped for surgery and electro hydrotherapy, with beds, linens and everything complete for \$50 per month; write, Lieut. John H. Bell, M. O. R. C., Laredo, Texas. Q

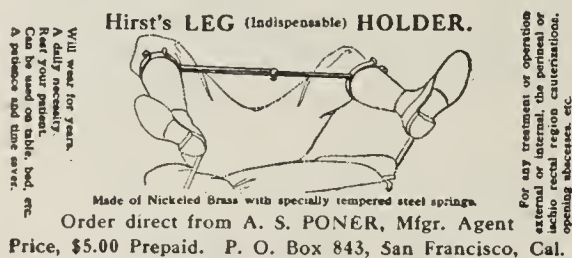
MISCELLANEOUS—FOR SALE

FOR SALE—NICE COTTAGE IN LOUISIANA town; fine location for doctor; only one physician here at present time; large territory and plenty of work for two; cozy four-room cottage, nice hall, roomy kitchen, pleasant dining room, fine barn, garage; am moving away; price, \$2,500. Add. J. Lacombe, Echo P. O., Rapides Parish, La. S

See page 20 for cost of classified and commercial announcement advertisements.

IT IS OFTEN EMBARRASSING

to be eyed by assistants during operative work. The Hirst Leg Holder, has no eyes, and displaces two assistants. Get one!! You will be pleased with its practical, convenient features.



Doctor, shall we post this sample tin of

EDUCATOR CRACKERS

to you? Your name on a postal will do

JOHNSON EDUCATOR FOOD CO.

30 Educator Building

BOSTON

Archives of Internal Medicine

Each issue contains original studies on clinical medicine as observed at the bedside or in the laboratory. Special emphasis is laid on the scientific application of diagnostic deductions to therapeutic principles.

Subscription \$4.00 per annum. Reduction of \$1.00 made to members and subscribers to Journal A.M.A. Sample copy sent on receipt of 4c. in stamps.

American Medical Association
535 N. Dearborn St.,
Chicago

DRUG STORES FOR SALE

FOR SALE—DRUG STORE—OWNER RETIRING; sales \$17,000 year; last stock invoice \$6,600; deal one of best in Nebraska; population 3,100; part cash considered; rare opportunity; rich farming community; manufacturing; no soda, phonographs, wall paper; superior schools. Ed. J. Steidl, Crete, Neb. U

STENOGRAPHERS

GEO. B. COCK,

Liberty Building, Philadelphia, Pa. Est. 1896.

Experience 39 yrs.: medical, 13

MEDICAL BROKERS

NATIONAL CLEARING HOUSE FOR U. S. for doctors wanting sell or buy practice. Doctors wanting locum tenens, positions, partnerships. Doctors wanting partners, assistants, nurses, etc. Service for dentists, veterinarians, nurses. Drug positions. Drug stores sold and furnished. Come to Omaha for consultation, if service desired, make deposit. Otherwise write F. V. Kniest, R.P., Bee Building, Omaha, Neb. Established 1904. EE

PUBLISHERS AND PRINTERS

DOCTORS' STATIONERY—OF ALL KINDS—Send for samples and price list. Physicians' labels, size 2 by 3 inches, your name, address, blank lines for directions; noncurling gummed paper; 1,000 prepaid \$1; money order, drafts, stamps (no checks). The Fuller Press, 1863 Ogden Ave., Chicago, Ill. GG

1,000 PRESCRIPTION BLANKS FOR \$1.00 Made up in tablet form, printed on linen finish bond paper, and mailed to you post paid. Write for samples. Jacobi, Fourth and Green Streets, Philadelphia, Pa. GG

STEEL DIE EMBOSSED STATIONERY—Distinctive and impressive for the medical profession; will send samples and prices upon request. Hammond Printing Co., Fremont, Neb.

1918 DIRECTORY—\$2 LESS IF YOU TAKE advantage of the prepublication offer on page 14, this issue. This new edition of the American Medical Directory will give up-to-the-minute data on practically every physician in the U. S. and Canada—even to the office hours in the larger cities. And there are ten other departments of information just as useful—Society Membership, Medical Men in U. S. Service, Medical Colleges, Libraries, Publications, Purchasing Index, etc. No advance payment required. Simply return coupon on page 14. American Medical Association, 535 N. Dearborn St., Chicago. GG

GUINEA-PIGS, RABBITS, ETC.

GUINEA-PIGS FOR EXPERIMENTAL OR breeding purposes; quality guaranteed; largest supply in America assures prompt shipment; prices reasonable; quoted on request. Cavies Distributing Co., 3100 Grand Ave., Kansas City, Mo.

(Continued on next page)

PLEASE MENTION THE JOURNAL A. M. A. WHEN WRITING TO ADVERTISERS

AGAR-AGAR DR. MAX EINHORN FORMULAS **PREPARATIONS** THE REINSCHILD CHEMICAL CO., BARCLAY ST. NEW YORK

SAMPLES AND PRICE LIST Mailed on Request

COAGULEN CIBA

LOCALLY—SUBCUTANEOUSLY—INTRAVENOUSLY
controls hemorrhage from the smaller vessels
IN GENERAL SURGERY AND HEMORRHAGIC DIATHESIS

A. KLIPSTEIN & COMPANY, NEW YORK

ISSUED BY THE SOCIETY OF
CHEMICAL INDUSTRY IN BASLE



Great Advance in Operative Asepsis. HUSTON'S OBSTETRICAL PAN

It is a Pan — Not a Pad.

Eliminates all danger of carrying infection from patient to patient.

Prophylactic cover thickly coated with paraffin or rubber is used once and destroyed.



MANY UNIQUE FEATURES

Strong metal frame makes pan rigid and deep. Frame can be boiled—cover is applied new for every operation. Supporting pad under patient's back

gives perfect comfort. Fluids drain quickly from operative area. Pan folds up and occupies small space. Quickly set up, easily handled, fits snugly and

comfortably to buttocks. Invaluable precaution against transmission of infectious matter.

Price of complete outfit in handsome case \$5.75; extra covers, genuine Para rubber covered 50c each. Descriptive pamphlet free.

HUSTON BROS. CO.

30 E. Randolph St., CHICAGO, ILL.

Send for our circulars describing complete lines surgical and electrical instruments.

DON'T WAIT

for that suitable opening to just "happen." Find it by means of a Classified Ad in

THE JOURNAL

AUTOMOBILES & ACCESSORIES

SAVE GASOLINE AND OIL — REGRIND the cylinders and fit new pistons and rings; quality work. Butler Mfg. Co., Indianapolis, Ind. II

THE VELIE AUTOMOBILE PAGE 33, this issue, has that beauty and refinement which every physician appreciates. With it is that power, that dependability, that he must have. Made in eight styles of bodies and all reasonably priced. Our announcement on page 33 tells more about the Velie; better still is the Velie Booklet; best of all would be a visit to your Velie dealer for demonstration. Velie Motors Corporation, 101 Velie Place, Moline, Ill. II

MISCELLANEOUS COM. ADVTS.

PROPER FOOD FOR THE DIABETIC IS sometimes difficult to select. Hepco Flour—refined, leguminous and unadulterated is scientifically correct. Specialists have been pleased to recommend it. It can be utilized in many ways pleasing and attractive to the patient. Physicians throughout the country use it with satisfactory results. Fuller information about Hepco will be found on page 47, this issue. Waukesha Health Products Co., 1333 Grand Ave., Waukesha, Wis. KK

WHEN FOOD IS NAUSEATING TRY "Ovaltine" for your patient. In addition to its nutritive qualities, we have paid strict attention to making Ovaltine attractive to the disordered tastes so often found in illness and convalescence. You can get a sample of this pleasing malt-milk-and-egg food beverage by simply writing us. See large announcement, page 15, this issue. The Wander Company, 23 N. Franklin St., Chicago, Dept. 2. KK

A SUBSTITUTE FOR MOTHER'S MILK that has been tried, tested and proved is Trommer's Malt Soup. See page 46, this issue. Try it in those cases where ordinary simple milk modification cannot be tolerated. Our descriptive booklet on "The Use of Malt Soup in Infant Feeding" is interesting to every physician handling diseases of infants and children. Copy to you on request. The Trommer Company, Fremont, Ohio. KK

EXCELSIOR

Universal Wire Gauze Splint



The late Dr. John B. Murphy used "chicken wire" constantly in his treatment of fractures in order to get a splint that could be molded to the limb. Plaster of Paris only partly meets these requirements. It is contra-indicated under certain conditions as acute swelling of the limb, compound fractures with copious discharge, etc.

The ideal splint is something of a screen or porous nature, that will fit "snug up" and retain its shape. The Excelsior Universal Wire Gauze Splint is made of steel woven into a gauze. It is just flexible enough for the fingers to readily mold it to fit any part of the body. Complete protection and immobility are absolutely insured. It is the "chicken wire" idea with a little more firmness and a lot more adaptability, convenience, cleanliness and satisfaction.

Let us send you booklet 1.

Wright Wire Company - Worcester, Mass.

Branch Offices and Warehouses: New York, Boston, Philadelphia, Chicago, San Francisco.

A Good Paying Practice

is a big thing to find. A small Classified Ad in THE JOURNAL will do this for you at Low Cost

Latest
1917
Model



This Set FREE
Bacteriological Set for Examination of Sputum, Blood and Body Secretions

It is a complete outfit containing everything needed for making any ordinary Examination. We include with the outfit a copy of Arneil's book on Urinary Analysis. We furnish this complete \$15 outfit absolutely free with Spencer Microscope on our Easy Rental-Purchase Plan.

\$10. Puts This Genuine Spencer MICROSCOPE In Your Office
Complete With Bacteriological Outfit

You realize, Doctor, how the microscope increases the efficiency of the professional service you render. You know how important the microscope is for reliable diagnosis; that to practice medicine without one in these advanced days of medical enlightenment is to grope in the dark. Every physician can now equip his office with the celebrated Spencer Microscope and Complete Bacteriological Outfit on our physicians' rental-purchase plan. The first month's payment of \$10 puts the entire outfit in your possession immediately so that you can start at once to give your patients the benefit of the outfit while you pay in small monthly installments.

Our Rental-Purchase Plan for Physicians

You buy the outfit by renting it. The entire outfit becomes yours for less than usual cash price of the Microscope alone—and you are given almost a full year to pay. No extras; no interest to pay; just dignified credit. Our physicians' rental-purchase plan is extremely liberal and absolutely free from all red-tape restrictions and annoyances of every kind.

Write Today

The attached coupon is for your convenience. Mail it to us today so that we may give you full particulars of our remarkable rental-purchase plan and complete description of this latest model 1917 Spencer Microscope and Bacteriological Set. Sending the coupon obligates you in no way. Let us explain our plan to you in full. You have nothing to lose and everything to gain. Write today—NOW.

A. S. ALOE COMPANY

"The Physicians' Popular Price Mail Order House"

546 Olive Street, St. Louis, Mo.

10 Days' Free Trial

You have ten days in which to examine and test the Microscope. Return it or keep it as you, yourself, may decide. If you are not convinced that you have gotten extraordinary value and a wonderful proposition, we want you to send the outfit back—at our expense! We'll cheerfully refund the payment you have made. The ten days' trial is to be entirely at our risk and at our expense.

Mail Coupon Today

A. S. ALOE CO., 546 Olive St., St. Louis, Mo.

Gentlemen:—Without obligation upon me, please send me full particulars of your Spencer Microscope Rental-Purchase Plan together with literature fully describing the instrument and Bacteriological Outfit.

Name

Address

City..... State

Absolutely Sterile LIGATURES

IN THE
IMPROVED



CONTAINER

Discriminating surgeons choose Hollister Ligatures, because—The tensile strength is absolutely assured—The material we use in Hollister Ligatures never knows infection—The new OVLtube stays where it is placed, breaks at the mark with a clean fracture and reduces the packing space by half. That is why they are known as

TUBES OF DISTINCTION

Hollister Ligatures are produced under the constant bacteriologic supervision of B. K. Hollister. We are a subsidiary of Wilson & Co., and the only catgut sterilizing concern controlling the source of its own supply. *Catalogs and samples gladly mailed on request.*

6620 Kimbark Ave.

HOLLISTER-WILSON LABORATORIES

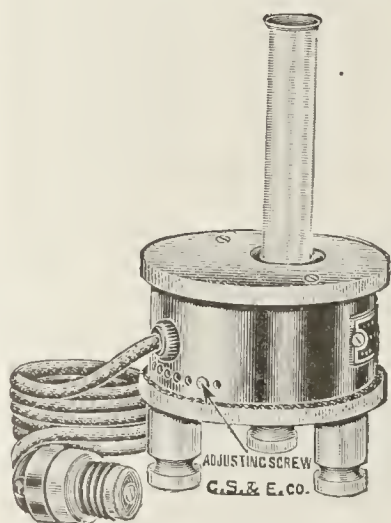
CHICAGO
U. S. A.

CHICAGO, U. S. A.

STERILIZE

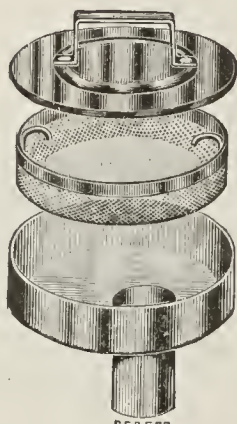
Your Hypo Syringe, Catheter, Scalpel,
Probes, Needles, Etc.

QUICKLY



No. 50 Test Tube Boiler.

Just
connect
to
ordinary
light
socket
—
Carry
it in
your
grip



No. 52 Sterilizer

Ask your dealer or write direct for
Bulletin No. 115.

CHICAGO SURGICAL AND ELECTRICAL CO.

Manufacturers

320 W. Superior St.

CHICAGO

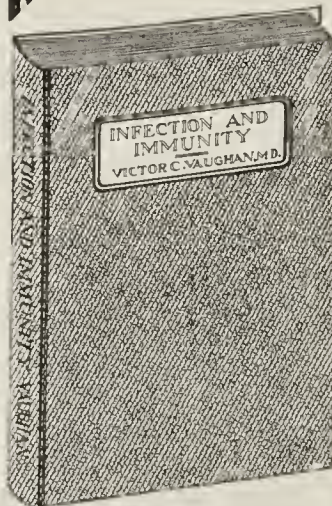
Infection and Immunity

VICTOR C. VAUGHAN, M.D.

The essential facts of infection and immunity accurately
and simply stated.

IT TELLS YOU

The history of infection
The growth of the germ theory
The facts about bacteria
The avenues of infection



The
History
Organism
Sources of
Infection
Avenues
of Infection
Distribution

Of

Tuberculosis Typhoid
Asiatic Cholera Anthrax
Dysentery Plague
Typhus Glanders
Symptomatic Anthrax
Malignant Edema
Leprosy Botulism
Malta Fever Pneumonia
Tetanus Diphtheria
Staphylococic and
Streptococic Infection

IT EXPLAINS

The Relation to Immunity of Phagocytosis, Specific Pricipitins
Agglutination, Opsonins, Germicidal Sera

IT DESCRIBES

The General Principles and Mechanism of Immunity

Cloth. 238 pp. Price, \$1.00

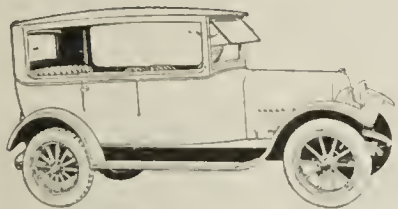
AMERICAN MEDICAL ASSOCIATION

535 N. Dearborn Street

CHICAGO



A sense of thorough satisfaction



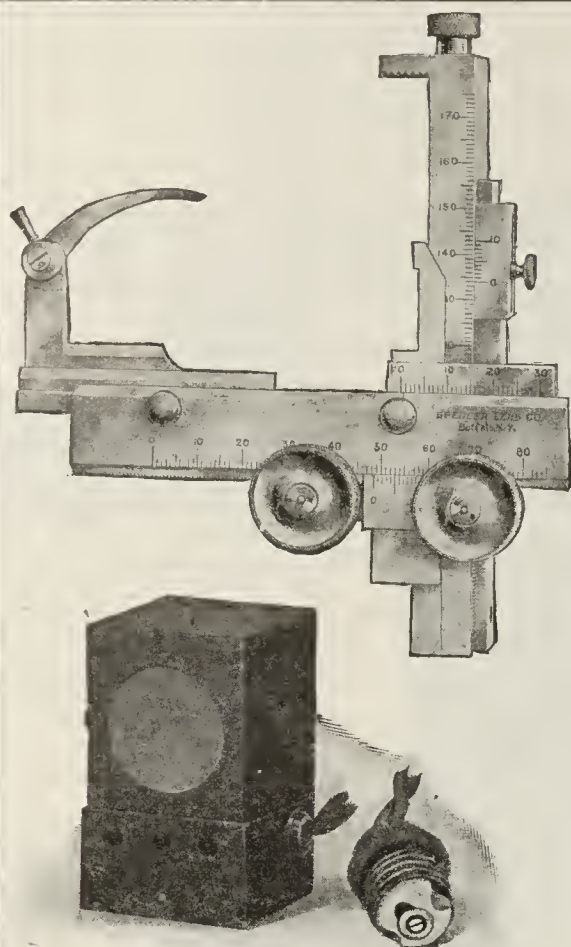
Sedan \$1835

comes over you as numerous cars line up in front of the hospital and you recognize how your Velie Six Cabriolet stands out among them—smart, handsome and dependably efficient. And it is your idea of a thoroughly *professional* car, too—with speed to get you anywhere and back, with power to take the hardest hills and roughest going. At your will, in an instant, it is either an open Roadster or enclosed Coupe.

Eight other Velie body styles include five-passenger Touring, seven-passenger Touring, two and four-passenger Roadsters, Touring Sedan, Coupe, and Town Car—at prices from \$1165 to \$2400. The Velie booklets are yours on request.

Velie

VELIE MOTORS CORPORATION, 101 Velie Place, MOLINE, ILL.



Increase your
Microscope
Efficiency
with a

SPENCER MECHANICAL STAGE

and a

SPENCER MINIATURE MICRO- LAMP

Spencer Instruments are pioneer models; incorporate the results of years of mature experience. They are the peers of their type of apparatus.

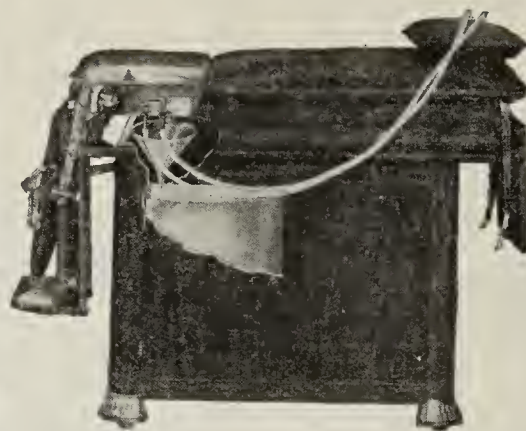
*All told in new
booklet—sent free.*

**SPENCER
COMPANY**



LENS

BUFFALO, N. Y.



Irrigating Table, No. 138

*The
Allison*
LINE OF OFFICE
EQUIPMENT IS
**DIFFERENT
DISTINCTIVE**
AND
DURABLE

"WHAT IS THE PSYCHIC INFLUENCE OF OFFICE EQUIPMENT ON A PATIENT, AND WHAT STYLE OF FURNITURE WILL PRODUCE THE BEST EFFECT?"

Anything that tends to suggest to the mind of the patient possible pain or distressing operations should be avoided. To set the mind of the patient at ease, the examining room should present a LIBRARY EFFECT rather than that of a hospital. The ALLISON LINE has been designed with the especial view of producing pleasing effects rather than arousing in the mind of the patient the dread or fear of an operation.

Send for Circular

"HOW SHALL I EQUIP MY OFFICE?"

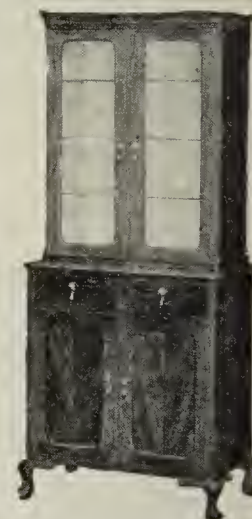
W. D. ALLISON COMPANY

Manufacturers

915 N. Alabama Street Indianapolis, Ind.

PRINCIPAL AGENCIES

691 Boylston St., Boston
924 S. Hill St., Los Angeles
110 E. 23d St., N. Y., 121 N. Wab., Chicago



Style 2154
Instrument Cabinet

FRENCH CATHETERS OF EVERY TYPE

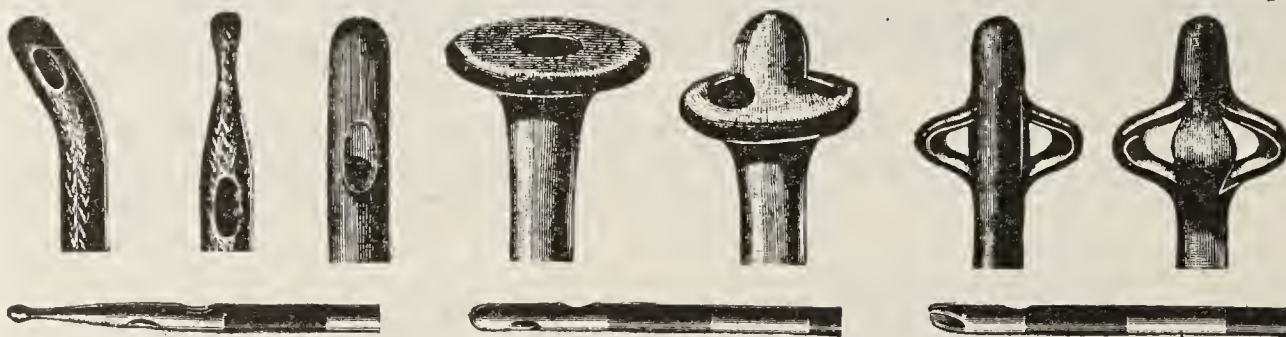
Mercier

Retention

Ureteral

X-Ray

Urethral



Can be immediately
supplied by our firm
regardless of the present
over-sea shipping dif-
ficulties.

ORDERS FILLED SAME DAY AS RECEIVED

V. MUELLER & COMPANY

1771-83 Ogden Avenue, CHICAGO

What To Prescribe and What Not To Prescribe

are questions you have to answer every day.

NEW AND NON-OFFICIAL REMEDIES

lists and describes only those newer medicaments that have been found worthy of therapeutic trial. A reliable guide in prescription work and a fine stimulus to professional development. Price \$1.00, prepaid. 436 pages, green cloth cover.

AMERICAN MEDICAL ASSOCIATION
535 N. Dearborn Street CHICAGO, ILL.

The essential
characteristics
of the non-offi-
cial, worth-
while remedies.
Simple and to
the point.

Composition,
Actions and Uses,
Dosage, Tests for
Purity, Estimate of
Therapeutic Value,
and Name of
Manufacturer are
given for each
preparation. Com-
pletely Indexed.

The Chicago Polyclinic and The Post-Graduate Medical School of Chicago

AFFILIATED

Offer the Following Courses:

CLINICAL INSTRUCTIONS in all departments of medicine and surgery. Clinical and Personal Courses in Eye, Ear, Nose and Throat.

SPECIAL PERSONAL COURSES in Surgery and Gynecology (*operating room work included*), Operative and Experimental Surgery on Cadaver and Dog.

PRACTICAL LABORATORY COURSES in Bacteriology, Blood, Urine, Sputum, Feces, Stomach Contents. Internships for those desiring hospital experience.

PRIVATE COURSES in any subject desired, besides the private courses in small classes outlined in the book of information.

LARGE DISPENSARY CLINICS. Three hospitals. Two training schools for nurses. *For further information write either:*

The Chicago Polyclinic
M. L. Harris, M.D., Sec'y.

Dept. B, 219 W. Chicago Ave.

The Post-Graduate Medical School of Chicago
Emil Ries, M.D., Sec'y.

Dept. B, 2400 S. Dearborn St.

New York Post-Graduate Medical School and Hospital

General, Separate Clinical and Special Courses of Individual Instruction. Courses in Operative Surgery on the Cadaver. Special Individual Instruction in the following branches:

Physical Diagnosis
Infant Feeding and Diagnosis
Diseases of the Stomach
Diagnosis of Focal Infections
Neurology

Vaccine and Serum Therapy
Practical Pediatrics
Cystoscopy (Male and Female)
Urethroscopy
Colon and Rectal Diseases

Refraction
Surgery of Nose and Throat (Operating Rooms)
Gynecology (Non-operative)
Roentgenology

FOR FURTHER DETAILED PARTICULARS, ADDRESS

The SECRETARY OF THE FACULTY

305 East Twentieth Street

NEW YORK CITY

NEW YORK POLYCLINIC Medical School and Hospital

341-351 West 50th Street, New York City

General, Separate Clinical, and Special Post-Graduate Courses of Individual Instruction as Assistants. Laboratory, Cadaver and Operative Courses in all branches.

Individual Instruction in the following branches:

PHYSICAL DIAGNOSIS
INFANT FEEDING AND DIAGNOSIS
TUBERCULOSIS (PULMONARY, GLANDULAR, BONE)
DRUG ADDICTIONS AND TOXEMIAS
DISEASES OF THE STOMACH (INCLUDING DIETETICS)
DERMATOLOGY (INCLUDING LABORATORY WORK)
GYNECOLOGY (OPERATIVE; NON-OPERATIVE)

X-RAY AND ELECTRO-THERAPEUTICS
HERNIA (LOCAL ANESTHESIA)
CYSTOSCOPY (MALE AND FEMALE)
URETHROSCOPY
RECTAL DISEASES
NEUROLOGY AND NEUROLOGICAL SURGERY (BRAIN, SPINAL CORD, PERIPHERAL NERVES)
EYE, EAR, NOSE AND THROAT

For further information address

JOHN A. WYETH, M.D., LL.D., President of the Faculty

ILLINOIS POST-GRADUATE MEDICAL SCHOOL

General clinics are conducted in Surgery, Gynecology, Orthopedics, Pediatrics, Obstetrics, Dermatology, Diseases of the Genito-Urinary Tract, Clinical Medicine, Eye, Ear, Nose and Throat.

PROFESSOR PAUL GRONNERUD CONDUCTS SPECIAL COURSES IN OPERATIVE SURGERY AND SURGICAL ANATOMY, TOGETHER WITH SPECIAL WORK UPON DOG.

Courses are given in Laboratory Diagnosis—covering Blood, Bacteria, Urinalysis and Gastric Contents. Also practical courses in the Wassermann Reaction. Noguchi and Gonorrhea Fixation, Colloidal Gold and Nonne Tests are given.

Address JAMES A. CLARK, M.D., Secretary

1844 W. Harrison Street, CHICAGO, ILL.

SPECIAL POST-GRADUATE WORK IN

Ophthalmology, Otology, Laryngology and Rhinology

Practical and Didactic Courses in Anatomy, Physiology, Pathology, Diagnosis, Treatment, Refraction and Operative Surgery in these specialties. Address

THE CHICAGO POLICLINIC

M. L. HARRIS, Secretary

219 W. Chicago Ave.,

CHICAGO, ILL.

SURGICAL TECHNIQUE CAN ONLY BE PERFECTED BY ACTUAL PRACTICE

The Laboratory of Surgical Technique is using an original plan of teaching the technique of surgery, giving the instruction, and enabling the doctor to do the operations over and over until he has mastered the technique. Particular attention is given to the table toilet, and the work is performed as humanely as though the operation were being done upon an anaesthetized human.

Personal Instruction, Actual Practice, Exceptional Facilities and Surroundings

THE LABORATORY OF SURGICAL TECHNIQUE

Phone Midway 4896

7629 Jeffery Ave., CHICAGO

FACULTY

Dr. Axel Werelius, Dr. Philip H. Kreuscher, Dr. Clifford C. Robinson, Dr. Emmet A. Printy, Dr. Edmund Andrews, Dr. Boyd S. Gardner, Dr. Lewis C. Emenhiser

EYE, EAR, NOSE AND THROAT

Special DIDACTIC and LABORATORY COURSES in the Anatomy, Pathology, Diagnosis, Treatment, Refraction and Operative Surgery.

Address: ILLINOIS POST-GRADUATE MEDICAL SCHOOL

JAMES A. CLARK, M.D., Sec.,

1844 W. Harrison Street, CHICAGO

W. A. FISHER, M.D. President

A. G. WIPPERN, M.D., Vice-President

Chicago Eye, Ear, Nose and Throat College

POST-GRADUATE INSTRUCTION

Diseases of the Eye, Ear, Nose and Throat and Fitting of Glasses

A House Physician is appointed in June and December.

Open the year round. Write for announcement to

J. R. HOFFMAN M.D., Secretary 235 WEST WASHINGTON STREET, CHICAGO

THE NEW YORK EYE and EAR INFIRMARY

School of Ophthalmology and Otolaryngology—For Graduates of Medicine.

Clinics daily by the Surgical staff of the Infirmary. Special courses in Ophthalmoscopy, Refraction, Operative Surgery of the Eye and Ear, Pathology and External Diseases of the Eye.

The abundant clinical material at this well-known institution affords students an unusual opportunity for obtaining a practical knowledge of these special subjects. Two vacancies in the House Staff exist in March, July and November of each year. For particulars address the Secretary,

DR. GEORGE S. DIXON, New York Eye and Ear Infirmary

MANHATTAN EYE, EAR and THROAT HOSPITAL

SCHOOL OF POST-GRADUATE INSTRUCTION

Individual and Graded Instruction in Eye, Ear and Throat Departments. The year is divided into four sessions beginning early in January, April, July and October. Special courses in Refraction, Operative Surgery in Eye, Ear, Nose and Throat; Bronchoscopy, Pathology and X-Ray.

For particulars address SECRETARY, 210 East 64th St., New York City.

HOSPITAL FOR DEFORMITIES AND JOINT DISEASES

8473 new cases were treated in the past year ending November 1, 1916

INFANTILE PARALYSIS

Clinic exceeds 200 patients daily. Treatment consists of electric baking, hydrotherapeutics, galvanic, faradic and sinusoidal electric currents, massage and muscle education before a mirror.

Also a course of instruction in differential diagnosis and the treatment of various forms of acute, subacute and chronic joint diseases, with special attention to focal infections, and the diagnosis and treatment of all other orthopedic conditions.

Application made to Dr. Henry W. Frauenthal, Medical Director, 1919 Madison Ave, New York City

A SCHOOL FOR GRADUATES OF MEDICINE

Los Angeles Medical Department

University of California

This institution possesses exceptional clinical facilities in both dispensary and hospital departments. *Clinical courses open throughout the year.* Why not pursue your post-graduate work in Los Angeles, California, a city of over 500,000 population. For catalogue, etc., address DR. GEORGE H. KRESS, Dean, 737 N. Broadway, LOS ANGELES, CALIFORNIA

Illinois Training School for Nurses

Founded 1880

Accredited by the Illinois State Board of Nurse Examiners. Offers a three-year course of training to women who wish to enter the nursing profession. Practical experience in Cook County Hospital, 2,200 beds. Private experience provided in other institutions.

Favorable applicants must meet the requirements of good health, of age (19-35), of good moral character, having had one year of High School instruction or its educational equivalent.

The school catalog and blanks will be sent on application to the SUPERINTENDENT OF NURSES, 509 Honore Street, CHICAGO, ILLINOIS

THE ANNOUNCEMENTS
OF "CLASS A"
MEDICAL SCHOOLS
ALONE ARE ACCEPTED
FOR THESE COLUMNS

It is of great importance to every prospective student of medicine that he should know the classification of the various medical institutions as fixed by the Council on Medical Education of the American Medical Association. This information is contained in pamphlet 91 which will be sent on receipt of 4c to cover cost of mailing.

The American Medical Association
535 N. Dearborn Street, Chicago, Ill.

University of Alabama SCHOOL OF MEDICINE

Mobile Ala.

Educational Requirements for Admission:—Two years of collegiate work, to include Physics, Chemistry, Biology and a modern foreign language, in addition to the full four year fourteen unit high school course.

The Combined Course: leading to the degrees of B.S. and M.D. in six years, is now offered by the University, and is recommended to all intending students.

For Catalogue and Information Address:

THE DEAN, School of Medicine, University of Alabama, Mobile, Alabama

RUSH MEDICAL COLLEGE

IN AFFILIATION WITH

THE UNIVERSITY OF CHICAGO

AUTUMN QUARTER COMMENCES OCT. 1, 1917.

Classes limited, and are now fully registered for next year.

For particulars, address

RUSH MEDICAL COLLEGE, Chicago, Ill.

UNIVERSITY OF LOUISVILLE, Medical Dept.

Eightieth Annual Session begins Sept. 25, 1917. Entrance requirements for the 1917-18 session—one year of College work in Physics, Chemistry, Biology and a modern foreign language, in addition to the fourteen units' work in an accredited, standard high-school.

Beginning with 1918-19 session, matriculates in medicine will be required to have two years of premedical college work. A premedical course of instruction is given in the Academic department of the University. A combined B.S. M.D. degree granted after two years of study in College of Arts and Sciences and four years in Medical Department.

Well equipped laboratories under full-time teachers. Clinical work in the New Million-dollar Public Hospital. For further information and catalogue, address the Dean,

HENRY ENOS TULEY, M.D., Louisville, Ky.

Washington University Medical School

SAINT LOUIS, MO.

Next session begins September 27, 1917. Early application for admission is desirable. For information and catalogue address the Dean.

SYRACUSE UNIVERSITY COLLEGE OF MEDICINE

ENTRANCE REQUIREMENTS: Two years in a registered College or School of Science. Combination courses recognized.

LABORATORY COURSES in well equipped laboratories under full time teachers

CLINICAL COURSES in the University Hospital, one general, one special, and the municipal hospitals and in the dispensary adjoining the college, in all of which senior students serve as clinical clerks. Tuition \$200.

Address The Secretary of the College of Medicine, 307 Orange St., Syracuse, N. Y.

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA

68th year begins September 19, 1917. Entrance requirements: two years of college work, including Chemistry, Physics, Biology and two languages other than English (one of which must be French or German).

Excellent laboratories. Full-time teachers. Clinical advantages: dispensaries, clinics, bedside instruction, out-patient obstetrical service. New and well equipped hospital. Post-graduate instruction.

For announcement and further information, address

Martha Tracy, M.D., Acting Dean, Box 600, N. College Ave. & 21 St., Phila., Pa.

MEDICAL COLLEGE OF VIRGINIA

MEDICAL COLLEGE OF VIRGINIA UNIVERSITY COLLEGE OF MEDICINE

Consolidated

Stuart McGuire, M.D., Dean

A. L. Gray, M.D., Chairman

New College Building, completely equipped, and modern laboratories. Extensive Dispensary service. Individual instruction, experienced Faculty, practical curriculum. For catalog or information, address **J. R. McCauley Secretary, 1142 E. Clay St., Richmond Virginia**

University of Michigan Medical School

Next Session begins October 2, 1917

The equivalent of two years of work in the college of Literature, Science and the Arts in this University is required for admission to this school, the same to include Chemistry (General, Qualitative Analysis, and Organic); Biology, and Physics, one year of each, including laboratory work; and two years of either French or German.

Combined courses leading to the degrees of B.S. and M.D., or to the degrees of A.B. and M.D. are offered.

The laboratories are well equipped, and the University Hospital affords ample clinical material.

Opportunity is given in all the laboratories for properly qualified persons to carry on original investigation, and credit toward the higher academic degrees A.M., Sc.D., Ph.D., and D.P.H., may be obtained for such work.

For announcement and further information, address

C. W. EDMUNDS, M.D., Secretary

ANN ARBOR, MICHIGAN

Disturbances of the Heart

Second edition, revised and enlarged, by Dr. Oliver T. Osborne of Yale Medical School. 269 pages of useful practical facts on cardiac affections.

PARTIAL CONTENTS

- | | |
|--|--|
| How to recognize cardiac weakness. | How to successfully handle a case of acute pericarditis. |
| How to determine the blood pressure. | How to identify cardiac murmurs. |
| How to outline a course of treatment for a patient with chronic myocarditis. | How to select and prescribe remedies for heart disturbances. |
| How to prescribe a diet for these cases and direct proper hydrotherapeutic measures. | |
| How alcohol and tobacco affect the heart. | |

A Vast Amount of Information in Little Space

American

Medical Association

535 N. Dearborn St., Chicago

CLOTH COVER

75c POSTPAID

University of Maryland, School of Medicine AND College of Physicians and Surgeons

Requirements for Admission: One year of College work in modern languages, Chemistry, Biology and Physics in addition to an approved four year high school course. Beginning with Jan. 1, 1918, two years of College work will be required.

Facilities for Teaching: Abundant laboratory space and equipment. Three large general hospitals absolutely controlled by the Faculty and thirteen hospitals devoted to specialities in which clinical teaching is done. The next regular session will open October 1st, 1917.

For catalogue apply to—**J. M. H. Rowland, M.D., Dean, N. E. Cor. Lombard and Greene Sts. Baltimore, Md.**



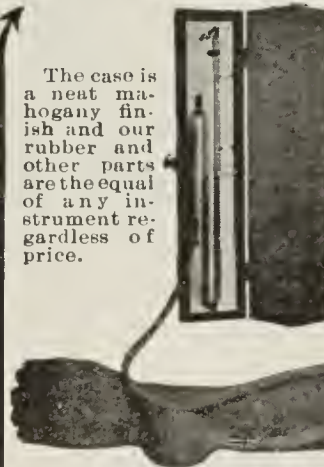
ELECTRIC STERILIZER with new conveniences. Tray supported from body—not attached to cover. Tray and contents freely removable. Inside unobstructed. Has automatic cut-out. *The only sterilizer equipped with wire-less heating unit.*

Made in four sizes.

The Prometheus Electric Company

511 W. 42d St., New York City

\$12.00 Buys the Unexcelled Dr. Beachler Pocket Sphygmomanometer



The case is a neat mahogany finish and our rubber and other parts are the equal of any instrument regardless of price.

No more accurate instrument made. Ideal for all clinical uses.

REGISTERS TO 300 MILLIMETERS

For Systolic and Diastolic Pressure

GUARANTEED ABSOLUTELY ACCURATE

Dimensions: (Outside measurements) 2 3/4 x 2 3/4 x 12 1/2 inches. Slips easily into the Pocket or Bag.

Sent prepaid on receipt of price. Address

The Reliable & Efficient Mfg. Co. 1195 East 124th St. Cleveland, Ohio

The Superiority of the Carnes Arm is Recognized by Leading Surgeons



See Fifth Edition of "Operative Surgery," page 1094. by Dr. J. F. Binnie; also Volume Six "Keen's Surgery," pages 918-922 inclusive. It embodies the movements of the natural hand and arm, and is built for service as well as appearance.

Send For Full Particulars

CARNES ARTIFICIAL LIMB CO. KANSAS CITY MISSOURI

THE MILWAUKEE SANITARIUM



RIVER ANNEX EAST HOUSE MAIN BUILDING OFFICE BATH HOUSE WEST HOUSE

Established in 1884

FOR MENTAL AND NERVOUS DISEASES

Wauwatosa, Wis.

Located at Wauwatosa (a suburb of Milwaukee) on C. M. & St. P. Ry., 2½ hours from Chicago, 15 minutes from Milwaukee, 5 minutes from all cars. Two lines street cars. Complete facilities and equipment, as heretofore announced. Psychopathic Hospital: Continuous baths, fire-proof building, separate grounds. West House: Rooms en suite with private bath. Gymnasium and recreation building: physical culture, "Zander" machines, shower baths. Modern bath house: Hydrotherapy, Electrotherapy, Mechanotherapy. Thirty acres beautiful hill, forest and lawn. Five houses. Individual treatment. Descriptive booklet will be sent on application.

Richard Dewey, A.M., M.D. Eugene Chaney, A.M., M.D. William T. Kradwell, M.D.
CHICAGO OFFICE: 25 E. Washington St., (Field Annex) Room 1823, Wednesday 1-3 P.M. (Except July and August) Telephone Central 1162. MILWAUKEE OFFICE: Goldsmith Bldg., Room 504, (by appointment) Telephone Main 81. Telephone Sanitarium Office, Milwaukee, Wauwatosa 16.

THE MERCER SANITARIUM

For Nervous and Mild Mental Disorders, Alcoholic and Drug Addictions. Located at Mercer, Pa., equidistant from Pittsburgh, Erie and Cleveland; 1500 feet elevation; 52 acres of attractive grounds. New treatment rooms including excellent hydrotherapeutic and electrotherapeutic facilities. Training School for Nurses; Dietetic department; Reeducational measures emphasized, especially Arts and Crafts and out-door occupations. Modern laboratory facilities. Address

W. W. RICHARDSON, M.D., Mercer, Pa.
(Formerly Chief Physician, State Hospital, Norristown, Pa.)



The Sacred Heart SANITARIUM

OF MILWAUKEE is a homelike restful place. Treatment of all metabolic, eliminative and chronic systematic disorders.

One hundred bed Psychopathic Hospital four blocks west.
For Descriptive Booklet Address
Sister Superior or Dr. S. S. Stack, Med. Supt.

DR. LOOPE'S HOSPITAL

An ethical, strictly modern, very private institution especially equipped for the scientific treatment of drug addictions and alcoholic inebriety. For information address

A. M. LOOPE, M.D., Medical Director
1956 East 79th Street CLEVELAND, OHIO

PLEASE MENTION THE JOURNAL A. M. A.
WHEN WRITING TO ADVERTISERS

Dr. Moody's Sanitarium, San Antonio, Texas, For Nervous and Mental Diseases, Drug and Alcohol Addictions.

Established 1903. Location and Climate delightful. Approved diagnostic and therapeutic methods; 7 buildings, each with separate lawns, bath rooms ensuite; 100 rooms; modern equipments; 15 acres, 350 shade trees.

G. H. MOODY, M.D. Supt. T. L. MOODY, M.D., Res. Phys. J. A. McINTOSH, M.D., Res. Phys.



KENILWORTH SANITARIUM

(Established 1905)

KENILWORTH, ILL.

(C. & N.W. Railway. Six miles north of Chicago)

Built and equipped for the treatment of nervous and mental diseases. Approved diagnostic and therapeutic methods. An adequate night nursing service maintained. Sound-proof rooms with forced ventilation. Elegant appointments. Bath rooms en suite, steam heating, electric lighting, electric elevator.

RESIDENT MEDICAL STAFF:

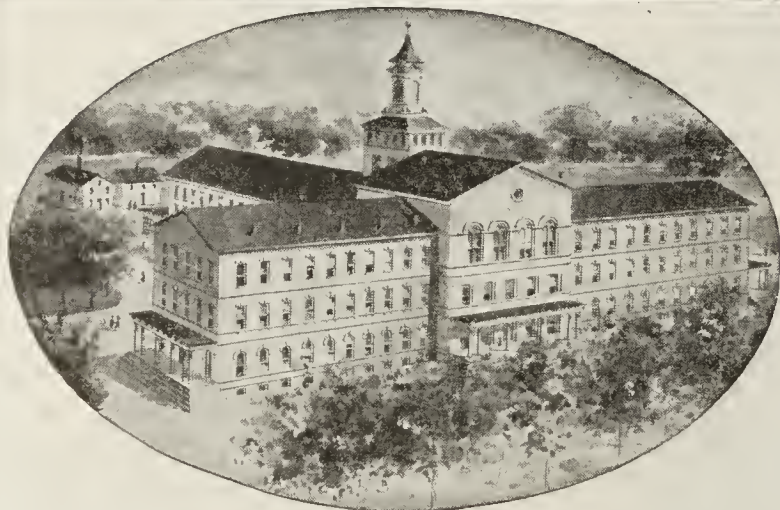
Ella Blackburn, M.D. Sherman Brown, M.D.,
Assistant Physician Medical Superintendent
Sanger Brown, M.D., Chief-of-Staff.

Chicago Office, 59 East Madison Street

Telephone Randolph 5794 Consultation by appointment only.

All correspondence should be addressed to

Kenilworth Sanitarium, Kenilworth, Ill.



OXFORD RETREAT

A private hospital for Nervous and Mental Diseases, Alcoholic and Narcotic Inebriety. Incorporated 1883. Separate departments for men and women. Careful attention to proper classification, modern conveniences, and accommodations. Facilities excellent. Electricity, Hydrotherapy and Massage. Site elevated, retired and beautiful. Ninety-six acres in lawn and forest.



THE PINES

A Neuropathic Hospital for women only. Mental cases not received in this building. First class in all its appointments. Under the same control and medical management as the Oxford Retreat. Thirty-nine miles from Cincinnati, eighty-four miles from Indianapolis, on C. I. & W. R. R.; ten trains daily.

For references, terms and descriptive circular address
R. HARVEY COOK, Physician-in-Chief, Oxford, Butler County, Ohio

LAKE GENEVA SANITARIUMS

For Mental and Nervous Diseases

Dr. Oscar A. King, Med. Director

Dr. O. C. Willhite, Supt.



Buildings are situated in 83 acres of attractive grounds, commanding superb views of the town and lake of Geneva. The accommodations, table, attendance, nursing and all appointments are designed to give proper attention to each individual case.

Terms moderate.

Chicago Office, 7 W. Madison St. Tuesdays and Fridays, 10-3. Telephone Central 2508.

All correspondence should be addressed

LAKE GENEVA SANITARIUMS, Lake Geneva, Wis.



Building absolutely fire-proof

WAUKESHA SPRINGS SANITARIUM

FOR NERVOUS DISEASES

BYRON M. CAPLES, M.D.
Superintendent

WAUKESHA : WIS.

"REST COTTAGE" College Hill, Cincinnati, O.



For purely nervous cases, nutritional errors and convalescents.

Completely equipped for hydrotherapy, massages, etc.

Cuisine to meet individual needs.

W. F. LANGDON,
Medical Director

B. A. WILLIAMS,
Resident Physician

EMERSON A. NORTH,
Resident Physician

H. P. COLLINS,
Business Manager

Dr. Weirick's Sanitarium

Formerly Dr. Broughton's Sanitarium, Established 1901

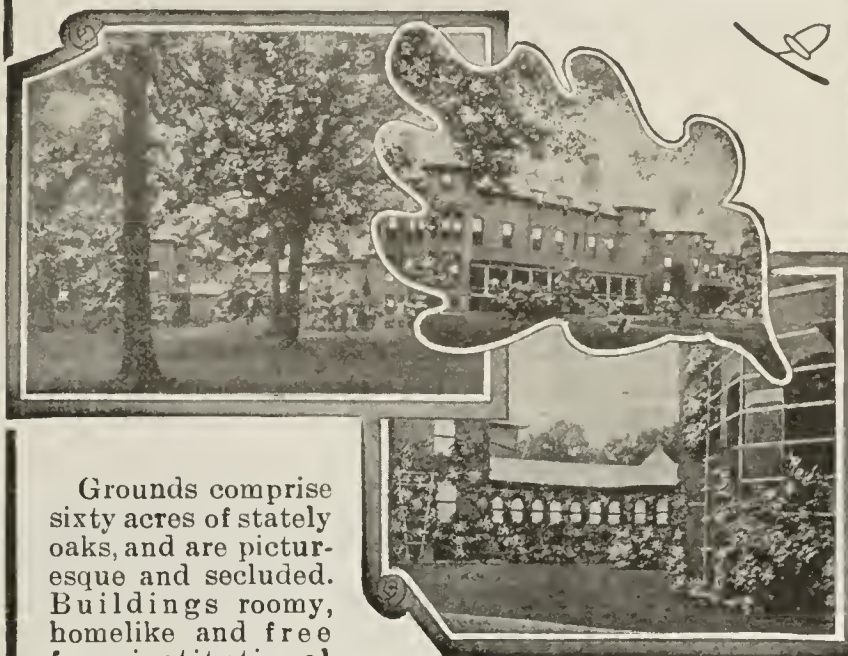


For Opium, Morphine, Cocaine and Other Drug Addictions, including Alcohol and Special Nervous Cases.

Methods easy, regular, humane. Good heat, light, water, help, board, etc. Number limited to 44. A well kept home. Nervous-Mental Department in charge of Dr. W. L. Ransom. Address, Dr. G. A. Weirick, Supt. Phone 536 2007 S. Main St. ROCKFORD, ILL.

Oak Grove Hospital

For Nervous and Mental Diseases



Grounds comprise sixty acres of stately oaks, and are picturesque and secluded. Buildings roomy, homelike and free from institutional features. Interiors bright and cheerful. Luxurious furnishings, superior appointments and skilled attendance. First-class cuisine. Static, Galvanic and Faradic Apparatus, Baruch hydrotherapeutic equipment, Turkish and Russian Baths, and Massage. Use of Gymnasium, Billiard Room, Bowling Alley, and Carriages, Free.

For terms address

DR. C. B. BURR, Medical Director, FLINT, MICHIGAN

Colfax School FOR THE Tuberculous

COLFAX, CALIFORNIA

Elevation 2422 ft. in Sierra Nevada Mountains

Hospital and housekeeping cottages for tuberculous patients

Daily medical supervision

Laboratory and well equipped X-ray Department.

ROBERT A. PEERS, M.D. - - - - Medical Director
Colfax, California

THE CINCINNATI SANITARIUM Inc. For Mental and Nervous Diseases

A strictly modern hospital fully equipped for the scientific treatment of nervous and mental affections. Situation retired and accessible. For details write for descriptive pamphlet.



F. W. LANGDON, M.D., Medical Director. B. A. WILLIAMS, M.D., Resident Physician.
EMERSON A. NORTH, M.D., Resident Physician.
H. P. COLLINS, Business Manager, Box No. 4, College Hill, CINCINNATI, OHIO

Saint Joseph Sanatorium

Albuquerque, N. M.

The management wishes to announce the acquisition of Dr. Leroy S. Peters, who from now on will act as Associate Medical Director, together with Dr. Oliver T. Hyde.



ARROWHEAD is famous for its MUD BATHS, which constitute an important feature of our treatment. They stimulate the skin, promote secretion and excretion and are appreciated by all patrons, especially those with rheumatic conditions.

ARROWHEAD HOT SPRINGS

California's Ideal Spa

You have patients who need rest, change of climate, surroundings and social life, others recovering from surgical operation. Send them to ARROWHEAD. Aside from its ideal location, climate, etc., it is splendidly equipped for the administration of mineral water, mud and natural steam baths. The mineral waters contain di-sodium arsenate, certified by reliable chemists and analyses conducted by the French Gov't in 1914; they are also radio-active. Their values have been established as a medicinal and dietetic aid in many pathologic conditions.

Come to ARROWHEAD yourself—you will enjoy it. A two weeks' stay after a year's hard grind will replenish your energies and fit you for renewed effort.

Send for booklet detailing all features of ARROWHEAD, accommodations, properties of waters, etc. It is educational and will interest you.

Address Mr. Seth Marshall, Mgr.

ARROWHEAD HOT SPRINGS, ARROWHEAD SPRINGS, CAL.

That combination of climate, just-right altitude of 3600 feet, shade trees, beautiful homes and congenial people—

ROSWELL
New Mexico
HAS IT!

For booklet A address HEALTH COMMITTEE, ROSWELL, N. M.



New Mexico Cottage Sanatorium

Silver City, New Mexico

FOR SUITABLE CASES OF PULMONARY AND LARYNGEAL TUBERCULOSIS

E. S. BULLOCK, M.D., Physician-in-Chief

WAYNE MacVEAGH, WILSON, Manager

WHEN YOU SEND your patients to this institution you can rest assured that you have done your best by them.

We have all that any Eastern or Middle West sanatoria can offer and in addition from 300 to 325 days of sunshine, low humidity, and altitude of 6,000 feet; wonderfully cool summers. "Chasing the Cure" is a pleasure here. The U. S. Government has endorsed this region by locating the one and a half million dollar army sanatorium at Fort Bayard. Some of the most eminent physicians of America testify to the value of this climate. The physician-in-chief has had twenty years experience in treating tuberculosis exclusively. This ought to appeal to you. Rates for ambulant patients moderate. No extras.

BOOKLET "A" IS YOURS FOR THE ASKING



ESTABLISHED 1901

The Charles B. Towns Hospital for Drug and Alcoholic Addictions

refers by special permission to many practitioners in a number of States who have professional knowledge of what this Hospital accomplishes for its patients.

These practitioners have either brought patients here and followed every detail of treatment and care in their professional capacity; or, they have observed the medical and sanative results of the Hospital's treatment in patients referred back to them on conclusion of the Hospital treatment.

Thus they are in a position to speak from actual professional experience not only of the medical results obtained by the treatment administered here, but of the Hospital's service to its patients and of its personal and professional dealings with the practitioner.

No. 293
Central Park
West
New York
City

The Hospital is highly pleased to be permitted to refer the *professional* inquirer to fellow practitioners in his own State or vicinity, of whom inquiry may be made direct as to the results that may be expected to follow the definite medical treatment for habit and addiction and the scientific recuperative after-care as administered and carried out in this hospital.

SHORTLE'S Albuquerque Sanatorium For Tuberculosis

Altitude 5100 feet. Rates moderate. No extras. Climatic conditions unsurpassed



A private sanatorium where the closest personal attention is given each patient. Complete laboratory and X-Ray equipment for diagnostic purposes. Compression of the lung and sun-bath treatment after the method of Rollier. Steam heat, hot and cold water, electric lights, call bells, local and long distance telephones and private porches for each room. Bungalows if desired.

Situated but 1½ miles from **ALBUQUERQUE**, the largest city and best market of NEW MEXICO, permits of excellent meals and service at a moderate price. Write for booklet A.

A. G. SHORTLE, M.D., Medical Director



THE EFFICACY, success and recorded data on the administration of Nauheim Baths at Hotel Chamberlin indicate as satisfactory results as for these Baths given abroad.

THE CHAMBERLIN NAUHEIM BATHS use filtered sea-water, giving a pure, natural, salt water of determined chemical constituents, all beneficial, plus CO₂, thoroughly incorporated by superior mechanical appliances. The method of administration provides a definite regulation of the amount of salt, quantity of gas and thermic conditions. These are frequently supplemented by Schott Resistance Movements, and are valuable in circulatory and cardiac derangements.

The Nauheim Baths are but one feature of The Chamberlin Department of Medicinal Baths, which includes Sea-water, Aix and Vichy Treatments, as well as a complete Electrotherapeutic installation.

GEO. K. VANDERSLICE, M.D., MEDICAL DIRECTOR

Hotel Chamberlin, the Sea-shore Spa of America—one of the country's great Resort Hotels—a luxurious home, ideally situated, affording a rarely distinctive social life and environment and an unusual variety of sports and recreations. Unsurpassed climate all the year round.

GEO. F. ADAMS, MANAGER, FORTRESS MONROE, VA.



HOMEWOOD SANITARIUM

GUELPH, ONTARIO

For Nervous and Mental Diseases and Selected Habit Cases.
Seven New Buildings, four of which are residential. Grounds comprise 75 acres of woods and lawns.
Recreation: In Summer—Golf, Tennis, Lawn Bowling, Croquet and Quoits. In Winter—Gymnasiums, Bowling Alleys, Billiards, Skating, Skiing, Snowshoeing and Tobogganing.
Diversions—Occupational Rooms, Music Rooms and Library.

Treatment—Daily Medical Attention, Hydrotherapy, Electricity and Massage.

Accommodation—Single Rooms, Rooms with Bath, or Complete Suites. A Good Cuisine.

GUELPH is situated on the Grand Trunk and Canadian Pacific Railways, seventy miles from Niagara Falls.

Rates are reasonable: For information apply to A. T. HOBBS, Medical Supt.

GRACE LUTHERAN Sanatorium for Tuberculosis, San Antonio, Texas

Modern and well equipped for the scientific treatment of tuberculosis. Located in San Antonio. Climate unexcelled the year around. Private rooms with bath and sleeping porches in main building. Individual cottages. Complete medical staff. Rates \$15 to \$40 per week; no extras.

For booklet and information address: **Rev. Paul F. Hein, Supt.** P. O. Box 214.



“NORWAYS” Hospital for Nervous Diseases and General Diagnosis

1820 East 10th Street, Indianapolis, Ind.

Devoted to the solution of all problems in Medicine, particularly Neurology, based on intensive study, research examination and observation of each individual case.

Patients promptly returned into family physician's care; those, only, requiring special treatment remain at the institution.

DR. ALBERT E. STERNE, Medical Director.

DR. CHAS. D. HUMES, Associate Director

Skilled Specialists in close co-operation

DR. BARNES SANITARIUM

STAMFORD, CONNECTICUT

A Private Sanitarium for Mental and Nervous Diseases. Also Cases of General Invalidism. Separate Department for cases of inebriety.

The buildings are modern, situated in spacious and attractive grounds, commanding superb views of Long Island Sound and surrounding hill country. The accommodations, table, attendance, nursing and all appointments are first-class in every respect. The purpose of the institution is to give proper medical care and the special attention needed in each individual case. 50 minutes from Grand Central Station. For terms and illustrated booklet, address Telephone 1867

F. H. BARNES, M.D., Med. Supt.

PRESCOTT, ARIZONA PAMSETGAAF SANATORIUM Altitude 5350 feet

FOR TUBERCULOSIS

JOHN W. FLINN, Medical Director

Pamsetgaaf is a quiet cottage sanatorium for the treatment of all forms of tuberculosis. It is beautifully situated among the pines in the mountains of Northern Arizona, and offers all the advantages of careful scientific treatment combined with the pure invigorating air of the Southwest in the midst of attractive surroundings. Especial attention to surgical tuberculosis. Write for illustrated booklet.

JOSIAH F. REED, Business Manager

IDYLEASE INN

Newfoundland, New Jersey

A quiet, restful health resort among the hills of Northern New Jersey. Large sunny porch; dry exhilarating air. All forms of hydrotherapy and massage under medical supervision. Believing that there is a curable physical basis for most chronic ailments, we seek the underlying cause through a scientific study of each individual case. Booklet sent on application. No Tubercular or Objectionable Cases. Telephone 21 Newfoundland.

D. E. DRAKE, M.D., President and Medical Director.

H. H. CATE, M.D., Associate Director.

Mountain Valley Springs Sanitarium

A quiet Mountain Resort for the treatment of Renal, Cardiac and circulatory diseases, Diabetes, Gout Rheumatism and other disturbances of metabolism requiring extra elimination. Within a few miles of America's great health resort—Arkansas' Hot Springs, which is under Government supervision and regulation. Freedom from city noise and distractions. The Famous Mountain Valley Springs on the grounds; actively Diuretic, Palatable and of low salt content. Homelike hotel with modern convenience. Individualized diet and water drinking based on thorough analysis of case, and adjusted from day to day to fit patient's condition. Invigorating mountain air, plenty of sunshine and a mild equable climate. Competent medical supervision by a resident physician. Home physician's orders carefully carried out. Weekly reports on request. Rest, baths, and exercise as indicated. Graduated exercise for Heart and High Blood Pressure cases. Patients taught to adjust themselves to changed conditions of living, necessitated by damaged heart, blood vessels and kidneys. No Infectious, Alcoholic or Insane cases accepted. Rates reasonable. Accommodations good. Booklet and further information on request.

Mountain Valley Springs Company

Mountain Valley, Ark.



BANCROFT TRAINING SCHOOL

A home for the training of children whose mental development has not progressed normally.

Founded 1883 by Margaret Bancroft. Winter quarters (18 acres) in beautiful Philadelphia suburb; summer schools (28 acres) at Owl's Head on the Maine coast. Enrollment limited to 50 pupils, both sexes. The staff consists of 76 employees, including resident physician, 10 teachers, 29 nurses and attendants. Physicians who desire to retain supervision of their cases will have the full co-operation of the resident and the consulting staff. Circular on request.

E. A. FARRINGTON, M.D., Box 133, Haddonfield, N.J.

WILBUR HOME

for Backward and Mentally Defective CHILDREN AND ADULTS

KALAMAZOO, MICHIGAN

A home where proper restraint is exercised and the mentally deficient are intelligently directed and encouraged. Has been in operation 30 years. Delightful surroundings, strict privacy and number of patients limited. Terms and other information given upon application. JOSEPH W. WILBUR, Superintendent P. O. Drawer 875. Kalamazoo, Michigan.

THE POTTENGER SANATORIUM MONROVIA CALIFORNIA

For Diseases of the LUNGS and THROAT



For particulars address POTTENGER SANATORIUM MONROVIA, CAL.

Los Angeles office, 1100-1101 Title Insurance Bldg Fifth and Spring Sts.

A thoroughly equipped institution for the scientific treatment of tuberculosis. Highclass accommodations. Ideal all-year-round climate. Surrounded by orange groves and beautiful mountain scenery. Forty-five minutes from Los Angeles.

F. M. POTTENGER A.M., M.D., LL.D. Medical Director

J. E. POTTENGER A.B., M.D.

Assistant Medical Director and Chief of Laboratory.

George H. Evans, M.D. Medical Consultant San Francisco.

It tells you what to avoid in proprietary remedies and why!

Propaganda for Reform in Proprietary Medicines

512 pages. Brown cloth cover. Gold lettering. Price, \$1.00 Postpaid.

AMERICAN MEDICAL ASSOCIATION

535 N. Dearborn Street, CHICAGO

“CONSUMPTION CURES”

is the name of one of many pamphlets issued by the Association. It is an illustrated brochure that exposes some of the most widely advertised nostrums sold as cures for consumption. Postpaid 10 cents a copy. American Medical Assn., 535 N. Dearborn St., Chicago



The Willows Maternity Sanitarium

AN ETHICAL HOSPITAL AND HOME
FOR THE CARE AND PROTECTION OF

UNFORTUNATE YOUNG WOMEN

Patients accepted at any time during gestation. Early entrance advisable. Open to the regular practitioner. Adoption of baby when arranged. Rates reasonable.

Write for Catalog and Prices

2927-29 Main St.

THE WILLOWS

Kansas City, Mo.

THE WILGUS SANITARIUM ROCKFORD, ILL.

For Mental and Nervous Diseases

Under the supervision of DR. SIDNEY D. WILGUS, formerly superintendent Elgin and Kankakee State Hospitals. Address DR. SIDNEY D. WILGUS, Box 304, Rockford, Ill. Long distance Bell phone 3767. Chicago address, 25 E. Washington St. Telephone Central 1098

Send for a pamphlet.

Telephone Central 1098

PETTEY & WALLACE SANITARIUM

FOR THE TREATMENT OF

Drug Addiction, Alcoholism, Mental and Nervous Diseases

A quiet, homelike, private, high-class institution. Licensed. Strictly ethical. Complete equipment. Best accommodations.

Resident physician and trained nurses. Drug patients treated by Dr. Pettey's original method.

Detached building for mental patients.

MEMPHIS, TENNESSEE

FAIR OAKS SUMMIT, N. J.

For the care and treatment of nervous affections, neurasthenia, states of simple depression, exhaustion states and cases requiring rest, hygiene, dietetics and occupational treatment. Insane and tubercular cases not accepted. Our Occupational Department is newly housed and equipped. Summit is located in the beautiful hill country of New Jersey, on the D. L. & W. R. R., twenty miles from New York City. The institution is thoroughly equipped with baths and electrical outfit.

DR. T. P. PROUT

NEW YORK OFFICE:

SUMMIT, N. J.

'Phone 143

40 East 41st St.

Phone 6950 Murray Hill

HIGHLAND SANITARIUM

Nashville, Tennessee



For the treatment of Nervous and Mental Diseases, General Invalidism and the Addictions, under supervision of DR. A. E. DOUGLAS, former superintendent Central Tennessee State Hospital, assisted by fifteen of Nashville's most eminent physicians. Strictly ethical. Modern equipment. Licensed. Moderate rates.

HIGHLAND SANITARIUM, Nashville, Tenn., R. F. D. 7, Phone Main 1826

LYNNHURST SANITARIUM

For Nervous Diseases, Mild Mental Disorders; an Improved Treatment for Opium-Morphin Addiction, which Eliminates Suffering and Craving.

Situated in the suburbs of Memphis, Tennessee, on 28 acres of beautiful woodland and ornamental shrubbery. Modern and approved methods in construction and equipment. Thorough ventilation, sanitary plumbing, low pressure steam heat, electric light and fire protection. Pure water. Experienced nurses. Special facilities for giving hydrotherapy, electrotherapy, massage, physical culture and rest treatment. Address

S. T. RUCKER M.D. Office, Goodwyn Institute MEMPHIS, TENN.

Neuronhurst

Dr. W. B. Fletcher's Sanatorium

For Nervous and Mental Diseases

Strictly psychopathic hospital for treatment of all forms of disease arising from organic or functional derangement of Brain and Spinal Cord. Buildings fully and modernly equipped. Electro- and Hydrotherapeutic advantages unexcelled. Physicians desiring to place patients in our care will receive every ethical attention.

Address DR. MARY A. SPINK, Supt. 1140 E. Market St., Indianapolis, Indiana

LABORATORY OF DR. ALLEN H. BUNCE

Atlanta, Georgia

A modern laboratory of clinical pathology, well-equipped for making pathological, bacteriological, serological and chemical examinations for physicians and surgeons.

Bleeding tubes, culture media and all other necessary containers furnished free. For fee list and information, address.

ALLEN H. BUNCE, A.B., M.D., Healey Building, Atlanta, Ga.

CHANNING SANITARIUM

(Established in Brookline 1879)

Has been transferred to Wellesley Avenue

WELLESLEY, MASS.

Seven new buildings on fifty acres of high woodland. Sleeping porch and private bath for each patient. Large and small suite cottages. Separate buildings for men and women. Facilities for occupation and diversion. Complete equipment for Vichy, Nauheim, and Electric Baths and other forms of Hydrotherapy.

DONALD GREGG, M. D.

WALTER CHANNING, M. D.

The Norbury Sanatorium

JACKSONVILLE ILLINOIS

Incorporated and Licensed

For the treatment of Nervous and Mental Disorders

Dr. Frank P. Norbury, MEDICAL DIRECTOR.

Dr. Albert H. Dollear, Superintendent.

Dr. Paul J. Ewerhardt, Associate Physician.

Address Communications

THE NORBURY SANATORIUM, Jacksonville, Illinois

Springfield Office: DR. FRANK P. NORBURY, 407 S. Seventh St., by appointment

DR. LYNCH'S SANATORIUM

FOR THE
TREATMENT
OF



All Private Rooms
Accommodations
Limited

Write for particulars
D. W. Lynch, M.D.
West Bend, Wis.

DIABETES and BRIGHT'S DISEASE

SUNMOUNT SANATORIUM

SANTA FE, N. M.

For TUBERCULOSIS

Unusual climatic advantages and location. Under direction of F. E. MERA, M.D., Resident Physician. Rates Reasonable.

Write for booklet and further particulars. to

SUNMOUNT SANATORIUM

::

Box 10, Santa Fe, New Mexico

LAS ENCINAS

A place for the Treatment of Nervous and General Diseases. Near Pasadena, California



Situated in a grove of 20 acres of Live Oaks in the country near Pasadena. Large central building and cottages. All chronic organic disorders received. No cases of Tuberculosis or Insanity received.

STEPHEN SMITH, Med. Dir.
Board of Directors: Drs. Norman Bridge, H. G. Brainerd, J. H. McBride, W. Jarvis Barlow, F. C. E. Matison.

PASADENA, CAL.

THE RADIUM INSTITUTE

1604 Mallers Bldg., 59 East Madison Street
Corner Wabash Avenue, Telephone Randolph 5794

CHICAGO

DR. FRANK E. SIMPSON, Director

TREATMENT of Malignant and Benign Growths with Radium, Post-Operative Prophylactic Radiations. Applicators for all purposes, including many of Special design. We desire to confer and cooperate with surgeons who wish to use Radium in inoperable cases.

A complimentary copy of The Radium Quarterly will be sent on request.

COUNCIL

DR. F. A. BESLEY DR. E. C. DUDLEY
DR. A. R. EDWARDS DR. O. T. FREER
DR. M. HERZOG DR. L. E. SCHMIDT
DR. G. F. SUKER



The Northwestern Hospital, Princeton, Minn.
Uses the "NATIONAL" Sterilizer

Widespread use is an evidence of efficiency which merits consideration in selecting sterilizing equipment.

"NATIONAL" High Pressure STERILIZERS

are used by thousands of hospitals, surgeons and general practitioners. They give the same results as an autoclave at one-fourth the price.

Three sizes—Doctor's, Medium and Hospital—at \$55, \$77 and \$132, complete with gas or gasoline burner or steam coil, as desired. Large capacity and quick action.

Sold by reputable dealers everywhere under an absolute guarantee of satisfaction.
Full description on request.

Northwestern Steel and Iron Works

Capital Stock \$200,000.00

788 Spring Street

Eau Claire, Wis.



Doctor's
Size

Only \$10.00

**Puts This
Complete
Outfit
In Your Office**



See, Doctor, What You Save!

This magnificent nine-piece, White Steel Aseptic Office Furniture Set is the last word in utility and beauty for the modern physician's office. Bought at the regular price, it would cost you as follows:

Regular Cash Price

1 White Steel Cabinet.....	\$60.00
1 White Steel Operating Table.....	30.00
1 White Steel Irrigator.....	20.00
1 White Steel Instrument Table.....	9.00
1 White Steel Chair.....	9.00
1 White Operator's Stool.....	6.00
1 White Steel Waste Basket.....	3.50
1 White H'dw'd Medicine Cabinet...	8.00
1 White Hardwood Costumer.....	4.50

Total Regular Price.....\$110.00

**Our Price Only \$110
You Save \$40**

and Have a Full Year To Pay

Send us only \$10 and, if you find everything satisfactory, pay the balance of our special bargain price of \$110 on our liberal credit terms of only **\$8.33** Per Mo. for 12 months.

Money Back Guarantee Every item in this splendid outfit is backed by the famous Aloe iron-clad guarantee. If not perfectly satisfactory—and you are to be the sole judge—return it at our expense and we will immediately refund your money. Every piece solidly constructed for long years of service. Heavy coating of fine white baked enamel makes it easy to keep clean. It does not become dingy. Send order today—\$10.00 is all you need to send with it. Complete description free on request.

A. S. ALOE CO., Surgical Supply Department
515 Olive St., St. Louis, Mo.

MADE IN AMERICA

Maltine Malt Soup Extract

—with which the preparation of Malt Soup becomes easy and satisfactory.

Pamphlet reflecting the views of DR. KELLER will be sent to physicians on application.

THE MALTINE COMPANY, Brooklyn, N.Y.

A Satisfactory Food

should first be easily digested—then easily prepared—clean—safe and wholesome. All the above factors must be considered if the food is to enjoy the confidence of the medical profession.

Gail Borden
EAGLE
BRAND
CONDENSED
MILK
THE ORIGINAL



for nearly sixty years has enjoyed this confidence, which is reflected in the consistently reliable quality of the product.

Samples, Analysis, and Literature will be mailed upon receipt of professional card.

BORDEN'S CONDENSED MILK COMPANY

Est. 1857

"Leaders of Quality"

New York

A satisfactory substitute for mothers' milk

TROMMER MALT SOUP

Cases of *sub-acute enteritis*, *infantile atrophy* and *marantic conditions* from any cause in which the ordinary simple milk modifications are not tolerated at all, will show decided improvement when this preparation is used.

Children when fed upon Trommer Malt Soup gain in weight, vitality and strength. It provides an excellent nutrient for all infants who are deprived of mothers' milk.

Descriptive booklet—The Use of Malt Soup in Infant Feeding—mailed on request. -- -- -- --

THE TROMMER COMPANY

FREMONT, OHIO

ELECTRIC COLLOIDAL METALS

ELECTRARGOL

Uniform Small Grained Electric Collodial Silver

General applications. All infectious diseases: Pneumonia, Typhoid, Exanthematic Typhus, Tetanus, Variola, Scarlatina, Erysipelas, Rheumatism.

Local treatment. Electrargol has given conclusive results in local applications in cases of Septicemia, gunshot and operative wounds, abscesses, whitlows, boils and in ophthalmology.

Sold in boxes of 6 ampoules of 5cc. (84.5 minims) } with equal number of Isotonising liquid ampoules
 " " " " 3 " 10cc. (169 minims) }
 also in bottles of 50 and 100cc. (Respectively 2 and 4 fl. ozs.) for local treatment
 also in special Drop-bottles of 10cc, (about 1/3 fl. ozs.) for ophthalmic use.

ELECTR-HG.

(ELECTROMERCUROL)

Electric Small-Grained
Stable Isotonic and Sterile
Collodial Mercury

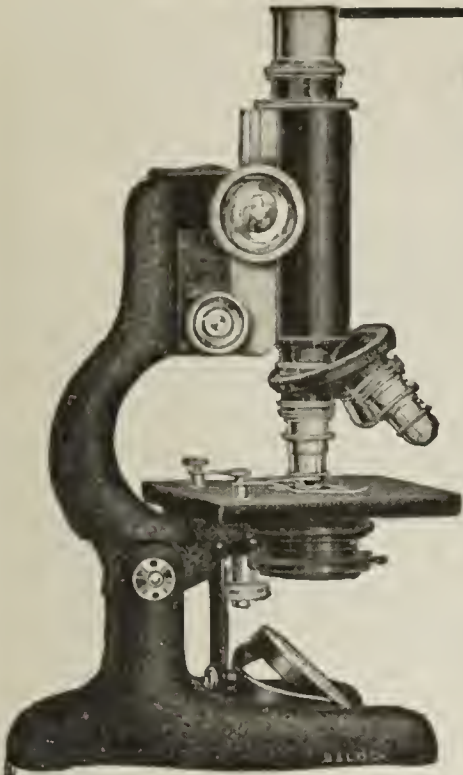
Electr-Hg has yielded good results by intramuscular, intravenous or intraspinal injections in mostly all manifestations of syphilis. In locomotor ataxia by subarachnoid injections.

Intramuscular injections are painless save in very rare cases. Intravenous injections may be given in large repeated doses. Intraspinal injections only give rise to a fugitive meningeal reaction.

Sold in boxes of 6 ampoules of 5cc (84.5 minims) with equal number of Isotonising liquid ampoules

Agents: E. FOUGERA & CO., Inc., 90-92 Beekman Street, New York City

CLIN LABORATORIES-PARIS



MICROSCOPE FFS8

As Supplied to Medical Departments,
U.S. Government

Side fine adjustment with positive stops; three objectives, including oil immersion, and two eyepieces of highest optical efficiency; screw substage with Abbe condenser; large stage; crystal black, mar-proof finish.

Price - - \$67.50

In establishing a medical career one of the primary essentials is high grade and absolutely dependable equipment. In so equipping yourself you can make no mistake in relying upon

Bausch^{and} Lomb Apparatus

for your optical and allied requirements—including microscopes, microtomes, centrifuges, blood counting apparatus, bacteriological apparatus and other laboratory supplies. Backed by more than 60 years of scientific and productive experience and considered standard in America's leading medical colleges and hospitals.



B. & L. HAEMACYTOMETER—Made in America

Offered with Thoma, Turk, Bass, Zappert—Ewing and Zappert—Neubauer rulings—accuracy thoroughly tested and guaranteed.

Write for illustrated circulars

Bausch & Lomb Optical Co.

400 ST. PAUL STREET ROCHESTER, N.Y.

New York Washington Chicago San Francisco
Leading American Makers of High Grade Optical Products

R



—for diabetics

Recommended by Specialists



is a refined, leguminous flour—unadulterated and wholesome. Made in our own clean, sanitary factory.



is popular with specialists and with general practitioners as a proper food in cases of diabetes mellitus.



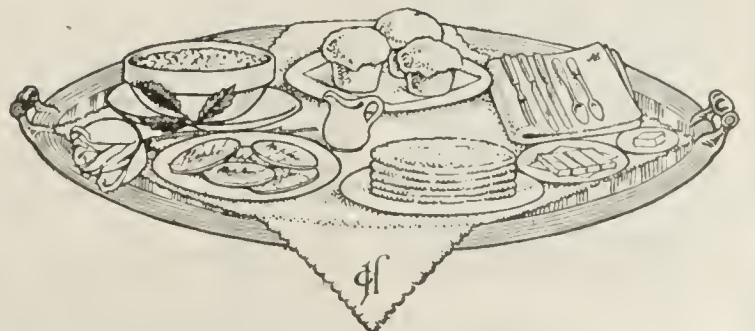
contains the ingredients for a well balanced nutritive diabetic food. The nutritive value of 500 gm. corresponds to approximately 2168 calories. It is the original Soya Bean Meal Hydro Process.



is economical. A \$3.75 can will feed one person eight weeks. Forty seven cents per week for a flour of high food value. Twelve Hepco gems cost \$0.27 to make; equal in food value to one dozen eggs. Free samples and analysis on request.

Waukesha Health Products Co.

1333 Grand Avenue, Waukesha, Wis.



FRAASS

WHENEVER YOU BUY
CONSULT FRAASS
CONDENSED
CATALOG

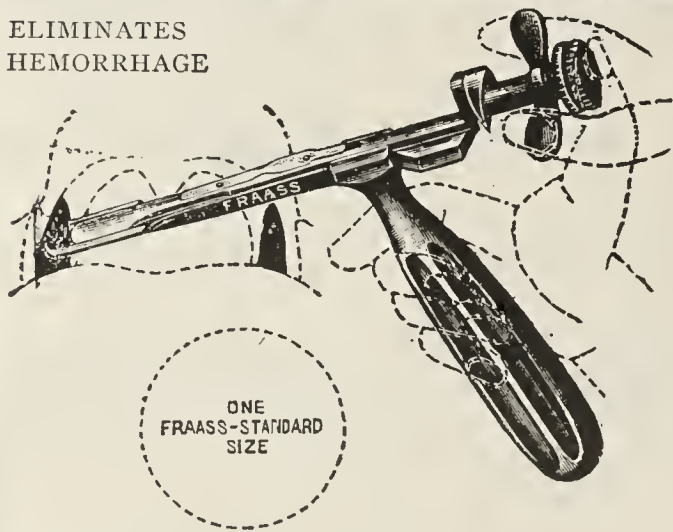
Demarest Sluder Tonsillectome

ONE-TURN PROPELLER-DOG TIGHTLY CLOSES DULL BLADE

EVERY USER ENTHUSIASTIC

The Instrument that makes THE SLUDER METHOD The Operation

ELIMINATES
HEMORRHAGE



MANUFACTURED AND GUARANTEED BY

AUG. E. FRAASS COMPANY, Incorporated

Highest Grade Eye-Ear-Nose-Throat Instrument Makers

1261 BROADWAY - NEW YORK

Marks an Epoch in the History of Artificial Limbs



MARKS' PATENTS of 1854 to 1912 cover all the accredited improvements in artificial legs and arms, and make the Marks' artificial limbs peerless. Rubber feet remove the jar and make the stump bearings easy. Rubber hands extend the limits of accommodations.

Light, Durable, Practical. Do not get out of order, are inexpensive to wear. Appreciated by over forty-eight thousand wearers and thousands of surgeons of prominence. Forty-nine highest awards granted by Industrial Expositions.

Appointed by U. S. Government, railroad companies, and other large corporations to furnish artificial limbs to pensioners and employees.

The Limits of the utility of Marks' artificial limbs are unbounded. Persons wearing them engage in every occupation and profession.

A conductor on an Eastern railroad wears an artificial arm with rubber hand. He holds tickets between his rubber finger and thumb while he punches them with his natural hand.

A telegraph operator uses a rubber hand in receiving and transmitting messages.

A signal man in the employ of a large railroad wears one artificial leg, and attends to his duties in an acceptable manner.

Send for Manual of Artificial Limbs. The book contains 384 pages, illustrated by 674 cuts, and a thousand testimonials. Instructions are given how to take measurements and obtain artificial limbs without leaving home.



A. A. MARKS

696 to 702 Broadway

NEW YORK, U. S. A.

NESTLÉ'S FOOD

does not call for the addition of raw cows' milk.

(a milk food in itself — not a milk modifier)

On the contrary, it requires merely the right amount of water and boiling for one minute to provide a germ-free and carefully balanced diet, adapted to nutritional needs of the growing child. Many physicians, therefore, have found that the use of Nestlé's Food is a dependable aid in the solution of the infant feeding problem, for it often enables them to avoid the bacterial dangers associated with the use of fresh cows' milk, and yet meet the nutritional requirements of the infant body.

There is a growing appreciation of the advantages of "the dry (concentrated milk) powder," which, when mothers' milk is not available—according to Forsythe, is the "safest and most convenient form of food for infant feeding." For nearly half a century Nestlé's Food has been recognized as one of the most serviceable and dependable preparations of its kind.

805 Call Building
San Francisco, Cal.

NESTLÉ'S FOOD COMPANY

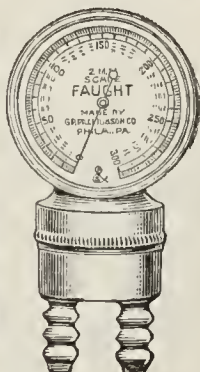
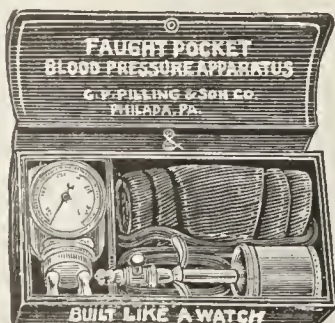
2507 Woolworth Bldg.
New York, N. Y.



Samples
on request

PILLING-FAUGHT Pocket Blood Pressure Apparatus

THE LATEST THOUGHT IN BLOOD PRESSURE



The Faught Pocket Apparatus

Not a Spring
Instrument

Built like a watch, can be carried in the pocket. Simple, accurate and easy to use. Always reliable. Adjusted in a moment. Just like taking a pulse. Price, complete, with arm band and inflating pump, in durable morocco case, including Faught's Primer.....\$22.50 net.

Signed certificate and a copy of Faught's Primer on blood pressure with every apparatus.

Made only by G. P. PILLING & SON COMPANY, PHILADELPHIA, PA.

The STORM BINDER and ABDOMINAL SUPPORTER

(PATENTED)



No Leather

No Whalebones

No Rubber Elastic

Washable

as

Underwear

Men, Women, Children and Babies

For Hernia, Relaxed Sacroiliac Articulations, Floating Kidney, High and Low Operations, Ptosis, Pregnancy, Obesity, Spasmodic Cough, etc.

Send for new folder and testimonials of physicians. General mail orders filled at Philadelphia only—within twenty-four hours.

KATHERINE L. STORM, M.D.

1541 Diamond Street,

Philadelphia

Diagnostic Instruments

Electrically Lighted Surgical Instruments stamped E. S. I. Co. are a great aid toward accurate diagnostic work.

We are originators and exclusive manufacturers of many of the most valuable diagnostic instruments known to the profession. They are designed by eminent physicians.



Battery

Holmes Naso-Pharyngoscope

Jackson Bronchoscopes and Laryngeal Specula

Tuttle and Lynch Procto-Sigmoidoscopes

Braasch Cystoscopes

Koch, Swinburne and Young Urethroscopes, etc.

For the convenience of the busy practitioner some of the most generally useful instruments have been assembled into a

General Diagnostic Outfit

This outfit weighs 4½ pounds and measures 3½x7x15 inches. All our instruments may be operated upon battery or by means of a socket current controller. It is compact and easily carried.

Illustrated and descriptive catalog sent on request. Be sure of exact name.

ELECTRO SURGICAL INSTRUMENT CO.
ROCHESTER, N. Y.



Dudley's Sterile Thermometer, no rubber valve, alcohol visible, alcohol proof markings, 1 min., patented case, \$1.50. Double case with mouth and recta thermometer, \$3.00. Thermometers alone 2 for \$1.50.

Dudley's Sterile Hypo, always sterile, ready for use. Case with ground glass Luer syringe, nickeloid needle, \$2.00. Platinum needles \$1.00 extra.

Send check or stamps. Money refunded if not entirely satisfactory. Agents Wanted. F. C. DUDLEY, M.D., 320 East 18th Street, BROOKLYN, N. Y.

Ask for "De Lyte Surgeon."
Insist on getting it.

"DE LYTE SURGEON"

Just what you want
ELECTRIC ILLUMINATING CASE
FOR EVERY PURPOSE AND USE

This is an ideal Complete Illuminating Case that is compact enough to carry in the vest pocket, that enables the physician to be prepared for every emergency where a good light is required, and an advantage in making his daily calls, i.e., to Examine and Treat the Throat, especially children; It saves time by using the non-gagable depressor.

For Examining and Treating Ear through the ear speculum, magnifying and illuminating the tympanic membranes. Examining the Nares through the nasal speculum, showing the turbinates and allowing packing under direct illumination.

This Magnifying Glass is excellent for illuminating and locating foreign bodies in the eye, also splinters or skin eruption; together with trans-illumination of the sinuses. Head-Band also for Obstetric Work or any Emergency Operation when both hands are required with no reflection of light in the eyes; doing away with the head mirror. This Complete Outfit with all attachments, including the Tongue Depressor, Ear Speculum, Nasal Speculum, Magnifying Glass, the new Arc Light Ever-ready Battery, Head-Band and Leather Case to carry them is Only \$6.00 prepaid; money refunded if not satisfied after 10 days' trial.

750 Eveready Batteries can be purchased anywhere. If your dealer offers "Something just as good" write to us first.

Made, Patented and Guaranteed by

WEDER SURGICAL MFG. CO.

4545 Germantown Ave.

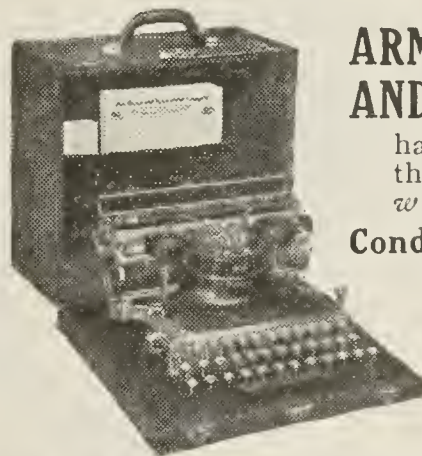
PHILADELPHIA, PA.

ARMY SURGEONS AND PHYSICIANS

have at hand now
their ideal of a
writing machine.

Condensed—Portable

11 Pounds
Unlimited Width of Paper.
Full Capacity.
Lightweight.
Small Compass.
Esthetic.



Multiplex Hammond

The Great Interchangeable-type Writing Machine

Two sets of type always in the machine,—“Just Turn the Knob.” It will do all that other machines can do AND IT STANDS ALONE in the special fields of writing endeavor.

⌘ β ∩ 3 3 & R

Surgeons, physicians, chemists, pharmacists, may have type sets representing fully their special characters and symbols; and on the same machine dainty small type for personal correspondence, both instantly brought into play. “Just Turn the Knob.”

ASK FOR SPECIAL PROFESSIONAL PROPOSITION
Monthly Payments Discounts for Cash

Catalogue gladly sent for the asking.

THE HAMMOND TYPEWRITER CO.
651 East 69th Street New York City, N.Y.

Tear off—Write name on margin

A Sterilizer With Four New Features

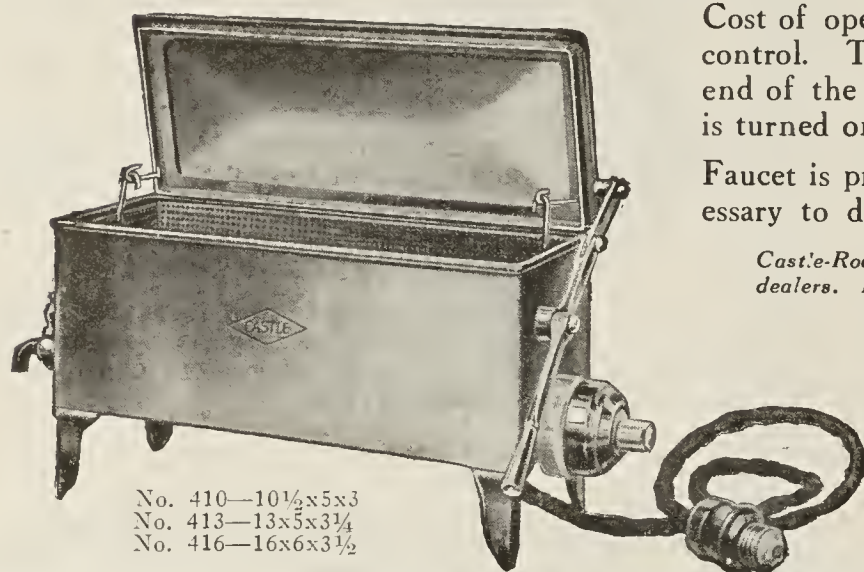
Push down on the cool lever—this opens the cover and lifts the instrument tray out of the boiling water. There are no more finger burns from steam and hot water.

The Castle automatic switch (patented) shuts off the current just before all the water is evaporated, so that you cannot overheat the Sterilizer or burn up your instruments.

Cost of operation is reduced to a minimum by a three heat control. The switch that controls the heat is right on the end of the sterilizer and has a dial that indicates which heat is turned on.

Faucet is provided to draw off the water and make it unnecessary to disconnect the sterilizer every time it is emptied.

Castle-Rochester Sterilizers are sold by the leading Surgical Instrument dealers. Information can be secured from your dealer or direct from us.



No. 410—10½x5x3
No. 413—13x5x3¼
No. 416—16x6x3½

Wilmot Castle Co.

805 St. Paul St., Rochester, N.Y., U.S.A.

Makers of the largest line of Sterilizers for Physicians, Laboratories, Hospitals and Dentists.



Carrel-Dakin Improved Apparatus Complete \$10.00. Less Stand, Flask, Syringe and No. 5 Instill Tube - \$4.25 With amber bottle add .50

Steel Punch for perforating tubing - \$2.00

Solution Powder, per box 1.25

Caldwell Paraffine Sprayer - 15.00

Pierce Paraffine Sprayer - 12.00

*Base Hospital Equipments
NURSES' OUTFITS, FOOD CARS, ETC.*

THE MAX WOCHER & SON CO.
Cincinnati, Ohio

EMCO Automobile OIL

Famous Bradford Crude petroleum refined by scientific methods in the world's largest independent refinery.

Sold by dealers generally, or shipped anywhere by the refinery under a Money-Back Guarantee.

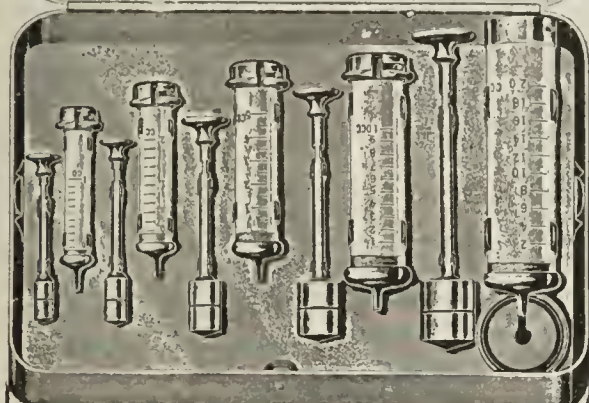
Prices and Samples on Request.



EMERY
MANUFACTURING
COMPANY
Bradford, Pa.

Real "RECORD" Syringes

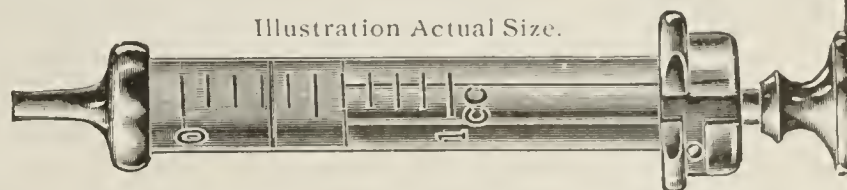
Made in U. S. A. by TAGLIABUE



CATALOG No. 1530
Complete Set of "Record" Syringes and Needles in Metal Case. List price, \$43.20

YOU BENEFIT YOURSELF, and you encourage American manufacture at the same time, when you *specify and secure* "TAG Real Record" on your Syringe Orders. Write for new price list of these Precision Syringes.

SPECIFY
(and Secure)
"TAG"
REAL RECORD



No. 1540, 1 c. c. Complete in metal case, with two needles.....\$3.75
No. 1510, 1 c. c. Syringe only..... 2.50

"TAG" SURGICAL SPECIALTIES

WRITE FOR SURGICAL CATALOGS Illustrating and describing Syringes for all purposes, Hypodermic Needles, Clinical Thermometers, Urinometers, the "TAG"-ROESCH and the "TAG"-SCHNEIDER Sphygmomanometers, and similar instruments of superior merit.

C. J. TAGLIABUE MFG. CO.

18-88 Thirty-Third Street, Brooklyn, New York City

THE removal of the tonsil is easily within the surgical skill of most physicians, the troubles that arise being due to hemorrhage, traumatism and injury to adjacent structures. Some of the techniques now in vogue are difficult to acquire and give satisfactory results only after long practice.

The perfect technique for general adoption must be one that is easily acquired, causes little if any hemorrhage, prevents injury to pillars, uvula and adjacent structures and assures a field clear of blood until the end of the operation.

Such an operation was described by invitation before the New York Academy of Medicine on March 28th of this year, and immediately attracted the attention of men throughout the country, because of the simple technique and the mildness of the reactions.

To those who are interested the official comprehensive reprint of this presentation will be mailed at once.

E. B. Meyrowitz
INCORPORATED

520 FIFTH AVENUE, NEW YORK

During Infancy and Childhood it is important but difficult to keep the bowels in order. It can be done by the judicious use of

Liquid Petrolatum Squibb

Heavy (Californian)

It is pure and safe, tasteless and odorless. Because it is neither a laxative, a cathartic, nor a purgative, but a perfect mechanical lubricant, is not absorbed by the system and does not disturb digestion, it may be given indefinitely in any necessary quantity. Thus it prevents intestinal toxæmia, restores normal action of the bowels, and aids in maintaining normal nutrition. Especially valuable for young patients during the summer and autumn months.

To be had at all drug stores in original one-pint packages under the Squibb label and guaranty.

LIQUID PETROLATUM SQUIBB, Heavy (Californian) is refined under our control and solely for us only by the Standard Oil Co. of California, which has no connection with any other Standard Oil Co.

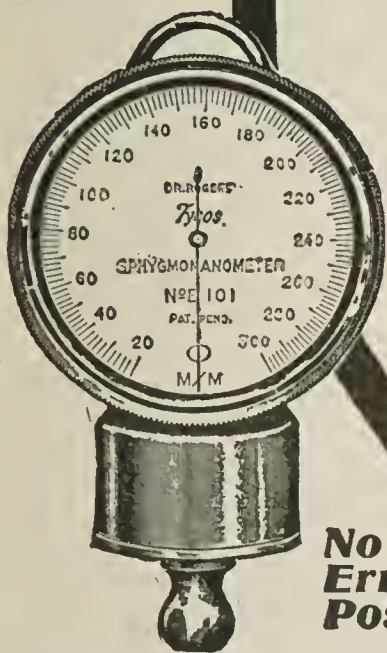
E. R. SQUIBB & SONS, NEW YORK

Manufacturing Chemists to the Medical Profession since 1858

ONLY
\$ 2.50
Needed to Place
Dr. ROGERS'
TYCOS
in Your
Office



**Proves
Its Own
Accuracy**



**No
Errors
Possible**

**\$25 the Lowest
Cash Price Elsewhere**

Every surgical instrument dealer in the U. S. must maintain the \$25 price for the genuine Dr. Rogers' Tycos even when sold for all cash with order. Besides giving you this lowest cash price we give you 9 months to pay.

No physician has a right to jeopardize his professional reputation by trusting to his physical senses in the matter of Blood Pressure when he can have this accurate, self-verifying Tycos Sphygmomanometer on these easy terms.

Free Booklet **Comprehensive Blood Pressure Manual**

Full of valuable information and advice. It explains thoroughly how to take Blood Pressure, so essential to the intelligent practice of medicine. This book included free with every instrument sold.

10 Days' Free Trial

Upon receipt of \$2.50 we will send you the complete Dr. Rogers Tycos Sphygmomanometer in a neat Morocco case, as easy to carry about as a pocket handkerchief. Use it ten days. Satisfy yourself that it is indeed all we claim for it. Should you, for any reason, not wish to keep it—return the outfit to us and we will cheerfully refund your money—no questions—no quibbling.

You take no risk at all. When you decide to keep the outfit simply remit us nine monthly payments of \$2.50 each and the Tycos becomes your property.

Let us have your "Sent-On-Approval" order today.

Genuine 1916 Latest Model ONLY
Self-Verifying Dr. Rogers
Tycos Sphygmomanometer \$25
\$2.50 Cash \$2.50 Each Month

Conceded to be an absolutely practical and satisfactory blood pressure instrument. Many physicians who, in college, were accustomed to the use of the "Mercury Blood Pressure" instrument find that, in their own practice, the Mercury instrument is entirely impracticable. Eventually progressive physicians will equip themselves with the Dr. Rogers Tycos. We are making it easy and convenient for you to do so now by offering it to you at its lowest cash price on terms of only \$2.50 with order and \$2.50 per month.

Our Iron Clad Guarantee We guarantee this Blood Pressure Instrument to be accurate—to be very simple to operate and we also guarantee it against all mechanical defects.

Self Verifying It is necessary that your Sphygmomanometer be correct every time it is used.

Glance at the illustration. You will notice that when not under pressure and perfectly balanced the hand rests exactly in the middle of the oval under this condition your reading will be correct. The movement of the accurately balanced hand directly over the wide spaces

between the engraved scale markings, enables the instant and accurate reading of pressure to the fraction of a millimeter.

Systolic and Diastolic Both systolic and diastolic pressures are registered with absolute accuracy.

Standardized Scale Scale graduated to 300 mm. and from exact center of oval zero it is individually standardized and a point marked on dial corresponding to each twenty (20) millimeters of chamber pressure. Each 20 mm. space is then accurately divided into ten engraved subdivisions representing a 2 mm. of pressure.

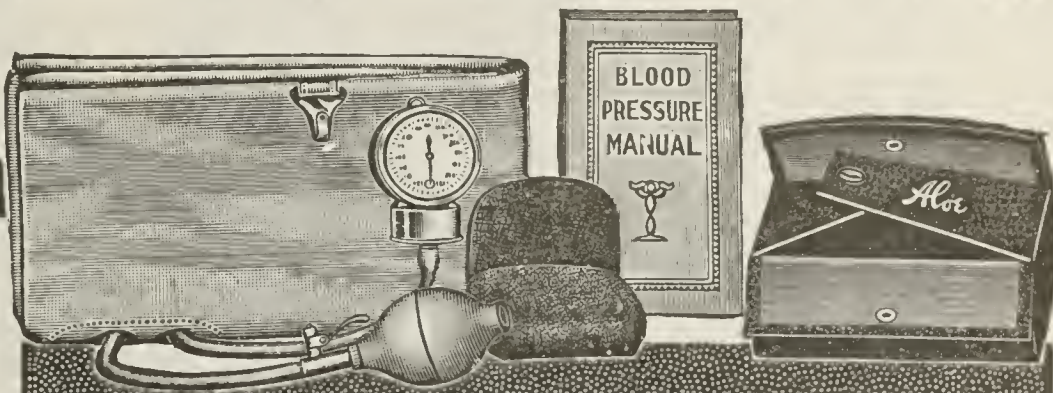
Sterilizable Sleeve The pressure bag can be easily removed so that the sleeve may be thoroughly sterilized. Instrument is unaffected by atmospheric or temperature changes.

Adaptability Easy to use; its great adaptability is shown if applied when a patient is in the midst of muscular excitement, such as convulsions, or during the exercise test to determine heart efficiency.

The Full Jeweled Movement is the same as in a high grade watch. It eliminates errors due to friction and oxidation of bearings and insures accuracy.

Specials We furnish the Tycos Sphygmomanometer complete with dial and felt case, bulb, adjustable sleeve, pressure bag, all in a fine, black genuine Morocco leather case.

A. S. ALOE CO., 515 Olive St., St. Louis, Mo.



Mail This Coupon Today

A. S. ALOE CO., Factory Distributors, 515 Olive St., St. Louis, Mo.

Enclosed please find \$2.50 as first payment on one Dr. Rogers' Tycos Sphygmomanometer as described in this advertisement. If I keep it I will pay \$2.50 a month until the total price of \$25 has been paid. If I return it within ten days it is understood that you refund the money I have paid.

Name

Street

City.....State

Stanolind

Trade Mark Reg. U. S. Pat. Off.

Liquid Paraffin

(Medium Heavy)

Tasteless — Odorless — Colorless

In Treating Hemorrhoids

STANOLIND Liquid Paraffin, used regularly, very generally relieves hemorrhoids and fissure, even when of some years' standing.

Since these morbid conditions are usually the result of constipation, and are aggravated by straining, Stanolind Liquid Paraffin aids by rendering the intestinal contents less adhesive, by allaying irritation and thus by permitting the diseased tissues to become healed.

Where a contraindication for operative treatment exists, the use of Stanolind Liquid Paraffin in these conditions will frequently give relief from distressing symptoms and may even permit the parts to be restored to a condition where operative procedure may be postponed.

The *special advantage* of Stanolind Liquid Paraffin lies in the fact that its beneficial effects are not diminished by continual use, as is the case with almost any other laxative.

Stanolind Liquid Paraffin acts by lubrication and by adding bulk to the indigestible intestinal residue.

A trial quantity with informative booklet will be sent on request.

Standard Oil Company

(Indiana)

72 West Adams Street
Chicago, U. S. A.





A Dependable Diet

Correctly balanced
Easily assimilated
Cleanly prepared



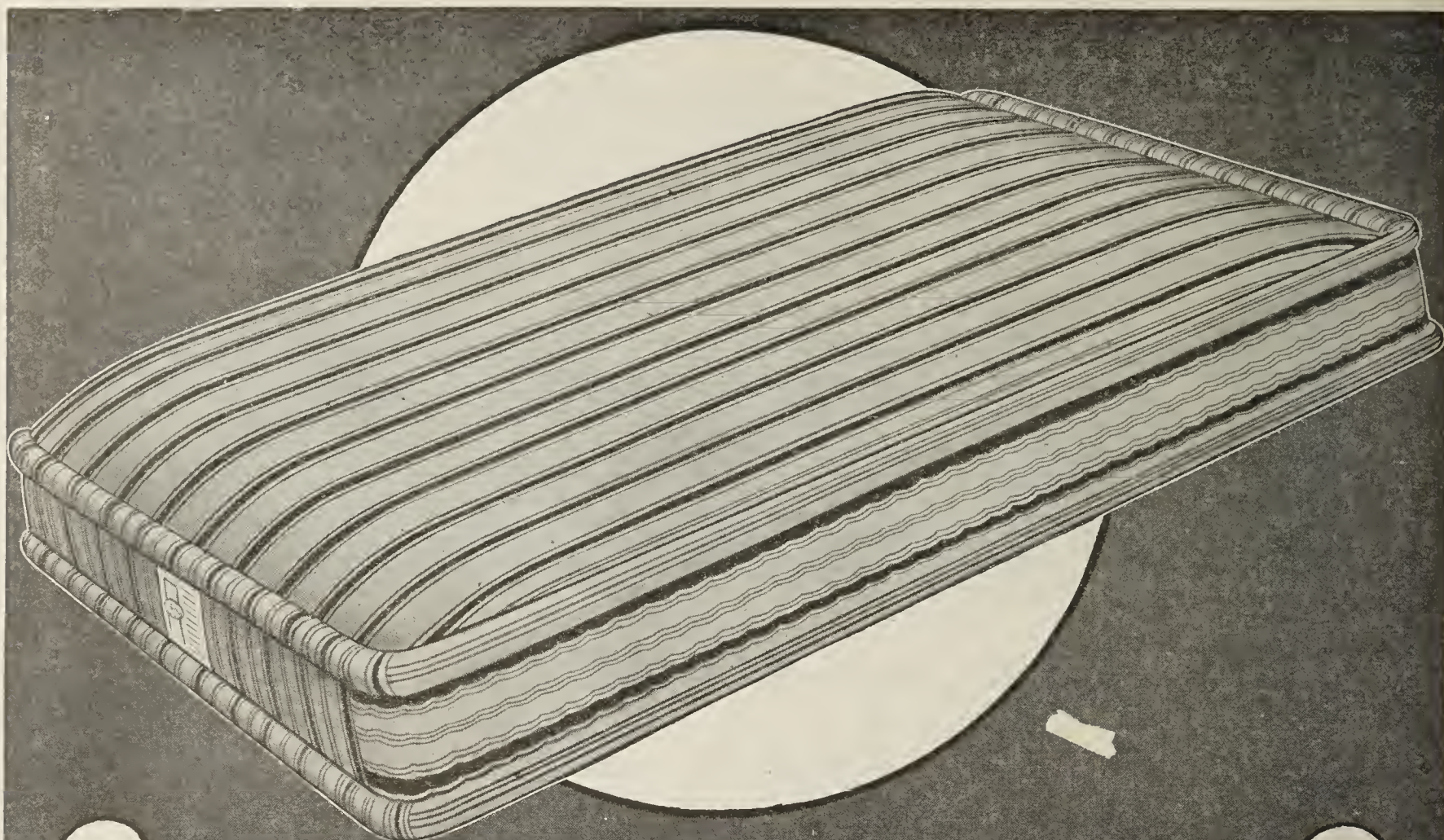
By priority — **The Original** — In flavor

Rich uniform milk
Choice wheat extract
Hardy barley malt

Horlick's Malted Milk Co.

Racine, Wis.





It Sterilizes Perfectly

For hospital beds there is no equal to this sanitary mattress. It is not only the most comfortable mattress made—but it is the only one known to us that can be sterilized without deterioration.

The **Sealy** Sanitary Tuftless Mattress

Guaranteed for twenty years against packing—spreading—bunching—or losing its buoyant resilience. Pays for itself many times over because it requires no remaking.

Comfortable—Sanitary

The Sealy is made from a single thick, fluffy bolt of pure long-fibre cotton, interwoven into one inseparable unit by our patented air-woven process. Contains no linters, felt, animal hair or other adulterants.

Easiest to keep clean because there are no leather tabs to catch dirt—no holes in top or bottom tick to permit entrance of foreign matter.

The Sealy Pillow—made by the same process and from the same materials—costs less and gives better service.

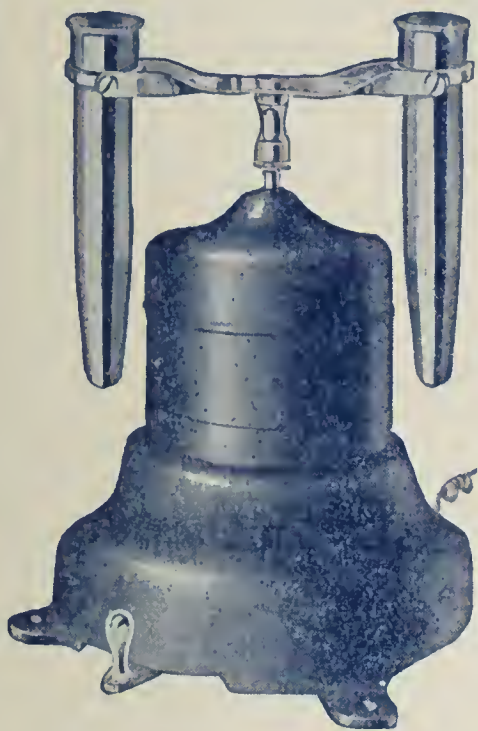
Get our prices from your local dealer or write us direct.

Sealy Mattress Co.

Sugar Land, Texas

Special Offer to Hospital Superintendents—We will gladly send you a Sealy Mattress for 60 nights free trial on your own bed. In no other way can you so thoroughly appreciate its wonderful comfort. Tell us the size of your bed.

Electric Centrifuge \$12.50



An unusually low price for a practical electric centrifuge. Never before sold for less than \$25.00.

Why use the old style hand centrifuge when for a little more you can secure this up-to-date and efficient electric centrifuge which will greatly simplify your work? This is the first time a practical electric centrifuge has been offered at anywhere near this price and we are able to make the price only by producing large quantities in the most efficient manner.

The new electric centrifuge is equipped with a Universal motor (for either direct or alternating current), mounted on heavy cast base which can be fastened to shelf or table. It is equipped with rheostat in base to control speed and comes complete with 2 alumi-

num tube holders, plain and graduated glass tubes, cord and socket. In actual use, with tubes filled, a speed of 1,800R.P.M. is secured on direct current, on alternating current 2,400R.P.M. We expect the demand to be exceptionally heavy on these instruments. Do not delay, but place your order at once.

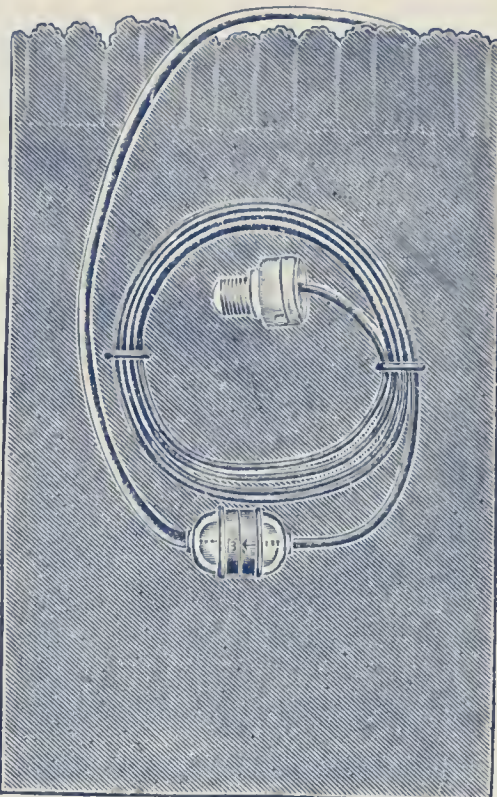
9W4215—Electric centrifuge with Universal motor \$12.50.

Electric Heating Pad, only \$4.50 —not \$7.00

Materials have advanced tremendously but we have been able to produce this high class pad in one size only, 8x12 inches, in enormous quantities so as to give our customers this special offer for a limited time.

The pad is a standard type, flexible, covered with Eiderdown and coming complete with silk cord and socket. This is a two heat pad, offering a range in temperature that will meet any condition. It is provided with two safety fuses which positively prevent overheating. It is only through making a single size pad in large quantities that we have been able to make this special price.

9W4670 — 8x12-inch Electric Heating pad, special price \$4.50.



FRANK S. BETZ COMPANY

HAMMOND, INDIANA

CHICAGO SALES DEPARTMENT: 30 EAST RANDOLPH STREET

THIGENOL

"ROCHE"



Thigenol "Roche"
does not cause permanent
stains on linen.

Price to Physicians

1oz. Vial.....\$.40

*same price
as
before the war.*

A SYNTHETIC SULPHUR COMPOUND,
UNVARYING IN COMPOSITION, ODORLESS
ON USE, ANTI-PRURITIC, NON-IRRITATING

THIGENOL "ROCHE"

is of therapeutic value in

DERMATOLOGY AND GYNECOLOGY

in Eczema, Acne
etc.

in Metritis, Vaginitis
etc.

Literature and information on request

THE HOFFMANN-LA ROCHE CHEMICAL WORKS

NEW YORK

CHANGE of PRICE

OF

Diphtheria Antitoxin

In future the price of Lederle's Diphtheria Antitoxin will be as follows:

Syringe package	1,000 units	\$.75
Syringe package	3,000 units	2.00
Syringe package	5,000 units	3.00
Syringe package	10,000 units	5.00

We solicit your cooperation in keeping down the cost of marketing biological products by reducing to a minimum the amount of your returns.

Lederle Antitoxin Laboratories

SCHIEFFELIN & CO., Selling Agents, New York.
Chicago, Marshall Field Annex Building.
Kansas City, Firestone Building.
St. Louis, Granite Building.
New Orleans, Maison Blanche Building.

Definite

Uncombined Remedies

WITH
LONG CLINICAL PROVING

The "H. W. & D." Products

BULGARA TABLETS

Bacillus Bulgaricus, Type "A."

LUTEIN TABLETS

Corpus Luteum of the Sow.

ENTERIC GLYCOTAURO

Purified Standardized Bile.

MERCURY SALICYLATE

Unique Suspension in Ampules.

Authorized Literature upon Request.

THE HYNSON, WESTCOTT & DUNNING

PHARMACEUTICAL LABORATORY

Baltimore

Maryland

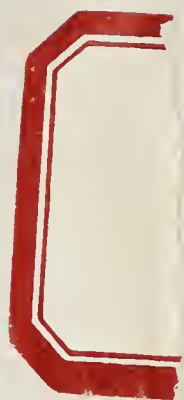
QUALITY IS OF FIRST IMPORTANCE

During the many years since we first solicited the medical profession to specify our laboratory products, it has been our constant aim to supply preparations of the highest attainable standard, that when specifying "WYETH," physicians may depend at all times on securing trustworthy products. It gratifies us to note that the medical profession generally have appreciated our determination, notwithstanding growing and aggressive competition, to maintain our reputation, long since established, for the reliability of our preparations. We have had a long and continued practical experience of more than fifty years during which time we have made it a point to surround ourselves with skillful chemists and pharmacists.

At this time, we desire again to assure our many friends in the medical profession of our purpose to supply products, skillfully prepared from carefully selected materials which have been accurately assayed and standardized in accordance with approved chemical and physiologic methods where such methods are known.

JOHN WYETH & BROTHER, Inc.,

PHILADELPHIA



UNIVERSITY OF ILLINOIS-URBANA



3 0112 001937124